



# TEST REPORT

## No. I18Z62189-EMC04

for

**Vodafone**

**Smart Phone**

**Model Name: VFD 630**

**FCC ID: 2AM86VFD630**

with

**Hardware Version: V0.2**

**Software Version: VFD 630-V01/VFD 630-V02**

**Issued Date: 2019-04-01**



**Note:**

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The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the U.S. Government.

**Test Laboratory:**

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## **REPORT HISTORY**

<b>Report Number</b>	<b>Revision</b>	<b>Description</b>	<b>Issue Date</b>
I18Z62189-EMC04	Rev.0	1 <sup>st</sup> edition	2019-02-27
I18Z62189-EMC04	Rev.1	Add software version description section 3.2 in Page 6	2019-04-01



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## 1. Test Laboratory

### 1.1. Testing Location

#### CTTL (huayuan North Road)

Address: No. 52, Huayuan North Road, Haidian District, Beijing, P. R. China  
100191

#### CTTL (BDA)

Address: No.18A, Kangding Street, Beijing Economic-Technology Development  
Area, Beijing, P. R. China 100176

### 1.2. Testing Environment

Normal Temperature: 15-35°C

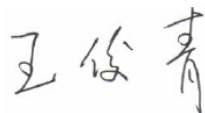
Relative Humidity: 20-75%

### 1.3. Project data

Testing Start Date: 2019-01-28

Testing End Date: 2019-02-26

### 1.4. Signature



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Wang Junqing

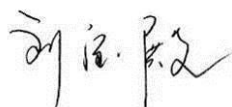
(Prepared this test report)



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Zhang Ying

(Reviewed this test report)



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Liu Baodian

Deputy Director of the laboratory

(Approved this test report)

## **2. Client Information**

### **2.1. Certification Manager Information**

Company Name: Shenzhen Tinno Mobile Technology Corp.  
Address /Post: 4/F, H-3 Building, OCT Eastern industrial Park, No.1 XiangShan East  
Road.,Nan Shan District, Shenzhen, P.R. China  
Contact Person: Robin.he  
Contact Email robin.he@tinno.com  
Telephone: 0755 8609 5550 - 8804  
Fax: /

### **2.2. Applicant Information**

Company Name: Wiko SAS  
Address /Post: 1, rue Capitaine Dessemond 13007 - Marseille - France.  
Contact Person: Laurent Dahan  
Contact Email ldahan@wikomobile.com  
Telephone: 33488089515  
Fax: 33488089520

### **2.3. Manufacturer Information**

Company Name: Vodafone Procurement Company S.à r.l.,  
Address /Post: 15 rue Edward Steichen, L-2540 Luxembourg, Grand-Duché de  
Luxembourg  
Contact Person: /  
Contact Email /  
Telephone: /  
Fax: /

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

#### **3.1. About EUT**

Description	Smart Phone
Model Name	VFD 630
FCC ID	2AM86VFD630
Extreme vol. Limits	3.5VDC to 4.4VDC (nominal: 3.85VDC)

Note: Components list, please refer to documents of the manufacturer; it is also included in the original test record of CTTL, Telecommunication Technology Labs, Academy of Telecommunication Research, MIIT.

#### **3.2. Internal Identification of EUT used during the test**

<b>EUT ID*</b>	<b>SN or IMEI</b>	<b>HW Version</b>	<b>SW Version</b>
EUT6	359956100018993 /359956100026996	V0.2	VFD 630-V01/VFD 630-V02

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

Note: The VFD630, manufactured by Vodafone Procurement Company S.à r.l., is a new product for conformance test. The only difference between the two SW is that, VFD 630-V02 supports dual SIM, while VFD 630-V01 supports single SIM. All the test cases in this report have been executed on SW VFD 630-V02.

#### **3.3. Internal Identification of AE used during the test**

<b>AE ID*</b>	<b>Description</b>	<b>SN</b>	<b>Remarks</b>
AE1	Battery	/	inbuilt
AE2	Charger	/	1861602CH016/017
AE6	USB Cable	/	1862189DC004
AE7	USB Cable	/	1862189DC000
AE8	Headset	/	1862189HS007

##### **AE1**

Model	PT30H415870W
Manufacturer	Shenzhen BYD Lithium Battery Company Limited
Capacitance	2900mAh
Nominal voltage	3.85V

##### **AE2**

Model	TN-050100U4A
Manufacturer	Wiko
Length of cable	/

##### **AE6**

Model	P103-BC2130-000
Manufacturer	/
Length of cable	/

##### **AE7**

Model	P103-BC2130-010
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Manufacturer /  
Length of cable /



AE8

Model P106-BC2130-000  
Manufacturer /  
Length of cable /

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

Note: The USB cables are shielded.

### **3.4. EUT set-ups**

<b>EUT set-up No.</b>	<b>Combination of EUT and AE</b>	<b>Remarks</b>
Set.11	EUT6+ AE1+ AE2+ AE6/AE7+AE8	Charger +FM
Set.12	EUT6+ AE1+ AE6/AE7	USB mode+MP3+GPS



## **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	2016
ANSI C63.4	American National Standard for Methods of Measurement of Radio- Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz	2014

Note: The test methods have no deviation with standards.

## 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, 3m 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

**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

Items	Test Name	Clause in FCC rules	Section in this report	Verdict	Test Location
1	Radiated Emission	15.109(a)	B.1	P	CTTL(huayuan North Road)
2	Conducted Emission	15.107(a)	B.2	P	CTTL(huayuan North Road)



## 7. Test Equipments Utilized

NO.	Description	TYPE	SERIES NUMBER	MANUFACTURE	CAL DUE DATE	CALIBRATION INTERVAL
1	Test Receiver	ESU26	100235	R&S	2019-03-31	1 year
2	Test Receiver	ESC13	100344	R&S	2019-02-28	1 year
3	Universal Radio Communication Tester	CMW500	150344	R&S	2019-12-26	1 year
4	LISN	ENV216	101200	R&S	2019-04-15	1 year
5	Signal Power	SMBV100A	260613	R&S	2019-12-27	1 year
6	EMI Antenna	VULB 9163	9163-483	Schwarzbeck	2021-08-21	3 years
7	EMI Antenna	3115	00167250	ETS-Lindgren	2020-05-21	3 years
8	PC	M4000e-17	M706GWXD	Lenovo	N/A	N/A
9	Printer	P1606dn	VNC3L52122	HP	N/A	N/A

Test Item	Test Software and Version	Software Vendor
Radiated Continuous Emission	EMC32 V9.01	R&S
Conducted Emission	EMC32 V8.52.0	R&S

## **ANNEX A: MEASUREMENT RESULTS**

### **A.1 Radiated Emission**

#### **Reference**

FCC: CFR Part 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 – 2014, 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 LENOVO M4000E-17, and the serial number of the PC is M706GWXD. The software is used to let the PC keep on copying data to MS, reading and erasing the data after copy action was finished.

Note: I/O information: Printer – USB, Mouse – PS/2, Keyboard – USB.

#### **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:

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

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.11:**

**Charging Mode/Average detector**

Frequency (MHz)	Measurement Result (dBμV/m)	Cable loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBμV)	Antenna Pol. (H/V)
17768.800	31.8	-18.5	45.6	4.700	H
17406.133	31.8	-19.2	41.5	9.500	H
17444.100	31.8	-19.2	41.5	9.500	V
17404.433	31.7	-19.2	41.5	9.400	H
17493.967	31.7	-19.2	41.5	9.400	H
17399.900	31.7	-19.2	41.5	9.400	H

**Charging Mode/Peak detector**

Frequency (MHz)	Measurement Result (dBμV/m)	Cable loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBμV)	Antenna Pol. (H/V)
17266.167	43.7	-19.5	41.5	21.700	H
17491.700	43.5	-19.2	41.5	21.200	H
17639.033	43.2	-18.9	45.6	16.500	V
17494.533	43.1	-19.2	41.5	20.800	H
17873.633	43.0	-18.5	45.6	15.900	H
17932.000	43.0	-17.7	45.6	15.100	H

**Measurement results for Set.12:**

**USB Mode/Average detector**

Frequency (MHz)	Measurement Result (dBμV/m)	Cable loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBμV)	Antenna Pol. (H/V)
17465.067	31.3	-19.2	41.5	9.000	H
17576.700	31.2	-18.9	45.6	4.500	H
17471.867	31.1	-19.2	41.5	8.800	V
17471.300	31.1	-19.2	41.5	8.800	H
17986.967	31.1	-17.7	45.6	3.200	H
17539.867	31.1	-19.2	45.6	4.700	H

**USB Mode/Peak detector**

Frequency (MHz)	Measurement Result (dBμV/m)	Cable loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBμV)	Antenna Pol. (H/V)
17295.067	43.3	-19.5	41.5	21.300	H
17875.333	43.0	-18.5	45.6	15.900	H
17617.500	43.0	-18.9	45.6	16.300	V
17717.800	43.0	-18.9	45.6	16.300	H
17837.367	42.7	-18.5	45.6	15.600	H
17616.367	42.7	-18.9	45.6	16.000	H

Charging Mode, Set.11

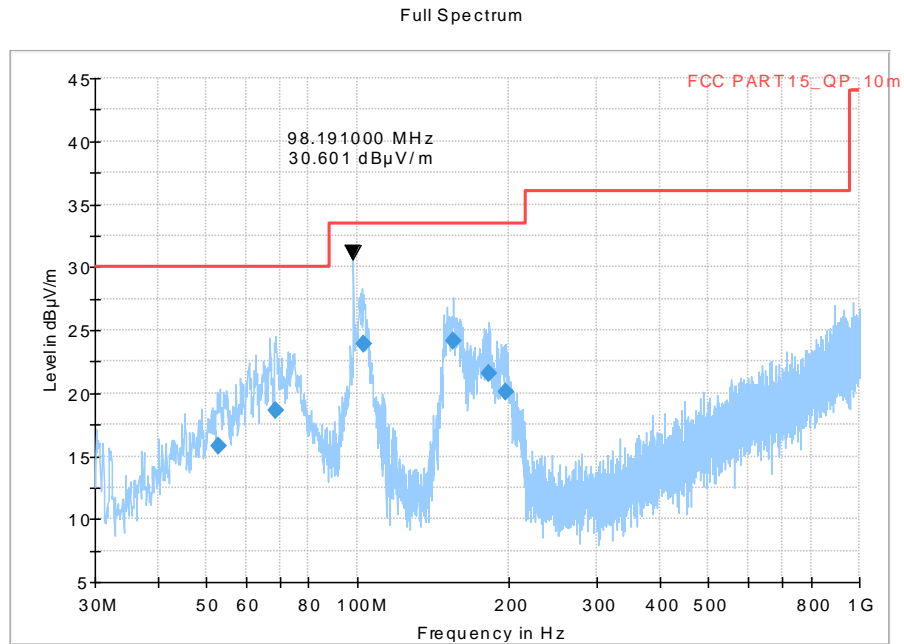
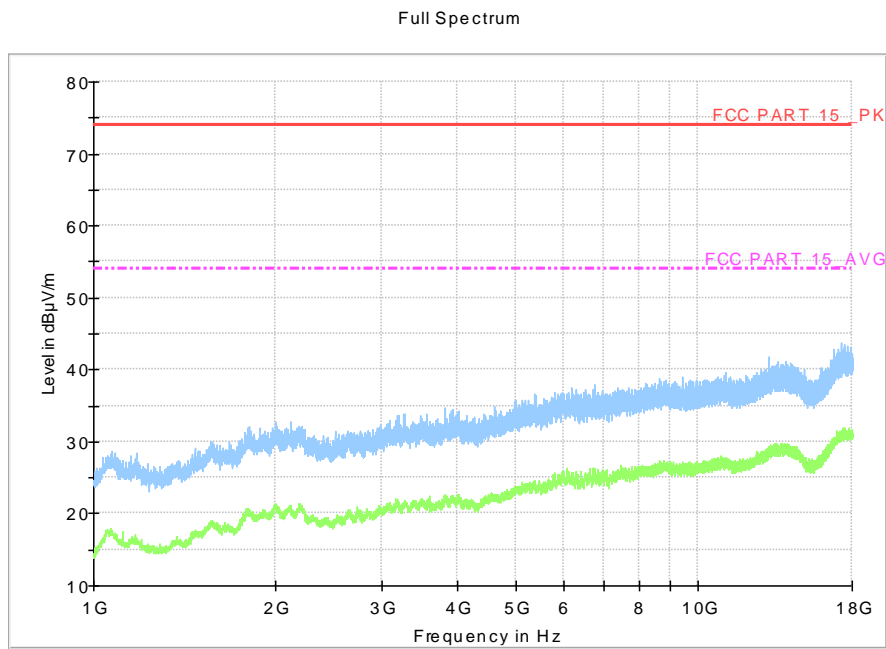


Fig A.1 Radiated Emission from 30MHz to 1GHz

Final Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)
52.961000	15.83	30.00	14.17	1000.0	120.000	112.0	V	69.0
68.763000	18.68	30.00	11.32	1000.0	120.000	125.0	V	120.0
102.574000	23.87	33.50	9.65	1000.0	120.000	202.0	V	81.0
154.927000	24.12	33.50	9.40	1000.0	120.000	108.0	V	62.0
182.729000	21.52	33.50	12.00	1000.0	120.000	102.0	V	120.0
197.611000	20.13	33.50	13.39	1000.0	120.000	187.0	V	151.0





**Fig A.2 Radiated Emission from 1GHz to 18GHz**

USB Mode, Set.12

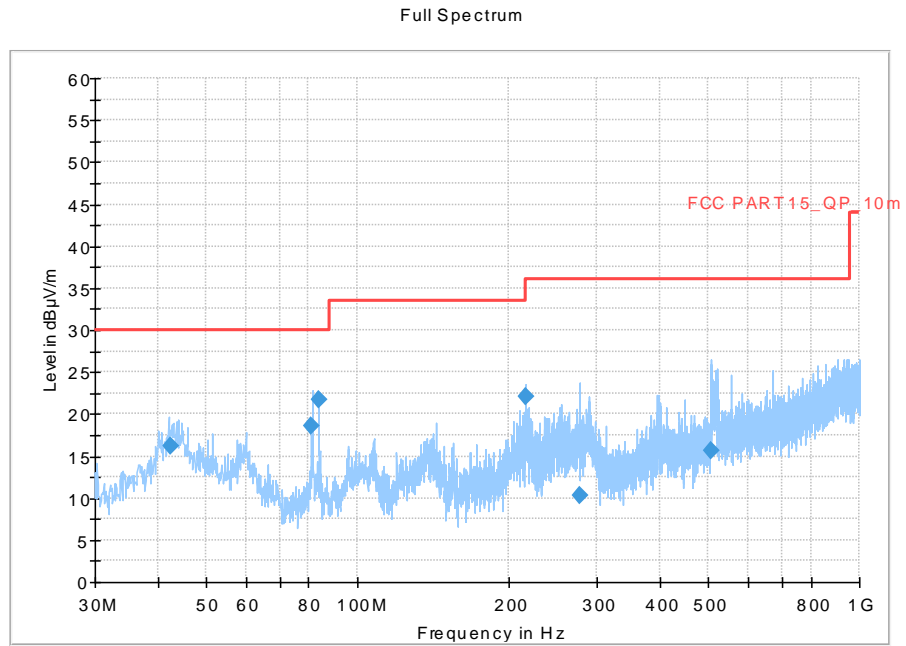
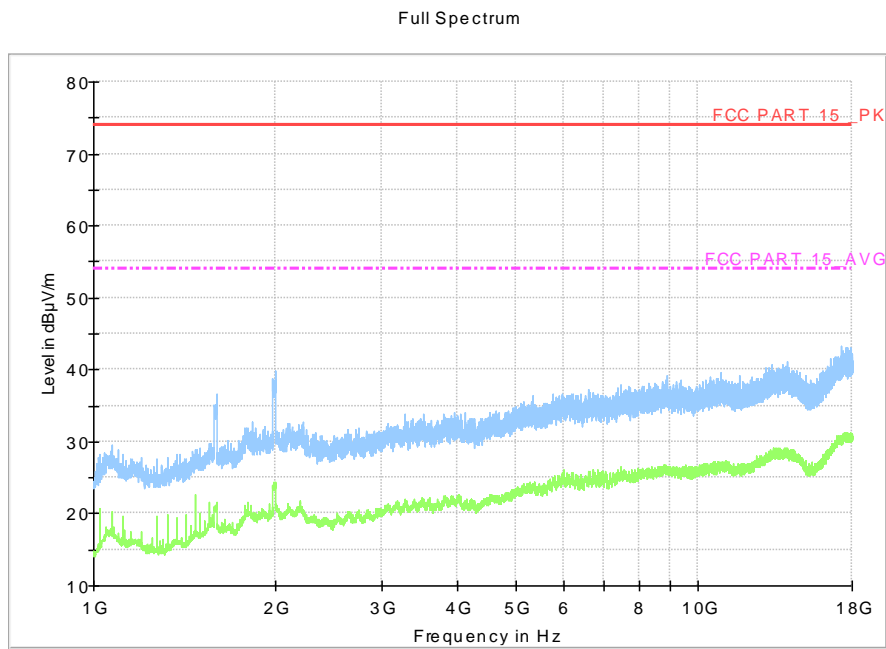


Fig A.3 Radiated Emission from 30MHz to 1GHz

Final Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)
42.328000	16.24	30.00	13.76	1000.0	120.000	111.0	V	15.0
81.027000	18.68	30.00	11.32	1000.0	120.000	125.0	V	30.0
84.052000	21.70	30.00	8.30	1000.0	120.000	188.0	V	30.0
216.120000	22.09	36.00	13.93	1000.0	120.000	108.0	V	157.0
277.142000	10.34	36.00	25.68	1000.0	120.000	105.0	V	120.0
507.720000	15.66	36.00	20.36	1000.0	120.000	325.0	V	30.0



**Fig A.4 Radiated Emission from 1GHz to 18GHz**

## A.2 Conducted Emission

### Reference

FCC: CFR Part 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 – 2014, 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 LENOVO M4000E-17, and the serial number of the PC is M706GWXD. The software is used to let the PC keep on copying data to MS, reading and erasing the data after copy action was finished.

Note: I/O information: Printer – USB, Mouse – PS/2, Keyboard – USB.

### 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.11

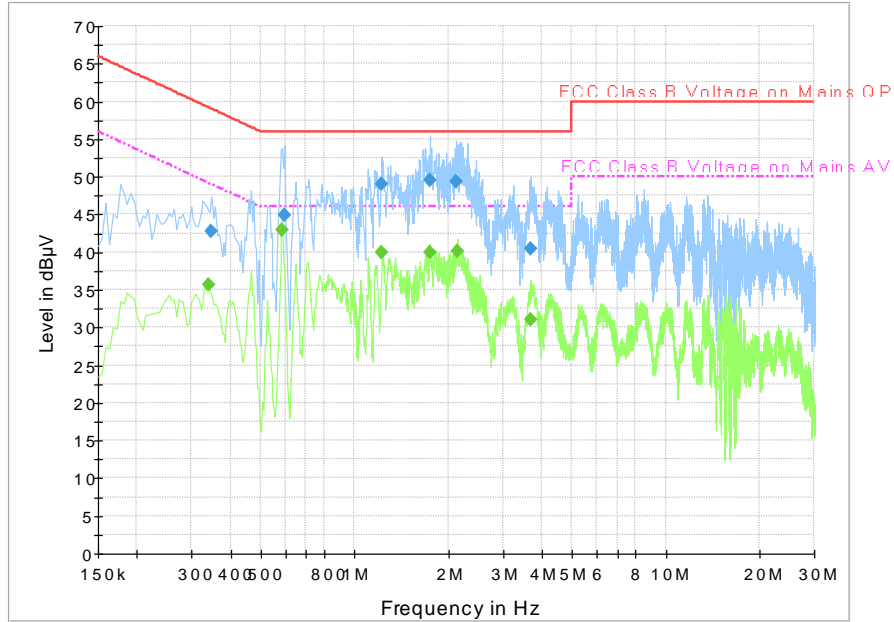


Fig A.5 Conducted Emission

#### Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.348000	42.7	2000.0	9.000	On	L1	19.8	16.3	59.0	
0.595500	45.0	2000.0	9.000	On	L1	19.8	11.0	56.0	
1.225500	49.0	2000.0	9.000	On	L1	19.6	7.0	56.0	
1.747500	49.6	2000.0	9.000	On	L1	19.7	6.4	56.0	
2.130000	49.4	2000.0	9.000	On	L1	19.7	6.6	56.0	
3.696000	40.4	2000.0	9.000	On	L1	19.6	15.6	56.0	

#### Final Result 2

Frequency (MHz)	Average (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.339000	35.6	2000.0	9.000	On	L1	19.8	13.6	49.2	
0.586500	42.9	2000.0	9.000	On	L1	19.9	3.1	46.0	
1.225500	40.0	2000.0	9.000	On	L1	19.6	6.0	46.0	
1.747500	39.9	2000.0	9.000	On	L1	19.7	6.1	46.0	
2.139000	40.1	2000.0	9.000	On	L1	19.7	5.9	46.0	
3.696000	31.1	2000.0	9.000	On	L1	19.6	14.9	46.0	

USB Mode, Set.12

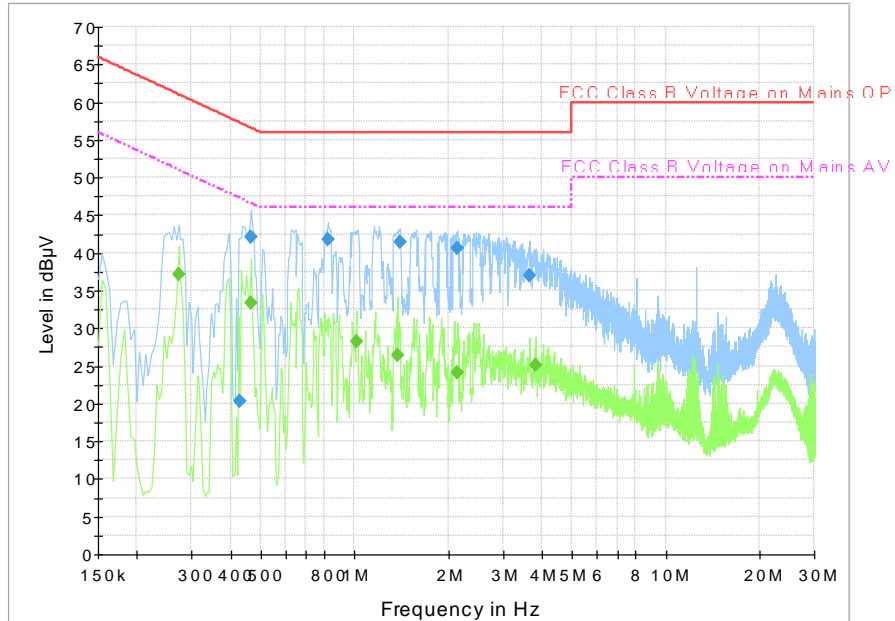


Fig A.6 Conducted Emission

Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.429000	20.3	2000.0	9.000	On	L1	19.9	36.9	57.3	
0.465000	42.1	2000.0	9.000	On	L1	19.9	14.5	56.6	
0.820500	41.8	2000.0	9.000	On	N	19.8	14.2	56.0	
1.396500	41.4	2000.0	9.000	On	N	19.6	14.6	56.0	
2.143500	40.7	2000.0	9.000	On	N	19.6	15.3	56.0	
3.655500	36.9	2000.0	9.000	On	N	19.7	19.1	56.0	

Final Result 2

Frequency (MHz)	Average (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.271500	37.2	2000.0	9.000	On	L1	19.8	13.9	51.1	
0.465000	33.3	2000.0	9.000	On	L1	19.9	13.3	46.6	
1.014000	28.2	2000.0	9.000	On	L1	19.6	17.8	46.0	
1.378500	26.4	2000.0	9.000	On	L1	19.6	19.6	46.0	
2.143500	24.1	2000.0	9.000	On	L1	19.7	21.9	46.0	
3.831000	25.2	2000.0	9.000	On	N	19.7	20.8	46.0	



**ANNEX B: Persons involved in this testing**

Test Item	Tester
Conducted Continuous Emission	Li Jinpeng
Radiated Continuous Emission	Yan Hancheng

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