



REPORT No.: SZ18030225E02

# TEST REPORT

**APPLICANT** : Fujian Newland Auto-ID Tech Co.,Ltd.

**PRODUCT NAME** : Information Terminal

**MODEL NAME** : NLS-NQuire1000

**BRAND NAME** : Newland

**FCC ID** : SL9NLS-NQUIRE1000

**STANDARD(S)** : 47 CFR Part 15 Subpart B

**TEST DATE** : 2018-07-03 to 2018-07-25

**ISSUE DATE** : 2018-07-26

Tested by: Zheng Fengjian  
Zheng Fengjian(Test Engineer)

Approved by: Andy Yeh  
Andy Yeh(Technical Director)

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**MORLAB**

SHENZHEN MORLAB COMMUNICATIONS TECHNOLOGY Co., Ltd.  
FL1-3, Building A, FeiYang Science Park, No.8 LongChang Road,  
Block67, BaoAn District, ShenZhen , GuangDong Province, P. R. China

Tel: 86-755-36698555

Http://www.morlab.cn

Fax: 86-755-36698525

E-mail: service@morlab.cn





# DIRECTORY

|                                               |           |
|-----------------------------------------------|-----------|
| <b>1. Technical Information</b>               | <b>3</b>  |
| 1.1. Applicant and Manufacturer Information   | 3         |
| 1.2. Equipment Under Test (EUT) Description   | 3         |
| <b>2. Test Results</b>                        | <b>5</b>  |
| 2.1. Applied Reference Documents              | 5         |
| 2.2. EUT Setup and Operating Conditions       | 6         |
| <b>3. 47 CFR Part 15B Requirements</b>        | <b>7</b>  |
| 3.1. Conducted Emission                       | 7         |
| 3.2. Radiated Disturbance                     | 11        |
| <b>Annex A Photographs of Test Setup</b>      | <b>18</b> |
| <b>Annex B Test Uncertainty</b>               | <b>20</b> |
| <b>Annex C Testing Laboratory Information</b> | <b>21</b> |

| Change History |            |                   |
|----------------|------------|-------------------|
| Issue          | Date       | Reason for change |
| 1.0            | 2018-07-26 | First edition     |
|                |            |                   |



# 1. Technical Information

**Note:** Provide by applicant

## 1.1. Applicant and Manufacturer Information

|                              |                                                                                                               |
|------------------------------|---------------------------------------------------------------------------------------------------------------|
| <b>Applicant:</b>            | Fujian Newland Auto-ID Tech Co.,Ltd.                                                                          |
| <b>Applicant Address:</b>    | Newland Science & Technology Park, No.1 Rujiang West Rd.,Mawei district,Fuzhou,Fujian,P.R.China               |
| <b>Manufacturer:</b>         | Shenzhen Chuangwei Electronic Appliance Tech Co., Ltd.                                                        |
| <b>Manufacturer Address:</b> | 4F & 6F, Overseas plant south, Skyworth Industrial Park, Shiyan Street, Bao'an District, Shenzhen, P.R. China |

## 1.2. Equipment Under Test (EUT) Description

|                             |                                                                                                                                                                              |                               |
|-----------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|
| <b>EUT Type:</b>            | Information Terminal                                                                                                                                                         |                               |
| <b>Serial No:</b>           | (N/A, marked #1 by test site)                                                                                                                                                |                               |
| <b>Hardware Version:</b>    | NQ1000-MB-D6-V02                                                                                                                                                             |                               |
| <b>Software Version:</b>    | NQ1000-Android-7-1-V005                                                                                                                                                      |                               |
| <b>Tx Frequency:</b>        | Bluetooth: 2402 MHz ~ 2480 MHz<br>802.11b/g/n-20: 2412 MHz ~ 2462 MHz;<br>802.11a/ac/n:5150 MHz ~ 5250 MHz; 5250 MHz ~ 5350 MHz;<br>5470 MHz ~ 5725 MHz;5725MHz ~ 5875 MHz;  |                               |
| <b>Rx Frequency:</b>        | Bluetooth: 2402 MHz ~ 2480 MHz<br>802.11b/g/n-20: 2412 MHz ~ 2462 MHz;<br>802.11a/ac/n:5150 MHz ~ 5250 MHz; 5250 MHz ~ 5350 MHz;<br>5470 MHz ~ 5725 MHz; 5725MHz ~ 5875 MHz; |                               |
| <b>Ancillary Equipment:</b> | <b>AC Adapter</b>                                                                                                                                                            |                               |
|                             | Brand Name:                                                                                                                                                                  | N/A                           |
|                             | Model No.:                                                                                                                                                                   | SYS1541-2412                  |
|                             | Serial No.:                                                                                                                                                                  | (N/A, marked #1 by test site) |
|                             | Rated Input:                                                                                                                                                                 | ~ 100-240V, 50/60Hz,1.0A      |
|                             | Rated Output:                                                                                                                                                                | ≒12V,2.0A                     |

**Note:**

1. The Information Terminal supports ISM 2.4GHz Bluetooth band and WIFI (802.11a/ac/b/g/n) band.



REPORT No.: SZ18030225E02

2. For a more detailed description, please refer to specification or user's manual supplied by the applicant and/or manufacturer.



## 2. Test Results

### 2.1. Applied Reference Documents

The objective of the report is to perform testing according to 47 CFR Part 15 Subpart B:

| No. | Identity       | Document Title          |
|-----|----------------|-------------------------|
| 1   | 47 CFR Part 15 | Radio Frequency Devices |

Test detailed items/section required by FCC rules and results are as below:

| No. | Section | Description        | Test Date  | Test Engineer  | Result |
|-----|---------|--------------------|------------|----------------|--------|
| 1   | 15.107  | Conducted Emission | 2018.07.03 | Zheng Fengjian | PASS   |
| 2   | 15.109  | Radiated Emission  | 2018.07.25 | Zheng Fengjian | PASS   |

NOTE: The tests were performed according to the method of measurements prescribed in ANSI C63.4-2014.



## 2.2. EUT Setup and Operating Conditions

| Test Item                                                                                                                                             |                                                                       |
|-------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------|
| <b>Radiated Emission</b>                                                                                                                              |                                                                       |
| Mode 1                                                                                                                                                | : EUT + Adapter + 2.4 G WIFI + U-Dish Card + Earphone                 |
| Mode 2                                                                                                                                                | : EUT + Adapter + 5 G WIFI + U-Dish Card + Earphone                   |
| Mode 3                                                                                                                                                | : EUT + Adapter + BT Classical + U-Dish Card + Earphone               |
| Mode 4                                                                                                                                                | : EUT + Adapter + BT LE + U-Dish Card + Earphone                      |
| <b>Mode 5</b>                                                                                                                                         | <b>: EUT + Adapter + U-Dish Card + Earphone + WIFI Idle + BT Idle</b> |
| Mode 6                                                                                                                                                | : EUT + Adapter + 2.4 G WIFI + SD Card + Earphone                     |
| Mode 7                                                                                                                                                | : EUT + Adapter + 5 G WIFI + SD Card + Earphone                       |
| Mode 8                                                                                                                                                | : EUT + Adapter + BT Classical + SD Card + Earphone                   |
| Mode 9                                                                                                                                                | : EUT + Adapter + BT LE + SD Card + Earphone                          |
| Mode 10                                                                                                                                               | : EUT + Adapter + SD Card + Earphone + WIFI Idle + BT Idle            |
| <b>Conducted Emission</b>                                                                                                                             |                                                                       |
| Mode 1                                                                                                                                                | : EUT + Adapter + 2.4 G WIFI + U-Dish Card + Earphone                 |
| Mode 2                                                                                                                                                | : EUT + Adapter + 5 G WIFI + U-Dish Card + Earphone                   |
| Mode 3                                                                                                                                                | : EUT + Adapter + BT Classical + U-Dish Card + Earphone               |
| Mode 4                                                                                                                                                | : EUT + Adapter + BT LE + U-Dish Card + Earphone                      |
| <b>Mode 5</b>                                                                                                                                         | <b>: EUT + Adapter + U-Dish Card + Earphone + WIFI Idle + BT Idle</b> |
| Mode 6                                                                                                                                                | : EUT + Adapter + 2.4 G WIFI + SD Card + Earphone                     |
| Mode 7                                                                                                                                                | : EUT + Adapter + 5 G WIFI + SD Card + Earphone                       |
| Mode 8                                                                                                                                                | : EUT + Adapter + BT Classical + SD Card + Earphone                   |
| Mode 9                                                                                                                                                | : EUT + Adapter + BT LE + SD Card + Earphone                          |
| Mode 10                                                                                                                                               | : EUT + Adapter + SD Card + Earphone + WIFI Idle + BT Idle            |
| Mode 1                                                                                                                                                | : EUT + Adapter + 2.4 G WIFI + BT Classical + U-Dish Card + Earphone  |
| <b>Remark:</b>                                                                                                                                        |                                                                       |
| The above test modes in boldface were the worst cases of conducted emission, radiated emission tests; only the test data of these modes was reported. |                                                                       |

During the measurement, the environmental conditions were within the listed ranges:

|                             |          |
|-----------------------------|----------|
| Temperature (°C):           | 15 - 35  |
| Relative Humidity (%):      | 30 - 60  |
| Atmospheric Pressure (kPa): | 86 - 106 |

## 3. 47 CFR Part 15B Requirements

### 3.1. Conducted Emission

#### 3.1.1. Requirement

According to FCC section 15.107, the radio frequency voltage that is conducted back onto the AC power line on any frequency within the band 150kHz to 30MHz shall not exceed the limits in the following table, as measured using a 50 $\mu$ H/50 $\Omega$  line impedance stabilization network (LISN).

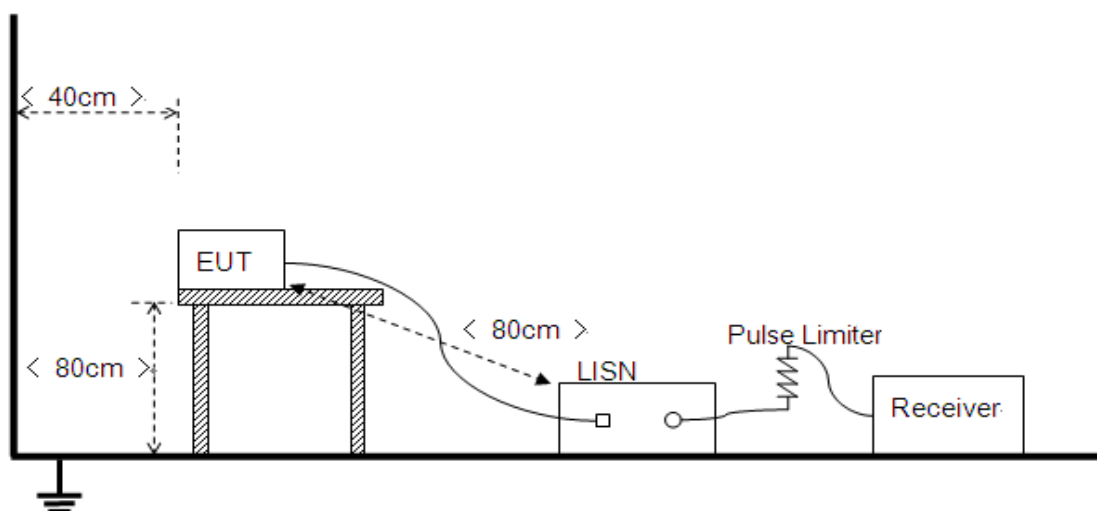
| Frequency range<br>(MHz) | Conducted Limit (dB $\mu$ V) |          |
|--------------------------|------------------------------|----------|
|                          | Quasi-peak                   | Average  |
| 0.15 - 0.50              | 66 to 56                     | 56 to 46 |
| 0.50 - 5                 | 56                           | 46       |
| 5 - 30                   | 60                           | 50       |

NOTE:

- The limit subjects to the Class B digital device.
- The lower limit shall apply at the band edges.
- The limit decreases linearly with the logarithm of the frequency in the range 0.15 - 0.50MHz.

#### 3.1.2. Test Setup

Please refer to Annex A for the photographs of the Test Configuration.





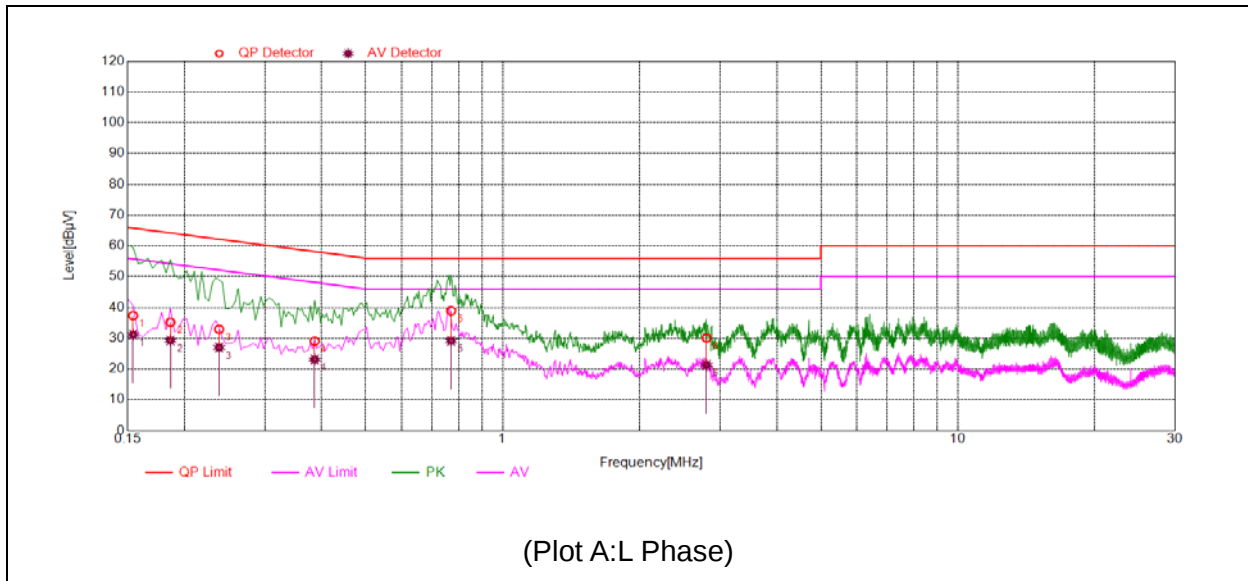
The EUT is placed on a 0.8m high insulating table, which stands on the grounded conducting floor, and keeps 0.4m away from the grounded conducting wall. The EUT is connected to the power mains through a LISN which provides  $50\Omega/50\mu\text{H}$  of coupling impedance for the measuring instrument. A Pulse Limiter is used to protect the measuring instrument. The factors of the whole test system are calibrated to correct the reading.

The power strip or extension cord has been investigated to make sure that the LISN integrity is maintained with respect to the impedance characteristics as prescribed in ANSI C63.4-2014 at Clause 4.3.

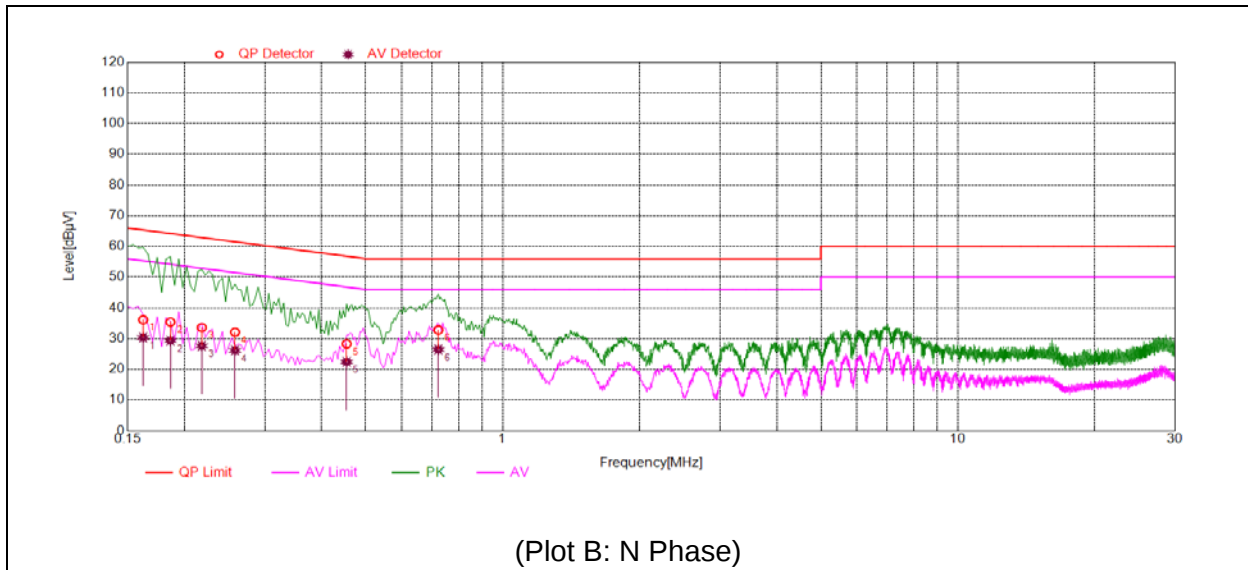
### 3.1.3. Test Result

The maximum conducted interference is searched using Peak (PK), Quasi-peak (QP) and Average (AV) detectors; the emission levels more than the AV and QP limits, and that have narrow margins from the AV and QP limits will be re-measured with AV and QP detectors. Tests for both L phase and N phase lines of the power mains connected to the EUT are performed. All test modes are considered, refer to recorded points and plots below.

## A. Test Plot and Suspicious Points:



| NO. | Fre.<br>(MHz) | Emission Level (dBμV) |         | Limit (dBμV) |         | Power-line | Verdict |
|-----|---------------|-----------------------|---------|--------------|---------|------------|---------|
|     |               | Quai-peak             | Average | Quai-peak    | Average |            |         |
| 1   | 0.1540        | 37.37                 | 31.16   | 65.78        | 55.78   | Line       | PASS    |
| 2   | 0.1859        | 35.20                 | 29.27   | 64.21        | 54.21   |            | PASS    |
| 3   | 0.2379        | 32.89                 | 27.00   | 62.17        | 52.17   |            | PASS    |
| 4   | 0.3859        | 29.04                 | 23.13   | 58.15        | 48.15   |            | PASS    |
| 5   | 0.7697        | 38.93                 | 29.15   | 56.00        | 46.00   |            | PASS    |
| 6   | 2.8045        | 30.09                 | 21.29   | 56.00        | 46.00   |            | PASS    |



| NO. | Fre.<br>(MHz) | Emission Level (dBμV) |         | Limit (dBμV) |         | Power-line | Verdict |
|-----|---------------|-----------------------|---------|--------------|---------|------------|---------|
|     |               | Quai-peak             | Average | Quai-peak    | Average |            |         |
| 1   | 0.1620        | 36.17                 | 30.35   | 65.36        | 55.36   | Neutral    | PASS    |
| 2   | 0.1860        | 35.39                 | 29.34   | 64.21        | 54.21   |            | PASS    |
| 3   | 0.2179        | 33.62                 | 27.64   | 62.90        | 52.90   |            | PASS    |
| 4   | 0.2579        | 32.11                 | 26.17   | 61.50        | 51.50   |            | PASS    |
| 5   | 0.4537        | 28.29                 | 22.42   | 56.81        | 46.81   |            | PASS    |
| 6   | 0.7217        | 32.78                 | 26.44   | 56.00        | 46.00   |            | PASS    |

## 3.2. Radiated Disturbance

### 3.2.1. Requirement

According to FCC section 15.109 (a), the field strength of radiated emissions from unintentional radiators at a distance of 3 meters shall not exceed the following values:

| Frequency range (MHz) | Field Strength Limitation at 3m Measurement Dist |                       |
|-----------------------|--------------------------------------------------|-----------------------|
|                       | ( $\mu\text{V/m}$ )                              | (dB $\mu\text{V/m}$ ) |
| 30.0 - 88.0           | 100                                              | 20log 100             |
| 88.0 - 216.0          | 150                                              | 20log 150             |
| 216.0 - 960.0         | 200                                              | 20log 200             |
| Above 960.0           | 500                                              | 20log 500             |

As shown in FCC section 15.35(b), for frequencies above 1000MHz, the field strength limits are based on average detector. When average radiated emission measurements are specified in this part, including emission measurements below 1000MHz, there also is a limit on the radio frequency emissions, as measured using instrumentation with a peak detector function, corresponding to 20dB above the maximum permitted average limit for the frequency being investigated unless a different peak emission limit is otherwise specified in the rules.

Note:

- 1) The tighter limit shall apply at the boundary between two frequency range.
- 2) Limitation expressed in dB $\mu\text{V/m}$  is calculated by 20log Emission Level( $\mu\text{V/m}$ ).

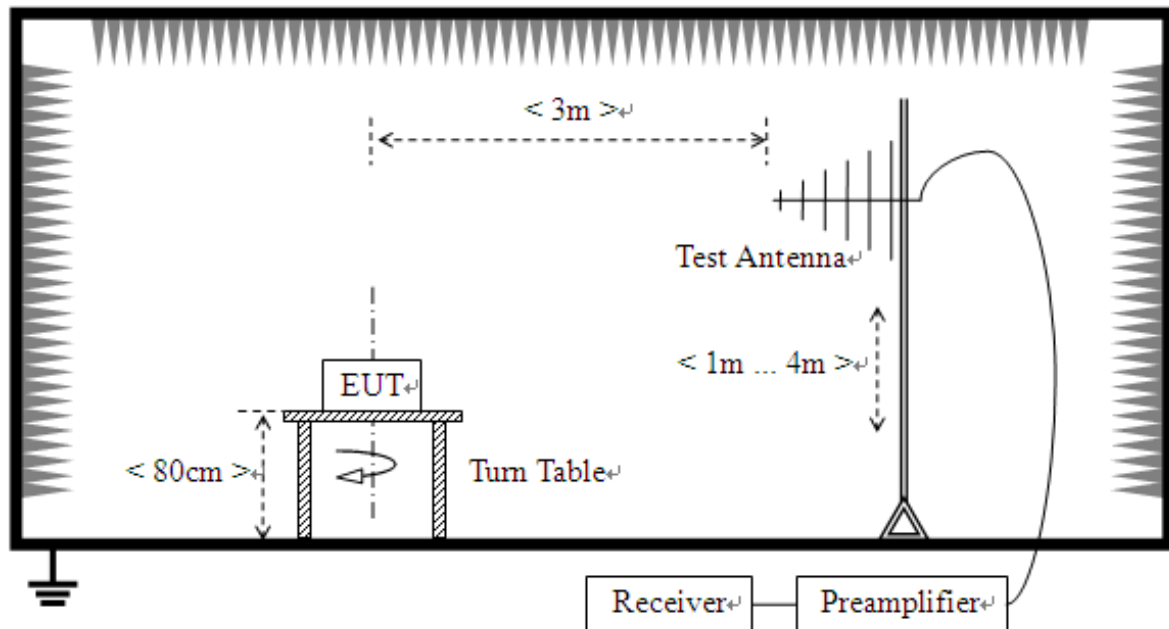
### 3.2.2. Frequency range of measurement

According to 15.33(b)(1), the frequency range of radiated measurement for the EUT is listed in the following table:

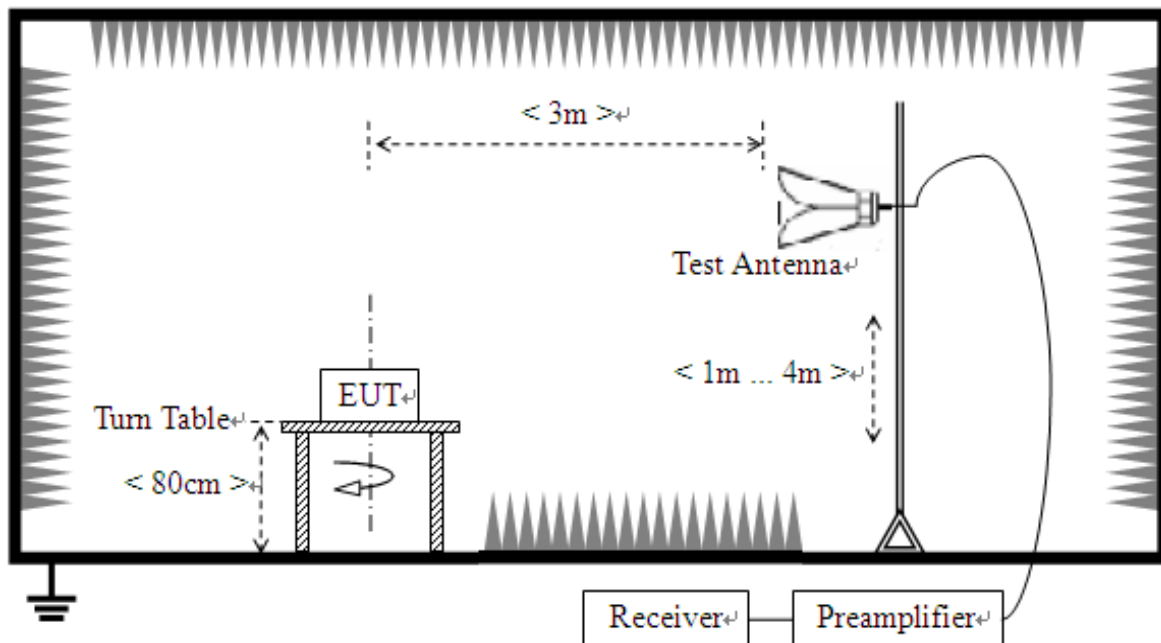
| Highest frequency generated or used in the device or on which the device operates or tunes (MHz) | Upper frequency of measurement range (MHz)                           |
|--------------------------------------------------------------------------------------------------|----------------------------------------------------------------------|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

### 3.2.3. Test Setup

- 1) For radiated emissions from 30MHz to 1GHz



- 2) For radiated emissions above 1GHz





The test is performed in a 3m Semi-Anechoic Chamber; the antenna factor, cable loss and so on of the site (factors) is calculated to correct the reading. The EUT is placed on a 0.8m high insulating Turn Table, and keeps 3m away from the Test Antenna, which is mounted on a variable-height antenna master tower.

For the test Antenna:

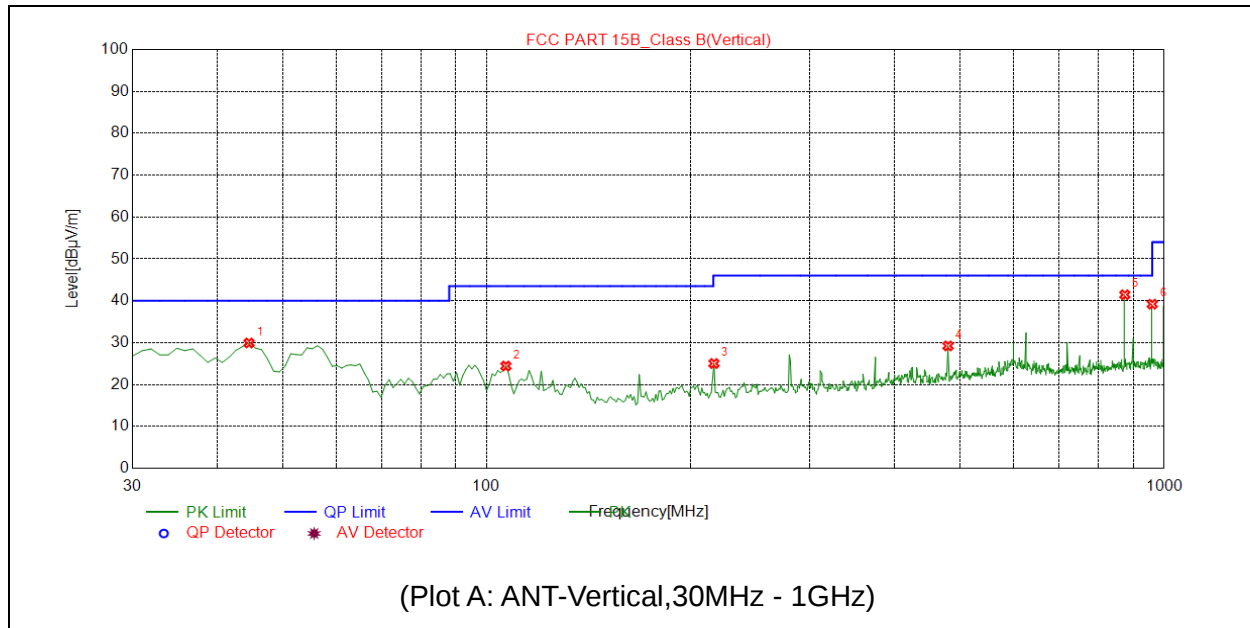
In the frequency range above 30MHz, Bi-Log Test Antenna (30MHz to 1GHz) and Horn Test Antenna (above 1GHz) are used. Test Antenna is 3m away from the EUT. Test Antenna height is varied from 1m to 4m above the ground to determine the maximum value of the field strength. The emission levels at both horizontal and vertical polarizations should be tested.

### **3.2.4. Test Result**

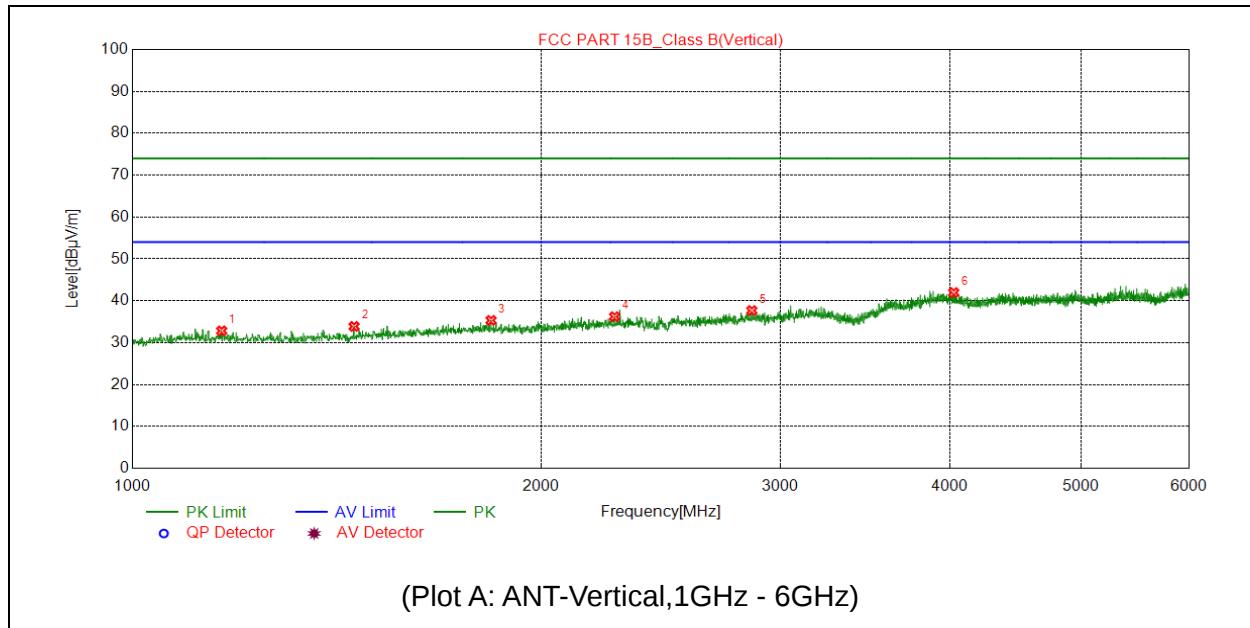
The maximum radiated emission is searched using PK, QP and AV detectors; the emission levels more than the limits, and that have narrow margins from the limits will be re-measured with AV and QP detectors. Both the vertical and the horizontal polarizations of the Test Antenna are considered to perform the tests. All test modes are considered, refer to recorded points and plots below.

The amplitude of emissions which (6GHz-30GHz) are attenuated more than 20 dB below the permissible value need not be reported.

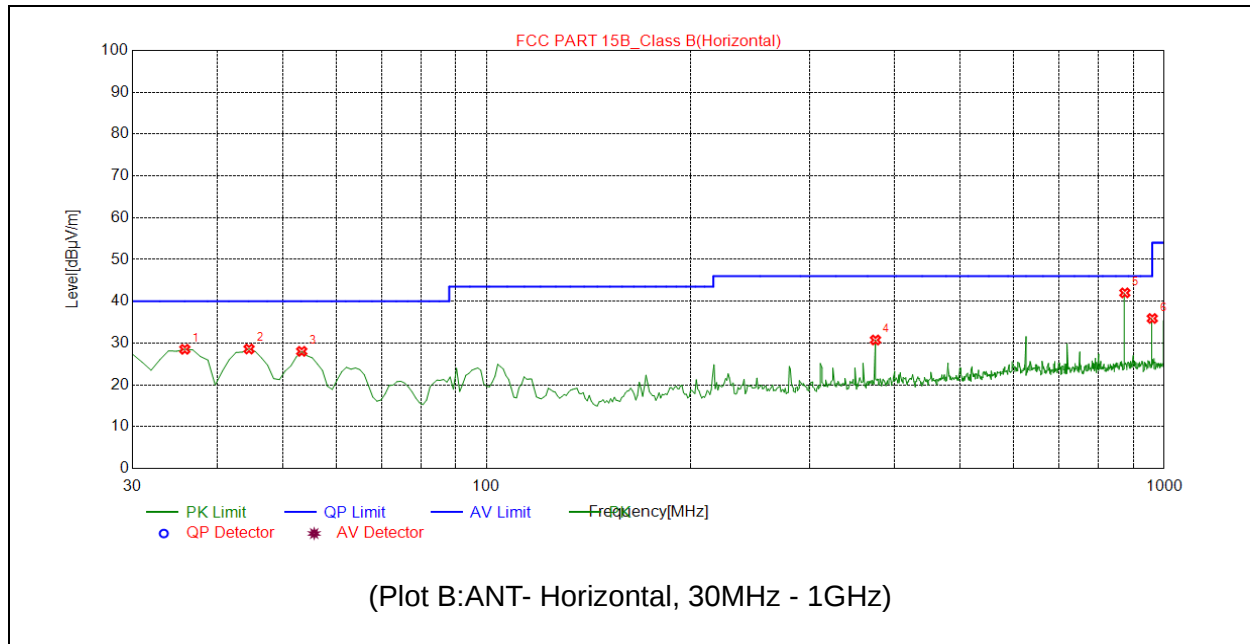
Note: All radiated emission tests were performed in X, Y, Z axis direction, and only the worst axis test condition was recorded in this test report.



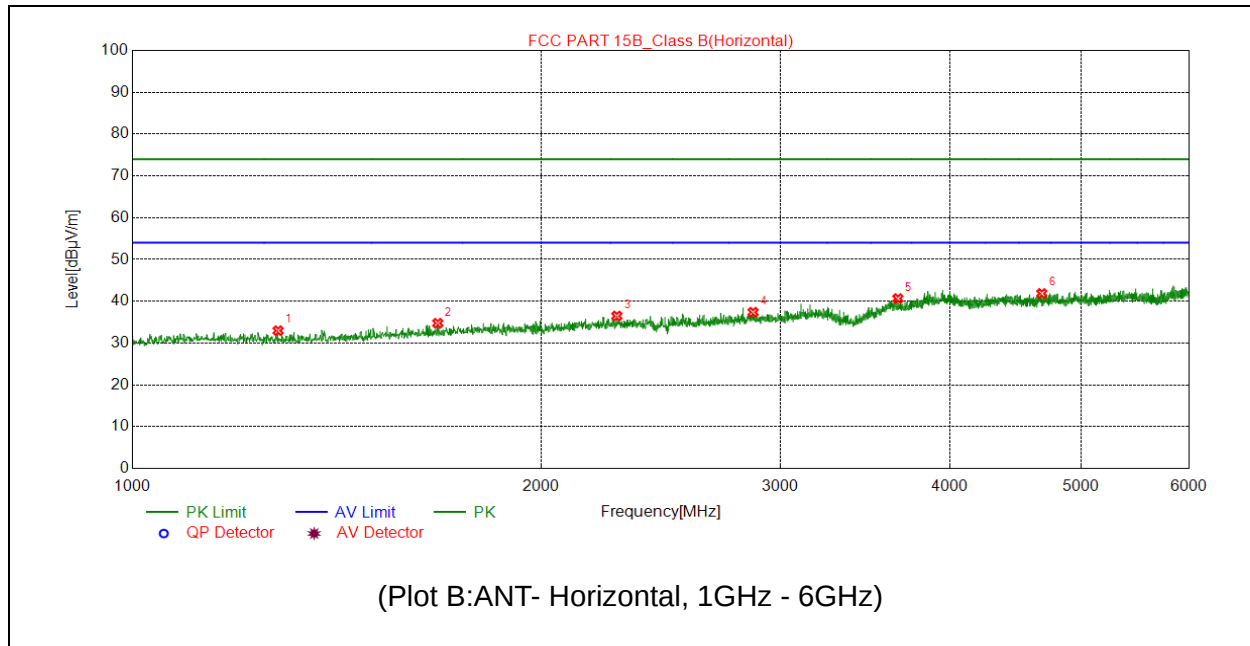
| No. | Fre.<br>MHz | Pk<br>dBμV/m | QP<br>dBμV/m | AV<br>dBμV/m | Limit-PK<br>dBμV/m | Limit-QP<br>dBμV/m | Limit-AV<br>dBμV/m | ANT | Verdict |
|-----|-------------|--------------|--------------|--------------|--------------------|--------------------|--------------------|-----|---------|
| 1   | 44.5646     | 29.92        | N.A          | N.A          | N.A                | 40.00              | N.A                | V   | PASS    |
| 2   | 106.7067    | 24.42        | N.A          | N.A          | N.A                | 43.50              | N.A                | V   | PASS    |
| 3   | 216.4264    | 25.03        | N.A          | N.A          | N.A                | 46.00              | N.A                | V   | PASS    |
| 4   | 479.5596    | 29.22        | N.A          | N.A          | N.A                | 46.00              | N.A                | V   | PASS    |
| 5   | 874.7447    | 41.44        | N.A          | N.A          | N.A                | 46.00              | N.A                | V   | PASS    |
| 6   | 960.1902    | 39.19        | N.A          | N.A          | N.A                | 54.00              | N.A                | V   | PASS    |



| No. | Fre.<br>MHz | Pk<br>dBμV/m | QP<br>dBμV/m | AV<br>dBμV/m | Limit-PK<br>dBμV/m | Limit-QP<br>dBμV/m | Limit-AV<br>dBμV/m | ANT | Verdict |
|-----|-------------|--------------|--------------|--------------|--------------------|--------------------|--------------------|-----|---------|
| 1   | 1163.0326   | 32.82        | N.A          | N.A          | 74.00              | N.A                | 54.00              | V   | PASS    |
| 2   | 1456.0912   | 33.88        | N.A          | N.A          | 74.00              | N.A                | 54.00              | V   | PASS    |
| 3   | 1837.1674   | 35.32        | N.A          | N.A          | 74.00              | N.A                | 54.00              | V   | PASS    |
| 4   | 2265.2531   | 36.21        | N.A          | N.A          | 74.00              | N.A                | 54.00              | V   | PASS    |
| 5   | 2859.3719   | 37.67        | N.A          | N.A          | 74.00              | N.A                | 54.00              | V   | PASS    |
| 6   | 4027.6055   | 41.96        | N.A          | N.A          | 74.00              | N.A                | 54.00              | V   | PASS    |



| No. | Fre.<br>MHz | Pk<br>dBμV/m | QP<br>dBμV/m | AV<br>dBμV/m | Limit-PK<br>dBμV/m | Limit-QP<br>dBμV/m | Limit-AV<br>dBμV/m | ANT | Verdict |
|-----|-------------|--------------|--------------|--------------|--------------------|--------------------|--------------------|-----|---------|
| 1   | 35.8258     | 28.51        | N.A          | N.A          | N.A                | 40.00              | N.A                | H   | PASS    |
| 2   | 44.5646     | 28.58        | N.A          | N.A          | N.A                | 40.00              | N.A                | H   | PASS    |
| 3   | 53.3033     | 28.02        | N.A          | N.A          | N.A                | 40.00              | N.A                | H   | PASS    |
| 4   | 374.6947    | 30.73        | N.A          | N.A          | N.A                | 46.00              | N.A                | H   | PASS    |
| 5   | 874.7447    | 42.01        | N.A          | N.A          | N.A                | 46.00              | N.A                | H   | PASS    |
| 6   | 960.1902    | 35.88        | N.A          | N.A          | N.A                | 54.00              | N.A                | H   | PASS    |



| No. | Fre.<br>MHz | Pk<br>dBμV/m | QP<br>dBμV/m | AV<br>dBμV/m | Limit-PK<br>dBμV/m | Limit-QP<br>dBμV/m | Limit-AV<br>dBμV/m | ANT | Verdict |
|-----|-------------|--------------|--------------|--------------|--------------------|--------------------|--------------------|-----|---------|
| 1   | 1280.0560   | 32.96        | N.A          | N.A          | 74.00              | N.A                | 54.00              | H   | PASS    |
| 2   | 1678.1356   | 34.75        | N.A          | N.A          | 74.00              | N.A                | 54.00              | H   | PASS    |
| 3   | 2274.2549   | 36.47        | N.A          | N.A          | 74.00              | N.A                | 54.00              | H   | PASS    |
| 4   | 2865.3731   | 37.38        | N.A          | N.A          | 74.00              | N.A                | 54.00              | H   | PASS    |
| 5   | 3663.5327   | 40.63        | N.A          | N.A          | 74.00              | N.A                | 54.00              | H   | PASS    |
| 6   | 4676.7353   | 41.86        | N.A          | N.A          | 74.00              | N.A                | 54.00              | H   | PASS    |

## Annex A Photographs of Test Setup

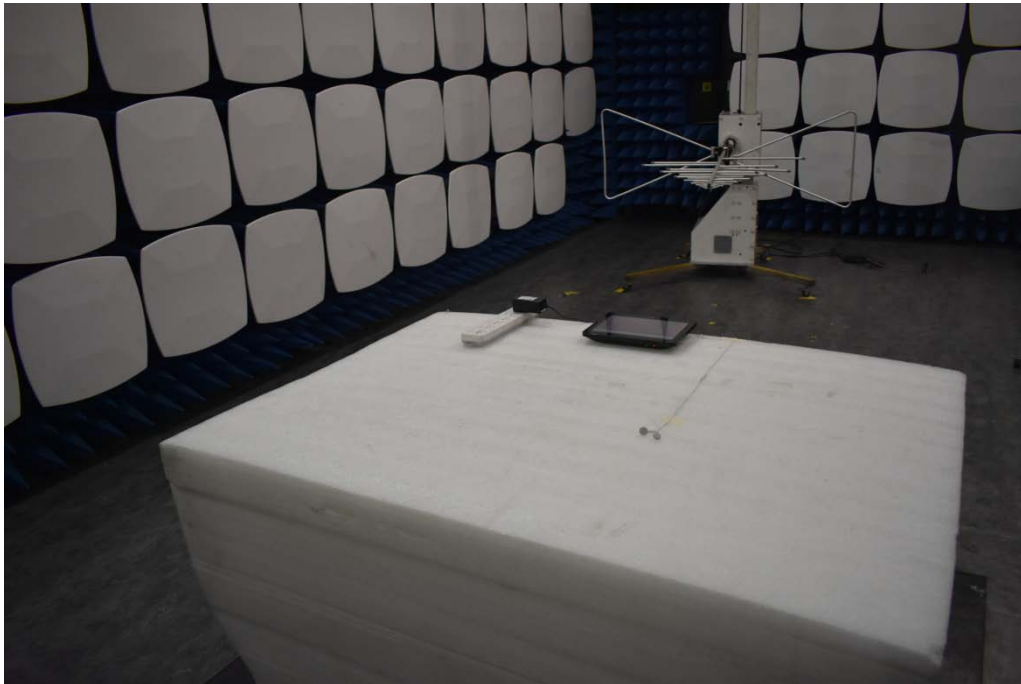
### 1. Mains Terminal Disturbance Voltage Measurement



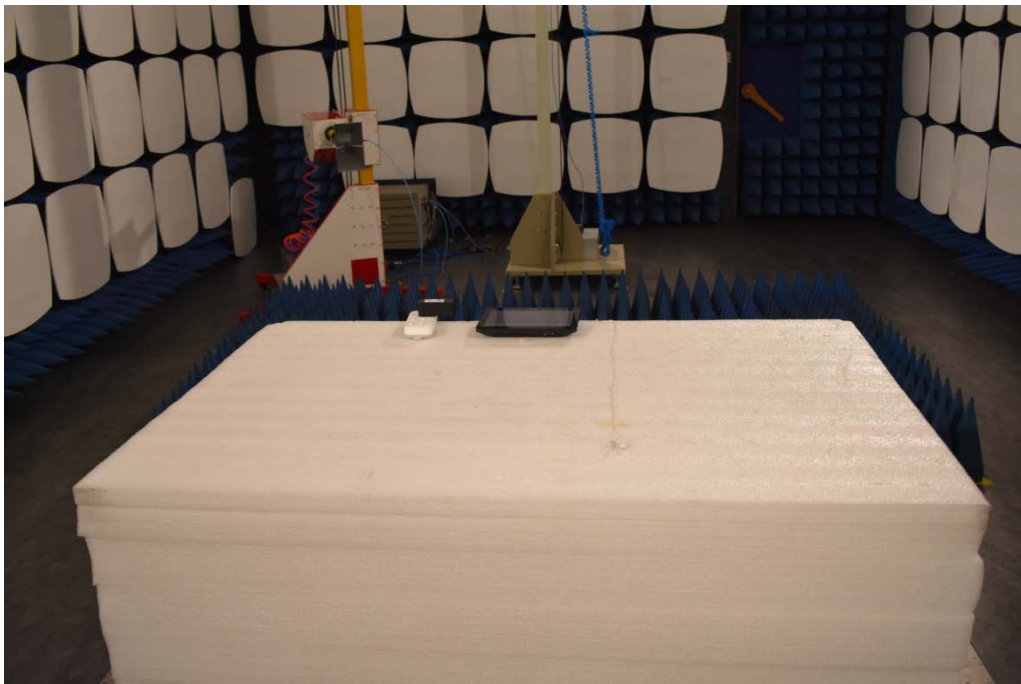
### 2. Conducted emission main's port side view



### 3. Radiated Field Strength Measurement(30MHz-1GHz)



### 4. Radiated Field Strength Measurement(above 1GHz)





## Annex B Test Uncertainty

The uncertainty is calculated using the methods suggested in the "Guide to the Expression of Uncertainty in Measurement" (GUM) published by ISO.

### Uncertainty of Conducted Emission Measurement

|                                                                        |              |         |
|------------------------------------------------------------------------|--------------|---------|
| Measuring Uncertainty for<br>a Level of Confidence of<br>95%(U=2Uc(y)) | 9kHz-150kHz  | ±4.1 dB |
|                                                                        | 150kHz-30MHz | ±3.7dB  |

### Uncertainty of Radiated Emission Measurement

|                                                                        |                |         |
|------------------------------------------------------------------------|----------------|---------|
| Measuring Uncertainty for<br>a Level of Confidence of<br>95%(U=2Uc(y)) | 30MHz-200MHz   | ±5.06dB |
|                                                                        | 200MHz-1000MHz | ±5.24dB |
|                                                                        | 1GHz-6GHz      | ±5.18dB |
|                                                                        | 6GHz-18GHz     | ±5.48dB |



## Annex C Testing Laboratory Information

### 1. Identification of the Responsible Testing Laboratory

|                                      |                                                                                                                                  |  |
|--------------------------------------|----------------------------------------------------------------------------------------------------------------------------------|--|
| <b>Company Name:</b>                 | Shenzhen Morlab Communications Technology Co., Ltd.                                                                              |  |
| <b>Department:</b>                   | Morlab Laboratory                                                                                                                |  |
| <b>Address:</b>                      | FL.3, Building A, FeiYang Science Park, No.8 LongChang Road, Block 67, BaoAn District, ShenZhen, Guangdong Province, P. R. China |  |
| <b>Responsible Test Lab Manager:</b> | Mr. Su Feng                                                                                                                      |  |
| <b>Telephone:</b>                    | +86 755 36698555                                                                                                                 |  |
| <b>Facsimile:</b>                    | +86 755 36698525                                                                                                                 |  |

### 2. Identification of the Responsible Testing Location

|                 |                                                                                                                                  |
|-----------------|----------------------------------------------------------------------------------------------------------------------------------|
| <b>Name:</b>    | Shenzhen Morlab Communications Technology Co., Ltd.<br>Morlab Laboratory                                                         |
| <b>Address:</b> | FL.3, Building A, FeiYang Science Park, No.8 LongChang Road, Block 67, BaoAn District, ShenZhen, Guangdong Province, P. R. China |

### 3. Accreditation Certificate

|                                       |                                                                                                                                            |
|---------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Accredited Testing Laboratory:</b> | The FCC designation number is CN1192.<br>Test firm registration number is 226174.<br>(Shenzhen Morlab Communications Technology Co., Ltd.) |
|---------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|

### 4. Test Software Utilized

| Model           | Version Number  | Producer |
|-----------------|-----------------|----------|
| JS32-RE         | Version 2.0.2.0 | Tonscend |
| TS+ -[ JS32-CE] | Version 2.5.0.0 | Tonscend |

**5. Test Equipments Utilized**

| Description           | Manufacturer | Model       | Serial No. | Cal. Date  | Due. Date  |
|-----------------------|--------------|-------------|------------|------------|------------|
| MXE EMI Receiver      | Agilent      | N9038A      | MY54130016 | 2018.05.08 | 2019.05.07 |
| Receiver              | KEYSIGHT     | N9038A      | MY56400093 | 2018.05.08 | 2019.05.07 |
| LISN                  | Schwarzbeck  | NSLK 8127   | 812744     | 2018.05.08 | 2019.05.07 |
| Pulse Limiter (20dB)  | VTSD         | 9561D       | 9537       | 2018.05.08 | 2019.05.07 |
| Test Antenna - Bi-Log | Schwarzbeck  | VULB 9163   | 9163-519   | 2018.05.08 | 2019.05.07 |
| Test Antenna - Horn   | Schwarzbeck  | BBHA 9120D  | 1774       | 2017.09.13 | 2018.09.12 |
| Semi-Anechoic Chamber | CRT          | 9m*6m*6m 1# | N/A        | 2017.11.19 | 2020.11.18 |
| Semi-Anechoic Chamber | CRT          | 9m*6m*6m 2# | N/A        | 2017.01.12 | 2020.01.11 |

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