

TEST REPORT

CERTIFICATE OF CONFORMITY

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

Report No.: FDCDVB-WTW-P22100074A

FCC ID: QYLAX211NG

Product: Notebook

Brand: Getac

Model No.: V110, V110G7, V110Y (Y= 10 characters, Y can be 0 to 9, A to Z, a to z, "/", "\", "-", "_" or blank for marketing purpose) (refer to item 3.1 for more details)

Received Date: 2022/10/25

Test Date: 2022/10/29 ~ 2022/10/30

Issued Date: 2023/1/11

Applicant: Getac Technology Corporation.

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

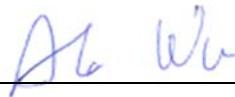
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FCC Registration /

Designation Number: 328930 / TW1050

Approved by: _____



Ace Wu / Project Engineer

, **Date:** _____

2023/1/11

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Prepared by : Polly Chien / Specialist

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Release Control Record

| Issue No. | Description | Date Issued |
|-----------------------|-------------------|-------------|
| FDCDVB-WTW-P22100074A | Original release. | 2023/1/11 |

1 Certificate

Product: Notebook

Brand: Getac

Model: V110, V110G7, V110Y (Y= 10 characters, Y can be 0 to 9, A to Z, a to z, "/", "\", "-", "_" or blank for marketing purpose) (refer to item 3.1 for more details)

Sample Status: Engineering sample

Applicant: Getac Technology Corporation.

Test Date: 2022/10/29 ~ 2022/10/30

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 -3.86 dB at 0.39400 MHz |
| FCC Part 15.109 | Radiated Emissions up to 1 GHz | Pass | Minimum passing Class B margin is -4.44 dB at 67.88 MHz |
| FCC Part 15.109 | Radiated Emissions above 1 GHz | Pass | Minimum passing Class B margin is -16.68 dB at 2848.83 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 | 2.99 dB | 3.4 dB (U_{cispr}) |
| Radiated Emissions up to 1 GHz | 30 MHz ~ 1 GHz | 4.72 dB | 6.3 dB (U_{cispr}) |
| Radiated Emissions above 1 GHz | 1 GHz ~ 6 GHz | 4.97 dB | 5.2 dB (U_{cispr}) |
| | 6 GHz ~ 18 GHz | 4.79 dB | 5.5 dB (U_{cispr}) |
| | 18 GHz ~ 40 GHz | 4.67 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 | Notebook |
| Brand | Getac |
| Model | V110, V110G7, V110Y (Y= 10 characters, Y can be 0 to 9, A to Z, a to z, "/", "\", "-", "_" or blank for marketing purpose) |
| Model Difference | Refer to note |
| Sample Status | Engineering sample |
| Operating Software | Windows 11 |
| Power Supply Rating | Refer to note |
| Accessory Device | Refer to note |
| Data Cable Supplied | NA |

Note:

1. This report is issued as a duplicate report to the original BV CPS report no.: FDCDVB-WTW-P22100074. The differences compared with original report are removing related data of SKU 4 & SKU 5 & SKU 6. Due to no effect on any test item and we didn't re-test.
2. All models are listed as below.

| Brand | Model | Difference |
|-------|--|-------------------|
| Getac | V110 | marketing purpose |
| | V110G7 | |
| | V110Y (Y= 10 characters, Y can be 0 to 9, A to Z, a to z, "/", "\", "-", "_" or blank for marketing purpose) | |

3. The EUT uses following accessories.

| | |
|--------------|---|
| Battery 1 | |
| Brand | Getac |
| Model | BP3S1P2100-S |
| Power Rating | Rating: 11.1Vdc, 2040mAh, 23Wh Typical name: 2100mAh, 24Wh |

| | |
|--------------|-----------------------------|
| Adapter 1 | |
| Brand | FSP |
| Model | FSP065-RBBN3 |
| Input Power | 100-240Vac, 50-60 Hz, 1.5 A |
| Output Power | 19.0Vdc, 3.42A |
| Power Line | 1.5m, with one core |

| | |
|--------------|--------------------------------|
| Adapter 2 | |
| Brand | Getac |
| Model | MTA190474W4 |
| Input Power | 100-240 Vac, 50-60Hz Hz, 1.6 A |
| Output Power | 19.0Vdc, 4.74A |
| Power Line | 1.55m, with two cores |

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 5800MHz, provided by Getac Technology Corporation., 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 Getac Technology Corporation., for detailed feature description, please refer to the manufacturer's specifications or user's manual.

EUT has been pre-tested under following configurations.

| Part | Brand | Model | Specification | Configuration | | |
|------------------|-----------|-------------|---------------------|---------------|-------|-------|
| | | | | SKU 1 | SKU 2 | SKU 3 |
| CPU | Intel | Alder Lake | i5-1235U (Non Vpro) | V | | V |
| | | | i7-1265U (Vpro) | | V | |
| DDR | Kingston | --- | 16GB (8GB+8GB) | V | | |
| | | --- | 32GB (16GB+16GB) | | V | |
| | | --- | 64GB (32GB+32GB) | | | V |
| SSD | SSSTC | --- | 256GB | V | | |
| | | --- | 512GB | | V | |
| | | --- | 1TB | | | V |
| LCD Panel | AUO | G116HAN01 | 11.6" | V | V | V |
| Touchscreen | Getac | --- | --- | V | V | V |
| Finger Print | Egistec | --- | --- | V | V | V |
| WLAN Module | Intel | AX211NGW | --- | V | V | V |
| GPS | GlobalSat | MC1010G | --- | V | V | V |
| RFID Module | NXP | PN-7462 | --- | | V | V |
| Digitizer Module | Getac | EMR116-UA00 | --- | | V | V |
| Bottom Camera | FOXLINK | FN80AF-443H | --- | V | V | V |
| | Chicony | CKAM816 | --- | V | V | V |
| Camera | FOXLINK | FN20FF-679H | --- | V | V | V |
| IR Camera | FOXLINK | FN23FF-678H | --- | | V | V |
| Option Bay | Honeywell | N6703 | Barcode | V | | V |
| | Getac | --- | SD Card reader | | V | |
| | Getac | --- | Smart Card | | V | |

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 | Conducted Emissions from Power Ports |
| 1 | EUT (SKU 1) + laptop mode + front camera + "H" pattern + bt Link + wifi 2.4g link + GPS link + HDMI link monitor (3840*2160) + USB-A HDD r/w + USB-C HDD r/w + COM link modem + earphone + barcode scan + lan 1Gbps link + finger printer + touch pen + adapter 1 |
| 2 | EUT (SKU 2) + laptop mode + bottom Camera + "H" pattern + bt Link + wifi 5g link + GPS link + RFID link + HDMI link monitor (3840*2160) + USB-A HDD r/w + USB-C link monitor (3840*2160) + COM link modem + earphone + sd card r/w + IC card r/w + lan 1Gbps link + finger printer + touch pen + adapter 2 |
| 3 | EUT (SKU 3) + table mode + front camera + "H" pattern + bt Link + wifi 6e link + GPS link + RFID link + HDMI link monitor (3840*2160) + USB-A HDD r/w + USB-C with USB-C adapter + COM link modem + earphone + barcode scan + lan 1Gbps link + finger printer + touch pen |

Notes:

1. There are both AC 240V/60Hz and AC 120V/60Hz to be pre-tested then AC 120V/60Hz has the highest emission value.
2. The worst case is that mode 1 is shown in bold.

| Test Condition | |
|----------------|--|
| Mode | Radiated Emissions up to 1 GHz |
| 1 | EUT (SKU 1) + laptop mode + front camera + "H" pattern + bt Link + wifi 2.4g link + GPS link + HDMI link monitor (3840*2160) + USB-A HDD r/w + USB-C HDD r/w + COM link modem + earphone + barcode scan + lan 1Gbps link + finger printer + touch pen + adapter 1 |
| 2 | EUT (SKU 2) + laptop mode + bottom Camera + "H" pattern + bt Link + wifi 5g link + GPS link + RFID link + HDMI link monitor (3840*2160) + USB-A HDD r/w + USB-C link monitor (3840*2160) + COM link modem + earphone + sd card r/w + IC card r/w + lan 1Gbps link + finger printer + touch pen + adapter 2 |
| 3 | EUT (SKU 3) + table mode + front camera + "H" pattern + bt Link + wifi 6e link + GPS link + RFID link + HDMI link monitor (3840*2160) + USB-A HDD r/w + USB-C with USB-C adapter + COM link modem + earphone + barcode scan + lan 1Gbps link + finger printer + touch pen |
| 4 | EUT (SKU 1) + laptop mode + front camera + "H" pattern + bt Link + wifi 2.4g link + GPS link + HDMI link monitor (3840*2160) + USB-A HDD r/w + USB-C HDD r/w + COM link modem + earphone + barcode scan + lan 1Gbps link + finger printer + touch pen |

Notes:

1. There are both AC 240V/60Hz and AC 120V/60Hz to be pre-tested then AC 120V/60Hz has the highest emission value.
2. The worst case is that mode 1 is shown in bold.

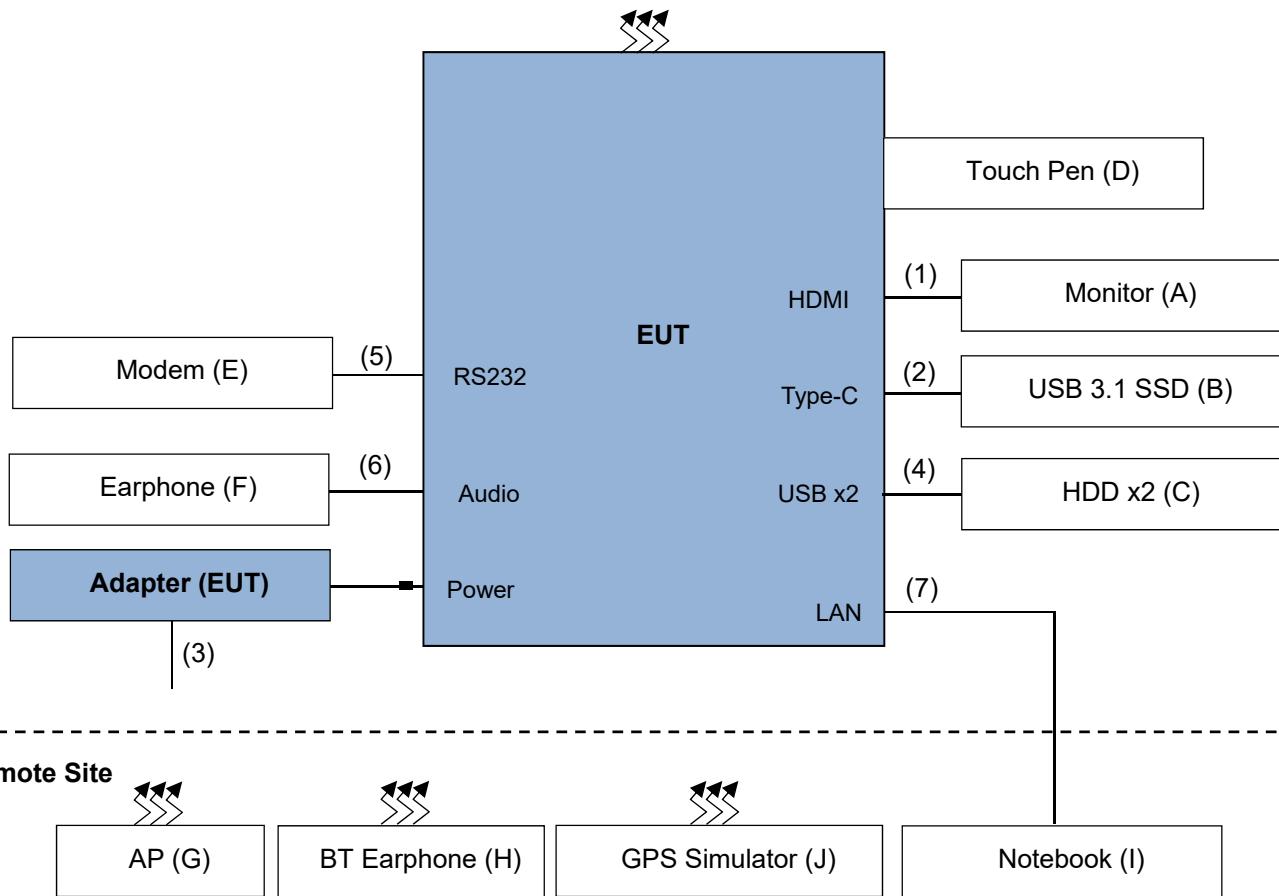
Test modes are presented in the report as below.

| Test Condition | |
|----------------|---|
| Mode | Conducted Emissions from Power Ports |
| - | EUT (SKU 1) + laptop mode + front camera + "H" pattern + bt Link + wifi 2.4g link + GPS link + HDMI link monitor (3840*2160) + USB-A HDD r/w + USB-C HDD r/w + COM link modem + earphone + barcode scan + lan 1Gbps link + finger printer + touch pen + adapter 1 |
| Mode | Radiated Emissions up to 1 GHz |
| - | EUT (SKU 1) + laptop mode + front camera + "H" pattern + bt Link + wifi 2.4g link + GPS link + HDMI link monitor (3840*2160) + USB-A HDD r/w + USB-C HDD r/w + COM link modem + earphone + barcode scan + lan 1Gbps link + finger printer + touch pen + adapter 1 |
| Mode | Radiated Emissions above 1 GHz |
| - | EUT (SKU 1) + laptop mode + front camera + "H" pattern + bt Link + wifi 2.4g link + GPS link + HDMI link monitor (3840*2160) + USB-A HDD r/w + USB-C HDD r/w + COM link modem + earphone + barcode scan + lan 1Gbps link + finger printer + touch pen + adapter 1 |

3.5 Test Program Used and Operation Descriptions

- a. The EUT was charged from adapter.
- b. The EUT linked with BT earphone via BT function.
- c. The barcode, camera and GPS function were activated.
- d. The EUT read and wrote data with HDDs and USB 3.1 SSD via USB Cable.
- e. The EUT sent "H" pattern to the monitor via HDMI cable, and monitor displayed them.
- f. The EUT sent audio signal to earphone.
- g. The EUT communicated data with the Notebook and AP, which acted as communication partners, via LAN and WLAN function.

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 | Monitor | ASUS | MX27U | J3LMRS000059 | FCC DoC Approved | - |
| B | USB 3.1 SSD | Transcend | ESD370C | G88779-0016 | FCC DoC Approved | - |
| C | HDD x2 | Transcend | 25M3 | G02688-0207 | N/A | - |
| | | | | G02688-0210 | N/A | - |
| D | Touch Pen | N/A | N/A | N/A | N/A | Supplied by applicant |
| E | Modem | ACEEX | 1414V/3 | 401008255 | IFAXDM1414 | - |
| F | Earphone | Apple | MB770FE/B | N/A | N/A | - |
| G | AP | D-LINK | DIR-815 | PVK21B5000399 | KA21R815A1 | - |
| H | BT Earphone | ELECOM | LBT-MPHS400 | N/A | N/A | - |
| I | Notebook | DELL | Latitude 5420 | C6F33F3 | FCC DoC Approved | - |
| J | GPS simulator | PENDULUM | GSG-54 | 191121 | N/A | - |

Note:

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

| ID | Cable Descriptions | Qty. | Length (m) | Shielding (Yes/No) | Cores (Qty.) | Remarks |
|----|--------------------|------|------------|--------------------|--------------|---|
| 1 | HDMI Cable | 1 | 2 | Yes | 0 | HDMI 2.0 (Brand: Amber, Model: HDMI-AA120) |
| 2 | USB-C Cable | 1 | 0.5 | Yes | 0 | - |
| 3 | Power Cable | 1 | 1.8 | No | 0 | Supplied by applicant |
| 4 | USB Cable | 2 | 0.5 | Yes | 0 | - |
| 5 | RS232 Cable | 1 | 1.2 | Yes | 0 | - |
| 6 | Audio Cable | 1 | 1.2 | Yes | 0 | - |
| 7 | LAN Cable | 1 | 10 | No | 0 | RJ45 Cat.5e, 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 |
|--|---------------------|----------------|--------------------|---------------------|
| DC-LISN SCHWARZBECK MESS-ELETTRONIK | NNBM 8126G | 8126G-069 | 2021/11/10 | 2022/11/9 |
| LISN R&S | ESH3-Z5 | 100311 | 2022/9/12 | 2023/9/11 |
| LISN ROHDE & SCHWARZ | ENV216 | 101826 | 2022/3/14 | 2023/3/13 |
| RF Coaxial Cable WOKEN | 5D-FB | Cable-cond1-01 | 2022/1/15 | 2023/1/14 |
| Software BVADT | BVADT_Cond_V7.3.7.4 | N/A | N/A | N/A |
| Test Receiver Rohde&Schwarz | ESCI | 100613 | 2021/12/3 | 2022/12/2 |
| V-LISN Schwarzbeck | NNBL 8226-2 | 8226-142 | 2022/8/31 | 2023/8/30 |

Notes:

1. The test was performed in HY - Conduction 1.
2. The VCCI Site Registration No. is C-12040.
3. Tested Date: 2022/10/30

4.2 Radiated Emissions up to 1 GHz

| Description Manufacturer | Model No. | Serial No. | Calibrated Date | Calibrated Until |
|------------------------------|-----------------------------|-------------------|--------------------|---------------------|
| Antenna Tower (H) | MFA-440 | 970705 | N/A | N/A |
| Antenna Tower (V) | MFA-440 | 9707 | N/A | N/A |
| Bi_Log Antenna Schwarbeck | VULB9168 | 9168-151 | 2022/10/24 | 2023/10/23 |
| | | 9168-154 | 2022/10/20 | 2023/10/19 |
| Controller (H) | MF7802 | 08093 | N/A | N/A |
| Controller (V) | MF7802 | 074 | N/A | N/A |
| Pre_Amplifier Sonoma | 310N | 352923 | 2022/5/14 | 2023/5/13 |
| | | 352924 | 2022/5/14 | 2023/5/13 |
| RF Coaxial Cable TIMES | LMR-600(11.8M)+LMR-400 (7M) | CABLE-CH1(HOR)-01 | 2022/9/3 | 2023/9/2 |
| | LMR-600(18M)+LMR-400 (7M) | CABLE-CH1(VER)-01 | 2022/9/3 | 2023/9/2 |
| Software | ADT_Radiated_V8.7.08 | N/A | N/A | N/A |
| Test Receiver ESR7 R&S | ESR | 101240 | 2021/11/3 | 2022/11/2 |
| | | 101264 | 2022/4/11 | 2023/4/10 |
| Turn Table | DS430 | 50303 | N/A | N/A |

Notes:

1. The test was performed in HY - 10M Chamber. The test site validated date: 2022/8/6 (NSA)
2. The VCCI Site Registration No. is R-11893.
3. Tested Date: 2022/10/29

4.3 Radiated Emissions above 1 GHz

| Description Manufacturer | Model No. | Serial No. | Calibrated Date | Calibrated Until |
|--|---------------------------------------|---------------------------------|--------------------|---------------------|
| Antenna Tower BVADT | AT100 | AT93021702 | N/A | N/A |
| Attenuator Mini-Circuits | BW-K3-2W44+ | PAD-CH3-04 | 2022/7/9 | 2023/7/8 |
| | BW-N4W5+ | PAD-CH3-03 | 2022/7/9 | 2023/7/8 |
| BandPass Filter MICRO-TRONICS | BRM17690-01 | 002 | 2022/9/3 | 2023/9/2 |
| | BRM50716-01 | G010 | 2022/9/3 | 2023/9/2 |
| Boresight antenna tower fixture BV | BAF-02 | 3 | N/A | N/A |
| Controller BVADT | SC100 | SC93021702 | N/A | N/A |
| Horn Antenna Schwarzbeck | BBHA 9120 D | 209 | 2021/11/14 | 2022/11/13 |
| | BBHA 9170 | 148 | 2021/11/14 | 2022/11/13 |
| N9030B - PXA Signal Analyzer KEYSIGHT | N9030B | MY60070562 | 2022/1/6 | 2023/1/5 |
| Pre_Amplifier Agilent | 8449B | 3008A02465 | 2022/3/19 | 2023/3/18 |
| Pre_Amplifier EMCI | EMC184045SE | 980856 | 2021/11/22 | 2022/11/21 |
| RF Coaxial Cable EMCI | EMC102-KM-KM-1000 | 200311 | 2022/7/9 | 2023/7/8 |
| | EMC102-KM-KM-3000 | 200313 | 2022/7/9 | 2023/7/8 |
| RF Coaxial Cable HUBER+SUHNER&EMCI | SUCOFLEX 104&EMC104-SM-SM- 8000 | Cable-CH3- 03(309224+170907) | 2022/7/9 | 2023/7/8 |
| Software BVADT | ADT_Radiated_V8.7.08 | N/A | N/A | N/A |
| Turn Table BVADT | TT100 | TT93021702 | N/A | N/A |

Notes:

1. The test was performed in HY - 966 Chamber 2. The test site validated date: 2022/5/21 (VSWR)
2. The VCCI Site Registration No. is G-20126.
3. Tested Date: 2022/10/29

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, Class A | FCC 15B, Class B | CISPR 22, Class A | CISPR 22, Class B | | |
| 30-88 | 39.1 | 29.5 | 40 | 30 | | |
| 88-216 | 43.5 | 33.1 | | | | |
| 216-230 | 46.4 | 35.6 | | | | |
| 230-960 | | | | | | |
| 960-1000 | 49.5 | 43.5 | 47 | 37 | | |

| Radiated Emissions Limits at 3 meters (dB μ V/m) | | | | | | |
|--|------------------|------------------|-------------------|-------------------|--|--|
| Frequencies (MHz) | FCC 15B, Class A | FCC 15B, Class B | CISPR 22, Class A | CISPR 22, Class B | | |
| 30-88 | 49.5 | 40.0 | 50.5 | 40.5 | | |
| 88-216 | 54.0 | 43.5 | | | | |
| 216-230 | 56.9 | 46.0 | | | | |
| 230-960 | | | | | | |
| 960-1000 | 60.0 | 54.0 | 57.5 | 47.5 | | |

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 μ V/m) | | |
|--|---------------------|---------------------|
| Frequency range | Class A | Class B |
| Above 1GHz | Avg: 60 Peak: 80 | Avg: 54 Peak: 74 |

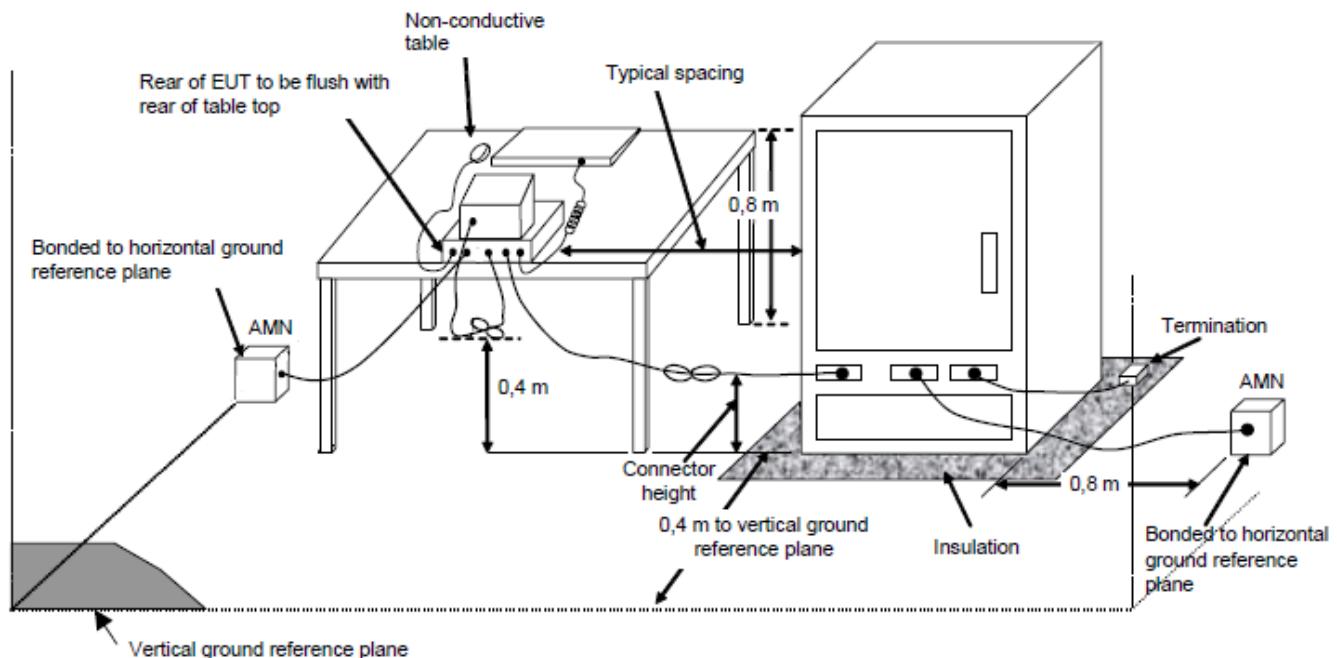
Notes: 1. These limit levels apply for a measurement distance of 3 m. If using a different measurement distance, the measured levels shall be extrapolated to the 3 m limit distance using a factor of 20 dB per decade of distance. The measurement distance shall place the measurement antenna in the far 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 insulation table; for 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.

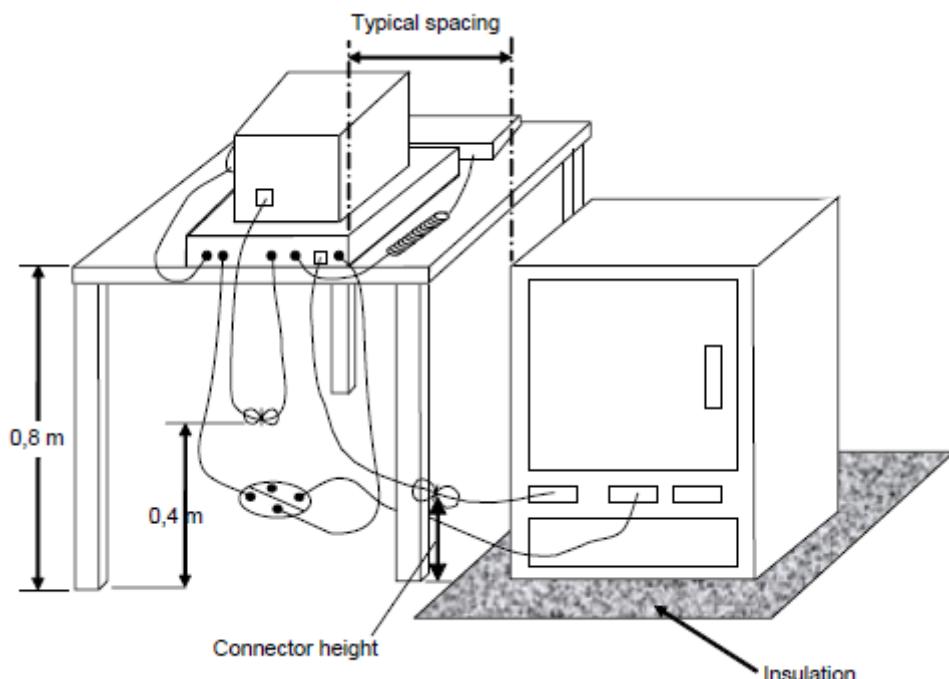


For the actual test configuration, please refer to the related Item – Photographs of the Test Configuration.

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 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 10 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.

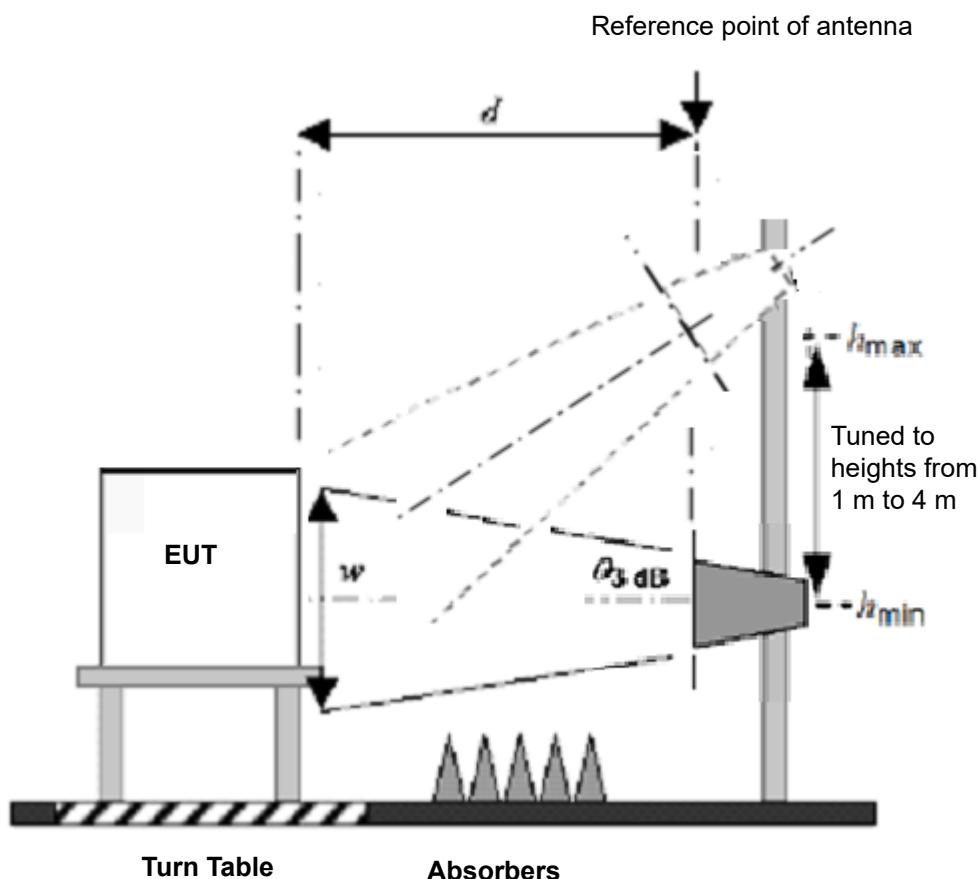


For the actual test configuration, please refer to the related Item – Photographs of the Test Configuration.

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 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 1 GHz to 18 GHz and $d = 1.5$ meters for 18 GHz to 30 GHz 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

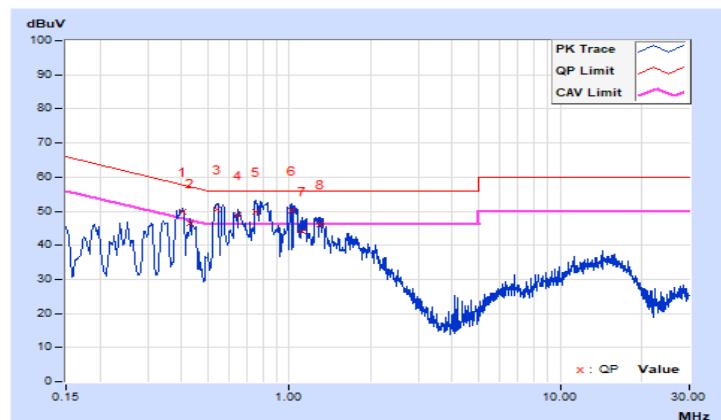
7.1 Conducted Emissions from Power Ports

| | | | |
|-----------------|------------------|--|--------------------------------------|
| Frequency Range | 150 kHz ~ 30 MHz | Detector Function & Resolution Bandwidth | Quasi-Peak (QP) / Average (AV), 9kHz |
| Input Power | 120 Vac, 60 Hz | Environmental Conditions | 23°C, 71% RH |
| Tested by | Slash Huang | | |

| 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 | 0.40600 | 9.69 | 40.13 | 29.36 | 49.82 | 39.05 | 57.73 | 47.73 | -7.91 | -8.68 |
| 2 | 0.43000 | 9.69 | 36.74 | 28.01 | 46.43 | 37.70 | 57.25 | 47.25 | -10.82 | -9.55 |
| 3 | 0.54257 | 9.69 | 40.83 | 32.29 | 50.52 | 41.98 | 56.00 | 46.00 | -5.48 | -4.02 |
| 4 | 0.64600 | 9.69 | 38.98 | 29.02 | 48.67 | 38.71 | 56.00 | 46.00 | -7.33 | -7.29 |
| 5 | 0.75000 | 9.70 | 40.06 | 27.70 | 49.76 | 37.40 | 56.00 | 46.00 | -6.24 | -8.60 |
| 6 | 1.01800 | 9.70 | 40.34 | 28.22 | 50.04 | 37.92 | 56.00 | 46.00 | -5.96 | -8.08 |
| 7 | 1.11400 | 9.70 | 34.39 | 26.43 | 44.09 | 36.13 | 56.00 | 46.00 | -11.91 | -9.87 |
| 8 | 1.29400 | 9.71 | 36.31 | 25.22 | 46.02 | 34.93 | 56.00 | 46.00 | -9.98 | -11.07 |

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

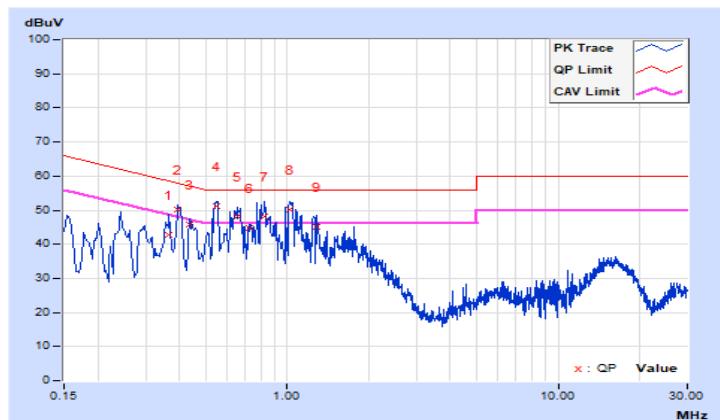


| | | | |
|-----------------|------------------|--|--------------------------------------|
| Frequency Range | 150 kHz ~ 30 MHz | Detector Function & Resolution Bandwidth | Quasi-Peak (QP) / Average (AV), 9kHz |
| Input Power | 120 Vac, 60 Hz | Environmental Conditions | 23°C, 71% RH |
| Tested by | Slash Huang | | |

| 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 | 0.36600 | 9.68 | 32.94 | 20.84 | 42.62 | 30.52 | 58.59 | 48.59 | -15.97 | -18.07 |
| 2 | 0.39400 | 9.69 | 40.39 | 34.43 | 50.08 | 44.12 | 57.98 | 47.98 | -7.90 | -3.86 |
| 3 | 0.43400 | 9.69 | 36.18 | 26.81 | 45.87 | 36.50 | 57.18 | 47.18 | -11.31 | -10.68 |
| 4 | 0.54544 | 9.69 | 41.37 | 32.25 | 51.06 | 41.94 | 56.00 | 46.00 | -4.94 | -4.06 |
| 5 | 0.65800 | 9.69 | 38.36 | 28.41 | 48.05 | 38.10 | 56.00 | 46.00 | -7.95 | -7.90 |
| 6 | 0.72880 | 9.70 | 35.04 | 25.10 | 44.74 | 34.80 | 56.00 | 46.00 | -11.26 | -11.20 |
| 7 | 0.82200 | 9.70 | 38.56 | 26.96 | 48.26 | 36.66 | 56.00 | 46.00 | -7.74 | -9.34 |
| 8 | 1.01800 | 9.70 | 40.58 | 30.15 | 50.28 | 39.85 | 56.00 | 46.00 | -5.72 | -6.15 |
| 9 | 1.28600 | 9.71 | 35.24 | 24.51 | 44.95 | 34.22 | 56.00 | 46.00 | -11.05 | -11.78 |

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



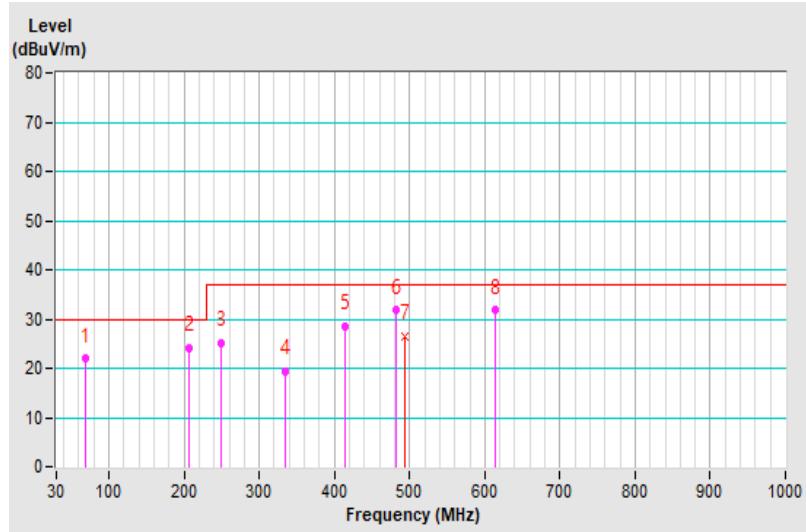
7.2 Radiated Emissions up to 1 GHz

| | | | |
|-----------------|----------------|--|--------------------------|
| Frequency Range | 30 MHz ~ 1 GHz | Detector Function & Resolution Bandwidth | Quasi-Peak (QP), 120 kHz |
| Tested By | Rolan Zheng | Environmental Conditions | 21°C, 65% RH |

| Antenna Polarity & Test Distance : Horizontal at 10 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 | 69.53 | 21.88 QP | 30.00 | -8.12 | 3.00 H | 125 | 37.73 | -15.85 |
| 2 | 207.32 | 24.11 QP | 30.00 | -5.89 | 3.50 H | 146 | 41.27 | -17.16 |
| 3 | 248.26 | 25.14 QP | 37.00 | -11.86 | 4.00 H | 86 | 40.10 | -14.96 |
| 4 | 333.96 | 19.38 QP | 37.00 | -17.62 | 4.00 H | 62 | 31.47 | -12.09 |
| 5 | 413.22 | 28.44 QP | 37.00 | -8.56 | 2.50 H | 69 | 38.45 | -10.01 |
| 6 | 482.19 | 31.77 QP | 37.00 | -5.23 | 2.00 H | 68 | 40.20 | -8.43 |
| 7 | 494.54 | 26.55 QP | 37.00 | -10.45 | 2.00 H | 49 | 34.72 | -8.17 |
| 8 | 614.60 | 31.76 QP | 37.00 | -5.24 | 1.50 H | 115 | 37.15 | -5.39 |

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

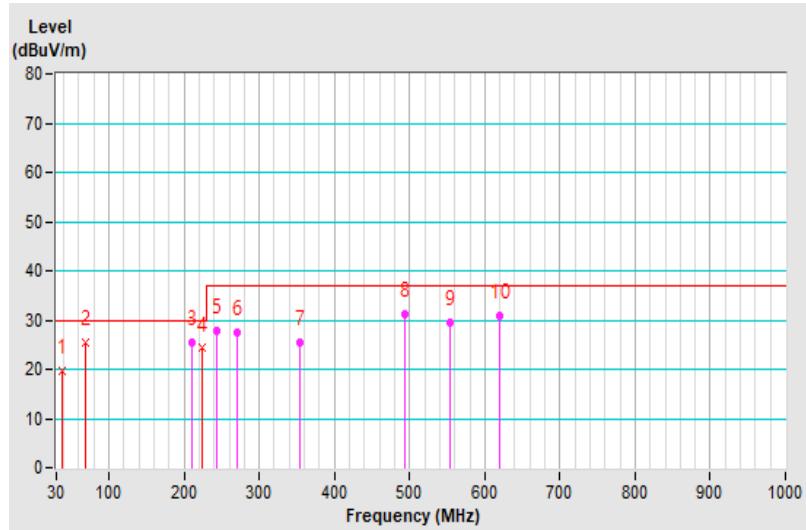


| | | | |
|-----------------|----------------|--|--------------------------|
| Frequency Range | 30 MHz ~ 1 GHz | Detector Function & Resolution Bandwidth | Quasi-Peak (QP), 120 kHz |
| Tested By | Rolan Zheng | Environmental Conditions | 21°C, 65% RH |

| Antenna Polarity & Test Distance : Vertical at 10 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 | 37.59 | 19.81 QP | 30.00 | -10.19 | 2.00 V | 285 | 33.40 | -13.59 |
| 2 | 67.88 | 25.56 QP | 30.00 | -4.44 | 1.00 V | 53 | 40.03 | -14.47 |
| 3 | 210.28 | 25.53 QP | 30.00 | -4.47 | 1.50 V | 77 | 41.21 | -15.68 |
| 4 | 224.67 | 24.27 QP | 30.00 | -5.73 | 1.50 V | 315 | 39.97 | -15.70 |
| 5 | 243.99 | 27.84 QP | 37.00 | -9.16 | 1.00 V | 166 | 41.79 | -13.95 |
| 6 | 271.30 | 27.55 QP | 37.00 | -9.45 | 1.00 V | 168 | 40.22 | -12.67 |
| 7 | 353.03 | 25.50 QP | 37.00 | -11.50 | 4.00 V | 150 | 36.02 | -10.52 |
| 8 | 494.60 | 31.24 QP | 37.00 | -5.76 | 2.50 V | 324 | 38.38 | -7.14 |
| 9 | 554.07 | 29.63 QP | 37.00 | -7.37 | 3.00 V | 212 | 35.72 | -6.09 |
| 10 | 619.60 | 30.80 QP | 37.00 | -6.20 | 3.00 V | 305 | 35.23 | -4.43 |

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



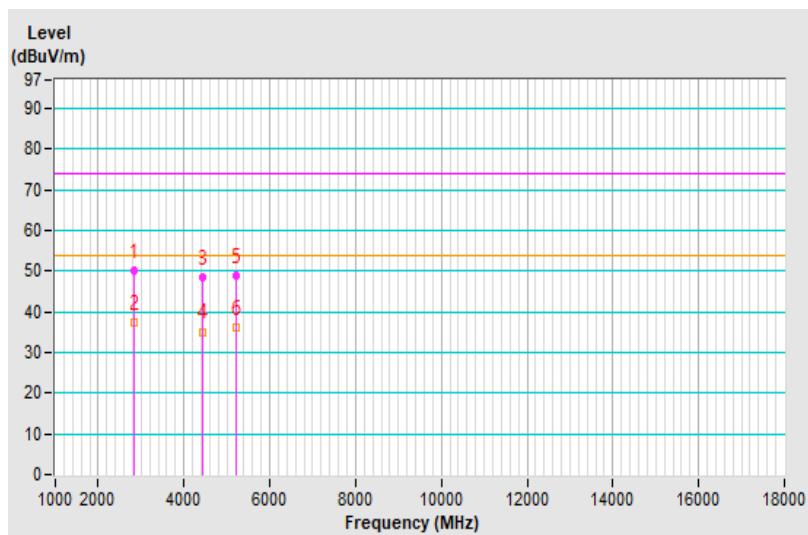
7.3 Radiated Emissions above 1 GHz

| | | | |
|-----------------|--------------|--|--------------------------------|
| Frequency Range | 1GHz ~ 18GHz | Detector Function & Resolution Bandwidth | Peak (PK) / Average (AV), 1MHz |
| Tested By | Nick Wu | Environmental Conditions | 25°C, 75% RH |

| 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 | 2848.83 | 49.94 PK | 74.00 | -24.06 | 1.00 H | 189 | 47.55 | 2.39 |
| 2 | 2848.83 | 37.32 AV | 54.00 | -16.68 | 1.00 H | 189 | 34.93 | 2.39 |
| 3 | 4419.51 | 48.63 PK | 74.00 | -25.37 | 1.35 H | 154 | 42.60 | 6.03 |
| 4 | 4419.51 | 35.08 AV | 54.00 | -18.92 | 1.35 H | 154 | 29.05 | 6.03 |
| 5 | 5224.12 | 48.71 PK | 74.00 | -25.29 | 1.63 H | 346 | 41.09 | 7.62 |
| 6 | 5224.12 | 36.16 AV | 54.00 | -17.84 | 1.63 H | 346 | 28.54 | 7.62 |

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



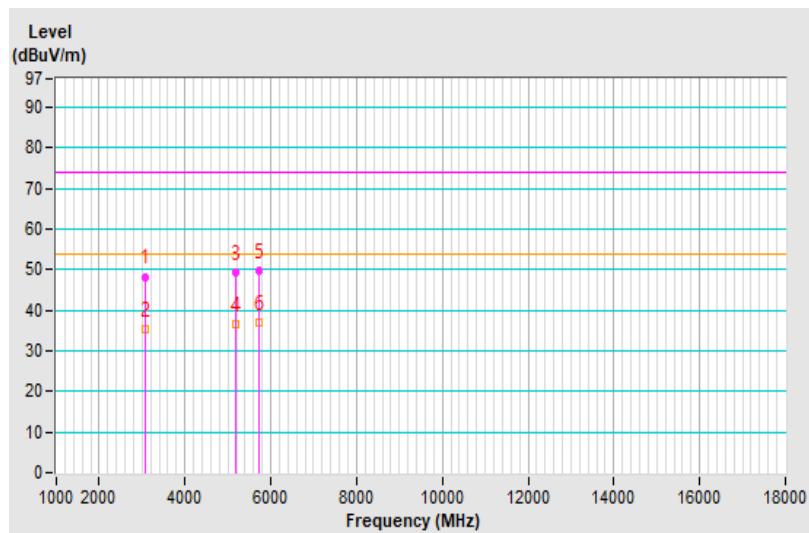
| | | | |
|-----------------|--------------|--|--------------------------------|
| Frequency Range | 1GHz ~ 18GHz | Detector Function & Resolution Bandwidth | Peak (PK) / Average (AV), 1MHz |
| Tested By | Nick Wu | Environmental Conditions | 25°C, 75% RH |

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 | 3081.99 | 48.24 PK | 74.00 | -25.76 | 1.21 V | 141 | 45.04 | 3.20 |
| 2 | 3081.99 | 35.24 AV | 54.00 | -18.76 | 1.21 V | 141 | 32.04 | 3.20 |
| 3 | 5184.30 | 49.33 PK | 74.00 | -24.67 | 1.44 V | 336 | 41.78 | 7.55 |
| 4 | 5184.30 | 36.50 AV | 54.00 | -17.50 | 1.44 V | 336 | 28.95 | 7.55 |
| 5 | 5733.54 | 49.85 PK | 74.00 | -24.15 | 1.00 V | 327 | 42.06 | 7.79 |
| 6 | 5733.54 | 36.96 AV | 54.00 | -17.04 | 1.00 V | 327 | 29.17 | 7.79 |

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

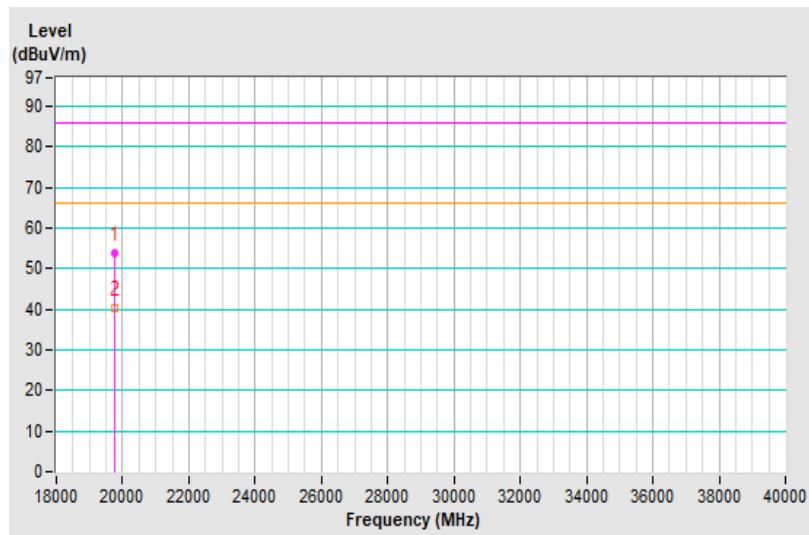


| | | | |
|-----------------|---------------|--|--------------------------------|
| Frequency Range | 18GHz ~ 30GHz | Detector Function & Resolution Bandwidth | Peak (PK) / Average (AV), 1MHz |
| Tested By | Nick Wu | Environmental Conditions | 23°C, 63% RH |

| Antenna Polarity & Test Distance : Horizontal at 1.5 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 | 19772.68 | 53.76 PK | 86.00 | -32.24 | 1.00 H | 116 | 58.81 | -5.05 |
| 2 | 19772.68 | 40.40 AV | 66.00 | -25.60 | 1.00 H | 116 | 45.45 | -5.05 |

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

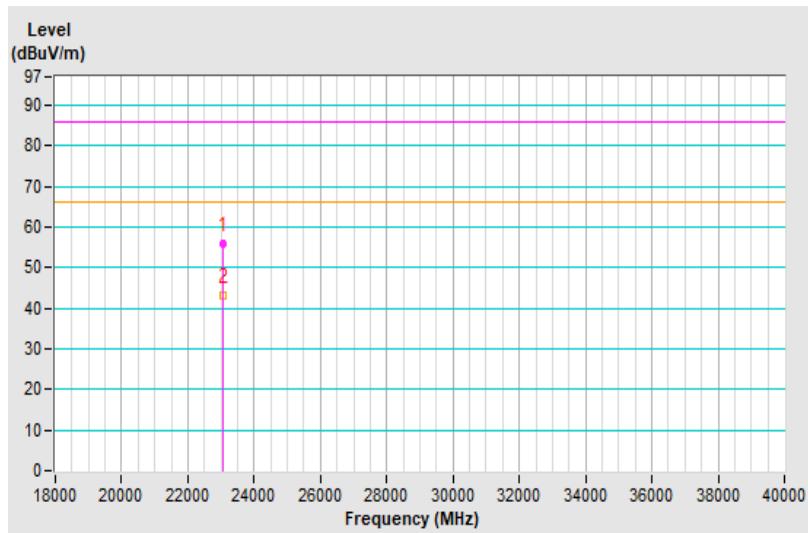


| | | | |
|-----------------|---------------|--|--------------------------------|
| Frequency Range | 18GHz ~ 30GHz | Detector Function & Resolution Bandwidth | Peak (PK) / Average (AV), 1MHz |
| Tested By | Nick Wu | Environmental Conditions | 23°C, 63% RH |

| Antenna Polarity & Test Distance : Vertical at 1.5 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 | 23068.25 | 55.74 PK | 86.00 | -30.26 | 1.00 V | 166 | 57.77 | -2.03 |
| 2 | 23068.25 | 43.27 AV | 66.00 | -22.73 | 1.00 V | 166 | 45.30 | -2.03 |

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



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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