# TEST REPORT

## No.23T04Z80397-011

**for**

**TCL Communication Ltd.**

**GSM/UMTS/LTE Mobile phone**

**T435D，T435SP，T435S，T435V，T435WS**

**FCC ID:2ACCJH178**

**with**

**Hardware Version: 03**
**Software Version: 9JS6**

**Issued Date: 2024-01-17**

**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.

**Test Laboratory:**

**CTTL-Telecommunication Technology Labs, CAICT**

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

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# REPORT HISTORY

| Report Number | Revision | Description | Issue Date |
|---|---|---|---|
| 23T04Z80397-011 | Rev.0 | 1st edition | 2024-01-17 |
| | | | |

Note: the latest revision of the test report supersedes all previous version.

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# 1. Test Laboratory

## 1.1. Introduction & Accreditation

**Telecommunication Technology Labs, CAICT** is an ISO/IEC 17025:2017 accredited test laboratory under American Association for Laboratory Accreditation (A2LA) with lab code 7049.01, and is also an FCC accredited test laboratory (CN1349), and ISED accredited test laboratory (CAB identifier:CN0066). The detail accreditation scope can be found on A2LA website.

## 1.2. Testing Location

Location 1: CTTL(BDA)

Address: No.18A, Kangding Street, Beijing Economic-Technology Development Area, Beijing, 100176, P. R. China

## 1.3. Testing Environment

Normal Temperature: 15-35℃

Relative Humidity: 20-75%

## 1.4. Project data

Testing Start Date: 2023-12-27

Testing End Date: 2024-01-12

## 1.5. Signature

**An Hui**

**(Prepared this test report)**

**Zhang Ying**

**(Reviewed this test report)**

**Zhang Xia**

**(Approved this test report)**

# 2. Client Information

## 2.1. Applicant Information

| | |
|---|---|
| Company Name: | TCL Communication Ltd. |
| Address: | 5/F, Building 22E, 22 Science Park East Avenue, Hong Kong Science Park, Shatin, NT, Hong Kong |
| Contact: | Annie Jiang |
| Email: | nianxiang.jiang@tcl.com |
| Telephone: | +86 755 3661 1621 |
| Fax: | +86 755 3661 2000-81722 |

## 2.2. Manufacturer Information

| | |
|---|---|
| Company Name: | TCL Communication Ltd. |
| Address: | 5/F, Building 22E, 22 Science Park East Avenue, Hong Kong Science Park, Shatin, NT, Hong Kong |
| Contact: | Annie Jiang |
| Email: | nianxiang.jiang@tcl.com |
| Telephone: | +86 755 3661 1621 |
| Fax: | +86 755 3661 2000-81722 |

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

## 3.1. About EUT

| | |
|---|---|
| Description | GSM/UMTS/LTE Mobile phone |
| Model Name | T435D，T435SP，T435S，T435V，T435WS |

Note: The EUT functions are described in Annex A of this test report. Specifications of the EUT were provided to fulfil the test. Samples undergoing test were selected by the client. 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

| EUT ID* | SN or IMEI | HW Version | SW Version | Date of Receipt |
|---|---|---|---|---|
| UT31a | 016495000011696 | 03 | 9JS6 | 2023-12-26 |

*EUT ID: is used to identify the test sample in the lab internally. The HW and SW version information were provided by the applicant.

## 3.3. Internal Identification of AE

| AE ID* | Description | Model | Manufacturer | Note |
|---|---|---|---|---|
| AE1 | Battery | TLi017D7 | Veken | --- |
| AE2 | Battery | TLi017DA | TIANMAO | --- |
| AE3 | Charger1 | UC11US | PUAN | --- |
| AE4 | Charger2 | UC11US | JUWEI | --- |
| AE5 | USB Cable | CDA0000254C1 | JUWEI | --- |
| AE6 | Headset | / | / | Provided by laboratory |

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

## 3.4. EUT set-ups

| EUT set-up No. | Combination of EUT and AE | Remarks |
|---|---|---|
| Set.1 | UT31a + AE1/2 + AE3 +AE5 | Charger1 |
| Set.2 | UT31a + AE1/2 + AE4 +AE5 | Charger2 |
| Set.3 | UT31a + AE1/2 + AE5 +AE6 | USB+FM |

# 4. Reference Documents

## 4.1. Documents supplied by applicant

EUT parameters, referring to Annex A for detailed information, were supplied by the client or manufacturer, which is the basis of testing. CAICT is not responsible for the accuracy of customer supplied technical information that may affect the test results (for example, antenna gain and loss of customer supplied cable).

## 4.2. 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 | 2023 |
| 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. Test Results

| Abbreviations used in this clause: | | |
|---|---|---|
| Verdict Column | P | Pass |
| | F | Fail |
| | BR | Re-use test data from basic model report. |
| | NA | Not applicable |
| | NM | Not measured |

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

# 6. Test Facilities Utilized

**Test instruments list:**

| No. | Equipment | Model | Serial Number | Manufacturer | Calibration Period | Calibration Due date |
|---|---|---|---|---|---|---|
| 1 | LISN | ENV216 | 101459 | R&S | 1 year | 2024-06-04 |
| 2 | Test Receiver | ESU26 | 100235 | R&S | 1 year | 2024-05-09 |
| 3 | Test Receiver | ESW44 | 103144 | R&S | 1 year | 2024-02-21 |
| 4 | EMI Antenna | VULB9163 | 01223 | Schwarzbeck | 1 year | 2024-08-18 |
| 5 | EMI Antenna | 3117 | 00119021 | ETS-Lindgren | 1 year | 2024-06-24 |

**Test software list:**

| Test Item | Test Software | Software Vendor |
|---|---|---|
| Radiated Emission | EMC32 | R&S |
| Conducted Emission | EMC32 | R&S |

**Semi-anechoic chamber utilized** did not exceed following limits along the 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 |

**Shielded room utilized** did not exceed following limits along the 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 |

# 7. Measurement Uncertainty

Where relevant, the following measurement uncertainty(worse case) levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

**Location 1: CTTL(BDA)**

| Test item | Frequency ranges | Measurement uncertainty |
|---|---|---|
| Radiated Emission | 30MHz-1GHz | 5.73dB(*k*=2) |
| | 1GHz-18GHz | 5.58dB(*k*=2) |
| Conducted Emission | 150kHz-30MHz | AC Power Line: 3.10dB(*k*=2) |

# ANNEX A: EUT parameters

| | | |
|---|---|---|
| Cellular Bands operate between 30MHz-960MHz | ☑GSM | Band 850/900/1800/1900 |
| | ☐CDMA | Band |
| | ☑WCDMA | Band 1/2/4/5/8 |
| | ☑LTE | Band 2/4/5/12/13/25/26/41/66/71 |
| | ☐5G NR SA | Band |
| | ☐5G NR NSA | Band |
| Other FCC Part 15B related features | ☑FM ☑MP3 ☑MP4 ☑Camera ☑USB data/charging | |

# ANNEX B: Detailed Test Results

## B.1. Radiated Emission

**Reference:** FCC Part 15.109(a).

**Method of measurement:** The field strength of radiated emissions from the unintentional radiator at distances of 3 meters(for 30MHz-1GHz) and 3 meters (for above 1GHz) were tested. The test was 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 the specified distance from the EUT. During the test, 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.

**EUT operating mode:** The EUT was operating in the USB data and/or charging mode. During the test, the EUT was connected to a charger in the case of charging mode. The EUT was tested while operating in licensed band Rx mode. All licensed band receivers that tune in the range of 30MHz-960MHz, as listed in Annex A, were investigated. Only the worst case emissions are reported. All equipment was placed on the test table top and arranged in a typical configuration in accordance with ANSI C63.4-2014 and manipulated to obtain worst case emissions.

**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. The limits for 10 meters distance is got by converting: Limit(10m) = Limit(3m) + 20[log(3/10)], which is according to FCC 15.109(g)(2)

**Test settings:**

| Frequency range (MHz) | RBW/VBW | Sweep Time (s) | Detector |
|---|---|---|---|
| 30-1000 | 120kHz (IF Bandwidth) | 5 | Peak/Quasi-peak |
| Above 1000 | 1MHz/3MHz | 15 | Peak, Average |

**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.

Note: The measurement results showed as followed are worst cases, and the combinations of different batteries, cables and headsets were considered if applicable.

**UT31a Charger + Camera + GSM 850MHz idle mode, Set.1**

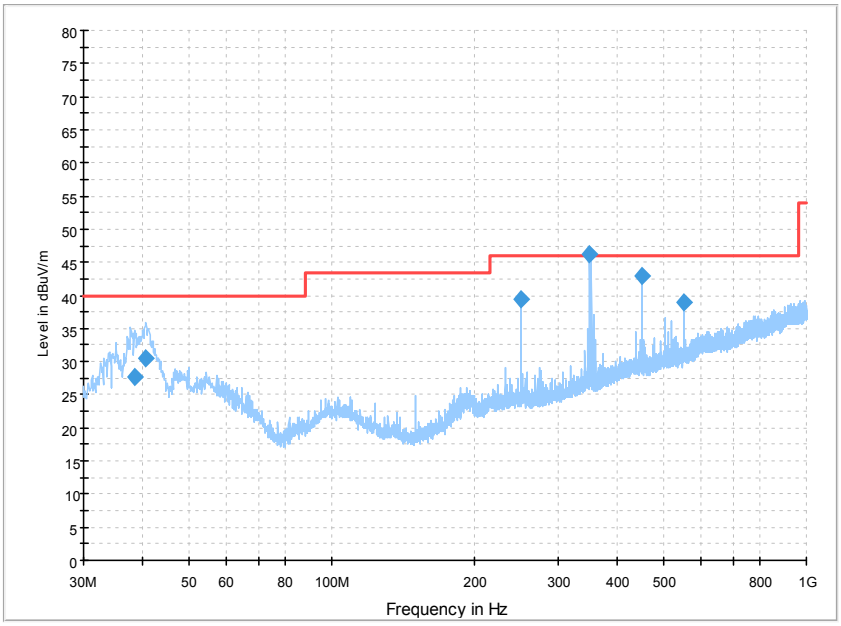


**Figure A.1 Radiated Emission from 30MHz to 1GHz**

**QP detector**

| Frequency (MHz) | QuasiPeak (dBuV/m) | Height (cm) | Polarization | Azimuth (deg) | Corr. (dB) | Margin (dB) | Limit (dBuV/m) |
|---|---|---|---|---|---|---|---|
| 38.342000 | 27.7 | 113.0 | V | 96.0 | -1.4 | 12.3 | 40.0 |
| 40.670000 | 30.4 | 100.0 | V | 38.0 | -0.6 | 9.6 | 40.0 |
| 249.996000 | 39.5 | 175.0 | V | 162.0 | 1.2 | 6.5 | 46.0 |
| 350.003000 | 45.9 | 100.0 | H | 38.0 | 4.2 | 0.1 | 46.0 |
| 450.010000 | 42.9 | 100.0 | V | 302.0 | 6.3 | 3.1 | 46.0 |
| 550.017000 | 38.9 | 175.0 | H | 282.0 | 8.0 | 7.1 | 46.0 |

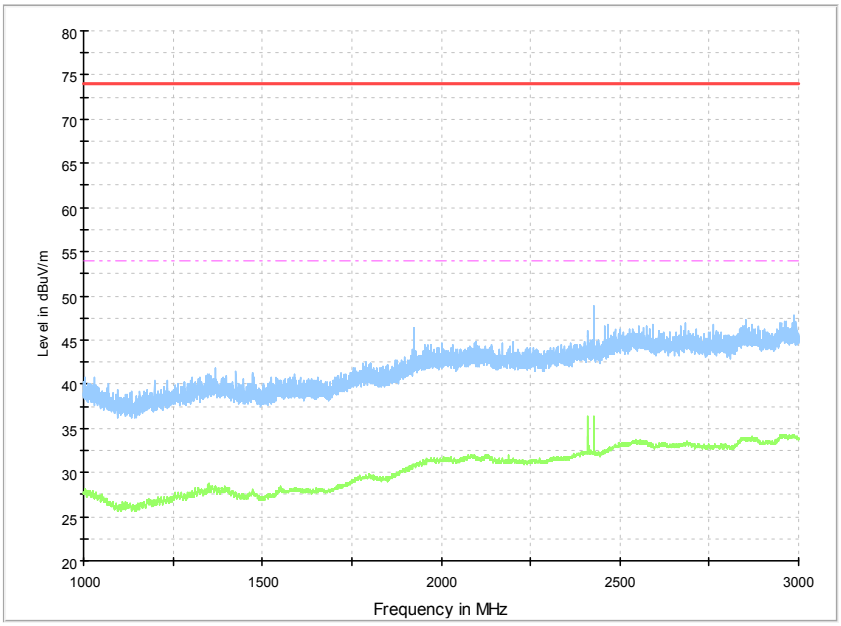


**Figure A.2 Radiated Emission from 1GHz to 3GHz**

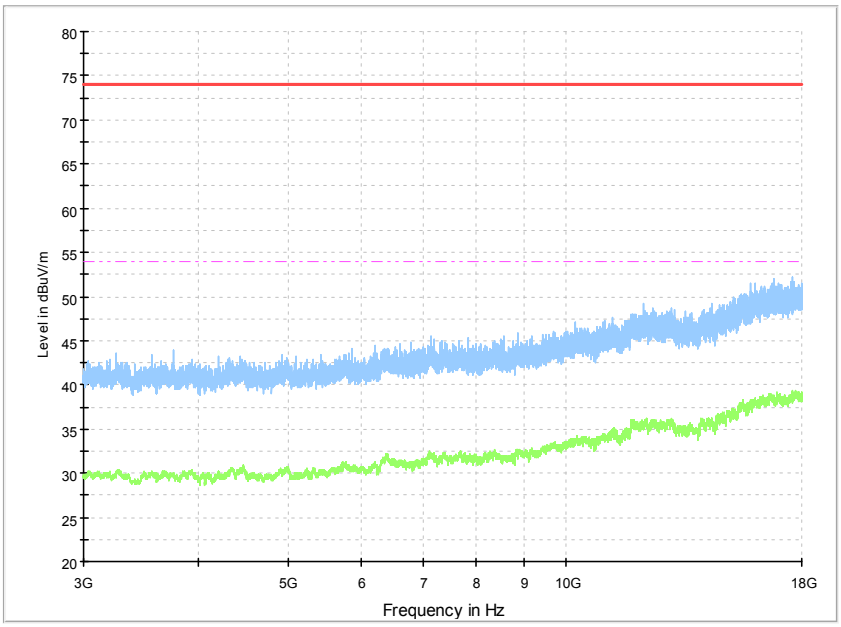


**Figure A.3 Radiated Emission from 3GHz to 18GHz**

**UT31a Charger + MP4 + WCDMA 850MHz idle mode, Set.2**

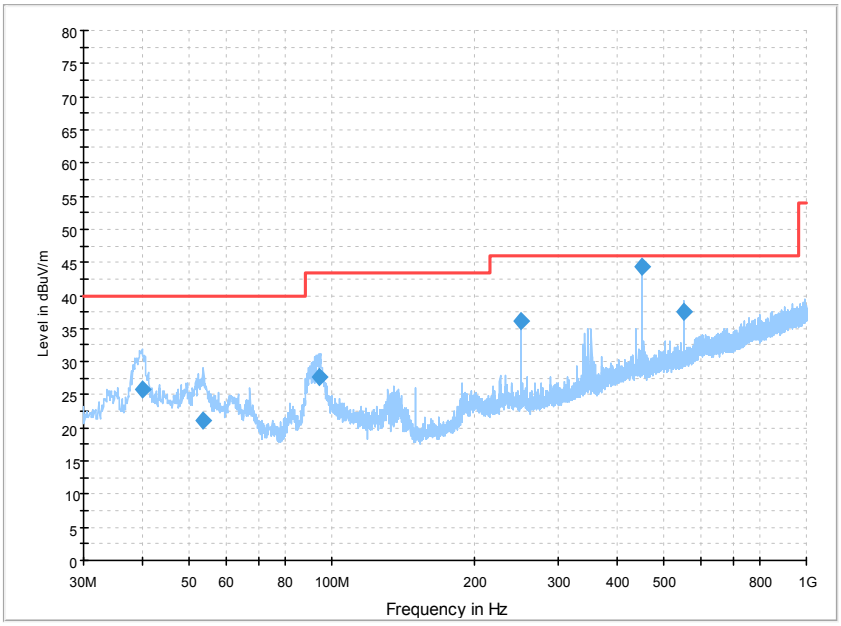


**Figure A.4 Radiated Emission from 30MHz to 1GHz**

**QP detector**

| Frequency (MHz) | QuasiPeak (dBuV/m) | Height (cm) | Polarization | Azimuth (deg) | Corr. (dB) | Margin (dB) | Limit (dBuV/m) |
|---|---|---|---|---|---|---|---|
| 39.797000 | 25.8 | 125.0 | V | 0.0 | -0.9 | 14.2 | 40.0 |
| 53.668000 | 21.1 | 100.0 | V | 244.0 | 0.3 | 18.9 | 40.0 |
| 93.826000 | 27.6 | 100.0 | V | 186.0 | -2.1 | 15.9 | 43.5 |
| 249.996000 | 36.1 | 100.0 | V | 167.0 | 1.2 | 9.9 | 46.0 |
| 450.010000 | 44.3 | 100.0 | H | 225.0 | 6.3 | 1.7 | 46.0 |
| 550.017000 | 37.5 | 100.0 | V | 12.0 | 8.0 | 8.5 | 46.0 |

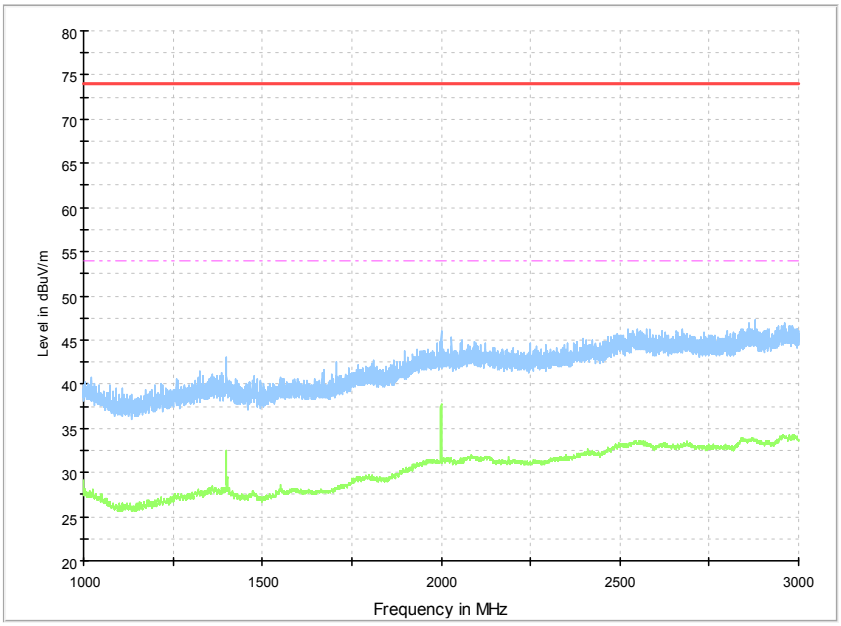


**Figure A.5 Radiated Emission from 1GHz to 3GHz**

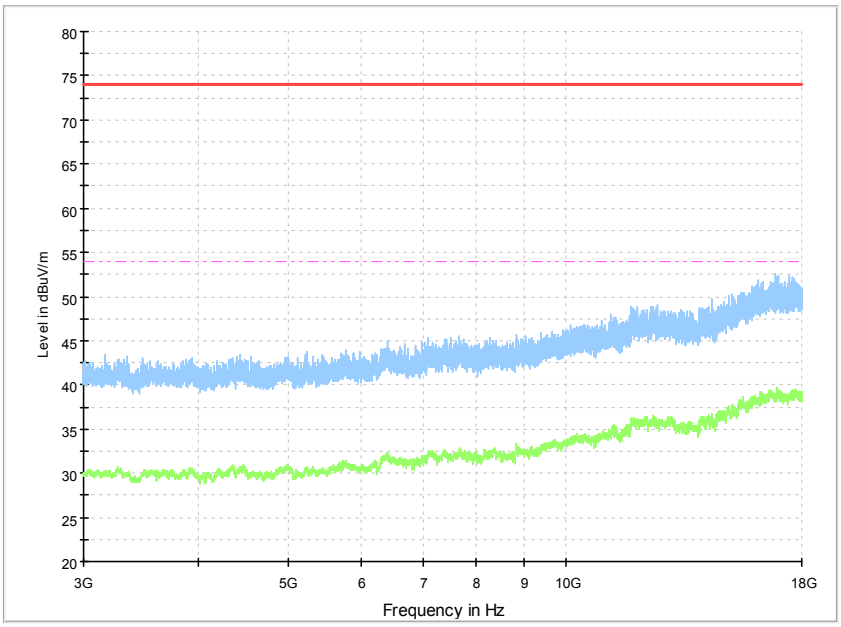


**Figure A.6 Radiated Emission from 3GHz to 18GHz**

**UT31a USB + FM + LTE Band5 idle mode, Set.3**

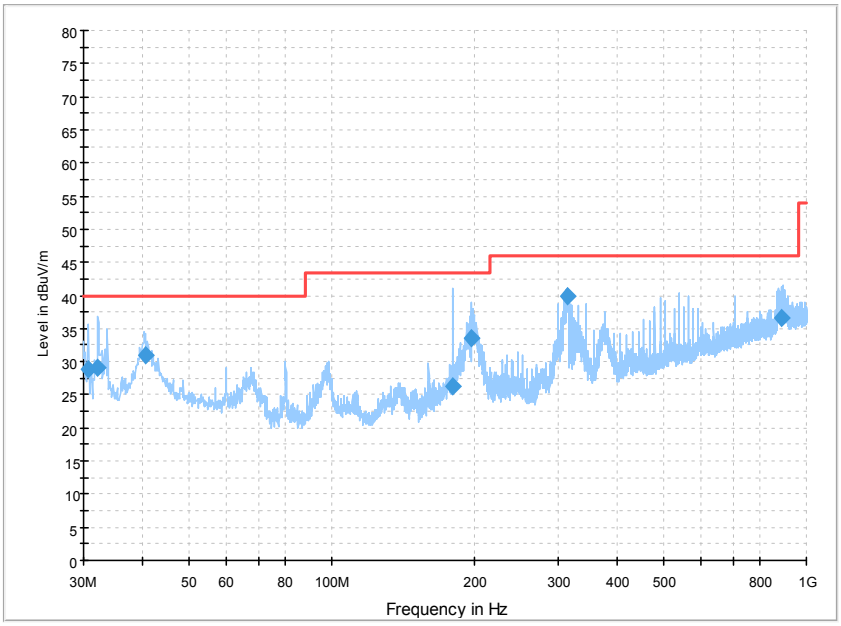


**Figure A.7 Radiated Emission from 30MHz to 1GHz**

**QP detector**

| Frequency (MHz) | QuasiPeak (dBuV/m) | Height (cm) | Polarization | Azimuth (deg) | Corr. (dB) | Margin (dB) | Limit (dBuV/m) |
|---|---|---|---|---|---|---|---|
| 30.776000 | 28.8 | 100.0 | V | 218.0 | -3.5 | 11.2 | 40.0 |
| 32.134000 | 29.0 | 100.0 | V | -39.0 | -3.5 | 11.0 | 40.0 |
| 40.476000 | 31.0 | 100.0 | V | 141.0 | -0.7 | 9.0 | 40.0 |
| 180.059000 | 26.4 | 100.0 | H | 212.0 | -2.8 | 17.1 | 43.5 |
| 196.549000 | 33.5 | 125.0 | H | 270.0 | -0.2 | 10.0 | 43.5 |
| 313.628000 | 39.8 | 100.0 | H | 257.0 | 2.1 | 6.2 | 46.0 |
| 889.323000 | 36.6 | 100.0 | V | 7.0 | 12.8 | 9.4 | 46.0 |

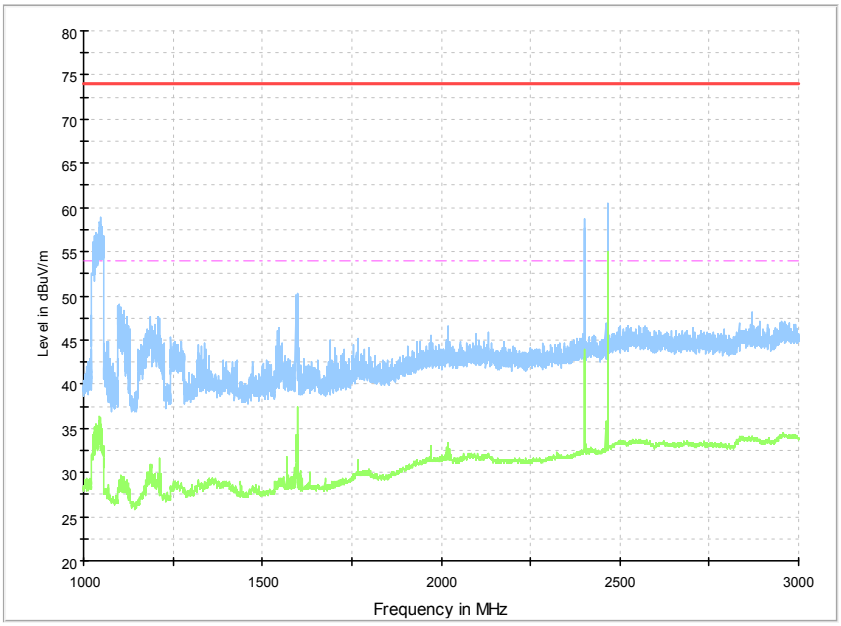


**Figure A.8 Radiated Emission from 1GHz to 3GHz**

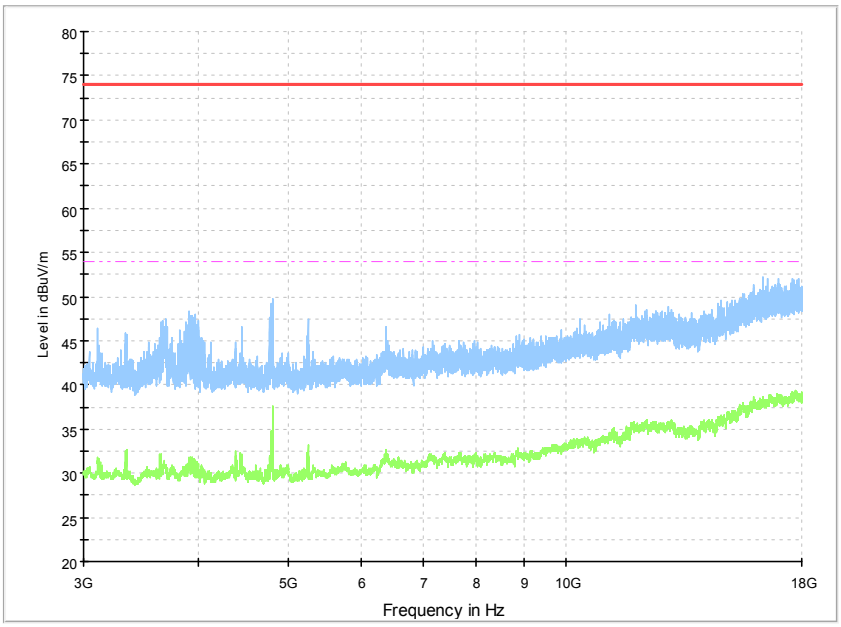


**Figure A.9 Radiated Emission from 3GHz to 18GHz**

## B.2. Conducted Emission

**Reference:** FCC: Part 15.107(a).

**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.

**EUT operating mode:** The EUT is operating in the charging mode and USB data mode if applicable.

**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 | | |

**Test Settings:**

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

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

**Measurement results:**

The measurement results showed as followed are worst cases, and the combinations of different batteries, cables and headsets were considered if applicable.

**UT31a Charger + Camera + GSM 850 idle mode, Set.1**

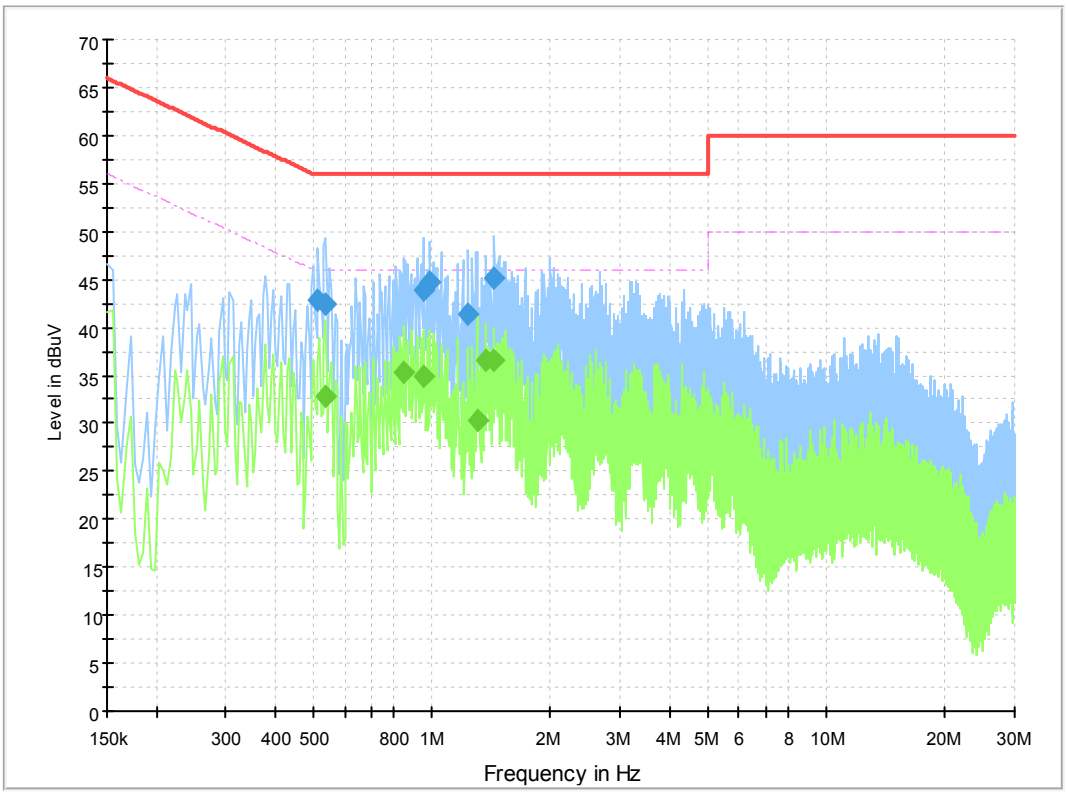


**Figure A.10 Conducted Emission**

**Final Result 1**

| Frequency (MHz) | QuasiPeak (dBuV) | Meas. Time (ms) | Bandwidth (kHz) | Filter | Line | Corr. (dB) | Margin (dB) | Limit (dBuV) |
|---|---|---|---|---|---|---|---|---|
| 0.514500 | 42.8 | 2000.0 | 9.000 | Off | L1 | 19.6 | 13.2 | 56.0 |
| 0.537000 | 42.4 | 2000.0 | 9.000 | Off | N | 19.6 | 13.6 | 56.0 |
| 0.951000 | 43.8 | 2000.0 | 9.000 | Off | L1 | 19.6 | 12.2 | 56.0 |
| 0.987000 | 44.7 | 2000.0 | 9.000 | Off | L1 | 19.7 | 11.3 | 56.0 |
| 1.234500 | 41.4 | 2000.0 | 9.000 | Off | L1 | 19.7 | 14.6 | 56.0 |
| 1.441500 | 45.2 | 2000.0 | 9.000 | Off | L1 | 19.7 | 10.8 | 56.0 |

**Final Result 2**

| Frequency (MHz) | CAverage (dBuV) | Meas. Time (ms) | Bandwidth (kHz) | Filter | Line | Corr. (dB) | Margin (dB) | Limit (dBuV) |
|---|---|---|---|---|---|---|---|---|
| 0.537000 | 32.9 | 2000.0 | 9.000 | Off | N | 19.6 | 13.1 | 46.0 |
| 0.847500 | 35.3 | 2000.0 | 9.000 | Off | L1 | 19.6 | 10.7 | 46.0 |
| 0.951000 | 35.0 | 2000.0 | 9.000 | Off | L1 | 19.6 | 11.0 | 46.0 |
| 1.302000 | 30.3 | 2000.0 | 9.000 | Off | N | 19.7 | 15.7 | 46.0 |
| 1.369500 | 36.6 | 2000.0 | 9.000 | Off | L1 | 19.7 | 9.4 | 46.0 |
| 1.441500 | 36.6 | 2000.0 | 9.000 | Off | L1 | 19.7 | 9.4 | 46.0 |

**UT31a Charger + MP4 + WCDMA 850 idle mode, Set.2**

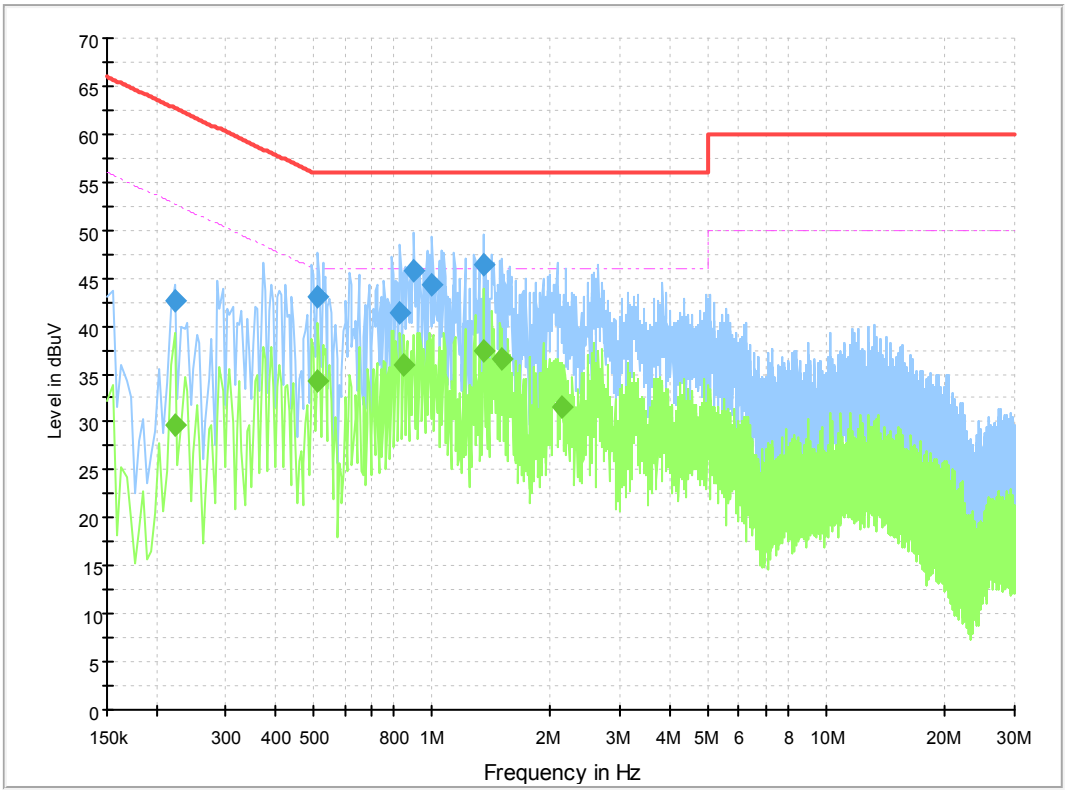


**Figure A.11 Conducted Emission**

**Final Result 1**

| Frequency (MHz) | QuasiPeak (dBuV) | Meas. Time (ms) | Bandwidth (kHz) | Filter | Line | Corr. (dB) | Margin (dB) | Limit (dBuV) |
|---|---|---|---|---|---|---|---|---|
| 0.222000 | 42.5 | 2000.0 | 9.000 | Off | L1 | 19.7 | 20.2 | 62.7 |
| 0.514500 | 43.1 | 2000.0 | 9.000 | Off | L1 | 19.6 | 12.9 | 56.0 |
| 0.829500 | 41.4 | 2000.0 | 9.000 | Off | N | 19.7 | 14.6 | 56.0 |
| 0.901500 | 45.7 | 2000.0 | 9.000 | Off | L1 | 19.6 | 10.3 | 56.0 |
| 1.000500 | 44.3 | 2000.0 | 9.000 | Off | L1 | 19.7 | 11.7 | 56.0 |
| 1.351500 | 46.3 | 2000.0 | 9.000 | Off | L1 | 19.7 | 9.7 | 56.0 |

**Final Result 2**

| Frequency (MHz) | CAverage (dBuV) | Meas. Time (ms) | Bandwidth (kHz) | Filter | Line | Corr. (dB) | Margin (dB) | Limit (dBuV) |
|---|---|---|---|---|---|---|---|---|
| 0.222000 | 29.7 | 2000.0 | 9.000 | Off | N | 19.7 | 23.0 | 52.7 |
| 0.514500 | 34.3 | 2000.0 | 9.000 | Off | L1 | 19.6 | 11.7 | 46.0 |
| 0.847500 | 35.9 | 2000.0 | 9.000 | Off | L1 | 19.6 | 10.1 | 46.0 |
| 1.351500 | 37.5 | 2000.0 | 9.000 | Off | L1 | 19.7 | 8.5 | 46.0 |
| 1.504500 | 36.5 | 2000.0 | 9.000 | Off | L1 | 19.7 | 9.5 | 46.0 |
| 2.134500 | 31.6 | 2000.0 | 9.000 | Off | L1 | 19.7 | 14.4 | 46.0 |

**UT31a USB + FM + LTE Band5 idle mode, Set.3**

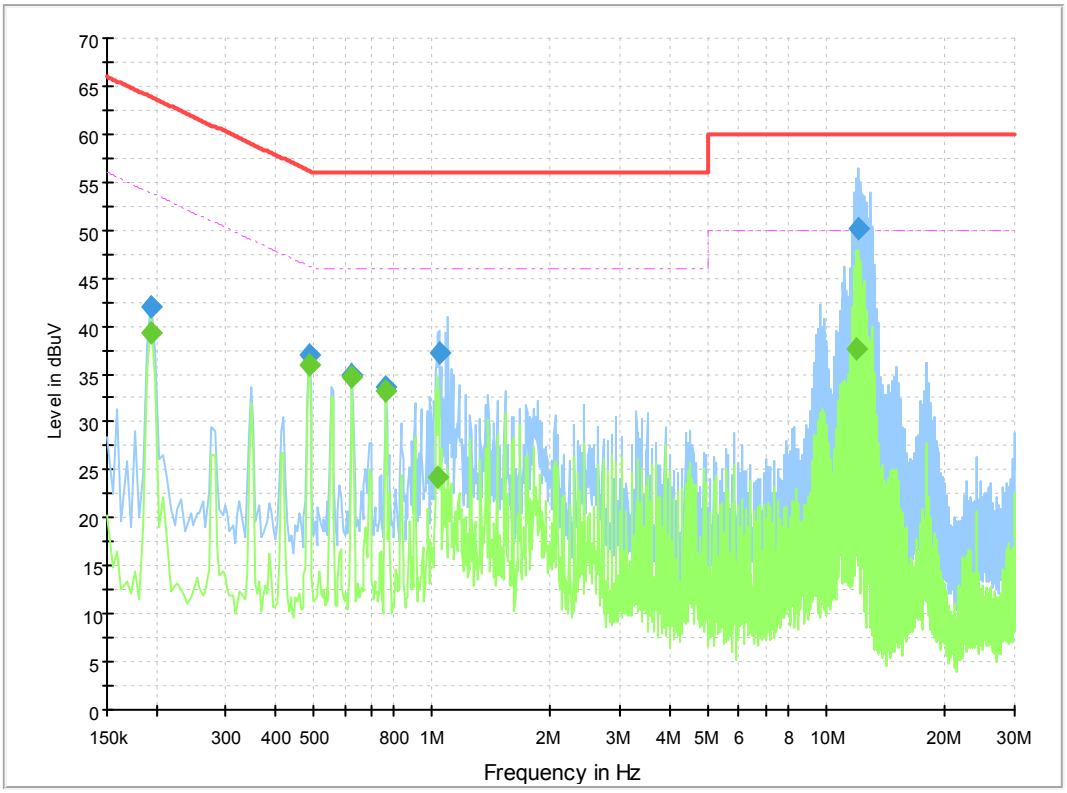


**Figure A.12 Conducted Emission**

**Final Result 1**

| Frequency (MHz) | QuasiPeak (dBuV) | Meas. Time (ms) | Bandwidth (kHz) | Filter | Line | Corr. (dB) | Margin (dB) | Limit (dBuV) |
|---|---|---|---|---|---|---|---|---|
| 0.195000 | 42.0 | 2000.0 | 9.000 | Off | L1 | 19.7 | 21.8 | 63.8 |
| 0.487500 | 37.0 | 2000.0 | 9.000 | Off | N | 19.6 | 19.2 | 56.2 |
| 0.627000 | 34.9 | 2000.0 | 9.000 | Off | N | 19.6 | 21.1 | 56.0 |
| 0.766500 | 33.6 | 2000.0 | 9.000 | Off | N | 19.7 | 22.4 | 56.0 |
| 1.041000 | 37.1 | 2000.0 | 9.000 | Off | N | 19.7 | 18.9 | 56.0 |
| 12.025500 | 50.2 | 2000.0 | 9.000 | Off | N | 19.9 | 9.8 | 60.0 |

**Final Result 2**

| Frequency (MHz) | CAverage (dBuV) | Meas. Time (ms) | Bandwidth (kHz) | Filter | Line | Corr. (dB) | Margin (dB) | Limit (dBuV) |
|---|---|---|---|---|---|---|---|---|
| 0.195000 | 39.3 | 2000.0 | 9.000 | Off | N | 19.7 | 14.5 | 53.8 |
| 0.487500 | 35.9 | 2000.0 | 9.000 | Off | N | 19.6 | 10.3 | 46.2 |
| 0.627000 | 34.7 | 2000.0 | 9.000 | Off | N | 19.6 | 11.3 | 46.0 |
| 0.766500 | 33.3 | 2000.0 | 9.000 | Off | L1 | 19.7 | 12.7 | 46.0 |
| 1.036500 | 24.2 | 2000.0 | 9.000 | Off | L1 | 19.7 | 21.8 | 46.0 |
| 11.886000 | 37.5 | 2000.0 | 9.000 | Off | L1 | 19.9 | 12.5 | 50.0 |

## ANNEX C: Persons involved in this testing

| Test Item | Tester |
|---|---|
| Radiated Emission | Zhao Wenhui |
| Conducted Emission | Yan Xiaorui |

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