



TEST REPORT

No. I14Z47766-EMC01

for

TCT Mobile Limited

HSUPA/HSDPA/UMTS dual-band/GSM quad-band mobile phone

Model Name: 4015A,4016A

FCC ID: RAD406

with

Hardware Version: PIO

Software Version: v6CGK

Issued Date: Oct. 15th, 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 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.

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REPORT HISTORY

Report Number	Revision	Description	Issue Date
I14Z47766-EMC01	Rev.0	1st edition	2014-10-15



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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. Testing Environment

Normal Temperature: 15-35°C

Relative Humidity: 20-75%

1.3. Project data

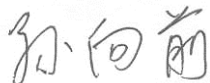
Testing Start Date: Sep.29th, 2014

Testing End Date: Oct.13th, 2014

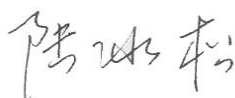
1.4. Signature



Qu Pengfei
(Prepared this test report)



Sun Xiangqian
(Reviewed this test report)



Lu Bingsong
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	HSUPA/HSDPA/UMTS dual-band/GSM quad-band mobile phone
Model Name	4015A,4016A
FCC ID	RAD406
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	014199007785938	PIO	v6CGK

*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-1583
AE2	Battery	/	/
AE3	Battery	/	/
AE4	Travel charger	/	14TCT-CH-0336
AE5	Travel charger	/	14TCT-CH-0082
AE6	Travel charger	/	14TCT-CH-1913
AE7	USB cable	/	14TCT-DC-0675
AE8	USB cable	/	14TCT-DC-0669
AE9	USB cable	/	14TCT-DC-0024
AE10	USB cable	/	14TCT-DC-0123
AE21	Battery	/	14TCT-BA-0093
AE22	Battery	/	14TCT-BA-0090
AE23	Battery	/	14TCT-BA-0109
AE24	Travel charger	/	14TCT-CH-0349
AE25	Travel charger	/	14TCT-CH-0583
AE26	Travel charger	/	14TCT-CH-0086

AE1, AE21, AE22, AE23

Model	CAB31P0000C1
Manufacturer	BYD
Capacitance	1300 mAh
Nominal voltage	3.7V



AE2

Model CAB31P0000C2
Manufacturer BAK
Capacitance 1300 mAh
Nominal voltage 3.7V

AE3

Model CAB31P0000C3
Manufacturer SCUD
Capacitance 1300 mAh
Nominal voltage 3.7V

AE4, AE24

Model CBA3007AG0C2
Manufacturer TENPAO
Length of cable /

AE5, AE25

Model CBA3007AG0C3
Manufacturer YINGJU
Length of cable /

AE6, AE26

Model CBA3007AG0C1
Manufacturer BYD
Length of cable /

AE7

Model CDA3122002C1
Manufacturer JUWEI
Length of cable 100 cm

AE8

Model CDA3122002C2
Manufacturer Shenghua
Length of cable 100 cm

AE9

Model CDA3122005C1
Manufacturer JUWEI
Length of cable /

AE10

Model CDA3122005C2
Manufacturer Shenghua
Length of cable /

*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	EUT1+ AE1/AE2/AE3+ AE4 + AE7/AE8/AE9/AE10	Charger
Set.2	EUT1+ AE1/AE2/AE3+ AE5 + AE7/AE8/AE9/AE10	Charger
Set.3	EUT1+ AE1/AE2/AE3+ AE6 + AE7/AE8/AE9/AE10	Charger
Set.4	EUT1+ AE1/AE2/AE3+ AE7/AE8/AE9/AE10	USB

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	< 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:

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	1/2/3/4	The test is performed in test location 1, 2, 3 or 4 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	1
2	Conducted Emission	15.107(a)	P	1



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	2015-07-16	1 year
3	Universal Radio Communication Tester	CMU200	109914	R&S	2015-04-13	1 year
4	Test Receiver	FSV	101047	R&S	2015-06-27	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 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 - 2009, 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.

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

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:

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

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 results 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
5010.313	31.0	-34.6	34.6	31.000	V
1931.875	30.8	-35.2	25.3	40.700	V
5784.063	30.7	-33.8	35.1	29.400	H
5013.125	30.6	-34.6	34.6	30.600	H
5769.063	30.6	-33.8	35.1	29.300	H
5764.063	30.6	-33.8	35.1	29.300	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
5219.063	42.8	-34.5	34.6	42.700	V
5767.813	42.6	-33.8	35.1	41.300	V
5803.125	42.5	-33.8	35.1	41.200	H
5762.188	42.4	-33.8	35.1	41.100	H
5761.563	42.4	-33.8	35.1	41.100	H
5784.375	42.2	-33.8	35.1	40.900	V

Measurement result for Set.2:

Charging Mode/Average detector

Frequency(MHz)	Result(dB μ V/m)	G _{PL} (dB)	G _A (dB/m)	P _{Mea} (dB μ V)	Polarity
5760.625	30.8	-33.8	35.1	29.500	H
1931.563	30.8	-35.2	25.3	40.700	V
5795.000	30.7	-33.8	35.1	29.400	H
5803.438	30.7	-33.8	35.1	29.400	V
5757.813	30.7	-33.8	35.1	29.400	V
5765.000	30.6	-33.8	35.1	29.300	H

Charging Mode/Peak detector

Frequency(MHz)	Result(dB μ V/m)	G _{PL} (dB)	G _A (dB/m)	P _{Mea} (dB μ V)	Polarity
5246.875	42.6	-34.5	34.6	42.500	H
5329.688	42.5	-34.8	34.6	42.700	V
5265.625	42.4	-34.5	34.6	42.300	H
5257.500	42.3	-34.5	34.6	42.200	V
5756.875	42.2	-33.8	35.1	40.900	V
4763.125	42.2	-34.9	33.1	44.000	H

Measurement result for Set.3:

Charging Mode/Average detector

Frequency(MHz)	Result(dB μ V/m)	G _{PL} (dB)	G _A (dB/m)	P _{Mea} (dB μ V)	Polarity
1931.875	31.4	-35.2	25.3	41.300	V
1931.563	30.8	-35.2	25.3	40.700	V
5766.250	30.7	-33.8	35.1	29.400	H
5765.938	30.7	-33.8	35.1	29.400	H
5764.063	30.7	-33.8	35.1	29.400	H
5767.500	30.7	-33.8	35.1	29.400	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
5748.125	43.0	-33.8	35.1	41.700	V
4945.938	42.8	-34.9	33.1	44.600	V
5525.625	42.4	-34.0	35.1	41.300	H
5262.188	42.4	-34.5	34.6	42.300	H
4155.625	42.4	-35.9	33.2	45.100	H
5010.000	42.3	-34.6	34.6	42.300	V

Measurement result for Set.4:

USB Mode/Average detector

Frequency(MHz)	Result(dB μ V/m)	G _{PL} (dB)	G _A (dB/m)	P _{mea} (dB μ V)	Polarity
1931.563	36.5	-35.2	25.3	46.400	V
1931.875	36.5	-35.2	25.3	46.400	V
1236.563	33.6	-41.0	24.1	50.500	H
1255.000	33.6	-41.1	24.1	50.600	H
1236.875	33.5	-41.0	24.1	50.400	H
1242.188	33.4	-41.0	24.1	50.300	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
1059.375	52.8	-41.7	24.1	70.400	V
1059.688	51.6	-41.7	24.1	69.200	V
1059.063	51.3	-41.7	24.1	68.900	H
1060.313	51.0	-41.7	24.1	68.600	H
1060.625	50.8	-41.7	24.1	68.400	H
1075.000	50.4	-41.6	24.1	67.900	V

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

Charging Mode, Set.1

Normal RE_30M-1GHz_10m

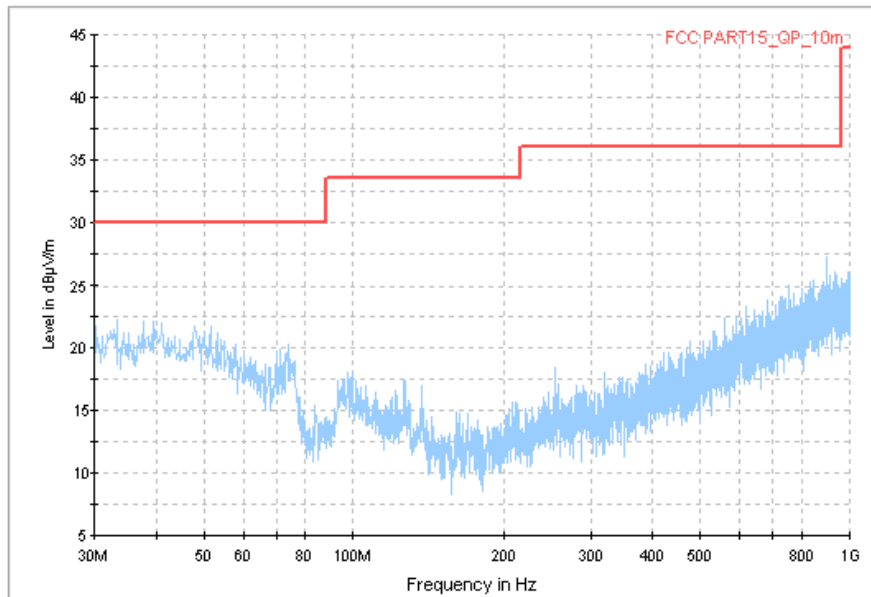


Fig.1 Radiated Emission from 30MHz to 1GHz

RE_1G-6GHz

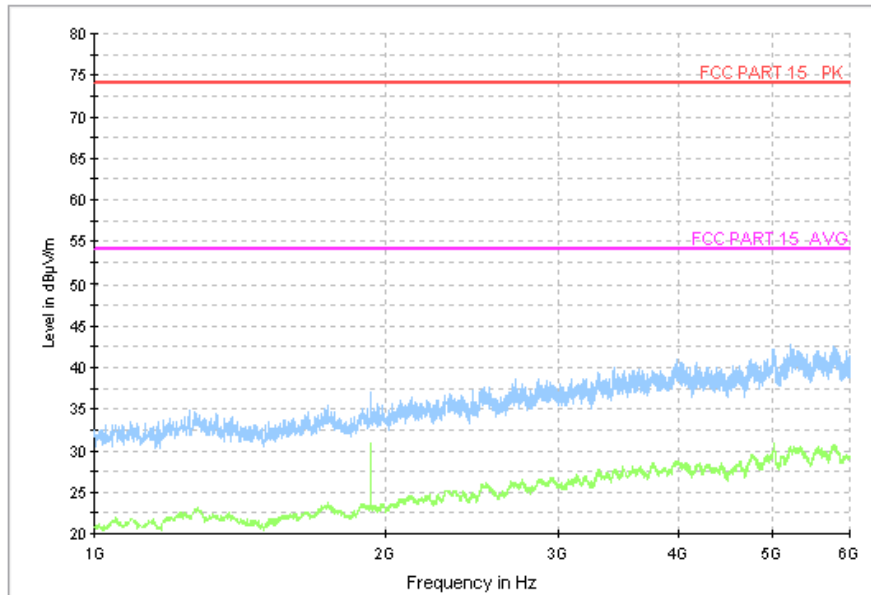


Fig.2 Radiated Emission from 1GHz to 6GHz

Charging Mode, Set.2

Normal RE_30M-1GHz_10m

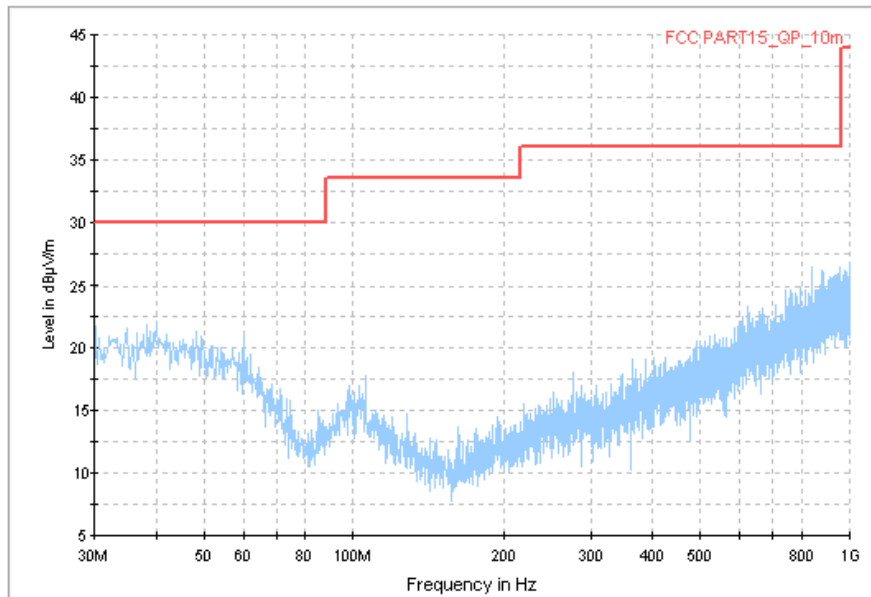


Fig.3 Radiated Emission from 30MHz to 1GHz

RE_1G-6GHz

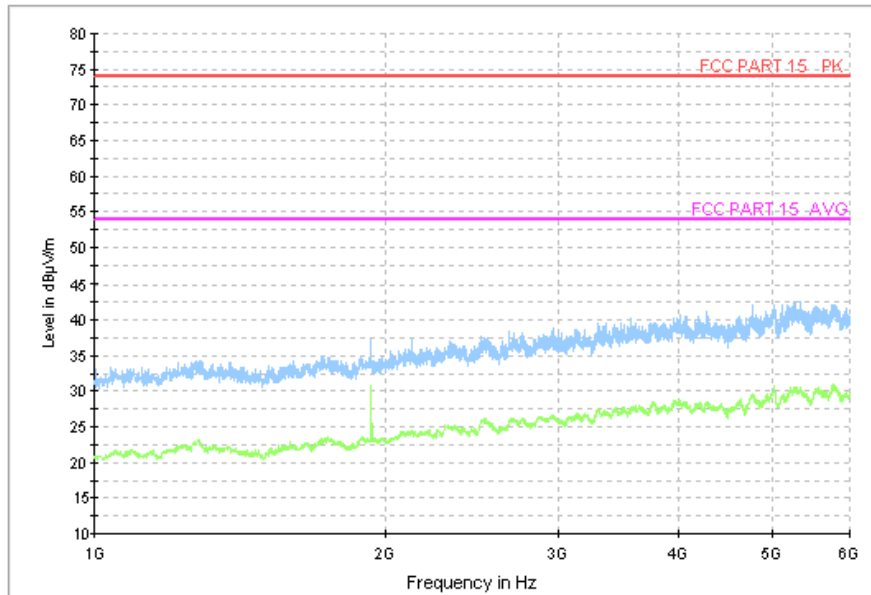


Fig.4 Radiated Emission from 1GHz to 6GHz

Charging Mode, Set.3

Normal RE_30M-1GHz_10m

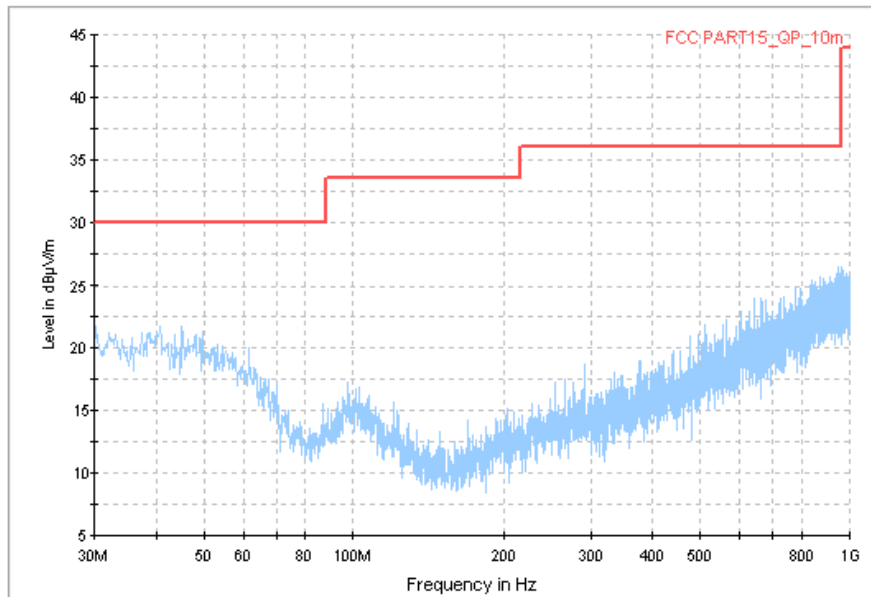


Fig.5 Radiated Emission from 30MHz to 1GHz

RE_1G-6GHz

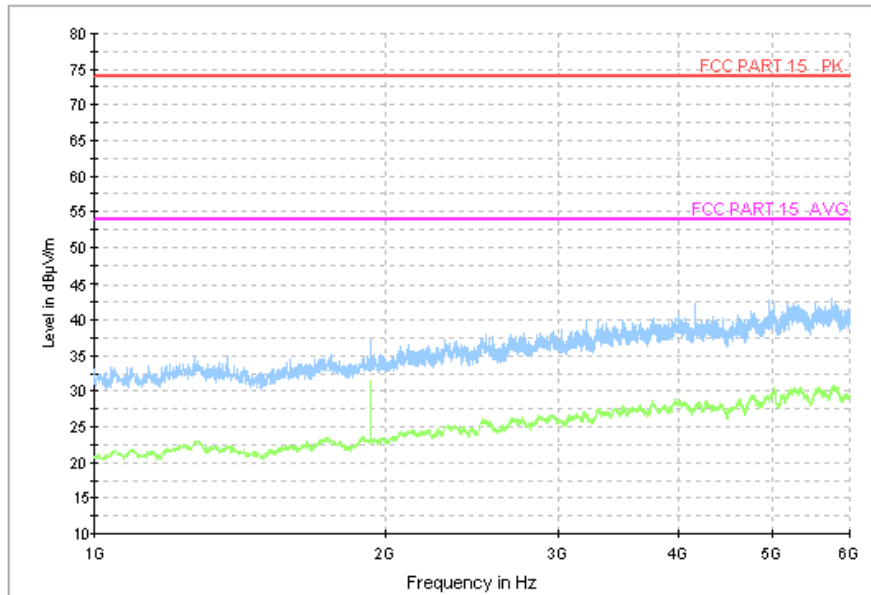


Fig.6 Radiated Emission from 1GHz to 6GHz

USB Mode, Set.4

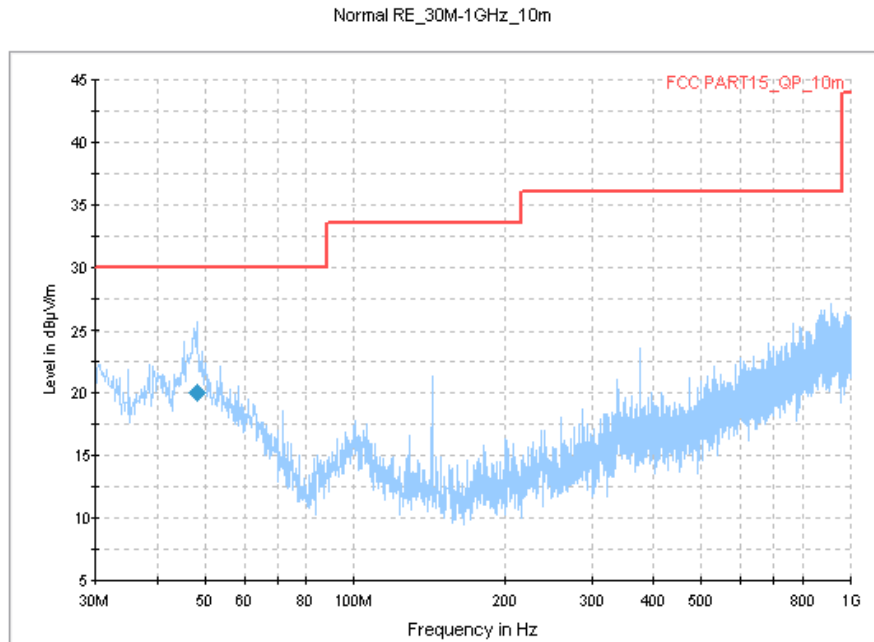


Fig.7 Radiated Emission from 30MHz to 1GHz

Final Result 1

Frequency MHz	QuasiPeak dB µV/m	Limit dB µV/m	Margin dB	Azimuth Deg	Polarization H/V
48.066250	20.1	30.0	9.9	2.0	V

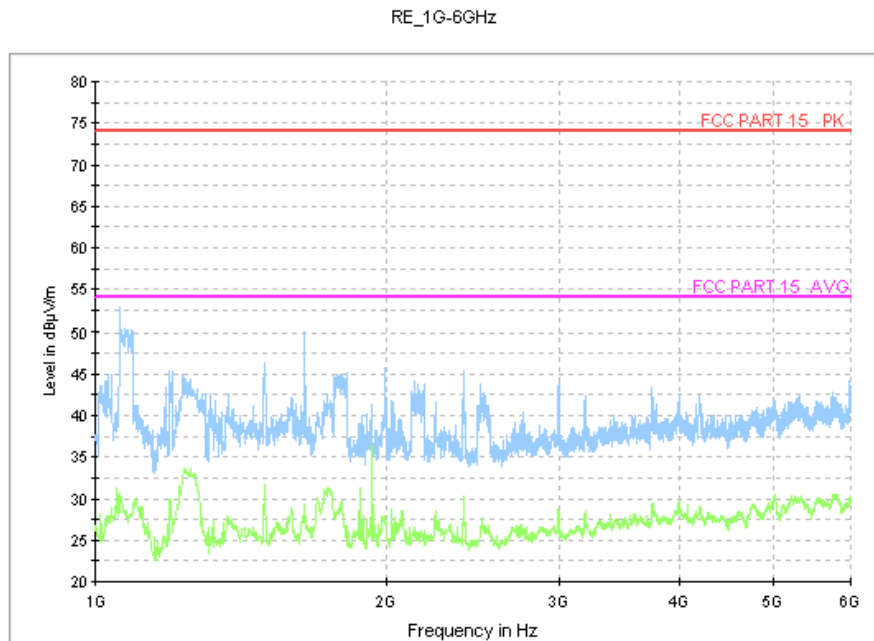


Fig.8 Radiated Emission from 1GHz to 6GHz

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 7.2.

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 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: $U= 2.9 \text{ dB}$, $k=2$.

Charging Mode, Set.1

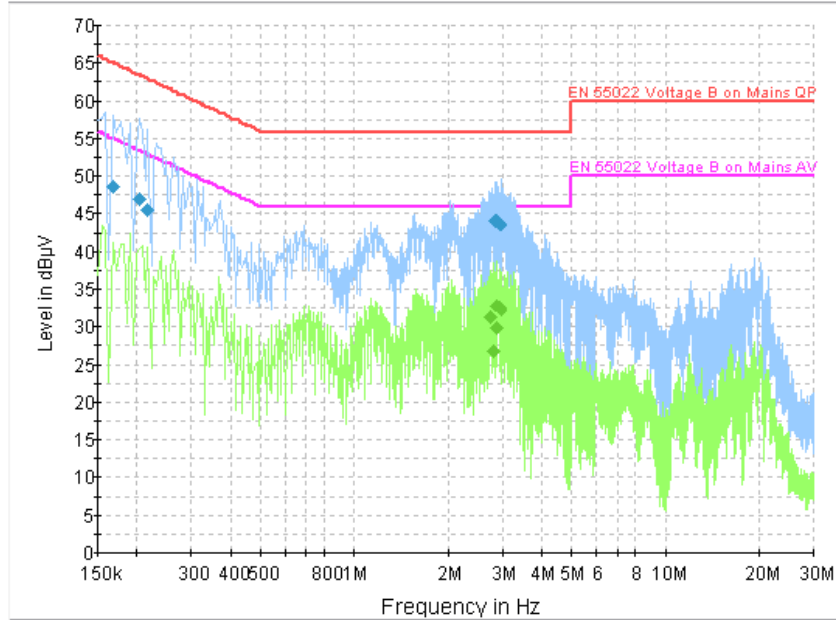


Fig.9 Conducted Emission

Final Result 1

Frequency (MHz)	QuasiPeak (dB µV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dB µV)
0.168000	48.6	GND	L1	20.2	16.4	65.1
0.204000	47.1	GND	L1	19.9	16.3	63.4
0.217500	45.5	GND	L1	19.9	17.4	62.9
2.818500	44.1	GND	L1	19.7	11.9	56.0
2.863500	44.1	GND	L1	19.7	11.9	56.0
2.962500	43.6	GND	L1	19.7	12.4	56.0

Final Result 2

Frequency (MHz)	CAverage (dB µV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dB µV)
2.746500	31.4	GND	L1	19.7	14.6	46.0
2.805000	26.7	GND	L1	19.7	19.3	46.0
2.863500	32.9	GND	L1	19.7	13.1	46.0
2.877000	29.9	GND	N	19.7	16.1	46.0
2.935500	32.5	GND	L1	19.7	13.5	46.0
2.949000	32.4	GND	L1	19.7	13.6	46.0

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

Charging Mode, Set.2

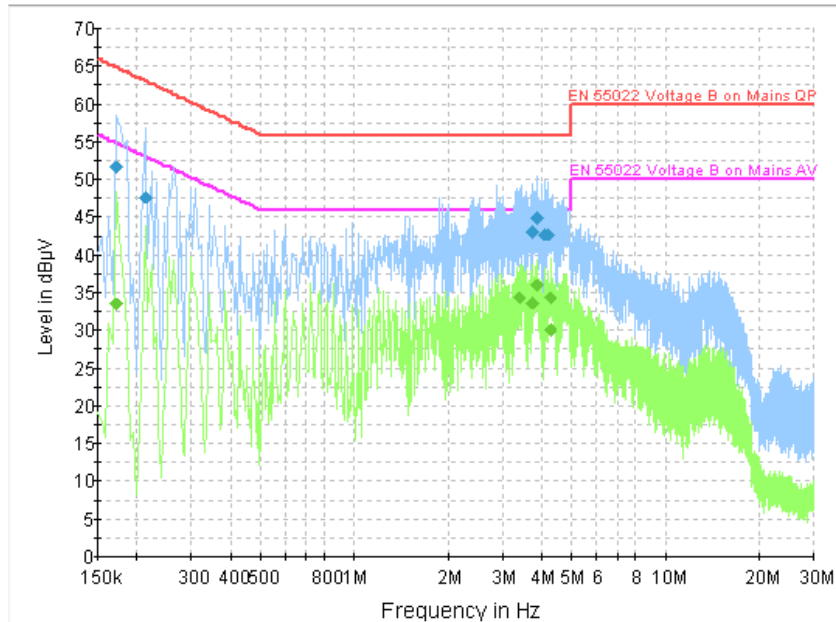


Fig.10 Conducted Emission

Final Result 1

Frequency (MHz)	QuasiPeak (dB µV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dB µV)
0.172500	51.7	GND	L1	20.1	13.1	64.8
0.213000	47.7	GND	L1	19.9	15.4	63.1
3.754500	43.1	GND	L1	19.7	12.9	56.0
3.858000	44.8	GND	L1	19.7	11.2	56.0
4.105500	42.8	GND	L1	19.7	13.2	56.0
4.177500	42.7	GND	L1	19.7	13.3	56.0

Final Result 2

Frequency (MHz)	CAverage (dB µV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dB µV)
0.172500	33.6	GND	L1	20.1	21.3	54.8
3.394500	34.4	GND	N	19.7	11.6	46.0
3.768000	33.6	GND	L1	19.7	12.4	46.0
3.871500	35.9	GND	L1	19.7	10.1	46.0
4.249500	30.0	GND	L1	19.7	16.0	46.0
4.263000	34.4	GND	L1	19.7	11.6	46.0

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

Charging Mode, Set.3

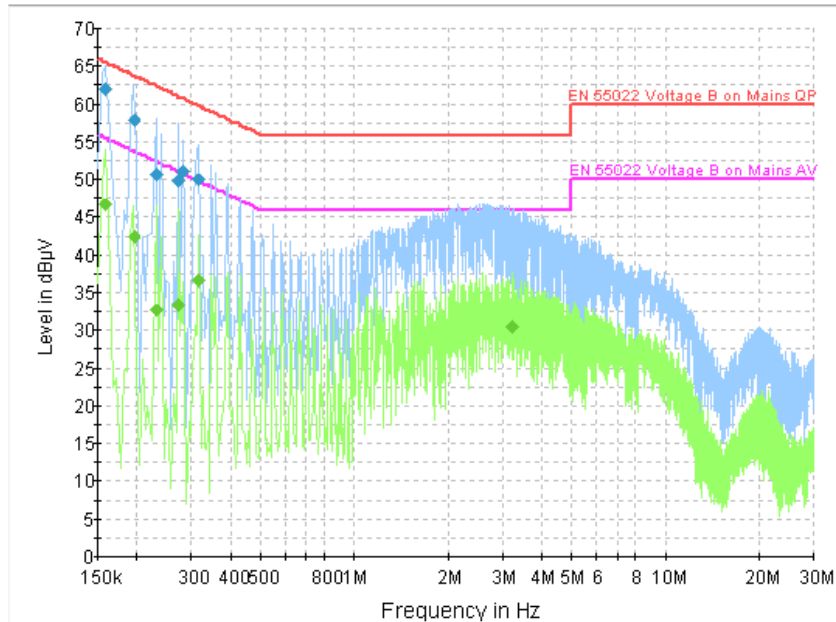


Fig.11 Conducted Emission

Final Result 1

Frequency (MHz)	QuasiPeak (dB µV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dB µV)
0.159000	62.2	GND	N	20.1	3.4	65.5
0.195000	58.0	GND	L1	20.0	5.8	63.8
0.231000	50.7	GND	L1	19.9	11.8	62.4
0.271500	49.9	GND	L1	19.9	11.2	61.1
0.280500	51.2	GND	L1	20.0	9.7	60.8
0.316500	50.0	GND	L1	20.0	9.8	59.8

Final Result 2

Frequency (MHz)	CAverage (dB µV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dB µV)
0.159000	46.8	GND	L1	20.1	8.7	55.5
0.195000	42.4	GND	L1	20.0	11.4	53.8
0.231000	32.7	GND	L1	19.9	19.8	52.4
0.271500	33.3	GND	L1	19.9	17.8	51.1
0.316500	36.6	GND	L1	20.0	13.2	49.8
3.196500	30.5	GND	L1	19.7	15.5	46.0

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

USB Mode, Set.4

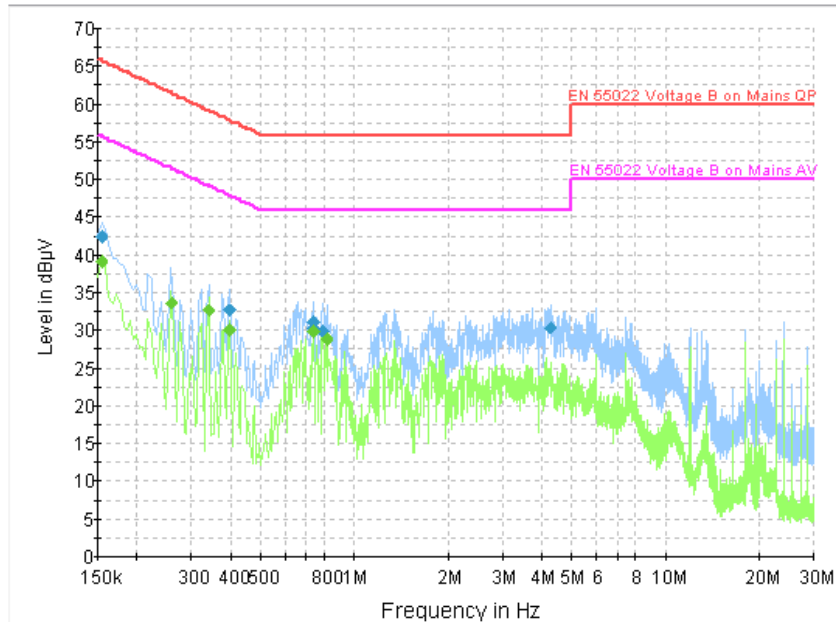


Fig.12 Conducted Emission

Final Result 1

Frequency (MHz)	QuasiPeak (dB µV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dB µV)
0.154500	42.4	GND	L1	20.0	23.4	65.8
0.397500	32.7	GND	N	20.0	25.2	57.9
0.735000	31.2	GND	N	19.9	24.8	56.0
0.739500	30.3	GND	L1	19.9	25.7	56.0
0.793500	29.8	GND	N	19.9	26.2	56.0
4.272000	30.4	GND	L1	19.7	25.6	56.0

Final Result 2

Frequency (MHz)	CAverage (dB µV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dB µV)
0.154500	39.1	GND	L1	20.0	16.7	55.8
0.258000	33.6	GND	N	19.8	17.9	51.5
0.339000	32.7	GND	L1	20.0	16.5	49.2
0.397500	30.1	GND	N	20.0	17.8	47.9
0.735000	29.8	GND	N	19.9	16.2	46.0
0.811500	29.0	GND	N	19.9	17.0	46.0

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

END OF REPORT