



TEST REPORT

No. 2013TAR410

for

TCT Mobile Limited

UMTS Tri-band / GSM Quadband mobile phone

Model Name: Beetle Lite FF

Marketing Name: ONE TOUCH 4012A

FCC ID : RAD331

with

Hardware Version: PIO

Software Version: 114

Issued Date: 2013-05-28

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:

DAkks accreditation (DIN EN ISO/IEC 17025): No. DGA-PL-114/01-02

FCC 2.948 Listed: No.733176

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

TMC Beijing, Telecommunication Metrology Center of Ministry of Industry and Information Technology

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

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1. Test Laboratory

1.1. Testing Location

Company Name: TMC Beijing, Telecommunication Metrology Center of MIIT
Address: No 52, Huayuan beilu, Haidian District, Beijing, P. R. China
Postal Code: 100191
Telephone: 0086-10-62304633-2561
Fax: 0086-10-62304633-2504

1.2. Testing Environment

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

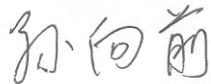
1.3. Project data

Testing Start Date: Apr. 27th, 2013
Testing End Date: Apr. 27th, 2013

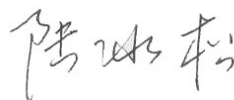
1.4. Signature



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 Limite
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

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. 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 | UMTS Tri-band / GSM Quadband mobile phone |
| Model Name | Beetle Lite FF |
| FCC ID | RAD331 |
| Extreme vol. Limits | 3.5VDC to 4.2VDC (nominal: 3.7VDC) |

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 |
|----------------|-------------------|-------------------|-------------------|
| EUT3 | 013498000103193 | PIO | 114 |

*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 |
|---------------|--------------------|-----------|
| AE1 | Battery | / |
| AE2 | Battery | / |
| AE3 | Battery | / |
| AE4 | Travel charger | / |
| AE5 | Travel charger | / |
| AE6 | USB cable | / |
| AE7 | USB cable | / |
| AE8 | USB cable | / |
| AE9 | USB cable | / |

AE1

| | |
|-----------------|--------------|
| Model | CAB60B0000C1 |
| Manufacturer | BYD |
| Capacitance | 1400mAh |
| Nominal voltage | 3.7V |

AE2

| | |
|-----------------|--------------|
| Model | CAB60B0000C2 |
| Manufacturer | BAK |
| Capacitance | 1400mAh |
| Nominal voltage | 3.7V |

AE3

| | |
|--------------|--------------|
| Model | CAB60BA000C1 |
| Manufacturer | SCUD |
| Capacitance | 1400mAh |

Nominal voltage 3.7V

AE4

Model CBA3007AG0C1
Manufacturer BYD
Length of cable \

AE5

Model CBA3007AG0C3
Manufacturer Yingju
Length of cable \

AE6

Model CDA3122002C1
Manufacturer Juwei
Length of cable 100cm

AE7

Model CDA3122002C2
Manufacturer Shenghua
Length of cable 100cm

AE8

Model CDA3122005C1
Manufacturer Juwei
Length of cable 100cm

AE9

Model CDA3122005C2
Manufacturer Shenghua
Length of cable 100cm

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

EUT set-ups

| EUT set-up No. | Combination of EUT and AE | Remarks |
|----------------|---------------------------|----------|
| Set.4 | EUT3+ AE1 + AE6 | USB Mode |
| Set.5 | EUT3+ AE1 + AE4+AE6 | Charger |
| Set.6 | EUT3+ AE1 + AE5+AE6 | Charger |

Note: MicroSD card was installed in the device during the test.

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 | 10-1-12 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 | 2003 |

5. LABORATORY ENVIRONMENT

Conducted chamber/ Control room did not exceed following limits along the EMC testing:

| | |
|--------------------------|----------------------------|
| Temperature | Min. = 15 °C, Max. = 35 °C |
| Relative humidity | Min. = 20 %, Max. = 80 % |
| Shielding effectiveness | > 110 dB |
| Electrical insulation | > 2 MΩ |
| Ground system resistance | < 0.5 Ω |

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

| | |
|-----------------------------------|--|
| Temperature | Min. = 15 °C, Max. = 30 °C |
| Relative humidity | Min. = 35 %, Max. = 60 % |
| Shielding effectiveness | > 100 dB |
| Electrical insulation | > 2 MΩ |
| Ground system resistance | < 0.5 Ω |
| Normalised site attenuation (NSA) | < ±3.5 dB, 3 m distance, from 30 to 1000 MHz |
| 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. = 30 °C |
| Relative humidity | Min. = 35 %, Max. = 60 % |
| Shielding effectiveness | > 110 dB |
| Electrical insulation | > 2 MΩ |
| Ground system resistance | < 1 Ω |
| Uniformity of field strength | Between 0 and 6 dB, from 80 to 4000 MHz |

6. SUMMARY OF TEST RESULTS

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

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

7. Test Equipments Utilized

| NO. | Description | TYPE | SERIES NUMBER | MANUFACTURE | CAL DUE DATE |
|------------|--------------------------------------|-------------|----------------------|--------------------|---------------------|
| 1 | LISN | ESH2-Z5 | 829991/012 | R&S | 2014-04-16 |
| 2 | Test Receiver | ESCI | 100344 | R&S | 2014-03-28 |
| 3 | EMI Antenna | VULB 9163 | 514 | Schwarzbeck | 2014-11-10 |
| 4 | Test Receiver | ESU26 | 100376 | R&S | 2013-11-07 |
| 5 | EMI Antenna | 3117 | 00139065 | ETS-Lindgren | 2014-07-31 |
| 6 | Universal Radio Communication Tester | CMU200 | 100680 | R&S | 2013-09-05 |
| 7 | Universal Radio Communication Tester | E5515C | MY48361083 | Agilent | 2014-03-16 |

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 is tested. Tested in accordance with the procedures of ANSI C63.4 - 2003, section 8.3.

A.1.2 EUT Operating Mode:

The EUT was placed on a non-conductive table. The measurement antenna was placed at a distance of 3 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.

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 755, and the serial number of the PC is 3908243625. 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 of emission (MHz) | Field strength (microvolts/meter) |
|-----------------------------|-----------------------------------|
| 30-88 | 100 |
| 88-216 | 150 |
| 216-960 | 200 |
| 960-4000 | 500 |

A.1.4 Test Condition

| Frequency of emission (MHz) | RBW/VBW | Sweep Time(s) |
|-----------------------------|---------------|---------------|
| 30-1000 | 100kHz/300kHz | 5 |
| 1000-4000 | 1MHz/1MHz | 15 |

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.

Charging Mode Set.5

| Frequency(MHz) | Result(dBuV/m) | GPL (dB) | GA (dB/m) | PMea(dBuV) | Polarity |
|----------------|----------------|----------|-----------|------------|------------|
| 2996.000 | 42.2 | -29.0 | 33.8 | 37.379 | HORIZONTAL |
| 2998.000 | 42.2 | -29.0 | 33.8 | 37.379 | VERTICAL |
| 3000.000 | 42.2 | -28.4 | 34.1 | 36.472 | HORIZONTAL |
| 2997.600 | 42.2 | -29.0 | 33.8 | 37.379 | HORIZONTAL |
| 2997.000 | 42.2 | -29.0 | 33.8 | 37.379 | VERTICAL |
| 2997.800 | 42.2 | -29.0 | 33.8 | 37.379 | VERTICAL |

Charging Mode Set.6

| Frequency(MHz) | Result(dBuV/m) | GPL (dB) | GA (dB/m) | PMea(dBuV) | Polarity |
|----------------|----------------|----------|-----------|------------|------------|
| 2996.600 | 42.3 | -29.0 | 33.8 | 37.479 | HORIZONTAL |
| 2998.000 | 42.2 | -29.0 | 33.8 | 37.379 | HORIZONTAL |
| 2997.200 | 42.2 | -29.0 | 33.8 | 37.379 | HORIZONTAL |
| 2999.800 | 42.2 | -29.0 | 33.8 | 37.379 | VERTICAL |
| 2996.000 | 42.2 | -29.0 | 33.8 | 37.379 | HORIZONTAL |
| 2995.800 | 42.2 | -29.0 | 33.8 | 37.379 | HORIZONTAL |

USB Mode Set.4

| Frequency(MHz) | Result(dBuV/m) | GPL (dB) | GA (dB/m) | PMea(dBuV) | Polarity |
|----------------|----------------|----------|-----------|------------|------------|
| 3000.000 | 43.1 | -28.4 | 34.1 | 37.372 | HORIZONTAL |
| 2999.800 | 42.9 | -29.0 | 33.8 | 38.079 | HORIZONTAL |
| 2999.600 | 42.6 | -29.0 | 33.8 | 37.779 | HORIZONTAL |
| 2999.200 | 42.4 | -29.0 | 33.8 | 37.579 | HORIZONTAL |
| 2993.200 | 42.3 | -29.0 | 33.8 | 37.479 | VERTICAL |
| 2999.400 | 42.3 | -29.0 | 33.8 | 37.479 | HORIZONTAL |

Charging Mode Set.5

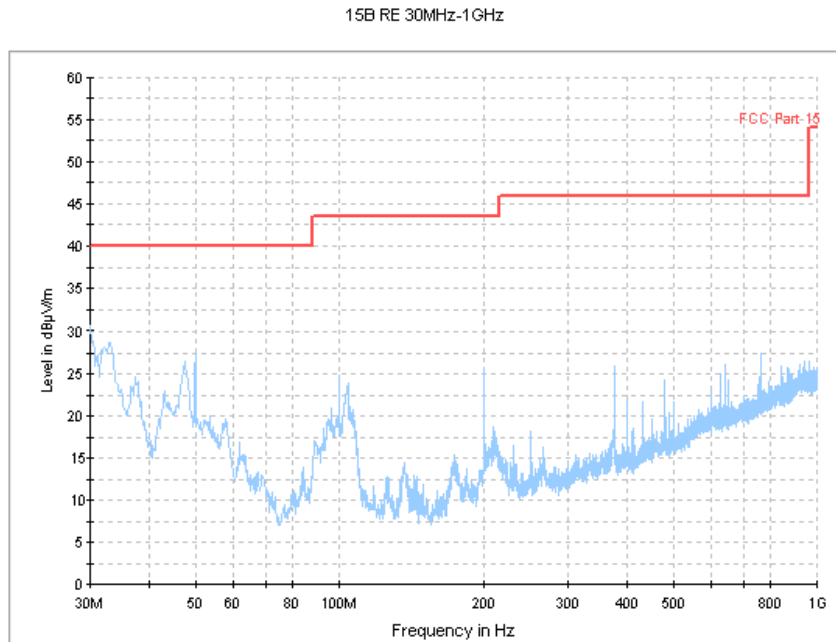


Figure A.1 Radiated Emission from 30MHz to 1GHz

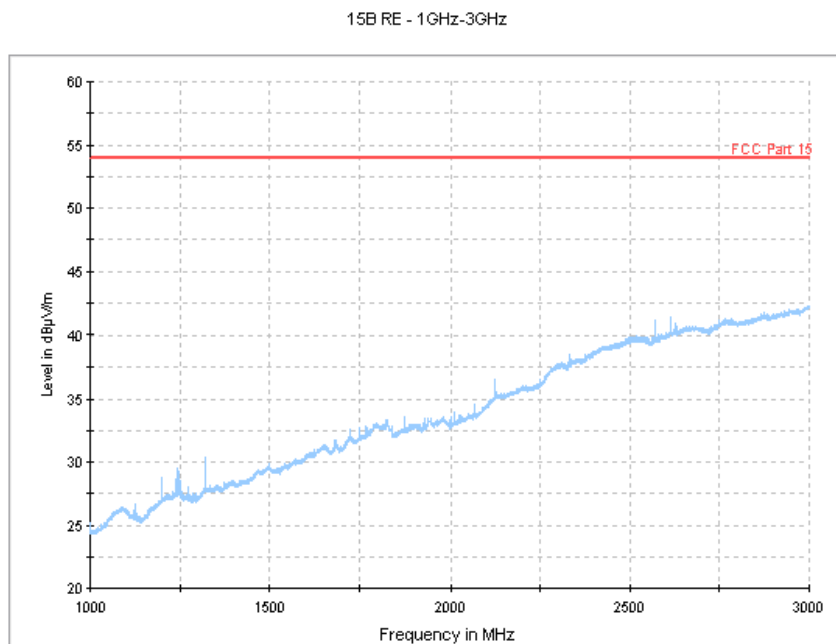


Figure A.2 Radiated Emission from 1GHz to 3GHz

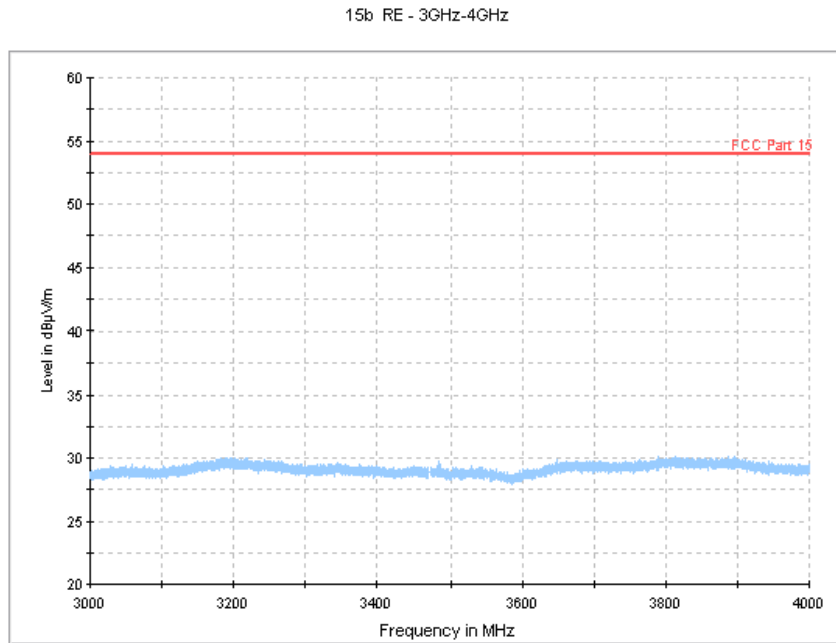


Figure A.3 Radiated Emission from 3GHz to 4GHz

Charging Mode Set.6

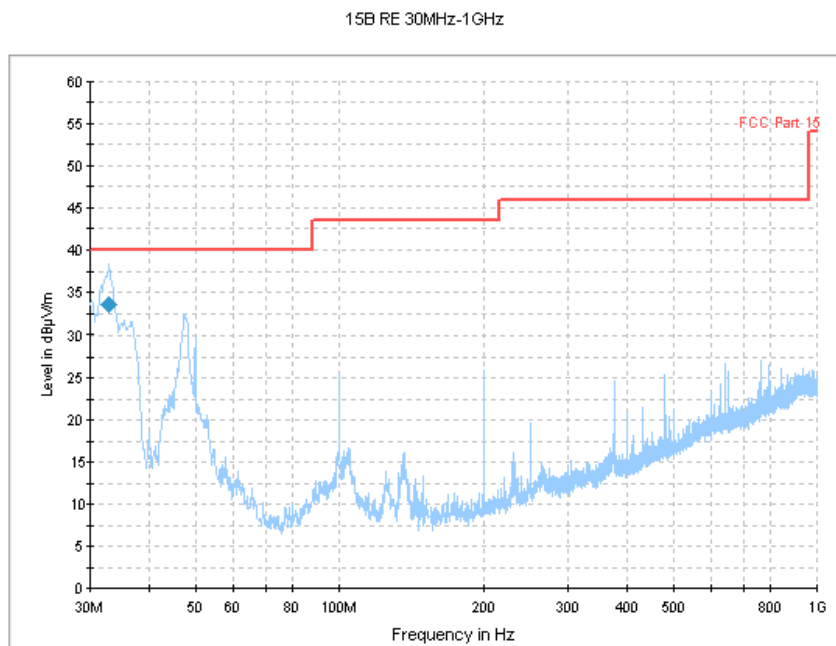


Figure A.4 Radiated Emission from 30MHz to 1GHz

Final Result 1

| Frequency (MHz) | QuasiPeak (dBµV/m) | Height (cm) | Polarization | Azimuth (deg) | Corr. (dB) | Margin (dB) |
|-----------------|--------------------|-------------|--------------|---------------|------------|-------------|
| 32.910000 | 33.6 | 100.0 | V | 167.0 | -23.7 | 6.4 |

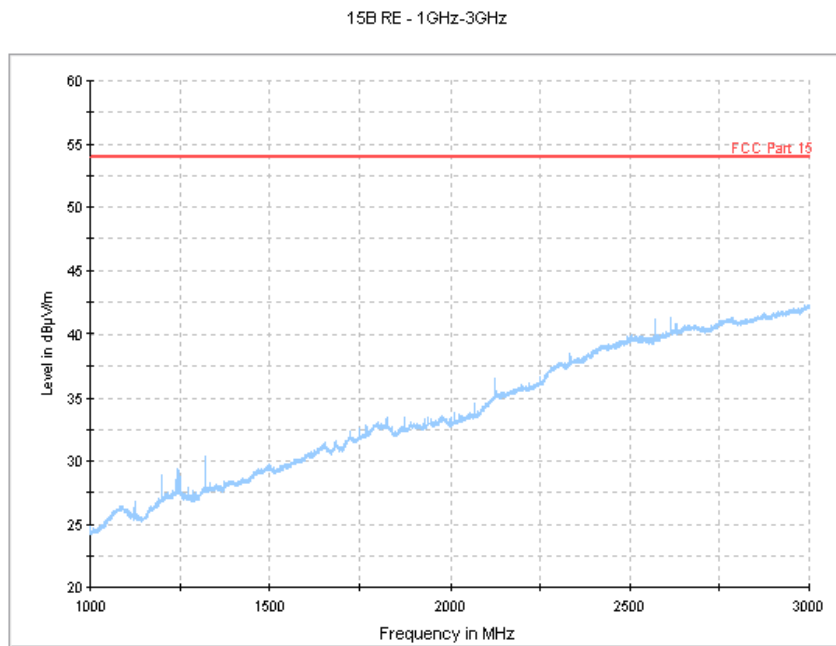


Figure A.5 Radiated Emission from 1GHz to 3GHz

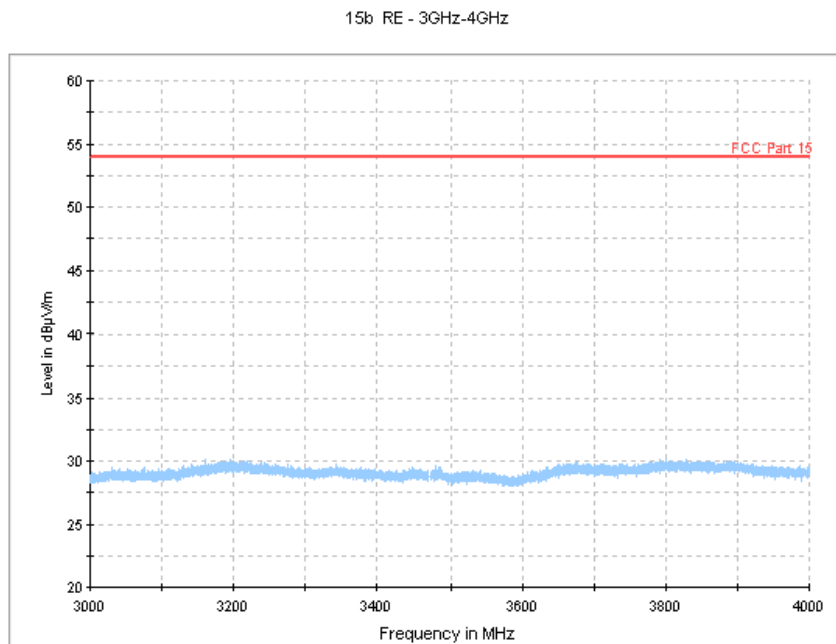


Figure A.6 Radiated Emission from 3GHz to 4GHz

USB Mode Set.4

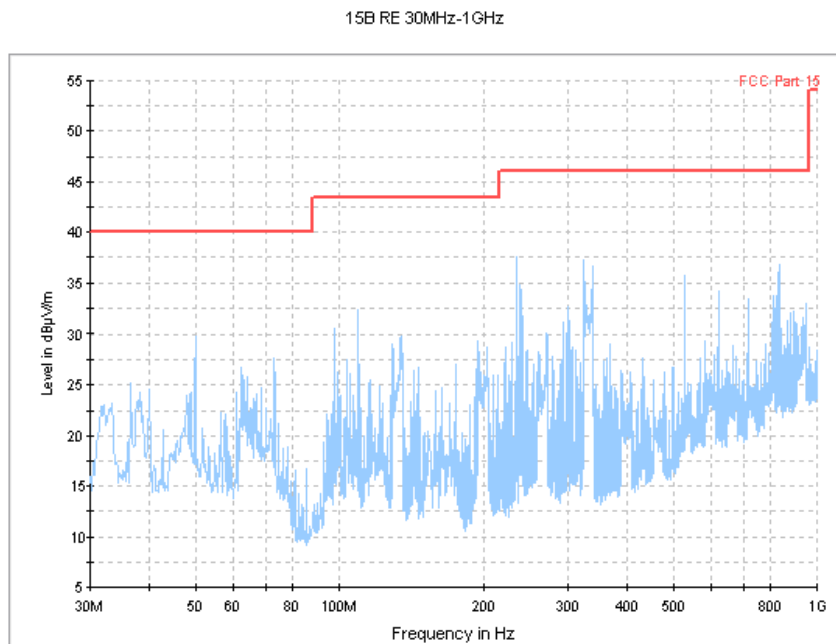


Figure A.7 Radiated Emission from 30MHz to 1GHz

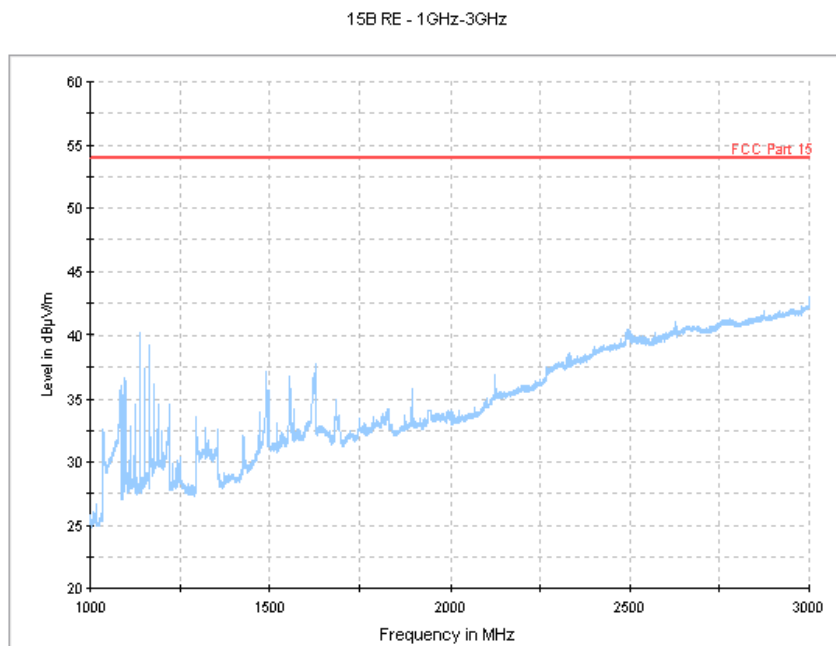


Figure A.8 Radiated Emission from 1GHz to 3GHz

15b RE - 3GHz-4GHz

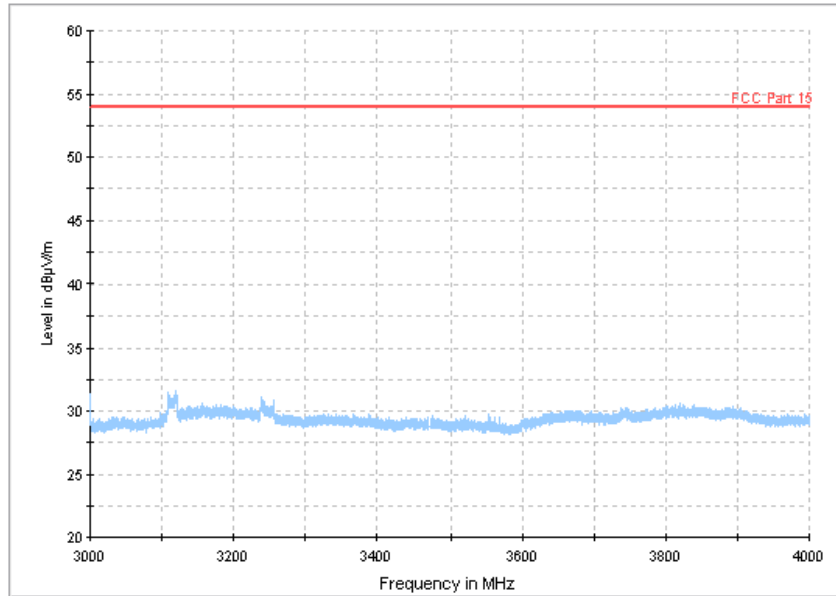


Figure A.9 Radiated Emission from 3GHz to 4GHz

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 - 2003, section 7.2.

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 755, and the serial number of the PC is 3908243625. 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 | Sweep Time(s) |
|------|---------------|
| 9kHz | 1 |

A.2.5 Measurement Results
Charging Mode Set.5

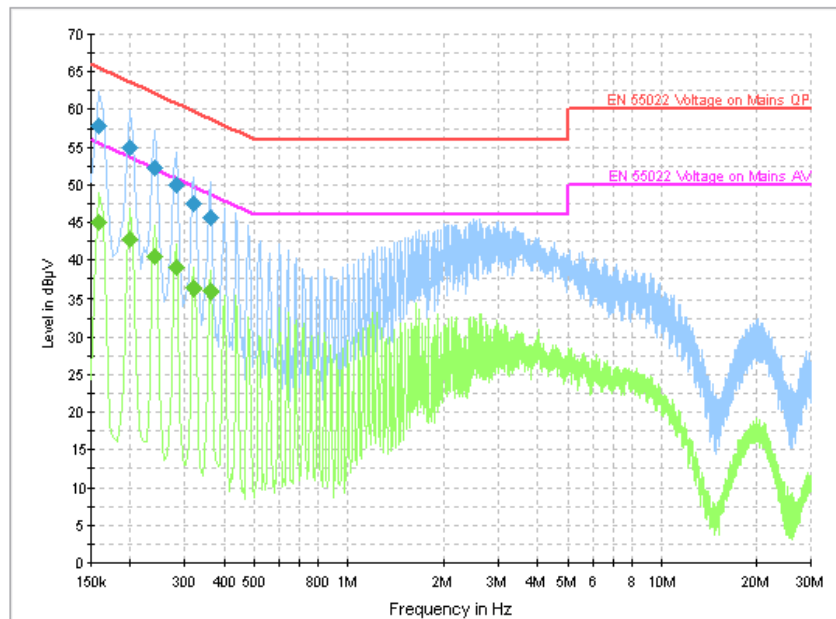


Figure A.10 Conducted Emission

Final Result 1

| Frequency (MHz) | QuasiPeak (dBµV) | PE | Line | Corr. (dB) | Margin (dB) | Limit (dBµV) |
|-----------------|------------------|-----|------|------------|-------------|--------------|
| 0.159001 | 57.7 | GND | L1 | 8.6 | 7.8 | 65.5 |
| 0.199501 | 54.9 | GND | L1 | 8.7 | 8.7 | 63.6 |
| 0.240001 | 52.3 | GND | L1 | 8.9 | 9.8 | 62.1 |
| 0.280501 | 50.0 | GND | L1 | 9.0 | 10.8 | 60.8 |
| 0.321001 | 47.6 | GND | L1 | 9.1 | 12.1 | 59.7 |
| 0.361501 | 45.6 | GND | L1 | 9.3 | 13.1 | 58.7 |

Final Result 2

| Frequency (MHz) | CAverage (dBµV) | PE | Line | Corr. (dB) | Margin (dB) | Limit (dBµV) |
|-----------------|-----------------|-----|------|------------|-------------|--------------|
| 0.159001 | 45.0 | GND | L1 | 8.6 | 10.5 | 55.5 |
| 0.199501 | 42.8 | GND | L1 | 8.7 | 10.8 | 53.6 |
| 0.240001 | 40.4 | GND | L1 | 8.9 | 11.7 | 52.1 |
| 0.280501 | 39.1 | GND | L1 | 9.0 | 11.7 | 50.8 |
| 0.321001 | 36.4 | GND | L1 | 9.1 | 13.3 | 49.7 |
| 0.361501 | 35.9 | GND | L1 | 9.3 | 12.8 | 48.7 |

Charging Mode Set.6

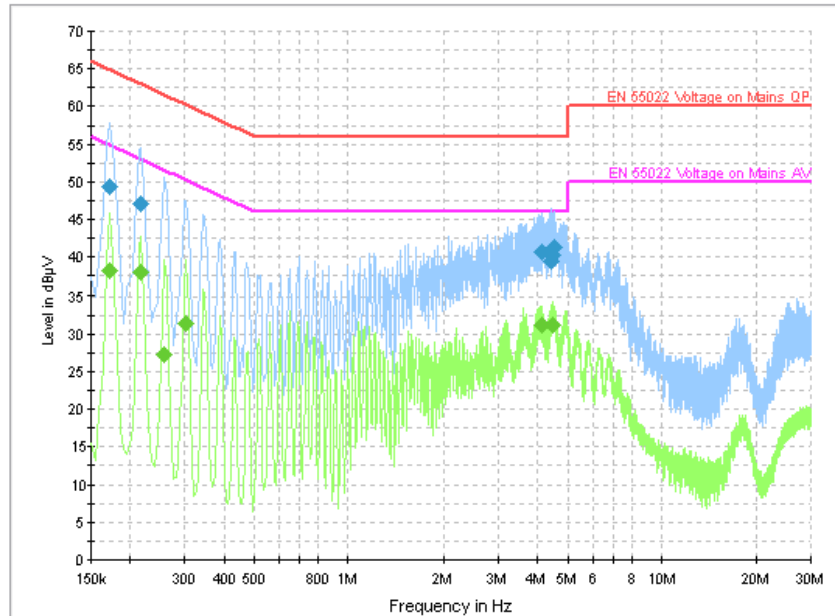


Figure A.11 Conducted Emission

Final Result 1

| Frequency (MHz) | QuasiPeak (dBµV) | PE | Line | Corr. (dB) | Margin (dB) | Limit (dBµV) |
|-----------------|------------------|-----|------|------------|-------------|--------------|
| 0.172501 | 49.3 | GND | L1 | 8.7 | 15.5 | 64.8 |
| 0.217501 | 47.1 | GND | L1 | 8.8 | 15.8 | 62.9 |
| 4.123501 | 40.6 | GND | L1 | 9.8 | 15.4 | 56.0 |
| 4.429501 | 39.4 | GND | L1 | 9.8 | 16.6 | 56.0 |
| 4.470001 | 40.3 | GND | L1 | 9.8 | 15.7 | 56.0 |
| 4.510501 | 41.4 | GND | L1 | 9.8 | 14.6 | 56.0 |

Final Result 2

| Frequency (MHz) | CAverage (dBµV) | PE | Line | Corr. (dB) | Margin (dB) | Limit (dBµV) |
|-----------------|-----------------|-----|------|------------|-------------|--------------|
| 0.172501 | 38.3 | GND | L1 | 8.7 | 16.5 | 54.8 |
| 0.217501 | 38.0 | GND | L1 | 8.8 | 15.0 | 52.9 |
| 0.258001 | 27.3 | GND | L1 | 8.9 | 24.2 | 51.5 |
| 0.303001 | 31.5 | GND | L1 | 9.1 | 18.7 | 50.2 |
| 4.110001 | 31.1 | GND | L1 | 9.8 | 14.9 | 46.0 |
| 4.447501 | 31.1 | GND | L1 | 9.8 | 14.9 | 46.0 |

USB mode Set.4

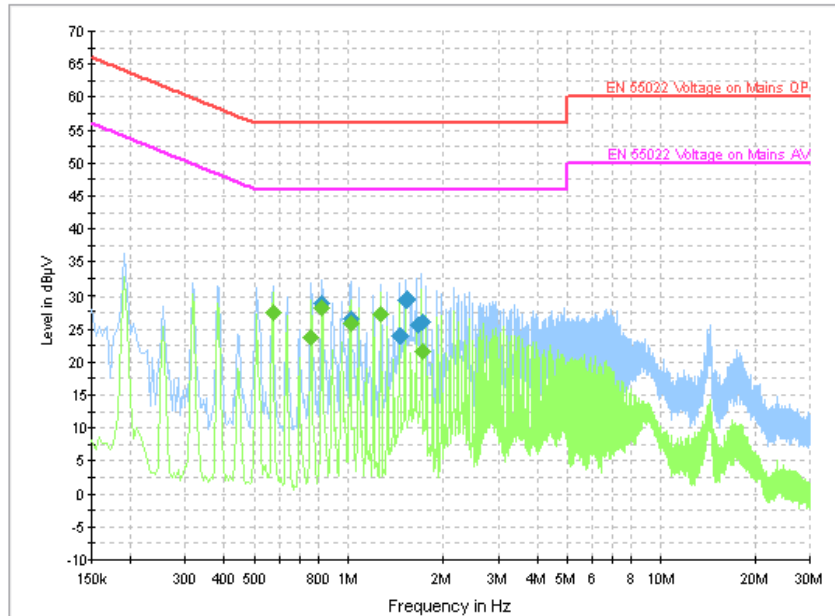


Figure A.12 Conducted Emission

Final Result 1

| Frequency (MHz) | QuasiPeak (dBµV) | PE | Line | Corr. (dB) | Margin (dB) | Limit (dBµV) |
|-----------------|------------------|-----|------|------------|-------------|--------------|
| 0.825001 | 29.0 | GND | N | 9.9 | 27.0 | 56.0 |
| 1.018501 | 26.6 | GND | N | 9.9 | 29.4 | 56.0 |
| 1.459501 | 23.9 | GND | N | 9.9 | 32.1 | 56.0 |
| 1.527001 | 29.5 | GND | N | 9.9 | 26.5 | 56.0 |
| 1.653001 | 25.7 | GND | N | 9.9 | 30.3 | 56.0 |
| 1.716001 | 26.2 | GND | N | 9.9 | 29.8 | 56.0 |

Final Result 2

| Frequency (MHz) | CAverage (dBµV) | PE | Line | Corr. (dB) | Margin (dB) | Limit (dBµV) |
|-----------------|-----------------|-----|------|------------|-------------|--------------|
| 0.573001 | 27.6 | GND | N | 9.9 | 18.4 | 46.0 |
| 0.762001 | 23.7 | GND | N | 9.9 | 22.3 | 46.0 |
| 0.825001 | 28.2 | GND | N | 9.9 | 17.8 | 46.0 |
| 1.018501 | 25.8 | GND | N | 9.9 | 20.2 | 46.0 |
| 1.270501 | 27.4 | GND | N | 9.9 | 18.6 | 46.0 |
| 1.716001 | 21.6 | GND | N | 9.9 | 24.4 | 46.0 |

END OF REPORT