

No. I15Z42457-EMC01

for

TCL Communication Ltd.

HSUPA/HSDPA/UMTS Dual band/GSM Quad band mobile phone

Model Name: 4003M

FCC ID: 2ACCJH004

with

Hardware Version: PIO

Software Version: vB2M

Issued Date: 2015-10-10

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:

FCC 2.948 Listed: No.525429

CTTL, Telecommunication Technology Labs, Academy of Telecommunication Research, MIIT

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

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

Email: cttl_terminals@catr.cn, website: www.chinattl.com



REPORT HISTORY

| Report Number Revision | | Description | Issue Date | |
|------------------------|-------|-------------|------------|--|
| I15Z42457-EMC01 | Rev.0 | 1st edition | 2015-10-10 | |



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1. Test Laboratory

1.1. Testing Location

Location 1: CTTL(huayuan North Road)

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

100191

1.2. <u>Testing Environment</u>

Normal Temperature: 15-35 °C Relative Humidity: 20-75%

1.3. Project data

Testing Start Date: 2015-09-24
Testing End Date: 2015-10-08

1.4. Signature

张 颖

Zhang Ying

(Prepared this test report)

出胸色

Qu Pengfei

(Reviewed this test report)

Liu Baodian

(Approved this test report)



2. Client Information

2.1. Applicant Information

Company Name: TCL Communication Ltd.

Address /Post: 5F, C building, No. 232, Liang Jing Road ZhangJiang High-Tech Park,

Pudong Area Shanghai, P.R. China. 201203

City: Shanghai Postal Code: 201203 Country: China

Contact Person: Gong Zhizhou

Contact Email zhizhou.gong@tcl.com
Telephone: 0086-21-61460890
Fax: 0086-21-61460602

2.2. Manufacturer Information

Company Name: TCL Communication Ltd.

Address /Post: 5F, C building, No. 232, Liang Jing Road ZhangJiang High-Tech Park,

Pudong Area Shanghai, P.R. China. 201203

City: Shanghai Postal Code: 201203 Country: China

Telephone: 0086-21-61460890 Fax: 0086-21-61460602



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

3.1. About EUT

Description HSUPA/HSDPA/UMTS Dual band/GSM Quad band mobile phone

Model Name 4003M

FCC ID 2ACCJH004

Extreme vol. Limits 3.5VDC to 4.2VDC (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, Academy of Telecommunication Research, MIIT.

3.2. Internal Identification of EUT used during the test

| EUT ID* | SN or IMEI | HW Version | SW Version |
|---------|-----------------|-------------------|------------|
| EUT1 | 355163070000093 | PIO | vB2M |

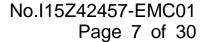
^{*}EUT ID: is used to identify the test sample in the lab internally.

3.3. Internal Identification of AE used during the test

| AE ID* | Description | SN | Remarks |
|--------|----------------|----|---------------|
| AE1 | battery | / | 14TCT-BA-2248 |
| AE2 | Travel Charger | / | 14TCT-CH-1227 |
| AE3 | Travel Charger | / | 14TCT-CH-0443 |
| AE4 | Travel Charger | / | 14TCT-CH-1053 |
| AE5 | Travel Charger | / | 14TCT-CH-1916 |
| AE6 | Travel Charger | / | 14TCT-CH-2180 |
| AE7 | USB Cable | / | 14TCT-DC-0380 |
| AE8 | USB Cable | / | 14TCT-DC-0590 |
| AE9 | USB Cable | / | 15TCT-DC-0186 |
| AE10 | battery | / | / |
| AE11 | battery | / | / |
| AE12 | USB Cable | / | / |
| AE13 | USB Cable | / | / |
| AE14 | USB Cable | / | 1 |
| | | | |

AE1

| Model | CAB31P0000CB |
|-----------------|--------------|
| Manufacturer | OCEANSUN |
| Capacitance | 1300mAh |
| Nominal voltage | 3.7V |





AE10

Model CAB1300015C2

Manufacturer SCUD
Capacitance 1300mAh
Nominal voltage 3.7V

AE11

Model CAB31P0000C1

Manufacturer BYD
Capacitance 1300mAh
Nominal voltage 3.7V

AE2

Type CBA3002AG0C3

Manufacturer Yingju Length of cable 124cm

AE3

Type CBA3002AG0C2

Manufacturer Tenpao Length of cable 120cm

AE4

Type CBA3002AG0C1

Manufacturer BYD
Length of cable 120cm

AE5

Type CBA3008AG0C2

Manufacturer Tenpao

Length of cable /

AE6

Type CBA3008AG0C3

Manufacturer Yingju
Length of cable /

AE7

Type CDA3122002C1

Manufacturer Juwei Length of cable 100cm

AE8

Type CDA3122002C2
Manufacturer Shenghua
Length of cable 97cm

AE9

Type CDA3122002C8

Manufacturer PUAN Length of cable 98cm



AE12

Type CDA3122005C1

Manufacturer Juwei

Length of cable

AE13

Type CDA3122005C2

Manufacturer Shenghua

Length of cable

AE14

Type CDA3122005C8

Manufacturer PUAN

Length of cable /

3.4. EUT set-ups

| EUT set-up No. | Combination of EUT and AE | Remarks |
|----------------|---------------------------|---------|
| Set.1 | EUT1 + AE1 + AE2 | Charger |
| Set.2 | EUT1 + AE1 + AE3 | Charger |
| Set.3 | EUT1 + AE1 + AE4 | Charger |
| Set.4 | EUT1 + AE1 + AE5 + AE7 | Charger |
| Set.5 | EUT1 + AE1 + AE6 + AE8 | Charger |
| Set.6 | EUT1 + AE1 + AE9 | USB |

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



4. Reference Documents

4.1. Reference Documents for testing

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

GHz

| Reference | Title | Version |
|------------------------|---|---------|
| FCC Part 15, Subpart B | Radio frequency devices - Unintentional Radiators | 10-1-14 |
| | | Edition |
| ANSI C63.4 | Methods of Measurement of Radio-Noise | 2014 |
| | Emissions from Low - Voltage Electrical and | |
| | Electronic Equipment in the Range of 9 kHz to 40 | |



5. LABORATORY ENVIRONMENT

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

| e e | |
|---|---|
| Temperature | Min. = 15 °C, Max. = 35 °C |
| Relative humidity | Min. = 15 %, Max. = 75 % |
| Shielding effectiveness | 0.014MHz-1MHz, >60dB; |
| | 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 |

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

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



6. SUMMARY OF TEST RESULTS

| Abbreviations used in this clause: | | |
|------------------------------------|---------|---|
| P | | Pass |
| Verdict Column | NA | Not applicable |
| | F | Fail |
| Location Column | 4/0/0/4 | The test is performed in test location A, B, C or D |
| Location Column | 1/2/3/4 | which are described in section 1.1 of this report |

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



7. Test Equipments Utilized

| NO. | NAME | TYPE | SERIES NUMBER | PRODUCER | CAL. DUE DATE | CAL. INTERVAL |
|-----|---|-----------------|----------------------------------|--------------|------------------|------------------|
| 1. | EMI Antenna | VULB 9163 | 9163-301 | Schwarzbeck | 2017-12-09 | 3 Years |
| 2. | Test Receiver | ESCI 7 | 100948 | R&S | 2016-07-07 | 1 Year |
| 3. | EMI Antenna | 3115 | 6914 | ETS-Lindgren | 2016-12-15 | 3 Years |
| 4. | Test Receiver for Conducted Emission | ESU26 | 100235 | R&S | 2016-03-02 | 1 Year |
| 5. | LISN | ENV216 | 101200 | R&S | 2016-07-07 | 1 Year |
| 6. | Universal Radio Communication Tester | CMU500 | 143008 | R&S | 2015-12-09 | 1 Year |
| 7. | PC | OPTIPLEX 380 | 2X1YV2X | DELL | / | / |
| 8. | Monitor | E1709Wc | CN-OJ672H-6 4180-9BF-1CR L | DELL | / | / |
| 9. | Printer | P1606dn | VNC3L52122 | HP | / | / |
| 10. | Keyboard | L100 | CN-ORH656-6 5890-03S-041 Y | DELL | / | / |
| 11. | Mouse | M-UAR | LZ013HC1YLV | DELL | / | / |



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, charging mode of MS and GPS 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.

For the charging mode, the EUT is keeping on playing MP3 file.

For the USB 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.

A.1.3 Measurement Limit

| Frequency range | Field strength limit (µV/m) | | | | | |
|-----------------|-----------------------------|---------|------|--|--|--|
| (MHz) | 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 |
| I | 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) | Result(dBμV/m) | G _{PL} (dB) | G _A (dB/m) | $P_{Mea}(dB\mu V)$ | Polarity |
|----------------|----------------|----------------------|-----------------------|--------------------|----------|
| 17982.433 | 43.8 | -17.7 | 45.6 | 15.900 | Н |
| 17968.267 | 43.7 | -17.7 | 45.6 | 15.800 | Н |
| 17976.767 | 43.7 | -17.7 | 45.6 | 15.800 | V |
| 17996.600 | 43.5 | -17.7 | 45.6 | 15.600 | V |
| 17990.367 | 43.5 | -17.7 | 45.6 | 15.600 | V |
| 17996.033 | 43.4 | -17.7 | 45.6 | 15.500 | V |

Charging Mode/Peak detector

| Fraguenov/MUz) | Result(dBμV/m) | G_PL | G _A (dB/m) | P _{Mea} (dBµV) | Polarity |
|----------------|-------------------|--------|-----------------------|-------------------------|----------|
| Frequency(MHz) | Κεδαιι(αδμ ۷/111) | (dB) | | | |
| 17988.100 | 55.6 | -17.7 | 45.6 | 27.700 | Н |
| 17984.133 | 55.2 | -17.7 | 45.6 | 27.300 | V |
| 17997.167 | 54.7 | -17.7 | 45.6 | 26.800 | V |
| 17990.933 | 54.6 | -17.7 | 45.6 | 26.700 | Н |
| 17976.767 | 54.5 | -17.7 | 45.6 | 26.600 | V |
| 17975.067 | 54.4 | -17.7 | 45.6 | 26.500 | Н |



Measurement results for Set.2:

Charging Mode/Average detector

| Frequency(MHz) | Result(dBμV/m) | G _{PL} (dB) | G _A (dB/m) | $P_{Mea}(dB\mu V)$ | Polarity |
|----------------|----------------|----------------------|-----------------------|--------------------|----------|
| 17998.300 | 43.6 | -17.7 | 45.6 | 15.700 | Н |
| 18000.000 | 43.6 | -45.6 | 44.5 | 44.666 | V |
| 17990.933 | 43.6 | -17.7 | 45.6 | 15.700 | Н |
| 17967.133 | 43.5 | -17.7 | 45.6 | 15.600 | V |
| 17966.567 | 43.5 | -17.7 | 45.6 | 15.600 | Н |
| 17986.967 | 43.4 | -17.7 | 45.6 | 15.500 | Н |

Charging Mode/Peak detector

| Frequency(MHz) | Result(dBμV/m) | G _{PL} (dB) | G _A (dB/m) | P _{Mea} (dBµV) | Polarity |
|----------------|----------------|----------------------|-----------------------|-------------------------|----------|
| 18000.000 | 53.7 | -45.6 | 44.5 | 54.766 | Н |
| 17999.433 | 53.2 | -17.7 | 45.6 | 25.300 | Н |
| 17998.867 | 52.0 | -17.7 | 45.6 | 24.100 | V |
| 17998.300 | 53.2 | -17.7 | 45.6 | 25.300 | Н |
| 17997.733 | 53.9 | -17.7 | 45.6 | 26.000 | V |
| 17997.167 | 53.5 | -17.7 | 45.6 | 25.600 | Н |

Measurement results for Set.3:

Charging Mode/Average detector

| Frequency(MHz) | Result(dB _μ V/m) | G _{PL} (dB) | G _A (dB/m) | P _{Mea} (dBµV) | Polarity |
|----------------|-----------------------------|----------------------|-----------------------|-------------------------|----------|
| 17960.333 | 43.7 | -17.7 | 45.6 | 15.800 | Н |
| 17986.967 | 43.6 | -17.7 | 45.6 | 15.700 | Н |
| 17995.467 | 43.6 | -17.7 | 45.6 | 15.700 | Н |
| 17971.667 | 43.6 | -17.7 | 45.6 | 15.700 | V |
| 17984.700 | 43.5 | -17.7 | 45.6 | 15.600 | V |
| 17967.700 | 43.5 | -17.7 | 45.6 | 15.600 | Н |

Charging Mode/Peak detector

| Frequency(MHz) | Result(dBμV/m) | G _{PL} (dB) | G _A (dB/m) | $P_{Mea}(dB\mu V)$ | Polarity |
|----------------|----------------|----------------------|-----------------------|--------------------|----------|
| 17886.667 | 55.0 | -18.5 | 45.6 | 27.900 | Н |
| 17954.667 | 54.9 | -17.7 | 45.6 | 27.000 | Н |
| 17917.833 | 54.6 | -17.7 | 45.6 | 26.700 | V |
| 17985.267 | 54.5 | -17.7 | 45.6 | 26.600 | Н |
| 17844.167 | 54.5 | -18.5 | 45.6 | 27.400 | V |
| 17907.633 | 54.5 | -18.5 | 45.6 | 27.400 | Н |



Measurement results for Set.4:

Charging Mode/Average detector

| Frequency(MHz) | Result(dB _μ V/m) | G _{PL} (dB) | G _A (dB/m) | P _{Mea} (dBμV) | Polarity |
|----------------|-----------------------------|----------------------|-----------------------|-------------------------|----------|
| 17974.500 | 43.9 | -17.7 | 45.6 | 16.000 | V |
| 17997.733 | 43.7 | -17.7 | 45.6 | 15.800 | Н |
| 17981.300 | 43.7 | -17.7 | 45.6 | 15.800 | V |
| 17998.867 | 43.6 | -17.7 | 45.6 | 15.700 | Н |
| 17981.867 | 43.6 | -17.7 | 45.6 | 15.700 | V |
| 17992.067 | 43.5 | -17.7 | 45.6 | 15.600 | Н |

Charging Mode/Peak detector

| Frequency(MHz) | Result(dBμV/m) | G _{PL} (dB) | G _A (dB/m) | $P_{Mea}(dB\mu V)$ | Polarity |
|----------------|----------------|----------------------|-----------------------|--------------------|----------|
| 17998.867 | 55.4 | -17.7 | 45.6 | 27.500 | Н |
| 17980.733 | 55.1 | -17.7 | 45.6 | 27.200 | V |
| 17970.533 | 54.5 | -17.7 | 45.6 | 26.600 | V |
| 17985.833 | 54.4 | -17.7 | 45.6 | 26.500 | Н |
| 17973.933 | 54.4 | -17.7 | 45.6 | 26.500 | Н |
| 17992.633 | 54.3 | -17.7 | 45.6 | 26.400 | Н |

Measurement results for Set.5:

Charging Mode/Average detector

| Frequency(MHz) | Result(dB _μ V/m) | G _{PL} (dB) | G _A (dB/m) | P _{Mea} (dBµV) | Polarity |
|----------------|-----------------------------|----------------------|-----------------------|-------------------------|----------|
| 17983.567 | 43.8 | -17.7 | 45.6 | 15.900 | V |
| 17994.900 | 43.7 | -17.7 | 45.6 | 15.800 | Н |
| 17998.300 | 43.5 | -17.7 | 45.6 | 15.600 | Н |
| 17986.967 | 43.4 | -17.7 | 45.6 | 15.500 | Н |
| 17986.400 | 43.4 | -17.7 | 45.6 | 15.500 | V |
| 17971.100 | 43.4 | -17.7 | 45.6 | 15.500 | Н |

Charging Mode/Peak detector

| Frequency(MHz) | Result(dB _μ V/m) | G _{PL} (dB) | G _A (dB/m) | P _{Mea} (dBµV) | Polarity |
|----------------|-----------------------------|----------------------|-----------------------|-------------------------|----------|
| 17956.933 | 55.2 | -17.7 | 45.6 | 27.300 | V |
| 17775.600 | 55.1 | -18.5 | 45.6 | 28.000 | Н |
| 17989.800 | 55.0 | -17.7 | 45.6 | 27.100 | V |
| 17990.933 | 54.9 | -17.7 | 45.6 | 27.000 | Н |
| 17992.067 | 54.4 | -17.7 | 45.6 | 26.500 | Н |
| 17943.900 | 54.4 | -17.7 | 45.6 | 26.500 | Н |



Measurement result for Set.6:

USB Mode/Average detector

| Frequency(MHz) | Result(dBµV/m) | G _{PL} (dB) | G _A (dB/m) | $P_{mea}(dB\mu V)$ | Polarity |
|----------------|----------------|----------------------|-----------------------|--------------------|----------|
| 17996.033 | 43.5 | -17.7 | 45.6 | 15.600 | V |
| 17994.900 | 43.3 | -17.7 | 45.6 | 15.400 | Н |
| 17988.100 | 43.3 | -17.7 | 45.6 | 15.400 | V |
| 17973.367 | 43.3 | -17.7 | 45.6 | 15.400 | Н |
| 17979.600 | 43.2 | -17.7 | 45.6 | 15.300 | Н |
| 17981.867 | 43.2 | -17.7 | 45.6 | 15.300 | V |

USB Mode/ Peak detector

| Frequency(MHz) | Result(dBµV/m) | G _{PL} (dB) | G _A (dB/m) | P _{mea} (dBµV) | Polarity |
|----------------|----------------|----------------------|-----------------------|-------------------------|----------|
| 17876.467 | 56.2 | -18.5 | 45.6 | 29.100 | V |
| 17972.800 | 55.1 | -17.7 | 45.6 | 27.200 | Н |
| 17992.633 | 54.7 | -17.7 | 45.6 | 26.800 | Н |
| 17950.133 | 54.6 | -17.7 | 45.6 | 26.700 | Н |
| 17973.367 | 54.6 | -17.7 | 45.6 | 26.700 | V |
| 17979.033 | 54.4 | -17.7 | 45.6 | 26.500 | Н |

Note: The measurement results of Set.1, Set.2, Set.3, Set.4, Set.5 and Set.6 showed here are worst cases of the combinations of different batteries and USB cables.





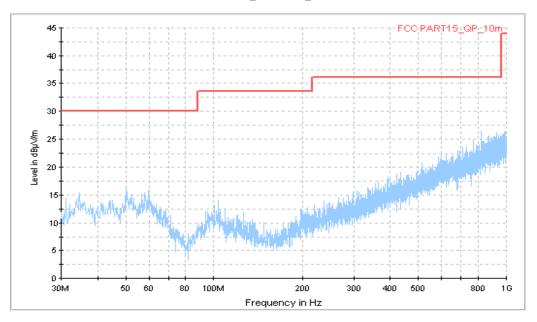


Figure A.1 Radiated Emission from 30MHz to 1GHz

Normal RE_1G-18GHz_directly

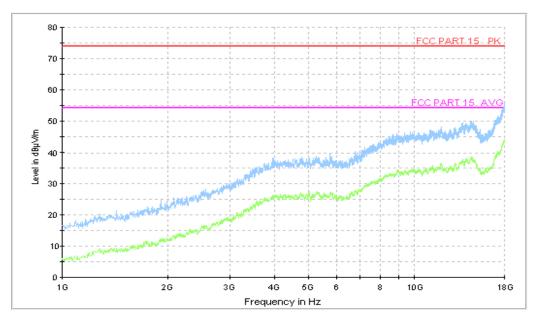


Figure A.2 Radiated Emission from 1GHz to 18GHz





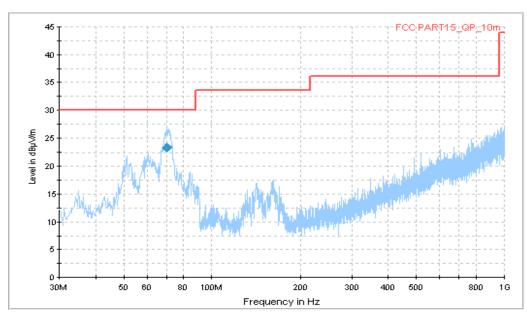


Figure A.3 Radiated Emission from 30MHz to 1GHz

Final Result 1

| Frequency | QuasiPeak | Height | Polarization | Azimuth | Corr. | Margin | Limit |
|-----------|-----------|--------|--------------|---------|-------|--------|----------|
| (MHz) | (dBµV/m) | (cm) | | (deg) | (dB) | (dB) | (dBµV/m) |
| 70.340500 | 23.4 | 288.0 | V | 159.0 | -15.2 | 6.6 | 30.0 |

Normal RE_1G-18GHz_directly

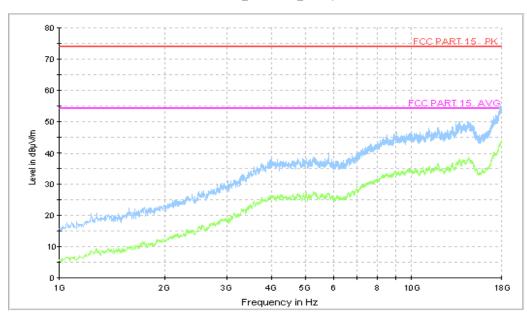


Figure A.4 Radiated Emission from 1GHz to 18GHz



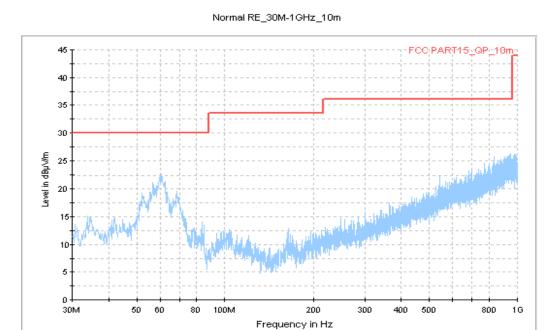


Figure A.5 Radiated Emission from 30MHz to 1GHz

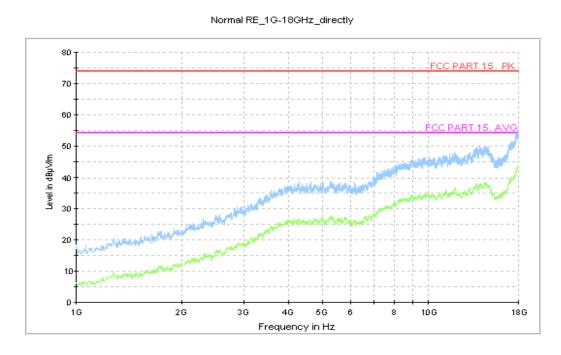


Figure A.6 Radiated Emission from 1GHz to 18GHz





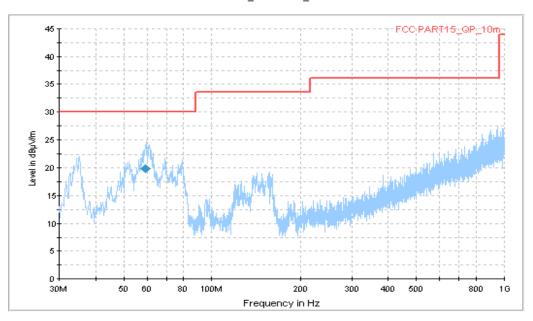


Figure A.7 Radiated Emission from 30MHz to 1GHz

Final Result 1

| Frequency | QuasiPeak | Height | Polarization | Azimuth | Corr. | Margin | Limit |
|-----------|-----------|--------|--------------|---------|-------|--------|----------|
| (MHz) | (dBµV/m) | (cm) | | (deg) | (dB) | (dB) | (dBµV/m) |
| 59.213500 | 19.9 | 325.0 | V | 150.0 | -12.0 | 10.1 | 30.0 |

Normal RE_1G-18GHz_directly

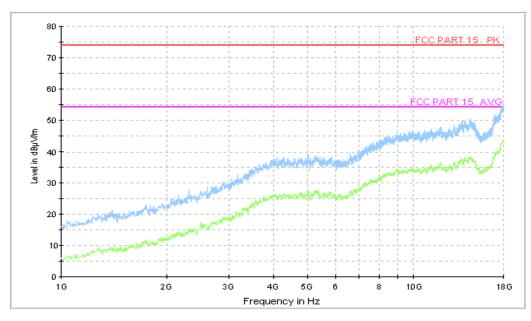


Figure A.8 Radiated Emission from 1GHz to 18GHz





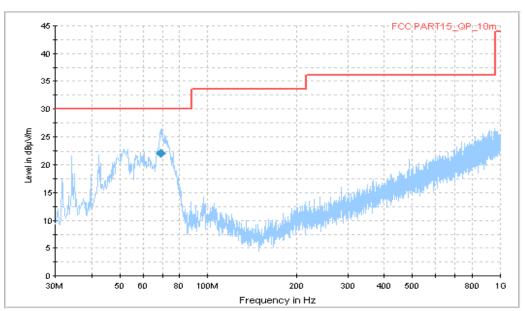


Figure A.9 Radiated Emission from 30MHz to 1GHz

Final Result 1

| Frequency | QuasiPeak | Height | Polarization | Azimuth | Corr. | Margin | Limit |
|-----------|-----------|--------|--------------|---------|-------|--------|----------|
| (MHz) | (dBµV/m) | (cm) | | (deg) | (dB) | (dB) | (dBµV/m) |
| 69.070500 | 22.1 | 100.0 | V | 150.0 | -14.9 | 7.9 | 30.0 |

Normal RE_1G-18GHz_directly

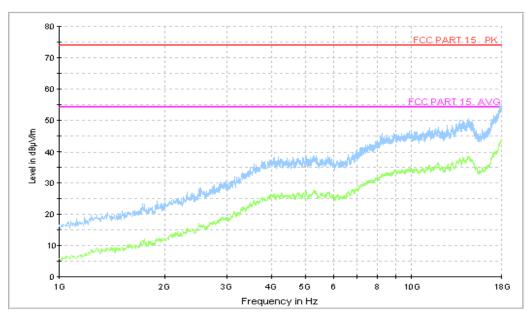


Figure A.10 Radiated Emission from 1GHz to 18GHz

1 G



USB Mode, Set.6

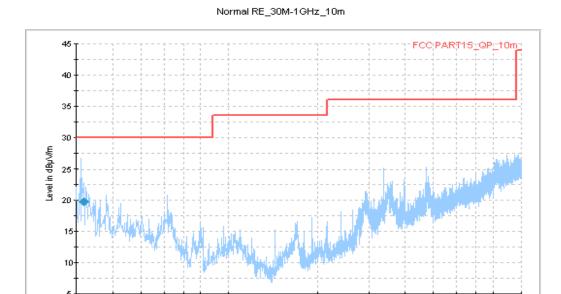


Figure A.11 Radiated Emission from 30MHz to 1GHz

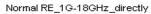
Frequency in Hz

100M

Final Result 1

30M

| Frequency | QuasiPeak | Height | Polarization | Azimuth | Corr. | Margin | Limit |
|-----------|-----------|--------|--------------|---------|-------|--------|----------|
| (MHz) | (dBµV/m) | (cm) | | (deg) | (dB) | (dB) | (dBµV/m) |
| 31.801000 | 19.7 | 275.0 | V | 286.0 | -13.6 | 10.3 | 30.0 |



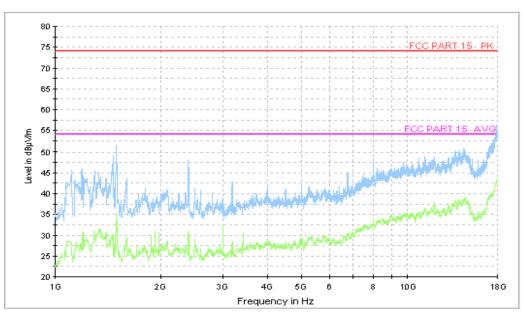


Figure A.12 Radiated Emission from 1GHz to 18GHz



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.

For the charging mode, the EUT is keeping on playing MP3 file.

For the USB 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.

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

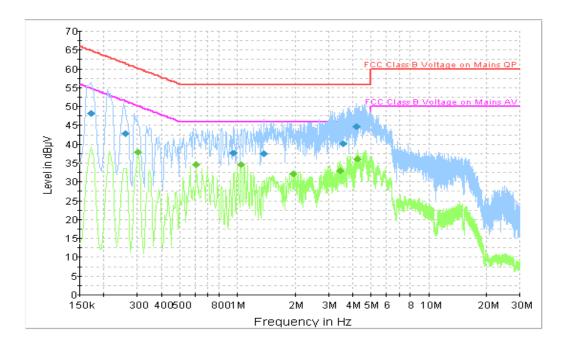


Figure A.13 Conducted Emission

Final Result 1

| Frequency | QuasiPeak | Line | Corr. | Margin | Limit |
|-----------|-----------|------|-------|--------|--------|
| (MHz) | (dBµV) | | (dB) | (dB) | (dBµV) |
| 0.172500 | 48.2 | N | 19.7 | 16.6 | 64.8 |
| 0.258000 | 43.0 | L1 | 19.8 | 18.5 | 61.5 |
| 0.955500 | 37.7 | N | 19.7 | 18.3 | 56.0 |
| 1.378500 | 37.5 | N | 19.7 | 18.5 | 56.0 |
| 3.597000 | 40.1 | N | 19.7 | 15.9 | 56.0 |
| 4.195500 | 44.7 | L1 | 19.7 | 11.3 | 56.0 |

Final Result 2

| Frequency | CAverage | Line | Corr. | Margin | Limit |
|-----------|----------|------|-------|--------|--------|
| (MHz) | (dBµV) | | (dB) | (dB) | (dBµV) |
| 0.303000 | 38.0 | L1 | 19.8 | 12.2 | 50.2 |
| 0.609000 | 34.6 | L1 | 19.8 | 11.4 | 46.0 |
| 1.041000 | 34.6 | L1 | 19.7 | 11.4 | 46.0 |
| 1.959000 | 32.2 | L1 | 19.6 | 13.8 | 46.0 |
| 3.448500 | 33.1 | L1 | 19.6 | 12.9 | 46.0 |
| 4.222500 | 36.1 | L1 | 19.7 | 9.9 | 46.0 |



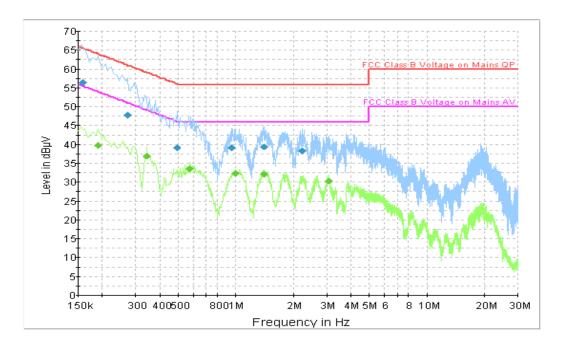


Figure A.14 Conducted Emission

Final Result 1

| i iliai itoodit i | | | | | |
|-------------------|-----------|------|-------|--------|--------|
| Frequency | QuasiPeak | Line | Corr. | Margin | Limit |
| (MHz) | (dBµV) | | (dB) | (dB) | (dBµV) |
| 0.159000 | 56.4 | L1 | 19.7 | 9.1 | 65.5 |
| 0.271500 | 47.9 | L1 | 19.8 | 13.2 | 61.1 |
| 0.492000 | 39.1 | L1 | 19.8 | 17.1 | 56.1 |
| 0.955500 | 39.2 | L1 | 19.7 | 16.8 | 56.0 |
| 1.401000 | 39.4 | L1 | 19.7 | 16.6 | 56.0 |
| 2.224500 | 38.4 | L1 | 19.6 | 17.6 | 56.0 |

Final Result 2

| Frequency | CAverage | Line | Corr. | Margin | Limit |
|-----------|----------|------|-------|--------|--------|
| (MHz) | (dBµV) | | (dB) | (dB) | (dBµV) |
| 0.190500 | 39.8 | L1 | 19.7 | 14.2 | 54.0 |
| 0.343500 | 36.9 | L1 | 19.8 | 12.2 | 49.1 |
| 0.573000 | 33.5 | L1 | 19.8 | 12.5 | 46.0 |
| 0.996000 | 32.4 | L1 | 19.7 | 13.6 | 46.0 |
| 1.401000 | 32.2 | L1 | 19.7 | 13.8 | 46.0 |
| 3.052500 | 30.3 | L1 | 19.7 | 15.7 | 46.0 |



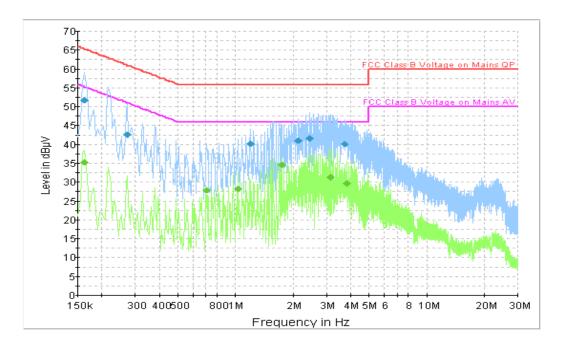


Figure A.15 Conducted Emission

Final Result 1

| Frequency | QuasiPeak | Line | Corr. | Margin | Limit |
|-----------|-----------|------|-------|--------|--------|
| (MHz) | (dBµV) | | (dB) | (dB) | (dBµV) |
| 0.163500 | 51.8 | N | 19.7 | 13.5 | 65.3 |
| 0.271500 | 42.6 | N | 19.8 | 18.5 | 61.1 |
| 1.194000 | 40.3 | L1 | 19.7 | 15.7 | 56.0 |
| 2.116500 | 41.1 | L1 | 19.6 | 14.9 | 56.0 |
| 2.440500 | 41.6 | L1 | 19.6 | 14.4 | 56.0 |
| 3.718500 | 40.2 | L1 | 19.7 | 15.8 | 56.0 |

Final Result 2

| Frequency | CAverage | Line | Corr. | Margin | Limit |
|-----------|----------|------|-------|--------|--------|
| (MHz) | (dBµV) | | (dB) | (dB) | (dBµV) |
| 0.163500 | 35.3 | L1 | 19.7 | 20.0 | 55.3 |
| 0.703500 | 28.0 | L1 | 19.8 | 18.0 | 46.0 |
| 1.023000 | 28.3 | L1 | 19.7 | 17.7 | 46.0 |
| 1.743000 | 34.7 | L1 | 19.7 | 11.3 | 46.0 |
| 3.160500 | 31.4 | L1 | 19.7 | 14.6 | 46.0 |
| 3.826500 | 29.8 | L1 | 19.7 | 16.2 | 46.0 |



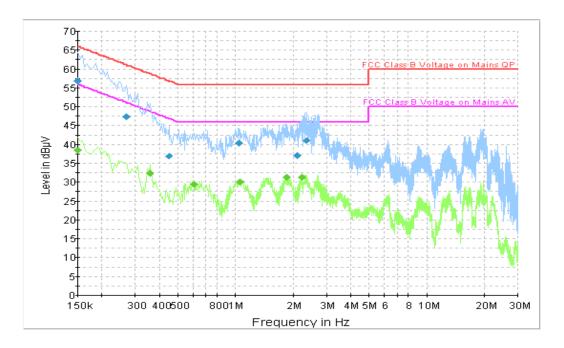


Figure A.16 Conducted Emission

Final Result 1

| Frequency | QuasiPeak | Line | Corr. | Margin | Limit |
|-----------|-----------|------|-------|--------|--------|
| (MHz) | (dBµV) | | (dB) | (dB) | (dBµV) |
| 0.150000 | 56.9 | L1 | 20.1 | 9.1 | 66.0 |
| 0.267000 | 47.3 | L1 | 19.7 | 13.9 | 61.2 |
| 0.447000 | 37.0 | L1 | 19.8 | 20.0 | 56.9 |
| 1.045500 | 40.5 | L1 | 19.7 | 15.5 | 56.0 |
| 2.094000 | 37.2 | N | 19.6 | 18.8 | 56.0 |
| 2.337000 | 41.2 | N | 19.6 | 14.8 | 56.0 |

Final Result 2

| Frequency | CAverage | Line | Corr. | Margin | Limit |
|-----------|----------|------|-------|--------|--------|
| (MHz) | (dBµV) | | (dB) | (dB) | (dBµV) |
| 0.150000 | 38.5 | N | 20.1 | 17.5 | 56.0 |
| 0.357000 | 32.4 | L1 | 19.8 | 16.4 | 48.8 |
| 0.609000 | 29.4 | L1 | 19.8 | 16.6 | 46.0 |
| 1.059000 | 30.1 | L1 | 19.7 | 15.9 | 46.0 |
| 1.846500 | 31.4 | L1 | 19.6 | 14.6 | 46.0 |
| 2.224500 | 31.3 | L1 | 19.6 | 14.7 | 46.0 |



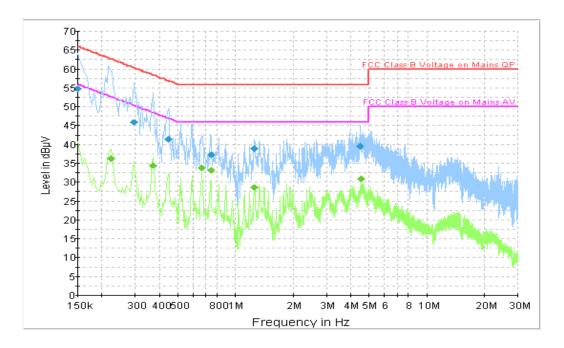


Figure A.17 Conducted Emission

Final Result 1

| Frequency | QuasiPeak | Line | Corr. | Margin | Limit | | |
|-----------|-----------|------|-------|--------|--------|--|--|
| (MHz) | (dBµV) | | (dB) | (dB) | (dBµV) | | |
| 0.150000 | 54.8 | L1 | 20.1 | 11.2 | 66.0 | | |
| 0.294000 | 45.9 | L1 | 19.7 | 14.5 | 60.4 | | |
| 0.442500 | 41.4 | L1 | 19.8 | 15.6 | 57.0 | | |
| 0.744000 | 37.4 | N | 19.8 | 18.6 | 56.0 | | |
| 1.257000 | 39.0 | L1 | 19.7 | 17.0 | 56.0 | | |
| 4.488000 | 39.7 | L1 | 19.7 | 16.3 | 56.0 | | |

Final Result 2

| Frequency | CAverage | Line | Corr. | Margin | Limit |
|-----------|----------|------|-------|--------|--------|
| (MHz) | (dBµV) | | (dB) | (dB) | (dBµV) |
| 0.222000 | 36.4 | L1 | 19.7 | 16.3 | 52.7 |
| 0.370500 | 34.6 | N | 19.8 | 13.9 | 48.5 |
| 0.667500 | 33.9 | L1 | 19.8 | 12.1 | 46.0 |
| 0.744000 | 33.2 | L1 | 19.8 | 12.8 | 46.0 |
| 1.261500 | 28.6 | N | 19.7 | 17.4 | 46.0 |
| 4.555500 | 30.9 | L1 | 19.6 | 15.1 | 46.0 |



USB Mode, Set.6

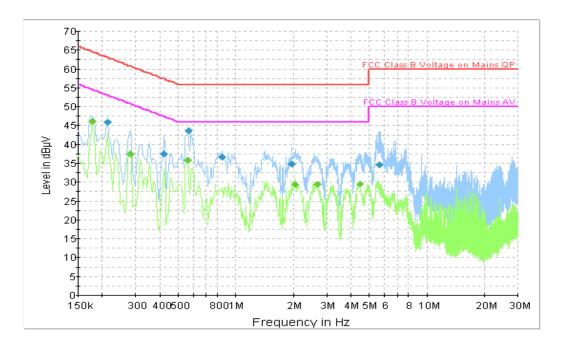


Figure A.18 Conducted Emission

Final Result 1

| QuasiPeak | Line | Corr. | Margin | Limit | | | |
|-------------|---------------------------------|--|--|--|--|--|--|
| $(dB\mu V)$ | | (dB) | (dB) | (dBµV) | | | |
| 45.8 | N | 19.8 | 17.3 | 63.1 | | | |
| 37.5 | L1 | 19.8 | 20.0 | 57.4 | | | |
| 43.7 | L1 | 19.8 | 12.3 | 56.0 | | | |
| 36.7 | N | 19.8 | 19.3 | 56.0 | | | |
| 34.9 | L1 | 19.6 | 21.1 | 56.0 | | | |
| 34.7 | L1 | 19.7 | 25.3 | 60.0 | | | |
| | (dBµV) 45.8 37.5 43.7 36.7 34.9 | (dBµV) 45.8 N 37.5 L1 43.7 L1 36.7 N 34.9 L1 | (dBμV) (dB) 45.8 N 19.8 37.5 L1 19.8 43.7 L1 19.8 36.7 N 19.8 34.9 L1 19.6 | (dBμV) (dB) (dB) 45.8 N 19.8 17.3 37.5 L1 19.8 20.0 43.7 L1 19.8 12.3 36.7 N 19.8 19.3 34.9 L1 19.6 21.1 | | | |

Final Result 2

| Frequency | CAverage | Line | Corr. | Margin | Limit | | |
|-----------|----------|------|-------|--------|--------|--|--|
| (MHz) | (dBµV) | | (dB) | (dB) | (dBµV) | | |
| 0.177000 | 46.2 | N | 19.7 | 8.5 | 54.6 | | |
| 0.280500 | 37.5 | N | 19.7 | 13.3 | 50.8 | | |
| 0.559500 | 35.8 | N | 19.8 | 10.2 | 46.0 | | |
| 2.044500 | 29.3 | N | 19.6 | 16.7 | 46.0 | | |
| 2.670000 | 29.3 | L1 | 19.7 | 16.7 | 46.0 | | |
| 4.465500 | 29.6 | N | 19.7 | 16.4 | 46.0 | | |

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

END OF REPORT