# TEST REPORT

## No. I17Z62005-EMC01

**for**

**TCL Communication Ltd.**

**Mobile Phone**

**6062W**

**FCC ID: 2ACCJBT09**

**with**

**Hardware Version: 06**

**Software Version: v1A65**

**Issued Date: 2018-03-09**

TESTING
NVLAP LAB CODE 600118-0

**Note:**

The test results in this test report relate only to the devices specified in this report. This report shall not be reproduced except in full without the written approval of CTTL.

The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the U.S.Government.

**Test Laboratory:**

CTTL, Telecommunication Technology Labs, CAICT

No. 52, Huayuan North Road, Haidian District, Beijing, P. R. China 100191.

Tel:+86(0)10-62304633-2512, Fax:+86(0)10-62304633-2504

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# REPORT HISTORY

| Report Number | Revision | Description | Issue Date |
|---|---|---|---|
| I17Z62005-EMC01 | Rev.0 | 1st edition | 2018-03-09 |

# CONTENTS

# 1. Test Laboratory

## 1.1. Testing Location

**CTTL(huayuan North Road)**

Address: No. 52, Huayuan North Road, Haidian District, Beijing, P. R. China100191

## 1.2. Testing Environment

Normal Temperature: 15-35℃

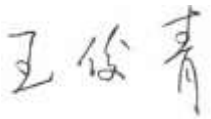
Relative Humidity: 20-75%

## 1.3. Project data

Testing Start Date: 2018-01-10

Testing End Date: 2018-02-18

## 1.4. Signature

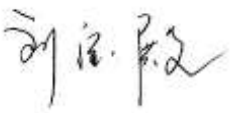


**Wang Junqing**

**(Prepared this test report)**

**Zhang Ying**

**(Reviewed this test report)**



**Liu Baodian**

**Deputy Director of the laboratory**

**(Approved this test report)**

# 2. Client Information

## 2.1. Applicant Information

| | |
|---|---|
| Company Name: | TCL Communication Ltd. |
| Address: | 7/F, Block F4, TCL Communication Technology Building, TCL International E City, Zhong Shan Yuan Road, Nanshan District, Shenzhen, Guangdong, P.R. China 518052 |
| City: | Shenzhen |
| Postal Code: | / |
| Country: | China |
| Telephone: | 0086-755-36611722 |
| Fax: | 0086-75536612000-81722 |

## 2.2. Manufacturer Information

| | |
|---|---|
| Company Name: | TCL Communication Ltd. |
| Address: | 7/F, Block F4, TCL Communication Technology Building, TCL International E City, Zhong Shan Yuan Road, Nanshan District, Shenzhen, Guangdong, P.R. China 518052 |
| City: | Shenzhen |
| Postal Code: | / |
| Country: | China |
| Telephone: | 0086-755-36611722 |
| Fax: | 0086-75536612000-81722 |

# 3. Equipment Under Test (EUT) and Ancillary Equipment (AE)

## 3.1. About EUT

| | |
|---|---|
| Description | Mobile Phone |
| Model Name | 6062W |
| FCC ID | 2ACCJBT09 |
| Extreme vol. Limits | 3.65VDC to 4.4VDC (nominal: 3.8VDC) |

Note: Components list, please refer to documents of the manufacturer; it is also included in the original test record of CTTL,Telecommunication Technology Labs, CAICT.

## 3.2. Internal Identification of EUT used during the test

| EUT ID* | SN or IMEI | HW Version | SW Version |
|---|---|---|---|
| EUT1 | 015126000202941 | 06 | v1A65 |

*EUT ID: is used to identify the test sample in the lab internally.

## 3.3. Internal Identification of AE used during the test

| AE ID* | Description | SN | Remarks |
|---|---|---|---|
| AE1 | Battery | / | / |
| AE2 | Charger | / | / |
| AE3 | USB Cable | / | / |

AE1

| | |
|---|---|
| Model | CAC3860010C1 |
| Manufacturer | BYD |
| Capacitance | 4000 mAh |
| Nominal voltage | 3.85V |

AE2

| | |
|---|---|
| Model | QC11US |
| Manufacturer | TIANPAO |
| Length of cable | / |

AE3

| | |
|---|---|
| Model | CDA0000103CF |
| Manufacturer | LUXSHARE |
| Length of cable | 80cm |

*AE ID: is used to identify the test sample in the lab internally.

Note: The USB cables are shielded.

### 3.4. EUT set-ups

| EUT set-up No. | Combination of EUT and AE | Remarks |
|---|---|---|
| Set.1 | EUT1+ AE1 + AE2+ AE3 | Charger |
| Set.2 | EUT1+ AE1 + AE3 | USB mode |

# 4. Reference Documents

## 4.1. Reference Documents for testing

The following documents listed in this section are referred for testing.

| Reference | Title | Version |
|---|---|---|
| FCC Part 15, Subpart B | Radio frequency devices - Unintentional Radiators | 2016 |
| ANSI C63.4 | American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz | 2014 |

Note: The test methods have no deviation with standards.

## 5. LABORATORY ENVIRONMENT

**Semi-anechoic chamber SAC-1** (23 meters×17meters×10meters) did not exceed following limits along the EMC testing:

| | |
|---|---|
| Temperature | Min. = 15 ℃, Max. = 35 ℃ |
| Relative humidity | Min. = 15 %, Max. = 75 % |
| Shielding effectiveness | 0.014MHz-1MHz, >60dB;<br>1MHz - 1000MHz, >90dB. |
| Electrical insulation | > 2 MΩ |
| Ground system resistance | < 4 Ω |
| Normalised site attenuation (NSA) | < ±4 dB, 10 m distance |
| Site voltage standing-wave ratio ($S_{VSWR}$) | Between 0 and 6 dB, from 1GHz to 6GHz |
| Uniformity of field strength | Between 0 and 6 dB, from 80 to 3000 MHz |

**Semi-anechoic chamber SAC-2** (10 meters×6.7meters×6.1meters) did not exceed following limits along the EMC testing:

| | |
|---|---|
| Temperature | Min. = 15 ℃, Max. = 35 ℃ |
| Relative humidity | Min. = 15 %, Max. = 75 % |
| Shielding effectiveness | 0.014MHz - 1MHz, >60dB;<br>1MHz - 1000MHz, >90dB. |
| Electrical insulation | > 2 MΩ |
| Ground system resistance | < 4 Ω |
| Normalised site attenuation (NSA) | < ± 4 dB, 3m distance, from 30 to 1000 MHz |
| Site voltage standing-wave ratio ($S_{VSWR}$) | Between 0 and 6 dB, from 1GHz to 18GHz |
| Uniformity of field strength | Between 0 and 6 dB, from 80 to 3000 MHz |

**Shielded room** did not exceed following limits along the EMC testing:

| | |
|---|---|
| Temperature | Min. = 15 ℃, Max. = 35 ℃ |
| Relative humidity | Min. = 20 %, Max. = 75 % |
| Shielding effectiveness | 0.014MHz-1MHz, >60dB;<br>1MHz－1000MHz, >90dB. |
| Electrical insulation | > 2 MΩ |
| Ground system resistance | < 4 Ω |

# 6. SUMMARY OF TEST RESULTS

| Abbreviations used in this clause: | | |
|---|---|---|
| Verdict Column | P | Pass |
| | NA | Not applicable |
| | F | Fail |

| Items | Test Name | Clause in FCC rules | Section in this report | Verdict | Test Location |
|---|---|---|---|---|---|
| 1 | Radiated Emission | 15.109(a) | B.1 | P | **CTTL(huayuan North Road)** |
| 2 | Conducted Emission | 15.107(a) | B.2 | P | **CTTL(huayuan North Road)** |

## 7. Test Equipments Utilized

| NO. | Description | TYPE | SERIES NUMBER | MANUFACTURE | CAL DUE DATE | CALIBRATION INTERVAL |
|---|---|---|---|---|---|---|
| 1 | Test Receiver | ESU26 | 100235 | R&S | 2018-04-01 | 1 year |
| 2 | Test Receiver | ESCI 7 | 100344 | R&S | 2018-03-15 | 1 year |
| 3 | Universal Radio Communication Tester | CMW500 | 143008 | R&S | 2018-11-26 | 1 year |
| 4 | Universal Radio Communication Tester | CMW500 | 155415 | R&S | 2019-01-15 | 1 year |
| 5 | LISN | ENV216 | 101200 | R&S | 2018-08-03 | 1 year |
| 6 | EMI Antenna | VULB 9163 | 9163-301 | Schwarzbeck | 2019-01-03 | 3 years |
| 7 | EMI Antenna | 3115 | 00167250 | ETS-Lindgren | 2018-11-30 | 3 years |
| 8 | PC | OPTIPLEX 380 | 2X1YV2X | DELL | N/A | N/A |
| 9 | Printer | P1606dn | VNC3L52122 | HP | N/A | N/A |
| 10 | Keyboard | L100 | CN0RH659658907ATOI40 | DELL | N/A | N/A |
| 11 | Mouse | M-UAE119 | LZ935220ZRC | Lenovo | N/A | N/A |

| Test Item | Test Software and Version | Software Vendor |
|---|---|---|
| Radiated Continuous Emission | EMC32 V9.01 | R&S |
| Conducted Emission | EMC32 V8.52.0 | R&S |

# ANNEX A: MEASUREMENT RESULTS

**A.1 Radiated Emission**

**Reference**

FCC: CFR Part 15.109(a).

**A.1.1 Method of measurement**

The field strength of radiated emissions from the unintentional radiator (USB mode of MS and charging mode of MS) at distances of 10 meters(for 30MHz-1GHz) and 3 meters (for above 1GHz) is tested. Tested in accordance with the procedures of ANSI C63.4 – 2014, section 8.3.

The EUT was placed on a non-conductive table. The measurement antenna was placed at a distance of 3/10 meters from the EUT. During the tests, the antenna height and the EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. This maximization process was repeated with the EUT positioned in each of its three orthogonal orientations.

**A.1.2 EUT Operating Mode**

The MS is operating in the USB mode and charging mode. During the test MS is connected to a PC via a USB cable in the case of USB mode and is connected to a charger in the case of charging mode. The model of the PC is DELL OPTIPLEX 380, and the serial number of the PC is 2X1YV2X. The software is used to let the PC keep on copying data to MS, reading and erasing the data after copy action was finished.

Note：I/O information：Printer – USB, Mouse – PS/2, Keyboard – USB.

**A.1.3 Measurement Limit**

| Frequency range (MHz) | Field strength limit (μV/m) | | |
|---|---|---|---|
| | Quasi-peak | Average | Peak |
| 30-88 | 100 | | |
| 88-216 | 150 | | |
| 216-960 | 200 | | |
| 960-1000 | 500 | | |
| >1000 | | 500 | 5000 |

Note: the above limit is for 3 meters test distance. 10 meters' limit is got by converting.

**A.1.4 Test Condition**

| Frequency range (MHz) | RBW/VBW | Sweep Time (s) | Detector |
|---|---|---|---|
| 30-1000 | 120kHz (IF Bandwidth) | 5 | Peak/Quasi-peak |
| Above 1000 | 1MHz/1MHz | 15 | Peak, Average |

**A.1.5 Measurement Results**

A "reference path loss" is established and the $A_{Rpl}$ is the attenuation of “reference path loss”. It includes the antenna factor of receive antenna and the path loss.

The measurement results are obtained as described below:

Result = $P_{Mea} + A_{Rpl} = P_{Mea} + G_A + G_{PL}$

Where

$G_A$: Antenna factor of receive antenna

$G_{PL}$: Path Loss

$P_{Mea}$: Measurement result on receiver.

Measurement uncertainty (worst case): $U$ = 4.3 dB, $k$=2.

**Measurement results for Set.1**:

**Charging Mode/Average detector**

| Frequency (MHz) | Measurement Result (dBμV/m) | Cable loss (dB) | Antenna Factor (dB/m) | Receiver Reading (dBμV) | Limit (dBμV/m) | Margin (dB) | Antenna Pol. (H/V) |
|---|---|---|---|---|---|---|---|
| 17915.0 | 38.7 | -17.7 | 45.6 | 10.8 | 54.0 | 15.3 | H |
| 17865.1 | 38.4 | -18.5 | 45.6 | 11.3 | 54.0 | 15.6 | V |
| 17466.2 | 38.4 | -19.2 | 41.5 | 16.1 | 54.0 | 15.6 | V |
| 17470.7 | 38.4 | -19.2 | 41.5 | 16.1 | 54.0 | 15.6 | V |
| 17899.7 | 38.4 | -18.5 | 45.6 | 11.3 | 54.0 | 15.6 | H |
| 17405.0 | 38.4 | -19.2 | 41.5 | 16.1 | 54.0 | 15.6 | H |

**Charging Mode/Peak detector**

| Frequency (MHz) | Measurement Result (dBμV/m) | Cable loss (dB) | Antenna Factor (dB/m) | Receiver Reading (dBμV) | Limit (dBμV/m) | Margin (dB) | Antenna Pol. (H/V) |
|---|---|---|---|---|---|---|---|
| 17436.7 | 50.4 | -19.2 | 41.5 | 28.1 | 74.0 | 23.6 | H |
| 17772.2 | 50.3 | -18.5 | 45.6 | 23.2 | 74.0 | 23.7 | H |
| 17735.4 | 50.3 | -18.9 | 45.6 | 23.6 | 74.0 | 23.7 | V |
| 17783.0 | 50.2 | -18.5 | 45.6 | 23.1 | 74.0 | 23.8 | V |
| 17352.3 | 50.1 | -19.5 | 41.5 | 28.1 | 74.0 | 23.9 | H |
| 17775.0 | 50.1 | -18.5 | 45.6 | 23.0 | 74.0 | 23.9 | H |

**Measurement results for Set.2:**

**USB Mode/Average detector**

| Frequency (MHz) | Measurement Result (dBμV/m) | Cable loss (dB) | Antenna Factor (dB/m) | Receiver Reading (dBμV) | Limit (dBμV/m) | Margin (dB) | Antenna Pol. (H/V) |
|---|---|---|---|---|---|---|---|
| 17909.3 | 38.4 | -18.5 | 45.6 | 11.3 | 54.0 | 15.6 | V |
| 17879.3 | 38.1 | -18.5 | 45.6 | 11.0 | 54.0 | 15.9 | H |
| 17874.2 | 38.1 | -18.5 | 45.6 | 11.0 | 54.0 | 15.9 | V |
| 17883.3 | 38.1 | -18.5 | 45.6 | 11.0 | 54.0 | 15.9 | H |
| 17482.6 | 38.1 | -19.2 | 41.5 | 15.8 | 54.0 | 15.9 | H |
| 17892.3 | 38.0 | -18.5 | 45.6 | 10.9 | 54.0 | 16.0 | H |

**USB Mode/ Peak detector**

| Frequency (MHz) | Measurement Result (dBμV/m) | Cable loss (dB) | Antenna Factor (dB/m) | Receiver Reading (dBμV) | Limit (dBμV/m) | Margin (dB) | Antenna Pol. (H/V) |
|---|---|---|---|---|---|---|---|
| 17841.9 | 50.1 | -18.5 | 45.6 | 23.0 | 74.0 | 23.9 | H |
| 17391.4 | 50.0 | -19.2 | 41.5 | 27.7 | 74.0 | 24.0 | H |
| 17401.0 | 49.5 | -19.2 | 41.5 | 27.2 | 74.0 | 24.5 | V |
| 17984.1 | 49.5 | -17.7 | 45.6 | 21.6 | 74.0 | 24.5 | H |
| 17869.1 | 49.5 | -18.5 | 45.6 | 22.4 | 74.0 | 24.5 | H |
| 17500.8 | 49.4 | -19.2 | 45.6 | 23.0 | 74.0 | 24.6 | V |

Note: The measurement results of Set.1, Set.2 showed here are worst cases of the combinations of different batteries and USB cables.

**Charging Mode, Set.1**

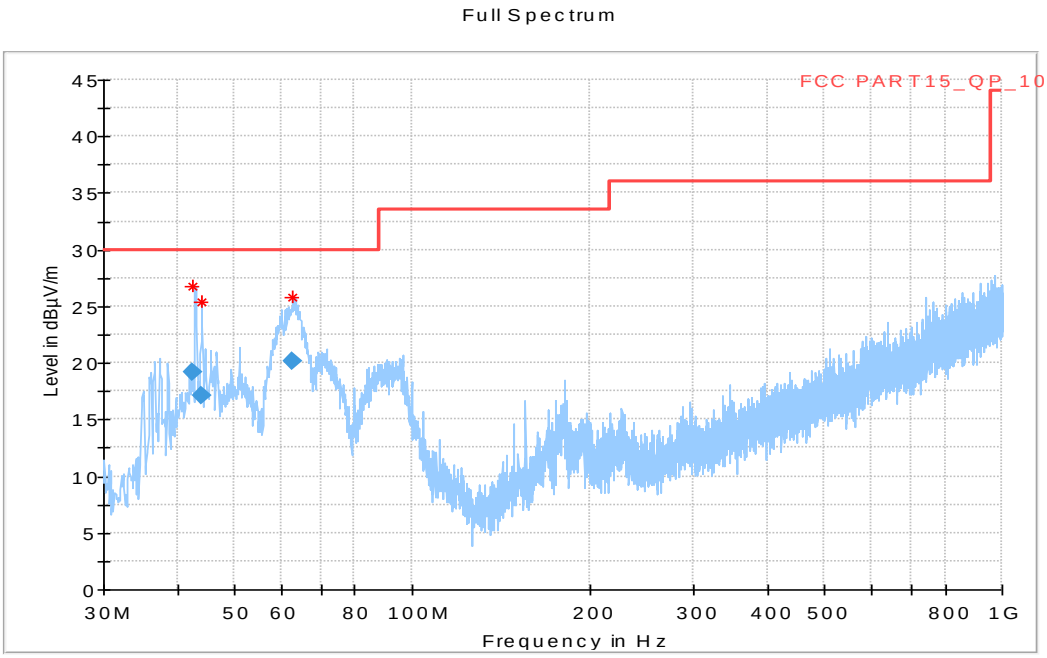



**Fig A.1 Radiated Emission from 30MHz to 1GHz**

## Final Result 1

| Frequency (MHz) | QuasiPeak (dBµV/m) | Height (cm) | Polarization | Azimuth (deg) | Corr. (dB) | Margin (dB) | Limit (dBµV/m) | Comment |
|---|---|---|---|---|---|---|---|---|
| 42.578000 | 19.16 | 184.0 | V | 210.0 | -12.1 | 10.84 | 30.00 | |
| 43.848000 | 17.16 | 286.0 | V | 165.0 | -11.9 | 12.84 | 30.00 | |
| 62.703000 | 20.11 | 103.0 | V | 60.0 | -12.9 | 9.89 | 30.00 | |

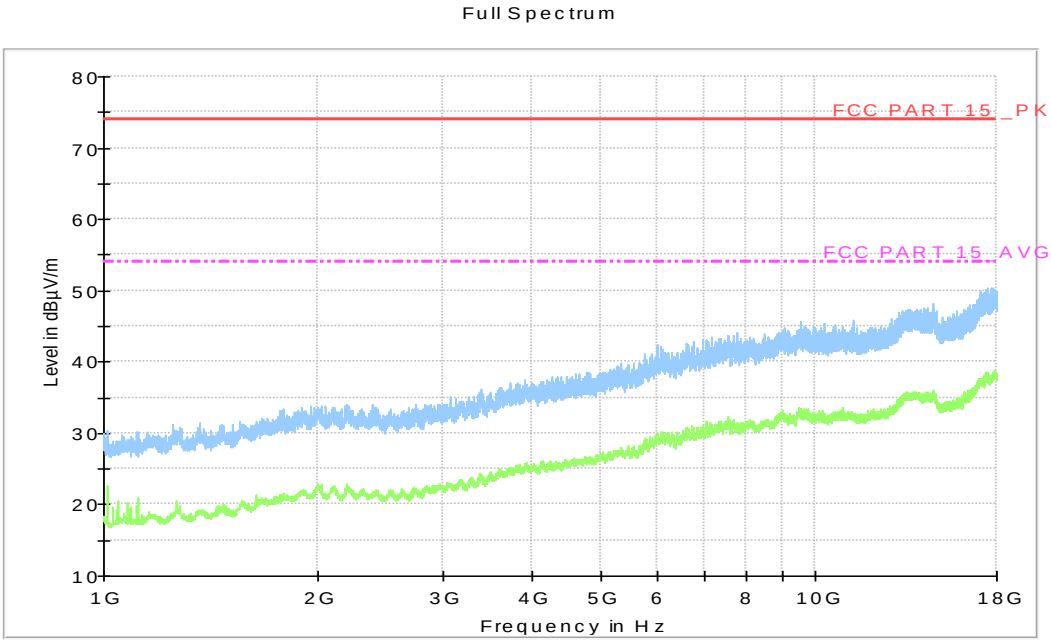



**Fig A.2 Radiated Emission from 1GHz to 18GHz**

**USB Mode, Set.2**

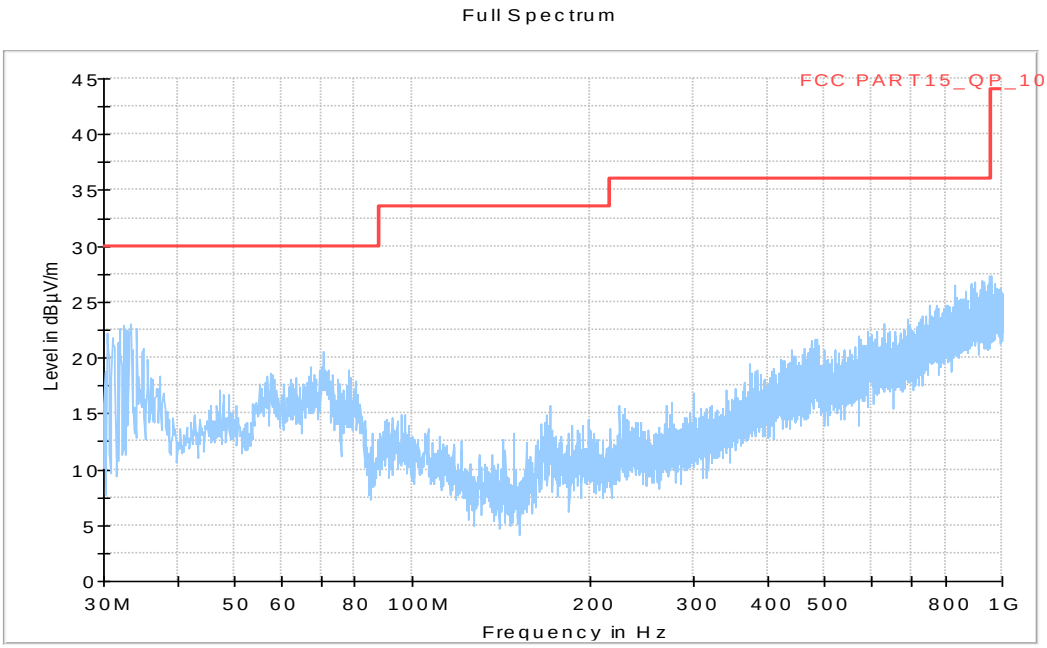



**Fig A.3 Radiated Emission from 30MHz to 1GHz**

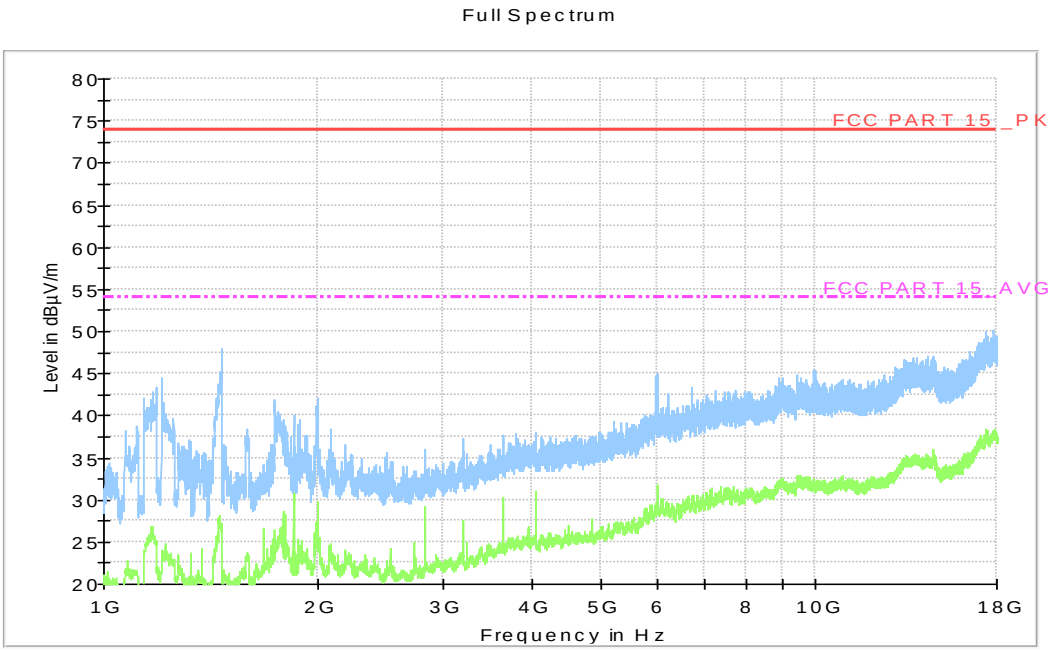



**Fig A.4 Radiated Emission from 1GHz to 18GHz**

**A.2 Conducted Emission**

**Reference**

FCC: CFR Part 15.107(a).

**A.2.1 Method of measurement**

For equipment that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits. Tested in accordance with the procedures of ANSI C63.4 – 2014, section 7.3.

**A.2.2 EUT Operating Mode**

The MS is operating in the USB mode and charging mode. During the test MS is connected to a PC via a USB cable in the case of USB mode and is connected to a charger in the case of charging mode. The model of the PC is DELL OPTIPLEX 380, and the serial number of the PC is 2X1YV2X. The software is used to let the PC keep on copying data to MS, reading and erasing the data after copy action was finished.

Note：I/O information：Printer – USB, Mouse – PS/2, Keyboard – USB.

**A.2.3 Measurement Limit**

| Frequency of emission (MHz) | Conducted limit (dBμV) | |
|---|---|---|
| | Quasi-peak | Average |
| 0.15-0.5 | 66 to 56* | 56 to 46* |
| 0.5-5 | 56 | 46 |
| 5-30 | 60 | 50 |
| *Decreases with the logarithm of the frequency | | |

**A.2.4 Test Condition in charging mode**

| Voltage（V） | Frequency（Hz） |
|---|---|
| 120 | 60 |

| RBW/IF bandwidth | Sweep Time(s) |
|---|---|
| 9kHz | 1 |

### A.2.5 Measurement Results

Measurement uncertainty: *U*= 2.9 dB, *k*=2.

**Charging Mode, Set.1**

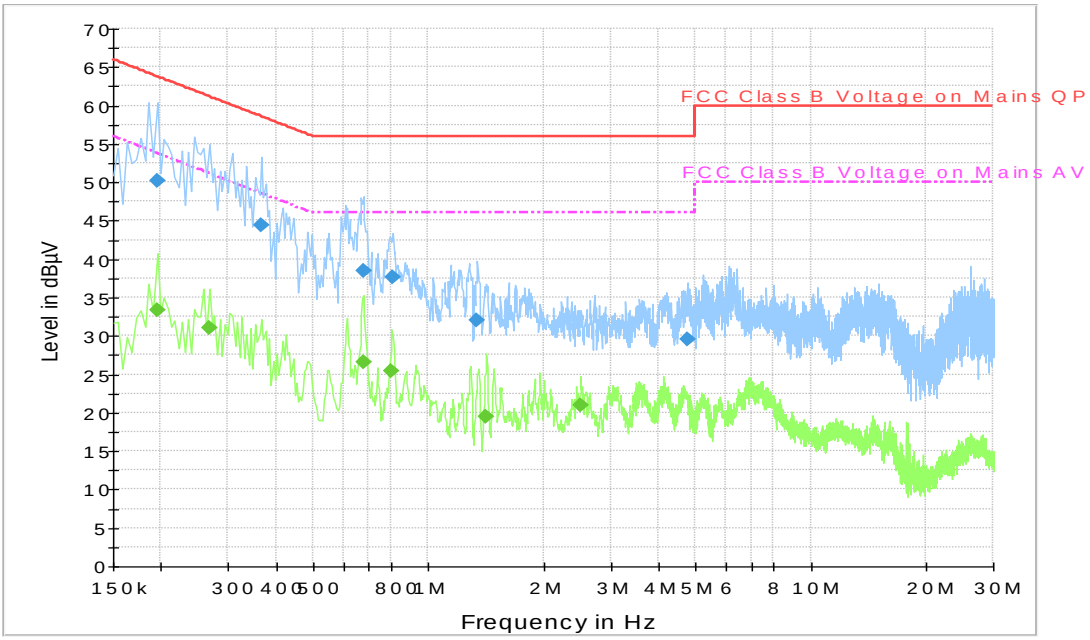



**Fig A.5 Conducted Emission**

## Final Result 1

| Frequency (MHz) | QuasiPeak (dBµV) | Meas. Time (ms) | Bandwidth (kHz) | Line | Corr. (dB) | Margin (dB) | Limit (dBµV) |
|---|---|---|---|---|---|---|---|
| 0.195000 | 50.2 | 2000.0 | 9.000 | L1 | 19.8 | 13.6 | 63.8 |
| 0.366000 | 44.4 | 2000.0 | 9.000 | L1 | 19.9 | 14.2 | 58.6 |
| 0.676500 | 38.5 | 2000.0 | 9.000 | L1 | 19.9 | 17.5 | 56.0 |
| 0.807000 | 37.6 | 2000.0 | 9.000 | L1 | 19.8 | 18.4 | 56.0 |
| 1.342500 | 32.1 | 2000.0 | 9.000 | N | 19.8 | 23.9 | 56.0 |
| 4.744500 | 29.5 | 2000.0 | 9.000 | N | 19.7 | 26.5 | 56.0 |

## Final Result 2

| Frequency (MHz) | Average (dBµV) | Meas. Time (ms) | Bandwidth (kHz) | Line | Corr. (dB) | Margin (dB) | Limit (dBµV) |
|---|---|---|---|---|---|---|---|
| 0.195000 | 33.3 | 2000.0 | 9.000 | L1 | 19.8 | 20.5 | 53.8 |
| 0.267000 | 31.0 | 2000.0 | 9.000 | L1 | 19.9 | 20.2 | 51.2 |
| 0.676500 | 26.6 | 2000.0 | 9.000 | L1 | 19.9 | 19.4 | 46.0 |
| 0.802500 | 25.4 | 2000.0 | 9.000 | L1 | 19.8 | 20.6 | 46.0 |
| 1.419000 | 19.5 | 2000.0 | 9.000 | L1 | 19.8 | 26.5 | 46.0 |
| 2.508000 | 21.0 | 2000.0 | 9.000 | L1 | 19.7 | 25.0 | 46.0 |

Note: The measurement results showed here are worst cases of the combinations of different batteries and USB cables.

**USB Mode, Set.2**

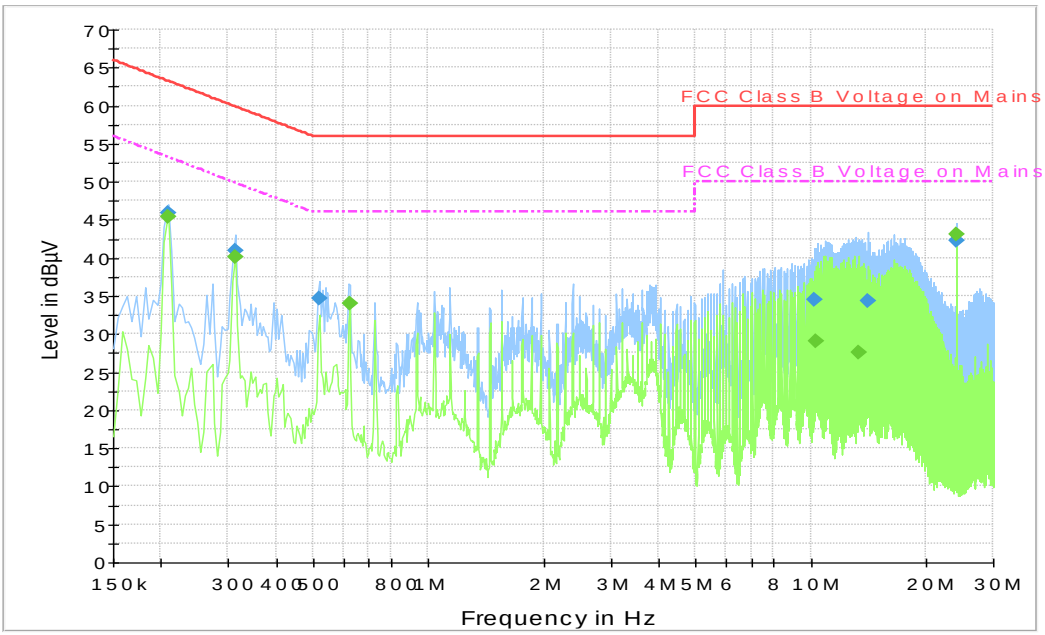



**Fig A.6 Conducted Emission**

## Final Result 1

| Frequency (MHz) | QuasiPeak (dBµV) | Meas. Time (ms) | Bandwidth (kHz) | Line | Corr. (dB) | Margin (dB) | Limit (dBµV) |
|---|---|---|---|---|---|---|---|
| 0.208500 | 45.9 | 2000.0 | 9.000 | N | 19.8 | 17.4 | 63.3 |
| 0.312000 | 41.0 | 2000.0 | 9.000 | N | 19.9 | 18.9 | 59.9 |
| 0.519000 | 34.6 | 2000.0 | 9.000 | N | 19.9 | 21.4 | 56.0 |
| 10.243500 | 34.5 | 2000.0 | 9.000 | L1 | 19.9 | 25.5 | 60.0 |
| 14.073000 | 34.3 | 2000.0 | 9.000 | L1 | 19.8 | 25.7 | 60.0 |
| 24.009000 | 42.3 | 2000.0 | 9.000 | L1 | 19.9 | 17.7 | 60.0 |

## Final Result 2

| Frequency (MHz) | Average (dBµV) | Meas. Time (ms) | Bandwidth (kHz) | Line | Corr. (dB) | Margin (dB) | Limit (dBµV) |
|---|---|---|---|---|---|---|---|
| 0.208500 | 45.4 | 2000.0 | 9.000 | N | 19.8 | 7.8 | 53.3 |
| 0.312000 | 40.1 | 2000.0 | 9.000 | N | 19.9 | 9.8 | 49.9 |
| 0.622500 | 34.1 | 2000.0 | 9.000 | N | 19.9 | 11.9 | 46.0 |
| 10.347000 | 29.0 | 2000.0 | 9.000 | L1 | 19.9 | 21.0 | 50.0 |
| 13.348500 | 27.5 | 2000.0 | 9.000 | L1 | 19.8 | 22.5 | 50.0 |
| 24.009000 | 43.1 | 2000.0 | 9.000 | N | 20.0 | 6.9 | 50.0 |

Note: The measurement results showed here are worst cases of the combinations of different batteries and USB cables.

## ANNEX B: Accreditation Certificate

United States Department of Commerce
National Institute of Standards and Technology

NVLAP®

Certificate of Accreditation to ISO/IEC 17025:2005

NVLAP LAB CODE: 600118-0

Telecommunication Technology Labs, CAICT
Beijing
China

*is accredited by the National Voluntary Laboratory Accreditation Program for specific services, listed on the Scope of Accreditation, for:*

Electromagnetic Compatibility & Telecommunications

*This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2005. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer to joint ISO-ILAC-IAF Communique dated January 2009).*

2016-09-29 through 2017-09-30
*Effective Dates*

*For the National Voluntary Laboratory Accreditation Program*

*****END OF REPORT*****