



TEST REPORT

No. I14Z45781-EMC01

for

TCT Mobile Limited

UMTS triband/GSM quadband mobile phone

Model Name: 7040T

FCC ID: RAD475

with

Hardware Version: PIO

Software Version: 2C33

Issued Date: Jun. 09th, 2014

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 TMC Beijing.

Test Laboratory:

FCC 2.948 Listed: No.733176

IC O.A.T.S listed: No.6629A-1

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1. Test Laboratory

1.1. Testing Location

Location D

Company Name: TMC Beijing, Telecommunication Metrology Center of MIIT
Address: No.18A, Kangding Street, Beijing Economic-Technological
Development Area, Beijing, China
Postal Code: 100176

1.2. Testing Environment

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

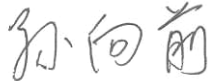
1.3. Project data

Testing Start Date: May. 19th, 2014
Testing End Date: May. 21st, 2014

1.4. Signature



Qu Pengfei
(Prepared this test report)



Sun Xiangqian
(Reviewed this test report)



Lu Bingsong
Deputy Director of the laboratory
(Approved this test report)

2. Client Information

2.1. Applicant Information

Company Name: TCT Mobile Limited
Address /Post: 5F, C building, No. 232, Liang Jing Road ZhangJiang High-Tech Park,
Pudong Area Shanghai, P.R. China.
City: Shanghai
Postal Code: 201203
Country: China
Contact Person: Gong Zhizhou
Contact Email: zhizhou.gong@jrdcom.com
Telephone: 0086-21-61460890
Fax: 0086-21-61460602

2.2. Manufacturer Information

Company Name: TCT Mobile Limited
Address /Post: 5F, C building, No. 232, Liang Jing Road ZhangJiang High-Tech Park,
Pudong Area Shanghai, P.R. China.
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 | UMTS triband/GSM quadband mobile phone |
| Model Name | 7040T |
| FCC ID | RAD475 |
| 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 Telecommunication Metrology Center of MIIT of People's Republic of China.

3.2. Internal Identification of EUT used during the test

| EUT ID* | SN or IMEI | HW Version | SW Version |
|---------|-----------------|------------|------------|
| EUT1 | 014053000102460 | PIO | 2C33 |
| EUT2 | 014053000102163 | PIO | 2C33 |
| EUT3 | 014053000102189 | PIO | 2C33 |
| EUT4 | 014053000101900 | PIO | 2C33 |

*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* | 描述 | 序列号 | 备注 |
|--------|----------------|-----|--------------|
| AE1 | Battery | / | 1445781BA013 |
| AE2 | Battery | / | 1445781BA010 |
| AE3 | Battery | | 1445781BA009 |
| AE4 | Battery | | 1445781BA011 |
| AE5 | Travel charger | / | 1445781CH005 |
| AE6 | Travel charger | / | 1445781CH006 |
| AE7 | USB cable | / | 1445781DC001 |
| AE8 | USB cable | / | 1445781DC011 |
| AE9 | USB cable | / | TCT-DC-0679 |
| AE10 | USB cable | / | TCT-DC-0674 |

AE1, AE2, AE3, AE4

| | |
|-----------------|--------------|
| Model | CAB2000013C2 |
| Manufacturer | SCUD |
| Capacitance | 2000 mAh |
| Nominal voltage | 3.8V |

AE5, AE6

| | |
|-----------------|--------------|
| Model | CBA3000AG0C1 |
| Manufacturer | Tenpao |
| Length of cable | / |

AE7, AE8

| | |
|-----------------|--------------|
| Model | CDA3122002C1 |
| Manufacturer | JUWEI |
| Length of cable | 100 cm |

AE9, AE10

| | |
|-----------------|--------------|
| Model | CDA3122002C2 |
| Manufacturer | Shenghua |
| Length of cable | 100 cm |

*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 | EUT4+ AE4+ AE6 + AE10 | Charging mode |
| Set.3 | EUT4+ AE4+ AE10 | 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 | 10-1-13 Edition |
| ANSI C63.4 | Methods of Measurement of Radio-Noise Emissions from Low - Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz | 2009 |

5. LABORATORY ENVIRONMENT

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

| | |
|---|---|
| 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 | < 4Ω |
| Normalised site attenuation (NSA) | < ± 4 dB, 3m/10m 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 |

Fully-anechoic chamber FAC-3 (9 meters×6.5 meters×4 meters) did not exceed following limits along the EMC testing:

| | |
|---|--|
| 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 |
| 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 °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: | | |
|------------------------------------|---------|---|
| Verdict Column | P | Pass |
| | NA | Not applicable |
| | F | Fail |
| Location Column | A/B/C/D | The test is performed in test location A, B, C or D which are described in section 1.1 of this report |

| Clause | List | Clause in FCC rules | Verdict | Location |
|--------|--------------------|---------------------|---------|----------|
| 1 | Radiated Emission | 15.109(a) | P | D |
| 2 | Conducted Emission | 15.107(a) | P | D |

7. Test Equipments Utilized

| NO. | Description | TYPE | SERIES NUMBER | MANUFACTURE | CAL DUE DATE | CALIBRATION INTERVAL |
|-----|--------------------------------------|--------------|------------------------------|--------------|--------------|----------------------|
| 1 | Test Receiver | ESCI | 100344 | R&S | 2015-03-03 | 1 year |
| 2 | Test Receiver | ESCI 7 | 100948 | R&S | 2014-07-18 | 1 year |
| 3 | Universal Radio Communication Tester | CMU200 | 109914 | R&S | 2015-04-13 | 1 year |
| 4 | Test Receiver | FSV | 101047 | R&S | 2014-06-30 | 1 year |
| 5 | LISN | ESH2-Z5 | 829991/012 | R&S | 2015-04-14 | 1 year |
| 6 | EMI Antenna | VULB 9163 | 9163-234 | Schwarzbeck | 2016-09-16 | 3 years |
| 7 | EMI Antenna | 3115 | 6914 | ETS-Lindgren | 2014-12-15 | 3 years |
| 8 | PC | OPTIPLEX 380 | 2X1YV2X | DELL | N/A | N/A |
| 9 | Monitor | E178FPc | CN-OWR979-64180 -7AJ-D2MS | DELL | N/A | N/A |
| 10 | Printer | P1606dn | VNC3L52122 | HP | N/A | N/A |
| 11 | Keyboard | L100 | CN0RH659658907 ATOI40 | DELL | N/A | N/A |
| 12 | Mouse | M-UAE119 | LZ935220ZRC | Lenovo | N/A | N/A |

ANNEX A: MEASUREMENT RESULTS

A.1 Radiated Emission (§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 a distance of 3 meters (above 1GHz) and 10 meters (below 1GHz) is tested. Tested in accordance with the procedures of ANSI C63.4 - 2009, section 8.3.

The EUT was placed on a non-conductive table. The measurement antenna was placed at a distance of 3 meters (above 1GHz) and 10 meters (below 1GHz) 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 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 (MHz) | Field strength limit ($\mu\text{V}/\text{m}$) | | |
|-----------------------|---|---------|------|
| | Quasi-peak | Average | Peak |
| 30-88 | 100 | | |
| 88-216 | 150 | | |
| 216-960 | 200 | | |
| 960-1000 | 500 | | |
| >1000 | | 500 | 5000 |

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:

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

Where

G_A : Antenna factor of receive antenna

G_{PL} : Path Loss

P_{Mea} : Measurement result on receiver.

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

Measurement result for Set.1:

Charging Mode/Average detector

| Frequency(MHz) | Result(dB μ V/m) | G_{PL} (dB) | G_A (dB/m) | P_{Mea} (dB μ V) | Polarity |
|----------------|----------------------|----------------------|--------------|-------------------------------|----------|
| 17893.750 | 49.3 | -18.5 | 45.6 | 22.200 | H |
| 17884.188 | 49.1 | -18.5 | 45.6 | 22.000 | V |
| 17898.531 | 49.1 | -18.5 | 45.6 | 22.000 | V |
| 17908.094 | 49.1 | -18.5 | 45.6 | 22.000 | V |
| 17893.219 | 49.0 | -18.5 | 45.6 | 21.900 | V |
| 17884.719 | 49.0 | -18.5 | 45.6 | 21.900 | V |

Charging Mode/Peak detector

| Frequency(MHz) | Result(dB μ V/m) | G_{PL} (dB) | G_A (dB/m) | P_{Mea} (dB μ V) | Polarity |
|----------------|----------------------|----------------------|--------------|-------------------------------|----------|
| 17862.406 | 60.8 | -18.5 | 45.6 | 33.700 | V |
| 17884.719 | 60.8 | -18.5 | 45.6 | 33.700 | V |
| 17860.281 | 60.6 | -18.5 | 45.6 | 33.500 | V |
| 17861.344 | 60.6 | -18.5 | 45.6 | 33.500 | H |
| 17854.438 | 60.6 | -18.5 | 45.6 | 33.500 | V |
| 17978.750 | 60.4 | -17.7 | 45.6 | 32.500 | V |

Measurement result for Set.3:

USB Mode/Average detector

| Frequency(MHz) | Result(dB μ V/m) | G _{PL} (dB) | G _A (dB/m) | P _{mea} (dB μ V) | Polarity |
|----------------|----------------------|----------------------|-----------------------|-------------------------------|----------|
| 17904.375 | 49.3 | -18.5 | 45.6 | 22.200 | H |
| 17881.531 | 49.3 | -18.5 | 45.6 | 22.200 | H |
| 17878.344 | 49.2 | -18.5 | 45.6 | 22.100 | V |
| 17898.000 | 49.2 | -18.5 | 45.6 | 22.100 | V |
| 17876.219 | 49.2 | -18.5 | 45.6 | 22.100 | V |
| 17886.313 | 49.2 | -18.5 | 45.6 | 22.100 | V |

USB Mode/ Peak detector

| Frequency(MHz) | Result(dB μ V/m) | G _{PL} (dB) | G _A (dB/m) | P _{mea} (dB μ V) | Polarity |
|----------------|----------------------|----------------------|-----------------------|-------------------------------|----------|
| 17893.750 | 61.5 | -18.5 | 45.6 | 34.400 | H |
| 17871.969 | 61.5 | -18.5 | 45.6 | 34.400 | V |
| 17875.156 | 61.3 | -18.5 | 45.6 | 34.200 | H |
| 17882.063 | 61.3 | -18.5 | 45.6 | 34.200 | V |
| 17876.219 | 60.9 | -18.5 | 45.6 | 33.800 | V |
| 17895.344 | 60.8 | -18.5 | 45.6 | 33.700 | V |

Charging Mode, Set.1

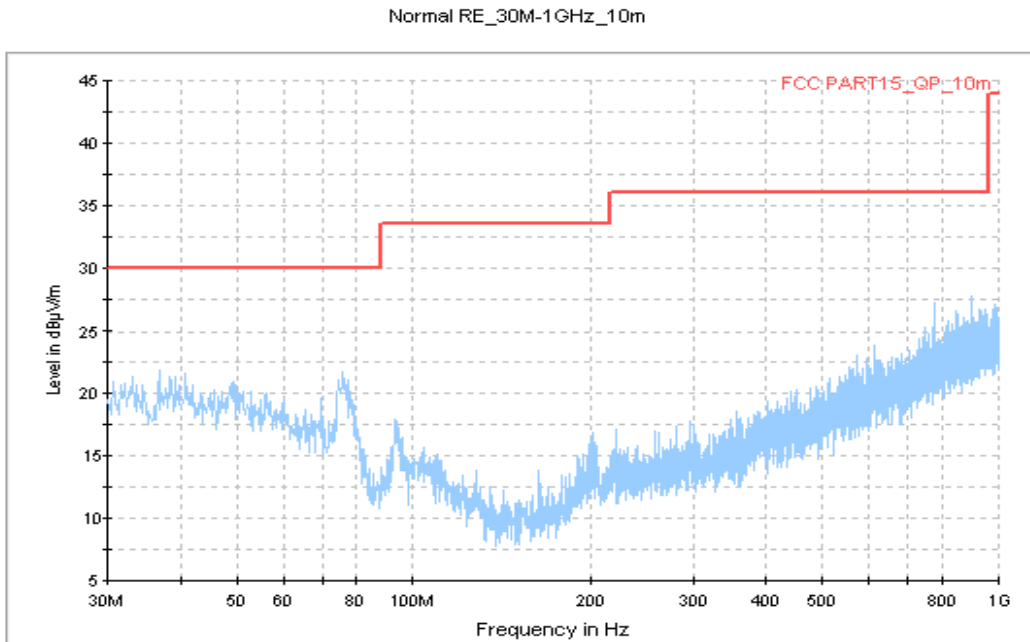


Figure A.1 Radiated Emission from 30MHz to 1GHz

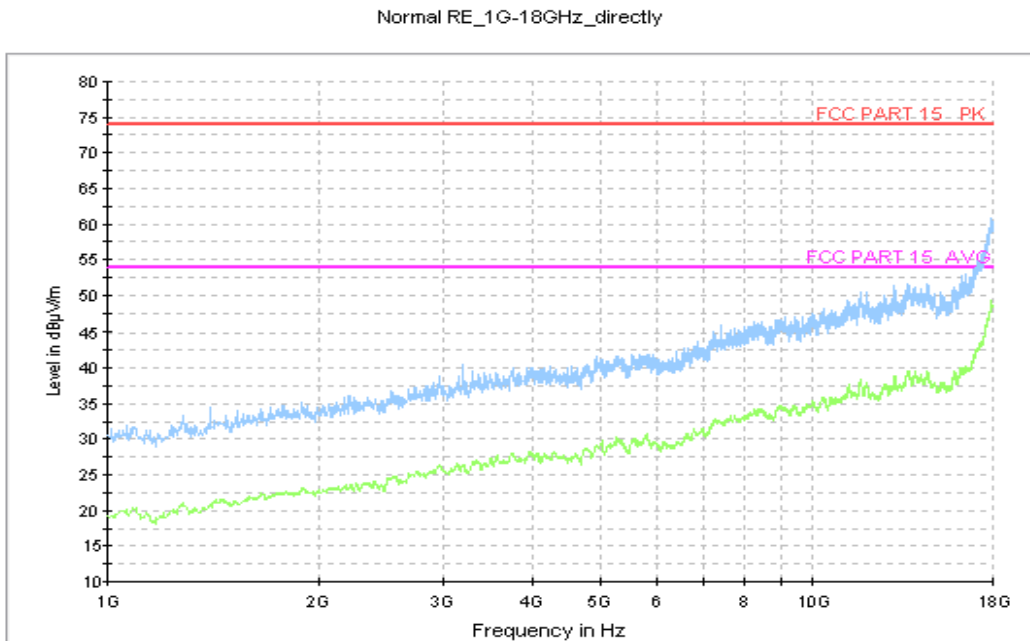


Figure A.2 Radiated Emission from 1GHz to 18GHz

USB Mode, Set.3

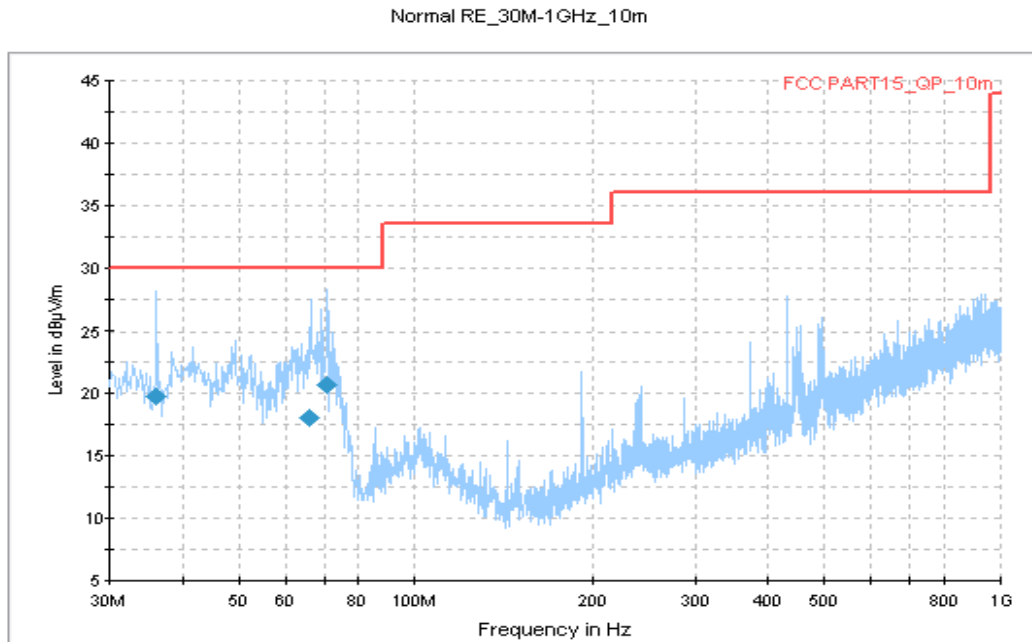


Figure A.3 Radiated Emission from 30MHz to 1GHz

Final Result 1

| Frequency (MHz) | QuasiPeak (dBµV/m) | Height (cm) | Polarization | Azimuth (deg) | Corr. (dB) | Margin (dB) | Limit (dBµV/m) |
|-----------------|--------------------|-------------|--------------|---------------|------------|-------------|----------------|
| 36.002500 | 19.8 | 100.0 | V | -11.0 | -19.2 | 10.2 | 30.0 |
| 65.835000 | 18.0 | 305.0 | V | 151.0 | -20.1 | 12.0 | 30.0 |
| 70.921250 | 20.7 | 384.0 | V | 266.0 | -21.5 | 9.3 | 30.0 |

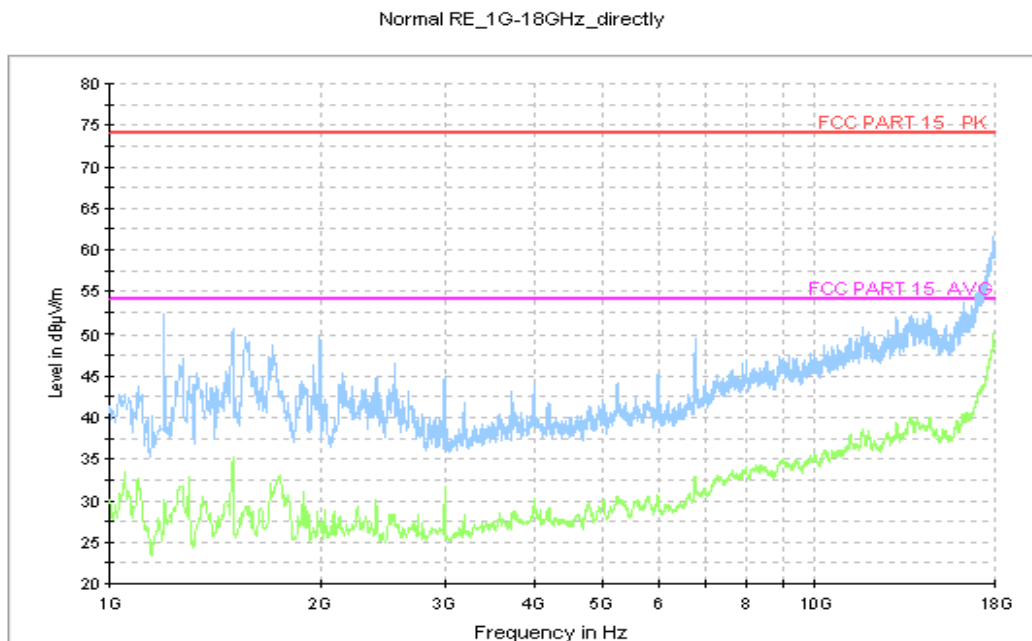


Figure A.4 Radiated Emission from 1GHz to 18GHz

A.2 Conducted Emission (§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 - 2009, 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 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 (dB μ V) | |
|-----------------------------|------------------------------|-----------|
| | 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

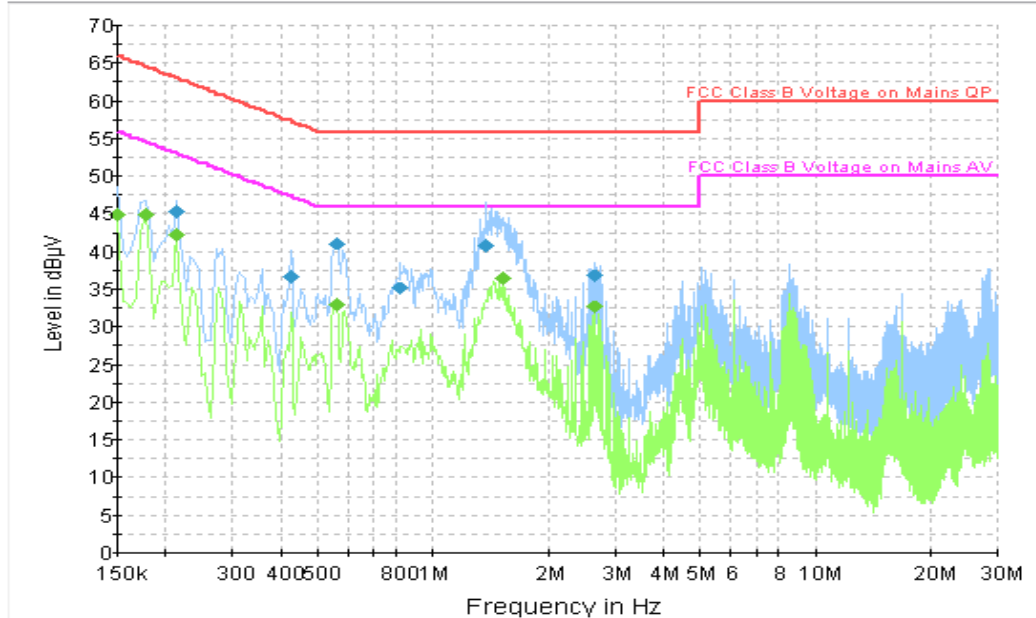


Figure A.5 Conducted Emission

Final Result 1

| Frequency (MHz) | QuasiPeak (dBµV) | PE | Line | Corr. (dB) | Margin (dB) | Limit (dBµV) |
|-----------------|------------------|-----|------|------------|-------------|--------------|
| 0. 213000 | 45. 4 | GND | L1 | 9. 8 | 17. 7 | 63. 1 |
| 0. 424500 | 36. 7 | GND | N | 9. 8 | 20. 7 | 57. 4 |
| 0. 559500 | 41. 0 | GND | N | 9. 8 | 15. 0 | 56. 0 |
| 0. 820500 | 35. 2 | GND | L1 | 9. 8 | 20. 8 | 56. 0 |
| 1. 378500 | 40. 7 | GND | L1 | 9. 7 | 15. 3 | 56. 0 |
| 2. 656500 | 36. 8 | GND | L1 | 9. 7 | 19. 2 | 56. 0 |

Final Result 2

| Frequency (MHz) | Average (dBµV) | PE | Line | Corr. (dB) | Margin (dB) | Limit (dBµV) |
|-----------------|----------------|-----|------|------------|-------------|--------------|
| 0. 150000 | 45. 0 | GND | L1 | 9. 8 | 11. 0 | 56. 0 |
| 0. 177000 | 44. 9 | GND | L1 | 9. 8 | 9. 7 | 54. 6 |
| 0. 213000 | 42. 2 | GND | L1 | 9. 8 | 10. 9 | 53. 1 |
| 0. 559500 | 33. 1 | GND | N | 9. 8 | 12. 9 | 46. 0 |
| 1. 527000 | 36. 4 | GND | N | 9. 7 | 9. 6 | 46. 0 |
| 2. 634000 | 32. 6 | GND | N | 9. 7 | 13. 4 | 46. 0 |

USB Mode, Set.3

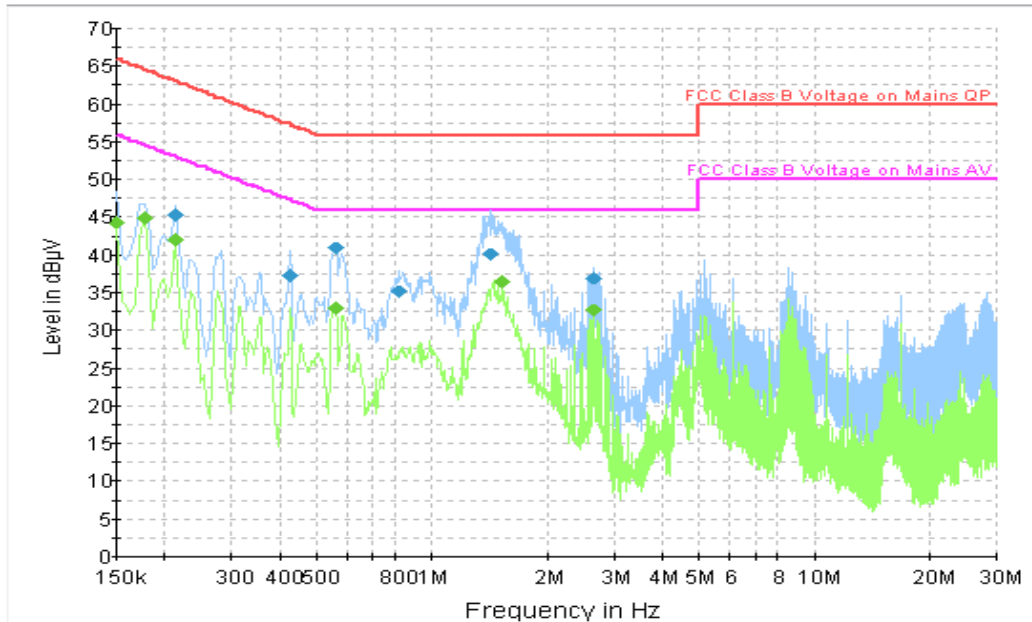


Figure A.6 Conducted Emission

Final Result 1

| Frequency (MHz) | QuasiPeak (dBµV) | PE | Line | Corr. (dB) | Margin (dB) | Limit (dBµV) |
|-----------------|------------------|-----|------|------------|-------------|--------------|
| 0. 213000 | 45. 4 | GND | L1 | 9. 8 | 17. 7 | 63. 1 |
| 0. 424500 | 37. 3 | GND | N | 9. 8 | 20. 1 | 57. 4 |
| 0. 559500 | 41. 0 | GND | N | 9. 8 | 15. 0 | 56. 0 |
| 0. 820500 | 35. 2 | GND | L1 | 9. 8 | 20. 8 | 56. 0 |
| 1. 428000 | 40. 2 | GND | N | 9. 7 | 15. 8 | 56. 0 |
| 2. 656500 | 36. 9 | GND | N | 9. 7 | 19. 1 | 56. 0 |

Final Result 2

| Frequency (MHz) | Average (dBµV) | PE | Line | Corr. (dB) | Margin (dB) | Limit (dBµV) |
|-----------------|----------------|-----|------|------------|-------------|--------------|
| 0. 150000 | 44. 4 | GND | L1 | 9. 8 | 11. 6 | 56. 0 |
| 0. 177000 | 45. 0 | GND | L1 | 9. 8 | 9. 7 | 54. 6 |
| 0. 213000 | 42. 1 | GND | L1 | 9. 8 | 11. 0 | 53. 1 |
| 0. 559500 | 33. 0 | GND | N | 9. 8 | 13. 0 | 46. 0 |
| 1. 527000 | 36. 6 | GND | L1 | 9. 7 | 9. 4 | 46. 0 |
| 2. 634000 | 32. 7 | GND | N | 9. 7 | 13. 3 | 46. 0 |

END OF REPORT