



# TEST REPORT

No. I15Z41150-EMC02

for

**ZTE Corporation**

**LTE/WCDMA/GSM Multi-Mode Ufi**

**Model Name: MF900**

with

**Hardware Version: HO2**

**Software Version: BD\_UROSMF900V1.0.0B04**

**Issued Date: 2015-06-26**

**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**

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## **REPORT HISTORY**

<b>Report Number</b>	<b>Revision</b>	<b>Description</b>	<b>Issue Date</b>
I15Z41150-EMC02	Rev.0	1st edition	2015-06-26



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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

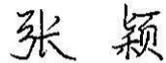
Relative Humidity: 20-75%

### 1.3. Project data

Testing Start Date: 2014-12-12

Testing End Date: 2014-12-26

### 1.4. Signature



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Zhang Ying  
(Prepared this test report)



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Qu Pengfei  
(Reviewed this test report)



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Liu Baodian  
(Approved this test report)



## **2. Client Information**

### **2.1. Applicant Information**

Company Name: ZTE corporation  
Address /Post: ZTE Plaza, Keji Road South, Hi-Tech, Industrial Park,Nanshan  
District,Shenzhen, Guangdong, 518057, P.R.China  
City: Guangdong  
Postal Code: 518057  
Country: China  
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### **2.2. Manufacturer Information**

Company Name: ZTE corporation  
Address /Post: ZTE Plaza, Keji Road South, Hi-Tech, Industrial Park,Nanshan  
District,Shenzhen, Guangdong, 518057, P.R.China  
City: Guangdong  
Postal Code: 518057  
Country: China  
Telephone: +86-21-68897541  
Fax: /



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

#### 3.1. About EUT

Description	LTE/WCDMA /GSM Multi-Mode Ufi
Model Name	MF900
FCC ID	SRQ-MF900
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
EUT1	866883021502259	HO2	BD_UROSMF900V1.0.0B04

\*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
AE3	Travel charger	/	1541150CH006
AE4	Travel charger	/	1541150CH009
AE2	USB Cable		1541150DC009

AE3

Model	STC-A51A-Z
Manufacturer	DOKOCOM
Length of cable	98cm

AE4

Model	STC-A515A-Z
Manufacturer	DOKOCOM
Length of cable	98cm

AE2

Model	
Manufacturer	/
Length of cable	98cm

\*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.6	EUT1 + AE2 + AE3	Charger
Set.7	EUT1 + AE2 + AE4	Charger
Set.4	EUT1 + AE2	USB

## **4. Reference Documents**

### **4.1. Reference Documents for testing**

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

<b>Reference</b>	<b>Title</b>	<b>Version</b>
FCC Part 15, Subpart B	Radio frequency devices - Unintentional Radiators	10-1-14 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.	NAME	TYPE	SERIES NUMBER	PRODUCER	CAL. DUE DATE	CAL. INTERVAL
1.	EMI Antenna	VULB 9163	9163-234	Schwarzbeck	2016-09-15	3 Years
2.	Test Receiver	ESCI 7	100948	R&S	2015-07-16	1 Year
3.	Test Receiver	FSV	101047	R&S	2015-07-03	1 Year
4.	EMI Antenna	3115	9906-5827	ETS-Lindgren	2016-11-19	3 Years
5.	Test Receiver	ESCI	100344	R&S	2016-03-03	1 Year
6.	LISN	ENV216	101200	R&S	2015-07-07	1 Year
7.	Universal Radio Communication Tester	CMU200	109914	R&S	2016-03-26	1 Year
8.	PC	OPTIPLEX 380	2X1YV2X	DELL	/	/
9.	Monitor	E1709Wc	CN-OJ672H-6 4180-9BF-1CR L	DELL	/	/
10.	Printer	P1606dn	VNC3L52122	HP	/	/
11.	Keyboard	L100	CN-ORH656-6 5890-03S-041 Y	DELL	/	/
12.	Mouse	M-UAR	LZ013HC1YLV	DELL	/	/

## **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

$G_{\text{PL}}$ : Path Loss

$P_{\text{Mea}}$ : Measurement result on receiver.

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

### Measurement results for Set.6:

#### Charging Mode/Average detector

Frequency(MHz)	Result(dB $\mu\text{V}/\text{m}$ )	GPL (dB)	GA (dB/m)	PMea(dB $\mu\text{V}$ )	Polarity
17974.500	43.7	-17.7	45.6	15.800	H
17964.867	43.7	-17.7	45.6	15.800	H
17968.267	43.6	-17.7	45.6	15.700	V
17972.800	43.6	-17.7	45.6	15.700	H
17976.767	43.6	-17.7	45.6	15.700	H
17975.633	43.5	-17.7	45.6	15.600	H

#### Charging Mode/Peak detector

Frequency(MHz)	Result(dB $\mu\text{V}/\text{m}$ )	GPL (dB)	GA (dB/m)	PMea(dB $\mu\text{V}$ )	Polarity
17967.700	55.3	-17.7	45.6	27.400	H
17968.267	55.1	-17.7	45.6	27.200	H
17967.133	55.0	-17.7	45.6	27.100	V
17983.000	55.0	-17.7	45.6	27.100	H
17984.133	54.9	-17.7	45.6	27.000	H
17996.033	54.9	-17.7	45.6	27.000	H

**Measurement results for Set.7:**

**Charging Mode/Average detector**

Frequency(MHz)	Result(dB $\mu$ V/m)	G <sub>PL</sub> (dB)	G <sub>A</sub> (dB/m)	P <sub>Mea</sub> (dB $\mu$ V)	Polarity
17967.700	44.0	-17.7	45.6	16.100	H
17963.167	43.9	-17.7	45.6	16.000	H
17970.533	43.8	-17.7	45.6	15.900	V
17966.567	43.8	-17.7	45.6	15.900	H
17987.533	43.8	-17.7	45.6	15.900	H
17972.233	43.8	-17.7	45.6	15.900	H

**Charging Mode/Peak detector**

Frequency(MHz)	Result(dB $\mu$ V/m)	G <sub>PL</sub> (dB)	G <sub>A</sub> (dB/m)	P <sub>Mea</sub> (dB $\mu$ V)	Polarity
17953.533	56.2	-17.7	45.6	28.300	H
17907.067	56.0	-18.5	45.6	28.900	H
17964.300	55.4	-17.7	45.6	27.500	V
17959.767	55.4	-17.7	45.6	27.500	H
17956.933	55.3	-17.7	45.6	27.400	H
17976.767	55.1	-17.7	45.6	27.200	H

**Measurement results for Set.4:**

**USB Mode/Average detector**

Frequency(MHz)	Result(dB $\mu$ V/m)	G <sub>PL</sub> (dB)	G <sub>A</sub> (dB/m)	P <sub>Mea</sub> (dB $\mu$ V)	Polarity
17996.033	43.4	-17.7	45.6	15.500	H
17983.567	43.4	-17.7	45.6	15.500	H
17989.233	43.3	-17.7	45.6	15.400	V
17990.933	43.2	-17.7	45.6	15.300	H
17988.667	43.1	-17.7	45.6	15.200	H
17961.467	43.1	-17.7	45.6	15.200	H

**USB Mode/Peak detector**

Frequency(MHz)	Result(dB $\mu$ V/m)	G <sub>PL</sub> (dB)	G <sub>A</sub> (dB/m)	P <sub>Mea</sub> (dB $\mu$ V)	Polarity
17827.167	54.3	-18.5	45.6	27.200	H
17943.333	53.9	-17.7	45.6	26.000	H
17952.400	53.8	-17.7	45.6	25.900	V
17938.800	53.8	-17.7	45.6	25.900	H
17982.433	53.7	-17.7	45.6	25.800	H
17980.167	53.6	-17.7	45.6	25.700	H

Note: The measurement results of Set.6, Set.7 and Set.4 showed here are worst cases of the combinations of different batteries and USB cables.

Charging Mode, Set.6

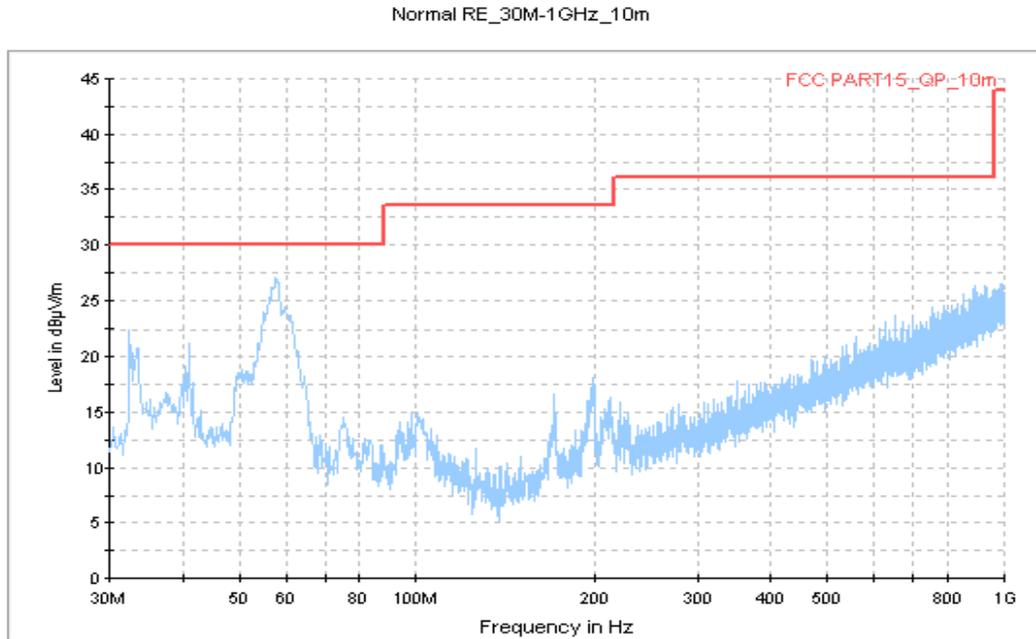


Fig.1 Radiated Emission from 30MHz to 1GHz

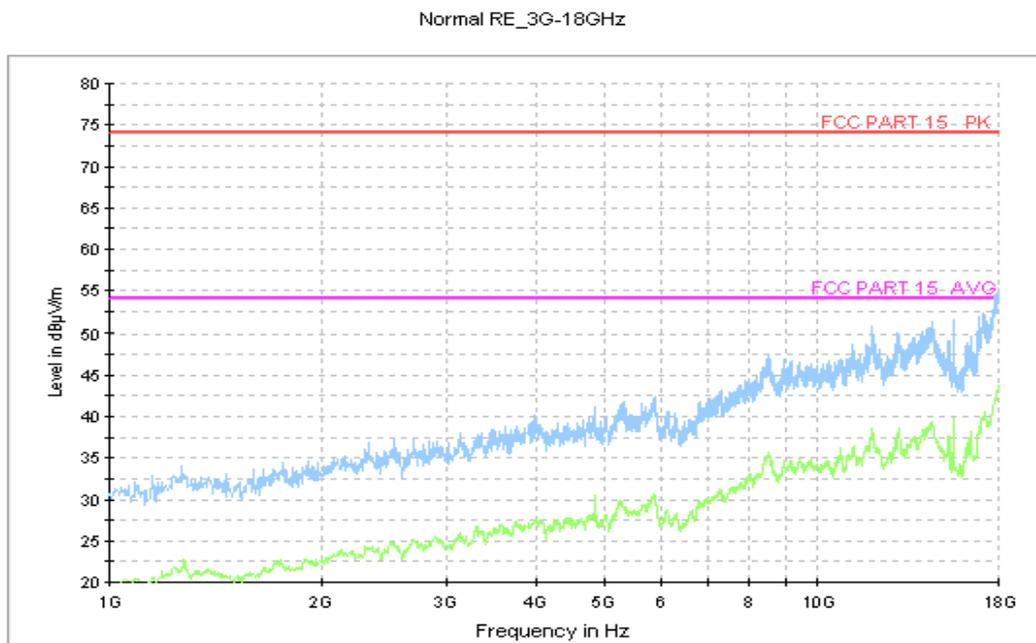


Fig.2 Radiated Emission from 1GHz to 18GHz

Charging Mode, Set.7

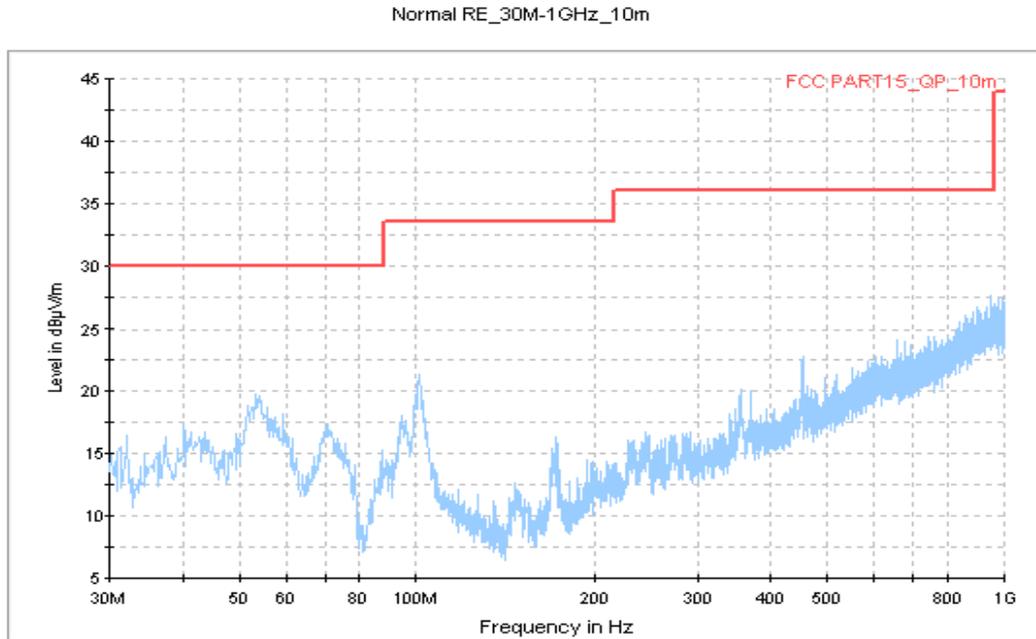


Fig.3 Radiated Emission from 30MHz to 1GHz

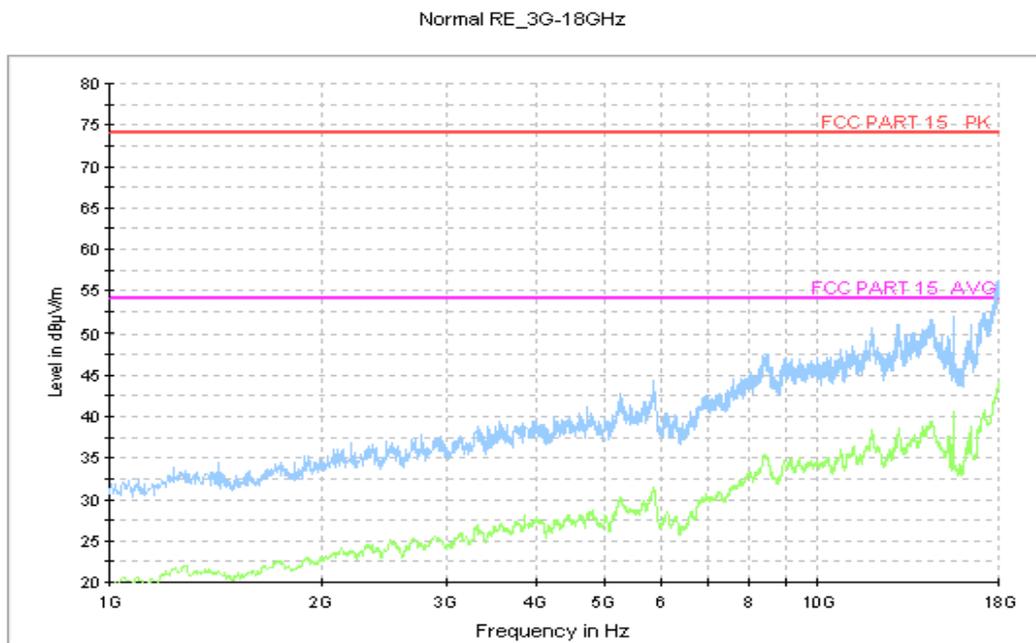


Fig.4 Radiated Emission from 1GHz to 18GHz

USB Mode, Set.4

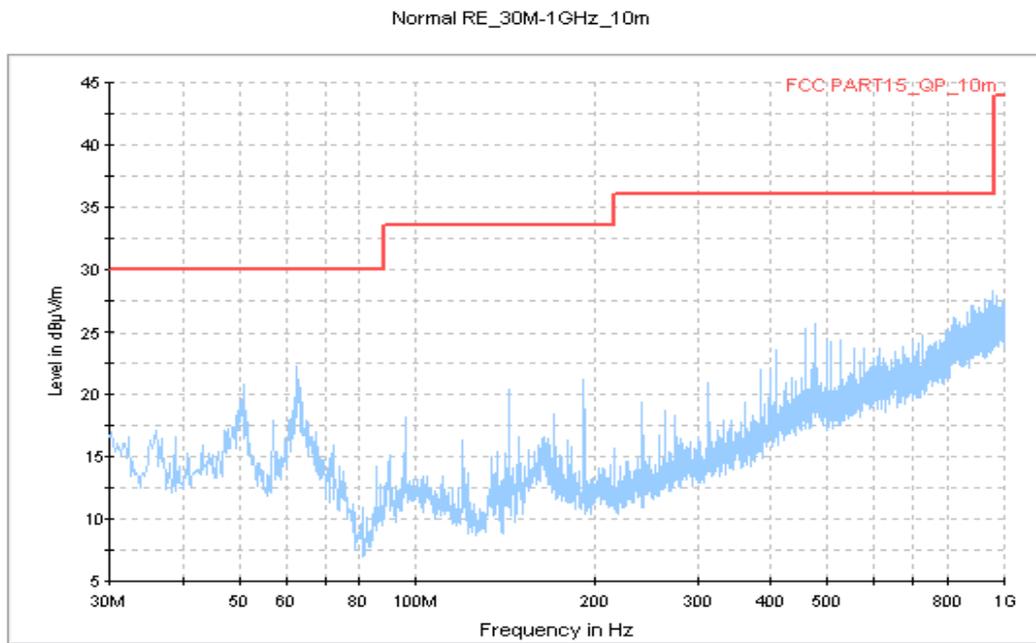


Fig.5 Radiated Emission from 30MHz to 1GHz

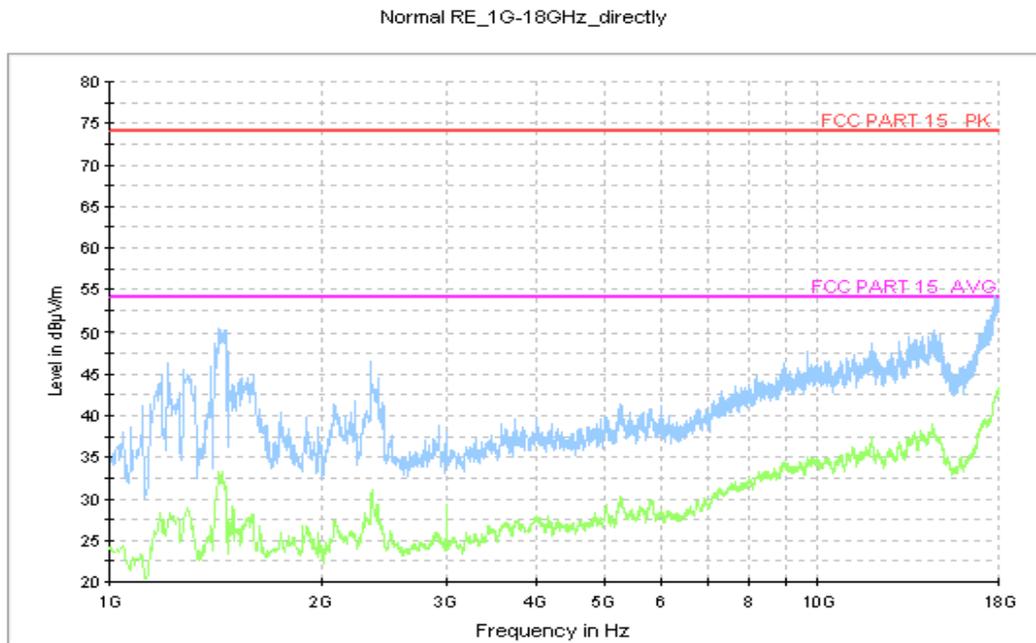


Fig.6 Radiated Emission from 1GHz to 18GHz

## 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 7.2.

### 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 $\mu$ 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

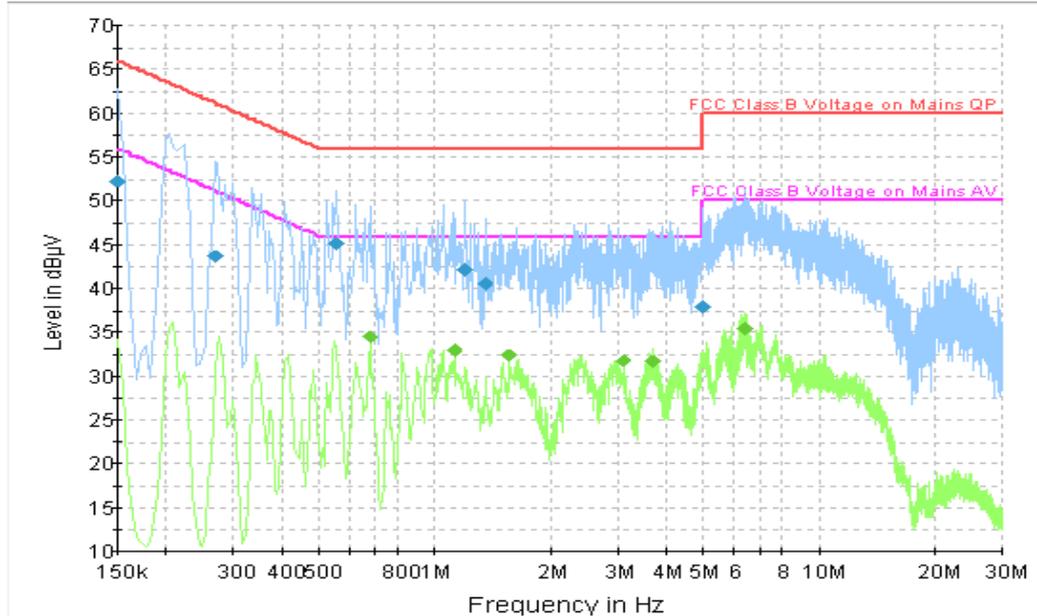
Voltage (V)	Frequency (Hz)
120	60

RBW/IF bandwidth	Sweep Time(s)
9kHz	1

### A.2.5 Measurement Results

Measurement uncertainty:  $U= 2.9$  dB,  $k=2$ .

#### Charging Mode, Set.6



**Fig.1 Conducted Emission**

#### Final Result 1

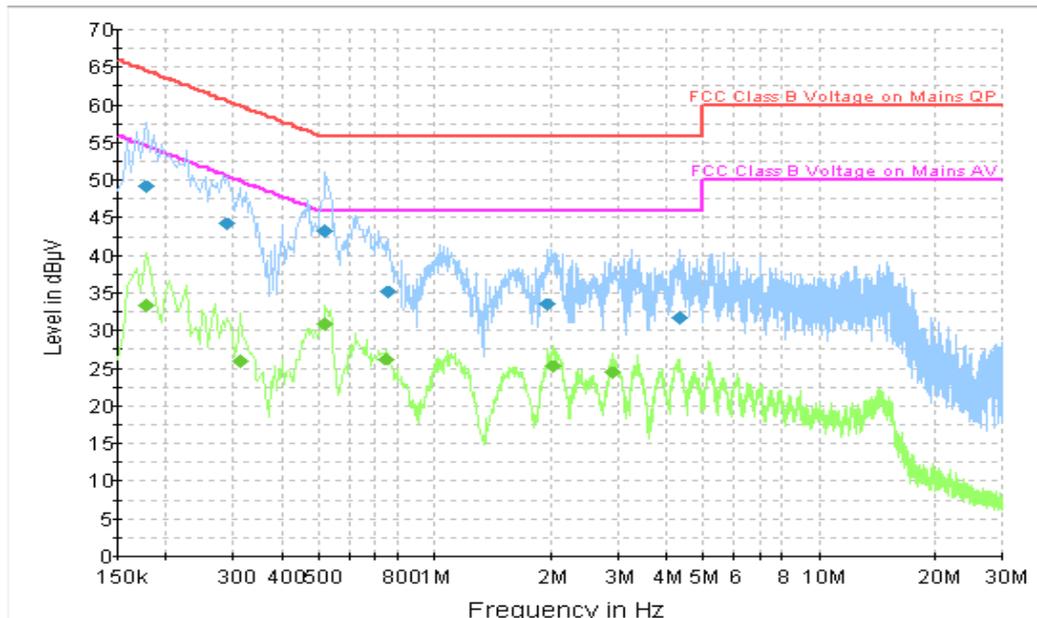
Frequency (MHz)	QuasiPeak (dB µV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dB µV)
0.150000	52.4	GND	L1	20.1	13.6	66.0
0.267000	43.7	GND	L1	19.7	17.6	61.2
0.555000	45.0	GND	L1	19.8	11.0	56.0
1.198500	42.2	GND	N	19.7	13.8	56.0
1.351500	40.6	GND	N	19.6	15.4	56.0
4.978500	37.9	GND	N	19.6	18.1	56.0

#### Final Result 2

Frequency (MHz)	CAverage (dB µV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dB µV)
0.676500	34.4	GND	L1	19.8	11.6	46.0
1.126500	32.9	GND	N	19.6	13.1	46.0
1.572000	32.4	GND	N	19.7	13.6	46.0
3.084000	31.8	GND	N	19.7	14.2	46.0
3.700500	31.7	GND	L1	19.7	14.3	46.0
6.378000	35.5	GND	L1	19.7	14.5	50.0

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

**Charging Mode, Set.7**



**Fig.2 Conducted Emission**

**Final Result 1**

Frequency (MHz)	QuasiPeak (dB µV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dB µV)
0.177000	49.1	GND	L1	19.7	15.5	64.6
0.289500	44.3	GND	N	19.8	16.3	60.5
0.519000	43.3	GND	L1	19.8	12.7	56.0
0.757500	35.2	GND	L1	19.8	20.8	56.0
1.977000	33.5	GND	L1	19.6	22.5	56.0
4.366500	31.8	GND	L1	19.7	24.2	56.0

**Final Result 2**

Frequency (MHz)	CAverage (dB µV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dB µV)
0.177000	33.4	GND	L1	19.7	21.2	54.6
0.312000	25.9	GND	L1	19.7	24.0	49.9
0.519000	30.9	GND	N	19.8	15.1	46.0
0.753000	26.3	GND	L1	19.8	19.7	46.0
2.026500	25.2	GND	L1	19.6	20.8	46.0
2.890500	24.4	GND	L1	19.7	21.6	46.0

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

USB Mode, Set.4

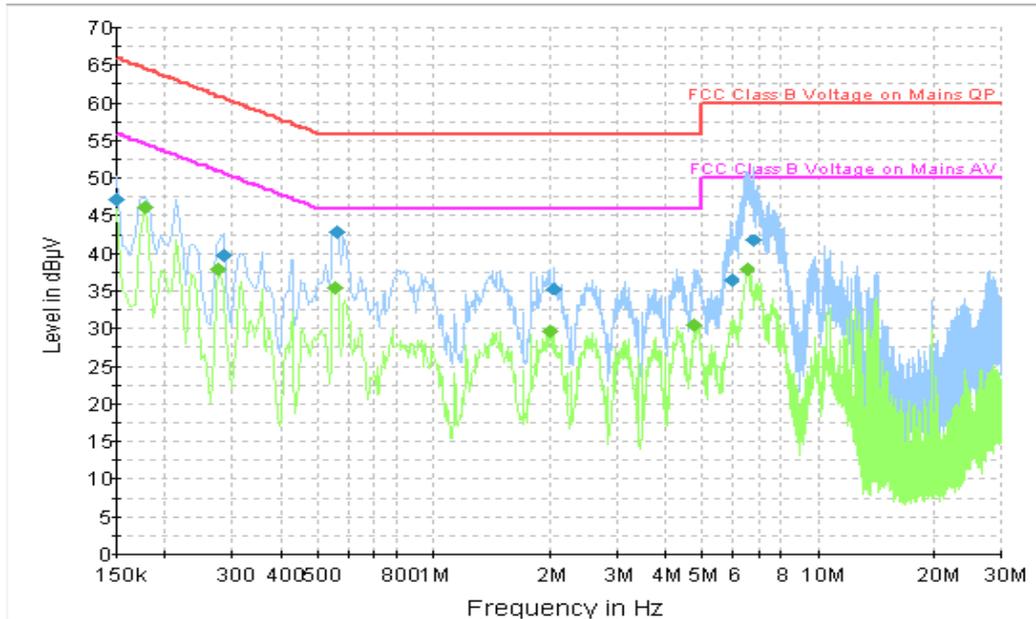


Fig.3 Conducted Emission

Final Result 1

Frequency (MHz)	QuasiPeak (dB µV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dB µV)
0.150000	47.1	GND	N	20.1	18.9	66.0
0.285000	39.8	GND	N	19.8	20.9	60.7
0.559500	42.9	GND	L1	19.8	13.1	56.0
2.067000	35.4	GND	N	19.6	20.6	56.0
5.959500	36.5	GND	L1	19.7	23.5	60.0
6.738000	41.7	GND	L1	19.7	18.3	60.0

Final Result 2

Frequency (MHz)	CAverage (dB µV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dB µV)
0.177000	46.3	GND	N	19.7	8.4	54.6
0.276000	38.0	GND	N	19.8	13.0	50.9
0.555000	35.5	GND	L1	19.8	10.5	46.0
1.999500	29.7	GND	N	19.6	16.3	46.0
4.776000	30.6	GND	N	19.7	15.4	46.0
6.540000	38.0	GND	N	19.7	12.0	50.0

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

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