



TEST REPORT

No. I15Z40087-EMC03

for

TCL Communication Ltd.

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

Model Name: VF695

FCC ID: 2ACCJH014

with

Hardware Version: PIO

Software Version: v8I1C

Issued Date: 2015-02-09

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: ctl_terminals@catr.cn, website: www.chinattl.com



REPORT HISTORY

Report Number	Revision	Description	Issue Date
I15Z40087-EMC03	Rev.0	1st edition	2015-02-09

CONTENTS

1. TEST LABORATORY	4
1.1. TESTING LOCATION	4
1.2. TESTING ENVIRONMENT	4
1.3. PROJECT DATA	4
1.4. SIGNATURE	4
2. CLIENT INFORMATION	5
2.1. APPLICANT INFORMATION.....	5
2.2. MANUFACTURER INFORMATION.....	5
3. EQUIPMENT UNDER TEST (EUT) AND ANCILLARY EQUIPMENT (AE)	6
3.1. ABOUT EUT.....	6
3.2. INTERNAL IDENTIFICATION OF EUT USED DURING THE TEST	6
3.3. INTERNAL IDENTIFICATION OF AE USED DURING THE TEST.....	6
3.4. EUT SET-UPS	8
4. REFERENCE DOCUMENTS.....	9
4.1. REFERENCE DOCUMENTS FOR TESTING.....	9
5. LABORATORY ENVIRONMENT.....	10
6. SUMMARY OF TEST RESULTS.....	11
7. TEST EQUIPMENTS UTILIZED.....	12
ANNEX A: MEASUREMENT RESULTS	13

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: 2015-01-23

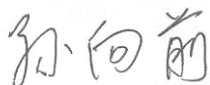
Testing End Date: 2015-02-04

1.4. Signature



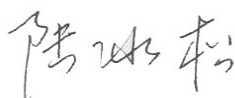
Qu Pengfei

(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: TCL Communication Ltd.
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@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.
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	VF695
FCC ID	2ACCJH014
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
EUT3	357773060002517	PIO	v8l1C

*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-2359
AE2	Battery	/	/
AE3	Travel charger	/	14TCT-CH-0713
AE4	Travel charger	/	14TCT-CH-0786
AE5	Headset	/	14TCT-HS-0958
AE6	Headset	/	14TCT-HS-1362
AE7	USB cable	/	14TCT-DC-0382
AE8	USB cable	/	14TCT-DC-0072
AE9	Travel charger	/	/
AE10	Travel charger	/	/
AE11	Travel charger	/	/
AE12	Battery	/	14TCT-BA-2343
AE13	Battery	/	14TCT-BA-2345
AE14	Battery	/	14TCT-BA-2344
AE15	Headset	/	14TCT-HS-0469
AE16	Headset	/	14TCT-HS-0951

AE1, AE12, AE13, AE14

Model	CAB1400017C2
Manufacturer	SCUD
Capacitance	1400mAh
Nominal voltage	3.7V



AE2

Model	CAB1400017C1
Manufacturer	BYD
Capacitance	1400mAh
Nominal voltage	V

AE3

Model	CBA0017AA1C2
Manufacturer	Tenpao
Length of cable	/

AE4

Model	CBA0017AA1C1
Manufacturer	BYD
Length of cable	/

AE5, AE15, AE16

Model	CCB3000A12C2
Manufacturer	Juwei
Length of cable	156cm

AE6

Model	CCB3000A12C1
Manufacturer	Shunda
Length of cable	159cm

AE7

Model	CDA6050000C2
Manufacturer	Shenghua
Length of cable	96cm

AE8

Model	CDA6050000C1
Manufacturer	JUWEI
Length of cable	100cm

AE9

Model	CBA3008AC1C1
Manufacturer	BYD
Length of cable	/

AE10

Model	CBA3008AB1C2
Manufacturer	Tenpao
Length of cable	/

AE11

Model	CBA3008AB1C1
Manufacturer	BYD
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	EUT3+ AE1/AE2+AE3+ AE7/AE8	Charger
Set.2	EUT3+ AE1/AE2+AE4+ AE7/AE8	Charger
Set.3	EUT3+ AE1/AE2+AE7/AE8	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	9906-5827	ETS-Lindgren	2016-11-19	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 ($\mu\text{V/m}$)		
	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:

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

Where

G_A : Antenna factor of receive antenna

G_{PL} : Path Loss

P_{Mea} : Measurement result on receiver.

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

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
9988.750	35.4	-24.2	38.0	21.600	V
9386.875	35.4	-25.6	38.4	22.600	H
9965.125	35.3	-24.2	38.0	21.500	V
9969.625	35.3	-24.2	38.0	21.500	H
9853.750	35.2	-24.8	38.0	22.000	V
9995.500	35.2	-24.2	38.0	21.400	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
9664.188	47.4	-25.4	38.0	34.800	V
9957.250	47.0	-24.9	38.0	33.900	V
9921.250	46.8	-24.9	38.0	33.700	H
9683.313	46.5	-24.5	38.0	33.000	V
9963.438	46.4	-24.2	38.0	32.600	H
8956.000	46.4	-26.7	38.0	35.100	V

Measurement results 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
9985.375	35.3	-18.5	45.6	22.300	H
9963.438	35.3	-18.5	45.6	22.200	V
9989.875	35.3	-18.5	45.6	22.100	V
9990.438	35.3	-18.5	45.6	22.100	H
9980.313	35.3	-18.5	45.6	22.100	H
9997.188	35.2	-18.5	45.6	22.100	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
9201.250	47.4	-26.0	38.4	35.000	H
9362.125	47.1	-26.3	38.4	35.000	V
9140.500	47.0	-26.1	38.4	34.700	V
9857.125	47.0	-24.8	38.0	33.800	H
9890.875	46.8	-24.9	38.0	33.700	H
8934.063	46.7	-26.7	38.0	35.400	V

Measurement results 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
1672.563	23.7	-18.5	45.6	20.000	V
1851.063	23.7	-18.5	45.6	19.800	V
2585.250	23.6	-18.5	45.6	19.800	V
1659.813	23.6	-18.5	45.6	19.700	V
2001.938	23.5	-18.5	45.6	19.700	V
1143.438	23.4	-18.5	45.6	19.600	H

USB Mode/Peak detector

Frequency(MHz)	Result(dB μ V/m)	G _{PL} (dB)	G _A (dB/m)	P _{Mea} (dB μ V)	Polarity
3048.500	33.7	-38.2	30.9	41.000	V
2599.063	33.7	-38.6	28.9	43.400	H
2560.813	33.6	-38.7	28.9	43.400	V
3013.438	33.6	-38.6	30.9	41.300	H
2467.313	33.6	-38.9	27.7	44.800	V
2012.563	33.6	-36.7	27.7	42.600	V

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

Charging Mode, Set.1

Normal RE_30M-1GHz_10m

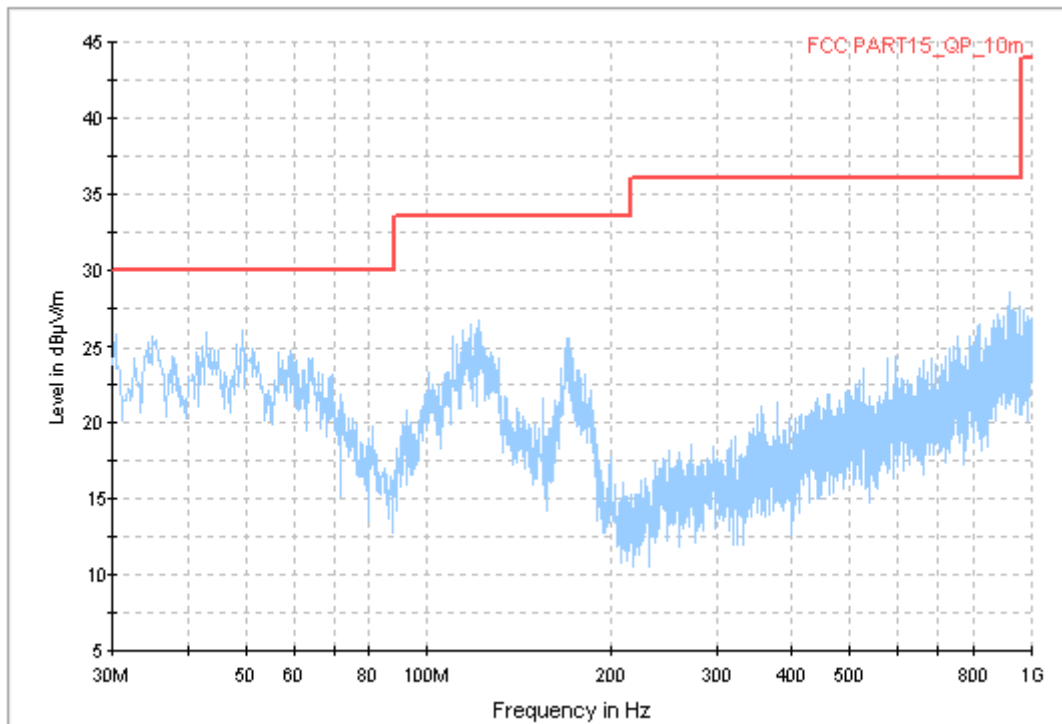


Fig.1 Radiated Emission from 30MHz to 1GHz

Normal RE_1G-18GHz_directly

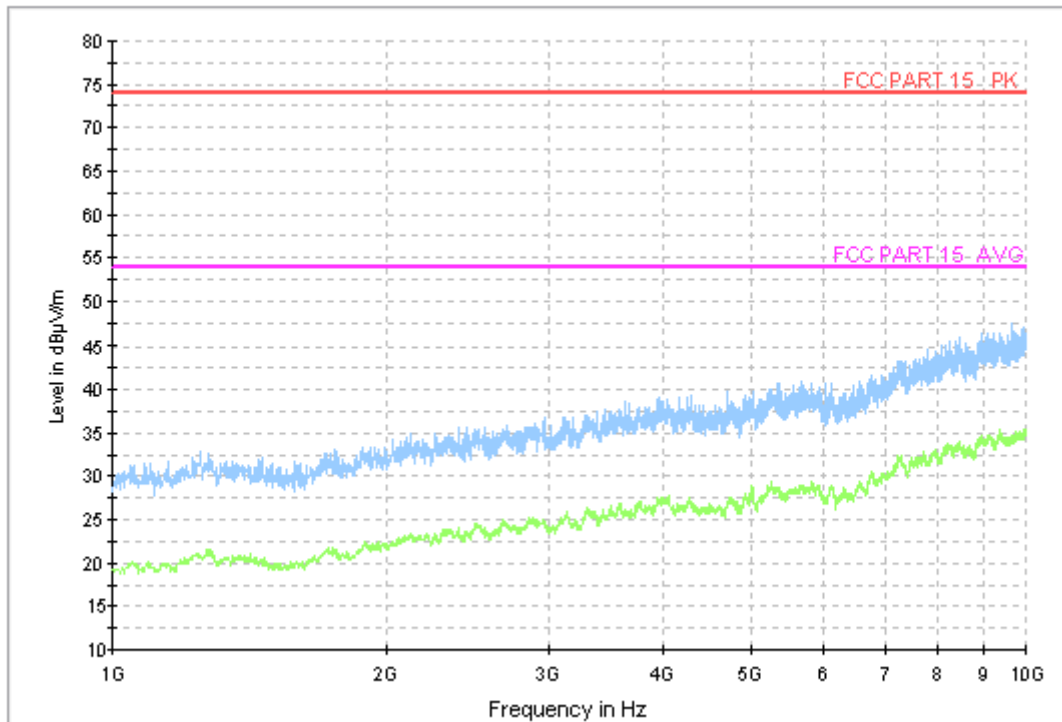


Fig.2 Radiated Emission from 1GHz to 10GHz

Charging Mode, Set.2

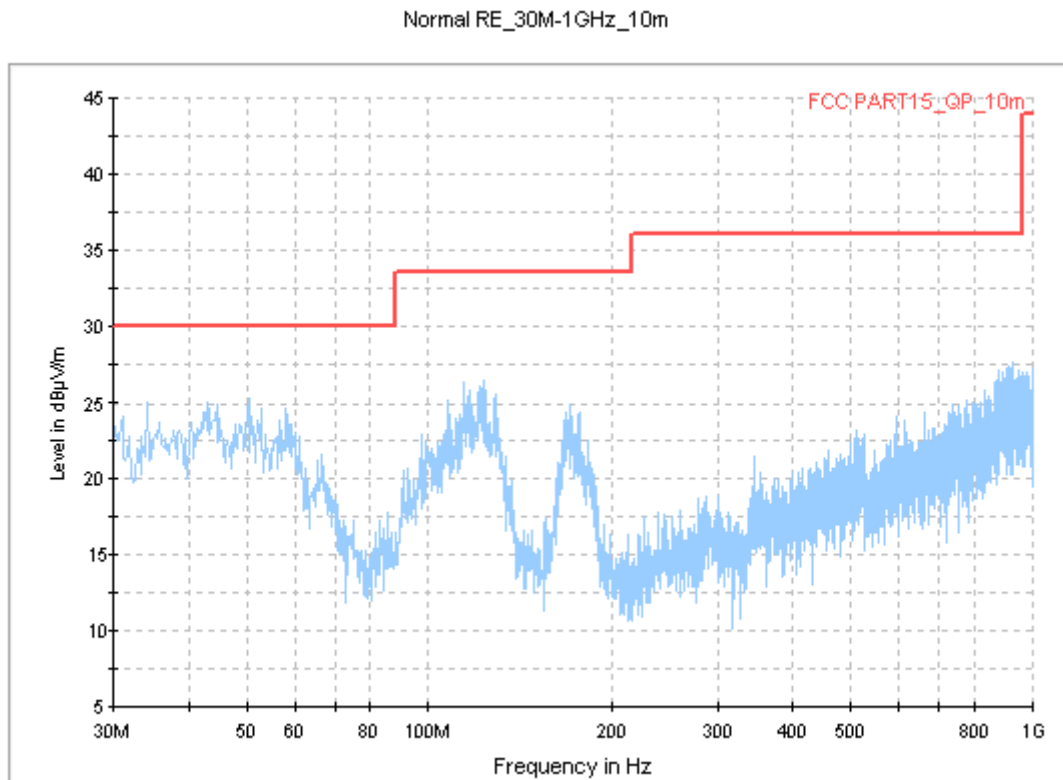


Fig.3 Radiated Emission from 30MHz to 1GHz

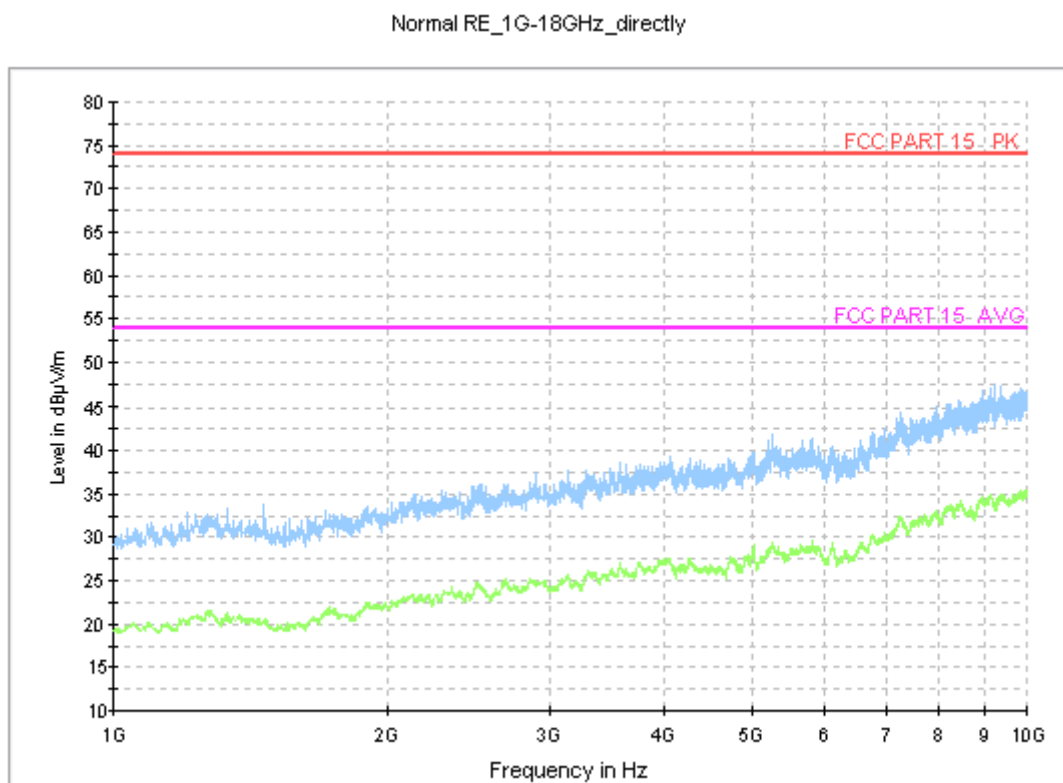


Fig.4 Radiated Emission from 1GHz to 10GHz

USB Mode, Set.3

Normal RE_30M-1GHz_10m

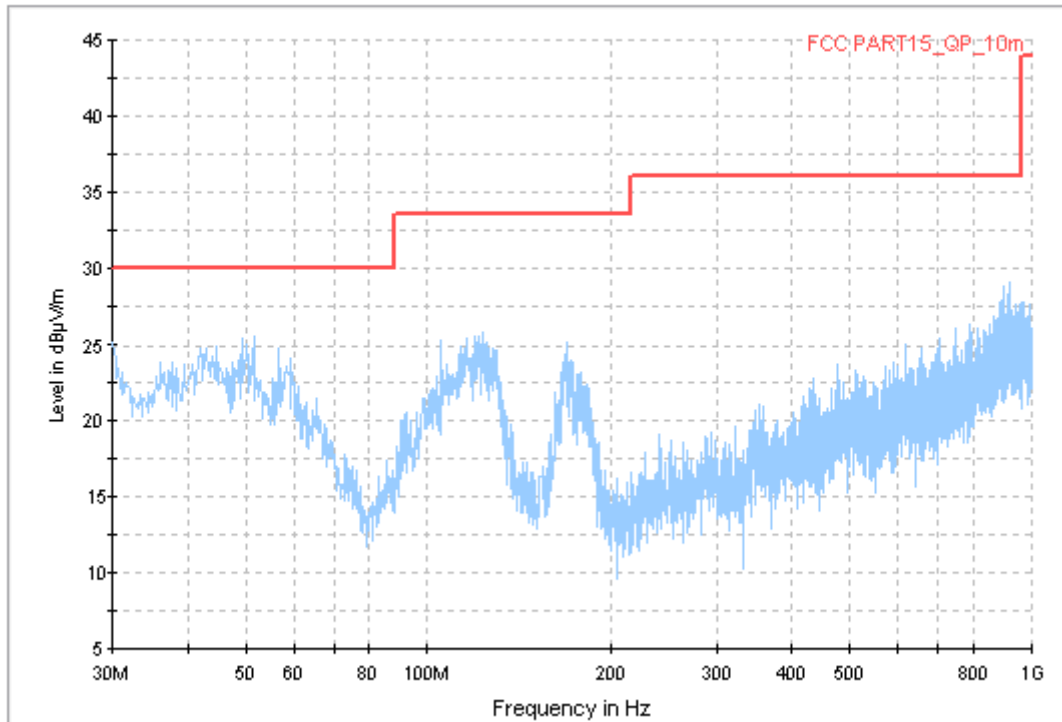


Fig.5 Radiated Emission from 30MHz to 1GHz

Normal RE_1G-18GHz_directly

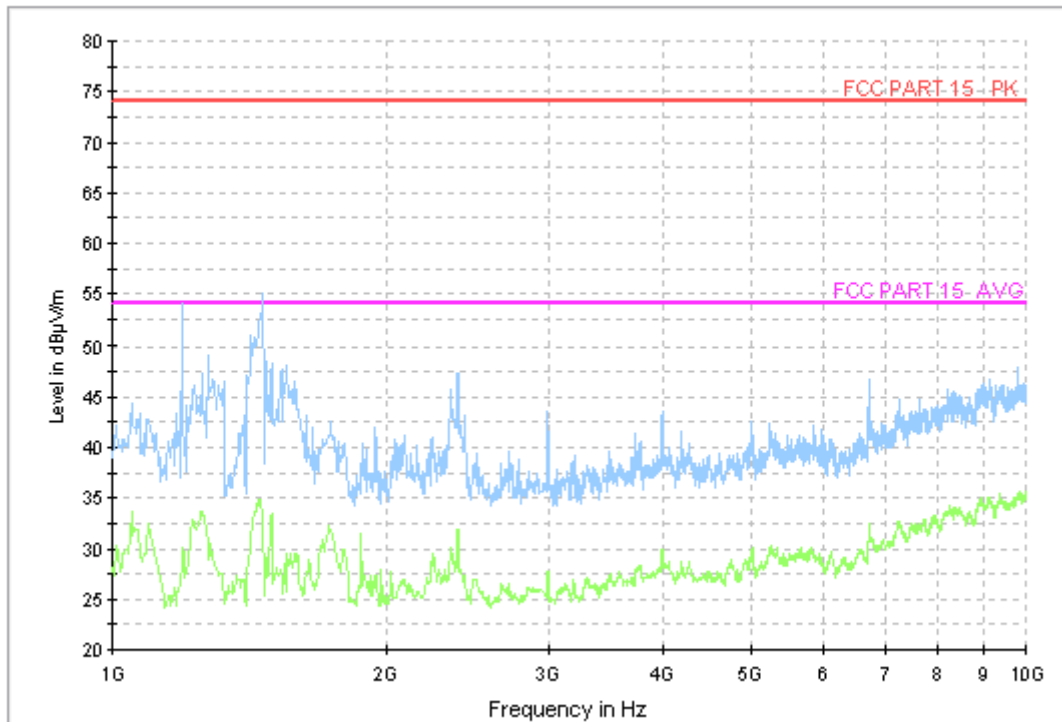


Fig.6 Radiated Emission from 1GHz to 10GHz

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

Charging Mode, Set.1

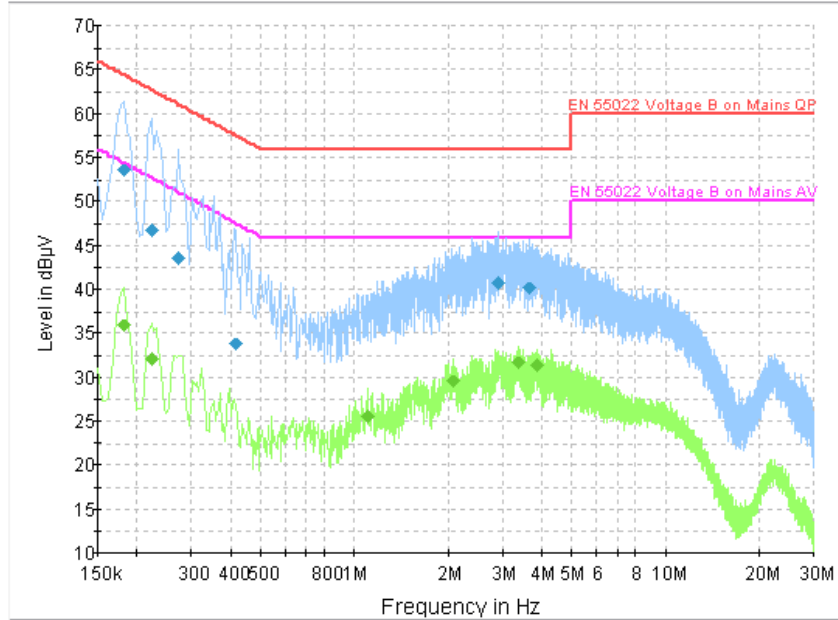


Fig.7 Conducted Emission

Final Result 1

Frequency (MHz)	QuasiPeak (dBμV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.181500	53.6	GND	L1	19.7	10.8	64.4
0.222000	46.9	GND	L1	19.7	15.9	62.7
0.271500	43.6	GND	L1	19.8	17.5	61.1
0.415500	33.8	GND	L1	19.8	23.7	57.5
2.895000	40.8	GND	L1	19.6	15.2	56.0
3.660000	40.2	GND	L1	19.7	15.8	56.0

Final Result 2

Frequency (MHz)	CAverage (dBμV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.181500	35.9	GND	L1	19.7	18.6	54.4
0.222000	32.0	GND	L1	19.7	20.7	52.7
1.099500	25.5	GND	L1	19.7	20.5	46.0
2.076000	29.6	GND	L1	19.6	16.4	46.0
3.363000	31.7	GND	L1	19.7	14.3	46.0
3.844500	31.4	GND	L1	19.7	14.6	46.0

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

Charging Mode, Set.2

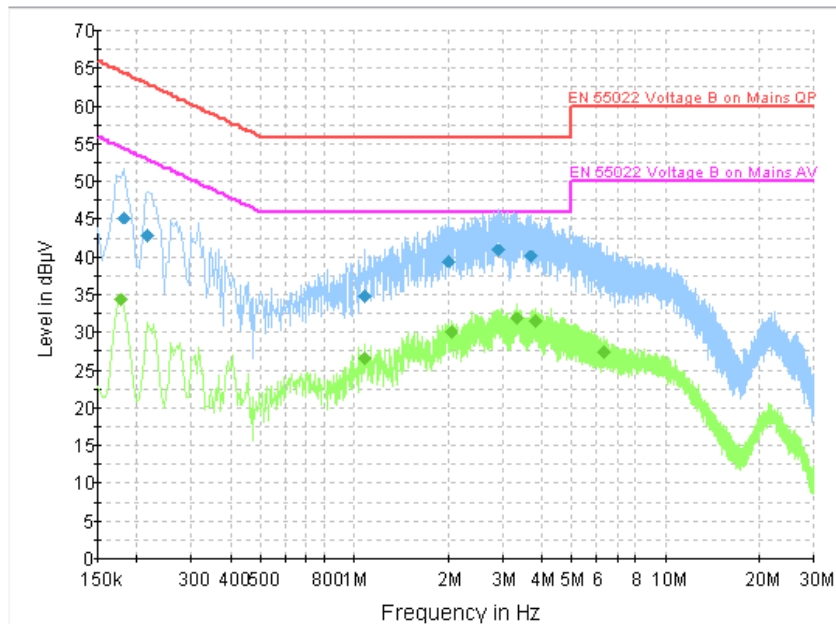


Fig.8 Conducted Emission

Final Result 1

Frequency (MHz)	QuasiPeak (dBμV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.181500	45.3	GND	L1	19.7	19.1	64.4
0.217500	42.9	GND	L1	19.8	20.0	62.9
1.086000	34.9	GND	L1	19.7	21.1	56.0
2.004000	39.5	GND	L1	19.6	16.5	56.0
2.904000	40.9	GND	L1	19.6	15.1	56.0
3.682500	40.1	GND	L1	19.7	15.9	56.0

Final Result 2

Frequency (MHz)	CAverage (dBμV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.177000	34.4	GND	N	19.7	20.3	54.6
1.086000	26.5	GND	L1	19.7	19.5	46.0
2.035500	30.0	GND	L1	19.6	16.0	46.0
3.340500	31.9	GND	L1	19.7	14.1	46.0
3.813000	31.5	GND	L1	19.7	14.5	46.0
6.324000	27.4	GND	L1	19.7	22.6	50.0

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

USB Mode, Set.3

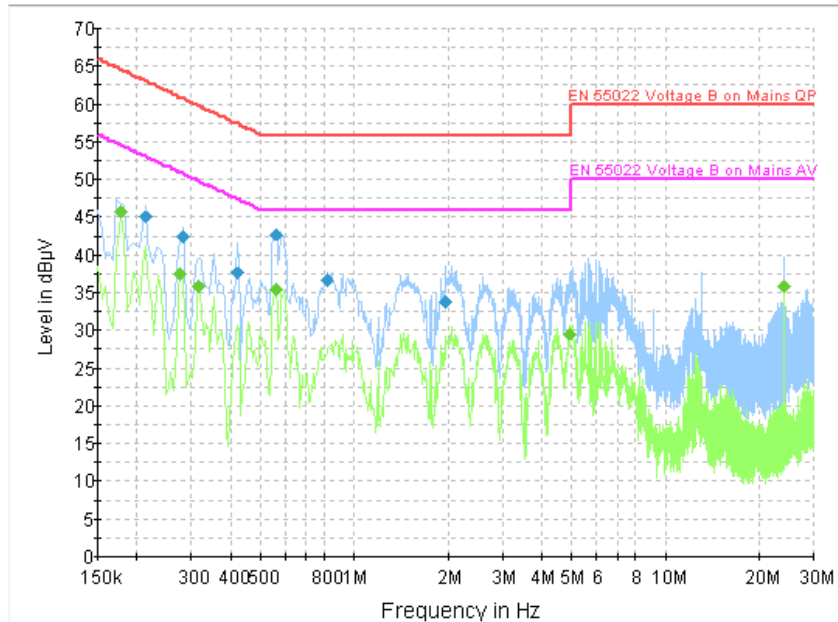


Fig.9 Conducted Emission

Final Result 1

Frequency (MHz)	QuasiPeak (dBμV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.213000	45.1	GND	N	19.8	18.0	63.1
0.280500	42.4	GND	N	19.7	18.4	60.8
0.420000	37.6	GND	L1	19.8	19.8	57.4
0.559500	42.8	GND	L1	19.8	13.2	56.0
0.811500	36.7	GND	N	19.8	19.3	56.0
1.968000	33.8	GND	N	19.6	22.2	56.0

Final Result 2

Frequency (MHz)	CAverage (dBμV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.177000	45.8	GND	N	19.7	8.8	54.6
0.276000	37.5	GND	N	19.8	13.4	50.9
0.316500	35.9	GND	N	19.7	13.9	49.8
0.559500	35.5	GND	N	19.8	10.5	46.0
4.929000	29.6	GND	N	19.6	16.4	46.0
24.054000	35.8	GND	L1	20.0	14.2	50.0

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

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