TEST REPORT

No. I19Z60566-EMC01

for

Shenzhen Tinno Mobile Technology Corp.

Smart Phone

Model Name: U304AA

FCC ID: XD6U304AA

with

Hardware Version: V1.0

Software Version: U304AAV01.18.11

Issued Date: 2019-05-07

TESTING
NVLAP LAB CODE 600118-0

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Test Laboratory:

CTTL, Telecommunication Technology Labs, CAICT

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REPORT HISTORY

Report Number	Revision	Description	Issue Date
I19Z60566-EMC01	Rev.0	1st edition	2019-05-07

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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. China100191

1.2. Testing Environment

Normal Temperature: 15-35℃

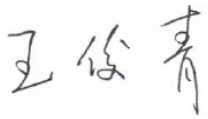
Relative Humidity: 20-75%

1.3. Project data

Testing Start Date: 2019-04-23

Testing End Date: 2019-05-06

1.4. Signature

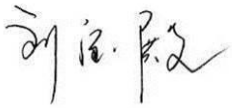


Wang Junqing

(Prepared this test report)

Zhang Ying

(Reviewed this test report)



Liu Baodian

Deputy Director of the laboratory

(Approved this test report)

2. Client Information

2.1. Applicant Information

Company Name:	Shenzhen Tinno Mobile Technology Corp.
Address:	4/F, H-3 Building,OCT Eastern Industrial Park. NO.1 XiangShan East Road, Nan Shan District, Shenzhen, P.R.China
City:	Shenzhen
Postal Code:	/
Country:	China
Contact Person	Jingwen.Guo
Contact Email	jingwen.guo@tinno.com
Telephone:	0755-86095550
Fax:	\

2.2. Manufacturer Information

Company Name:	Shenzhen Tinno Mobile Technology Corp.
Address:	4/F, H-3 Building,OCT Eastern Industrial Park. NO.1 XiangShan East Road, Nan Shan District, Shenzhen, P.R.China
City:	Shenzhen
Postal Code:	/
Country:	China
Contact	Jingwen.Guo
Telephone:	0755-86095550
Fax:	\

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

3.1. About EUT

Description	Smart Phone
Model Name	U304AA
FCC ID	XD6U304AA
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, CAICT.

3.2. Internal Identification of EUT used during the test

EUT ID*	SN or IMEI	HW Version	SW Version
EUT1	863382040008011	V1.0	U304AAV01.18.11

*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	/	/
AE2	Charger	/	/
AE3	USB Cable	/	/
AE4	Headset	/	/

AE1

Model	LT25H426271B
Manufacturer	Shenzhen BYD Lithium Battery Company Limited
Capacitance	2500 mAh
Nominal voltage	3.85V

AE2

Model	TN-050100U4A
Manufacturer	Shenzhen BMT Electrones Co,Ltd
Length of cable	/

AE3

Model	/
Manufacturer	/
Length of cable	100cm

AE4

Model	/
Manufacturer	/
Length of cable	125cm

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

Note: The USB cables are shielded.

3.4. EUT set-ups

EUT set-up No.	Combination of EUT and AE	Remarks
Set.1	EUT1+ AE2+ AE3+AE4	Charger+Headset
Set.2	EUT1+ AE3	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	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, 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

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. = 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	ESCI7	100948	R&S	2019-06-27	1 Year
2	Universal Radio Communication Tester	CMW500	143008	R&S	2019-11-26	1 year
3	LISN	ENV216	101200	R&S	2020-03-14	1 year
4	EMI Antenna	VULB 9163	9163-483	Schwarzbeck	2019-08-21	1 year
5	EMI Antenna	3115	00167250	ETS-Lindgren	2019-05-17	1 year
6	PC	OPTIPLEX 380	2X1YV2X	DELL	N/A	N/A
7	Printer	P1606dn	VNC3L52122	HP	N/A	N/A
8	Keyboard	L100	CN0RH659658907ATOI40	DELL	N/A	N/A
9	Mouse	M-UAE119	LZ935220ZRC	Lenovo	N/A	N/A

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 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.

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

A.1.3 Measurement Limit

Frequency range (MHz)	Field strength limit (μV/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:

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

Where

G_A: Antenna factor of receive antenna

G_{PL}: Path Loss

P_{Mea}: Measurement result on receiver.

Measurement uncertainty (worst case): U = 5.44 dB, k=2.

Measurement results for Set.1:

Charging Mode/Average detector

Frequency (MHz)	Measurement Result (dBμV/m)	Cable loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBμV)	Antenna Pol. (H/V)
17826.600	30.5	-18.5	45.6	3.400	H
17398.767	30.4	-19.2	41.5	8.100	H
17492.267	30.4	-19.2	41.5	8.100	V
17451.467	30.4	-19.2	41.5	8.100	H
17467.900	30.4	-19.2	41.5	8.100	H
17419.167	30.3	-19.2	41.5	8.000	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)
17408.967	42.2	-19.2	41.5	19.900	H
17618.067	42.2	-18.9	45.6	15.500	H
17333.033	42.2	-19.5	41.5	20.200	V
17372.133	42.2	-19.5	41.5	20.200	H
17609.000	42.1	-18.9	45.6	15.400	H
17830.000	41.9	-18.5	45.6	14.800	H

Measurement results for Set.2:

USB Mode/Average detector

Frequency (MHz)	Measurement Result (dBμV/m)	Cable loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBμV)	Antenna Pol. (H/V)
17828.867	39.6	-18.5	45.6	12.500	H
17779.000	39.6	-18.5	45.6	12.500	H
17823.200	39.4	-18.5	45.6	12.300	V
17795.433	39.4	-18.5	45.6	12.300	H
17968.267	39.4	-17.7	45.6	11.500	H
17469.033	39.4	-19.2	41.5	17.100	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)
17599.367	51.9	-18.9	45.6	25.200	H
17428.800	50.9	-19.2	41.5	28.600	H
17901.400	50.7	-18.5	45.6	23.600	V
17993.200	50.7	-17.7	45.6	22.800	H
17408.967	50.6	-19.2	41.5	28.300	H
17789.200	50.4	-18.5	45.6	23.300	H

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

Charging Mode, Set.1

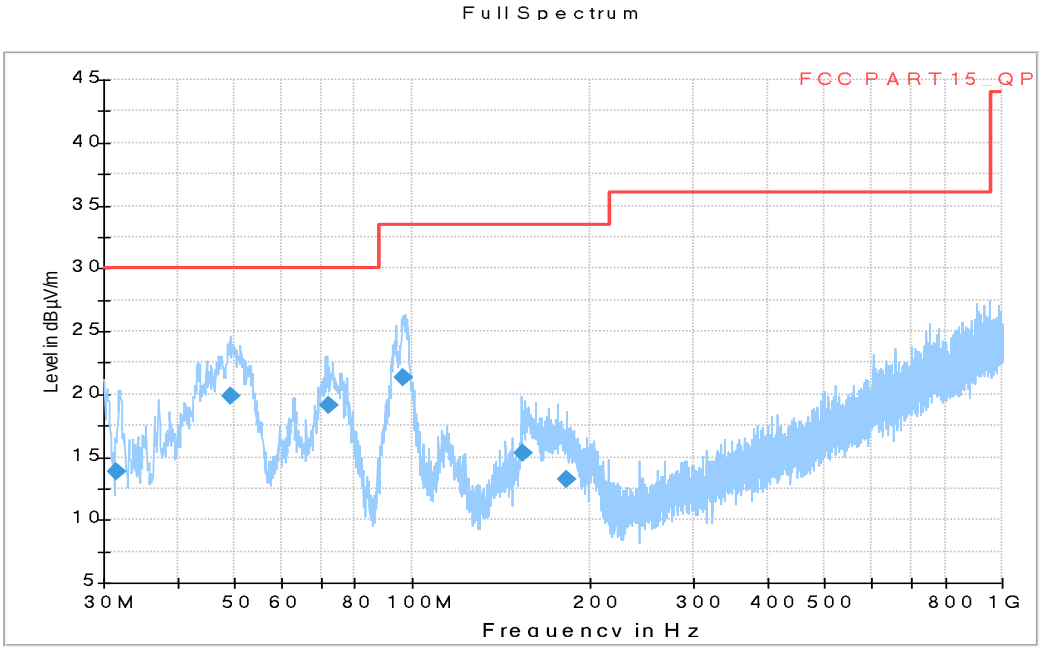


Fig A.1 Radiated Emission from 30MHz to 1GHz

Final_Result

Frequency (MHz)	QuasiPeak (dBµV /m)	Limit (dBµV /m)	Margin (dB)	Meas. Time	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)
31.506000	13.88	30.00	16.12	1000.0	120.000	121.0	V	-22.0
49.109000	19.83	30.00	10.17	1000.0	120.000	125.0	V	-25.0
72.310000	19.10	30.00	10.90	1000.0	120.000	197.0	V	-14.0
96.847000	21.29	33.50	12.23	1000.0	120.000	100.0	V	181.0
153.804000	15.29	33.50	18.23	1000.0	120.000	110.0	V	-29.0
182.267000	13.27	33.50	20.25	1000.0	120.000	190.0	V	200.0

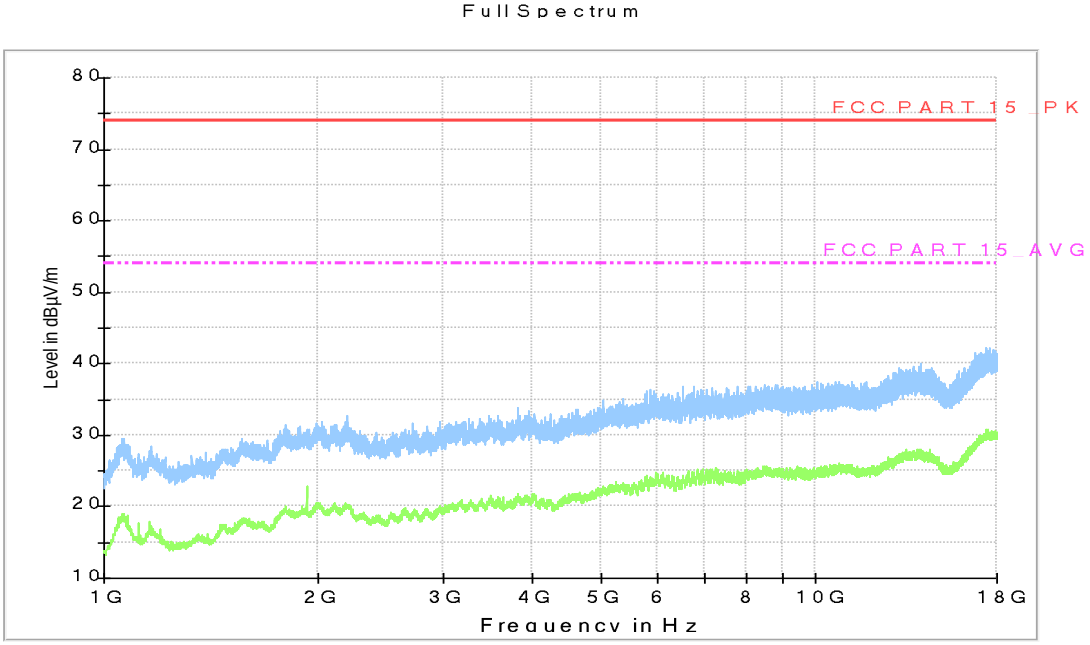


Fig A.2 Radiated Emission from 1GHz to 18GHz

USB Mode, Set.2

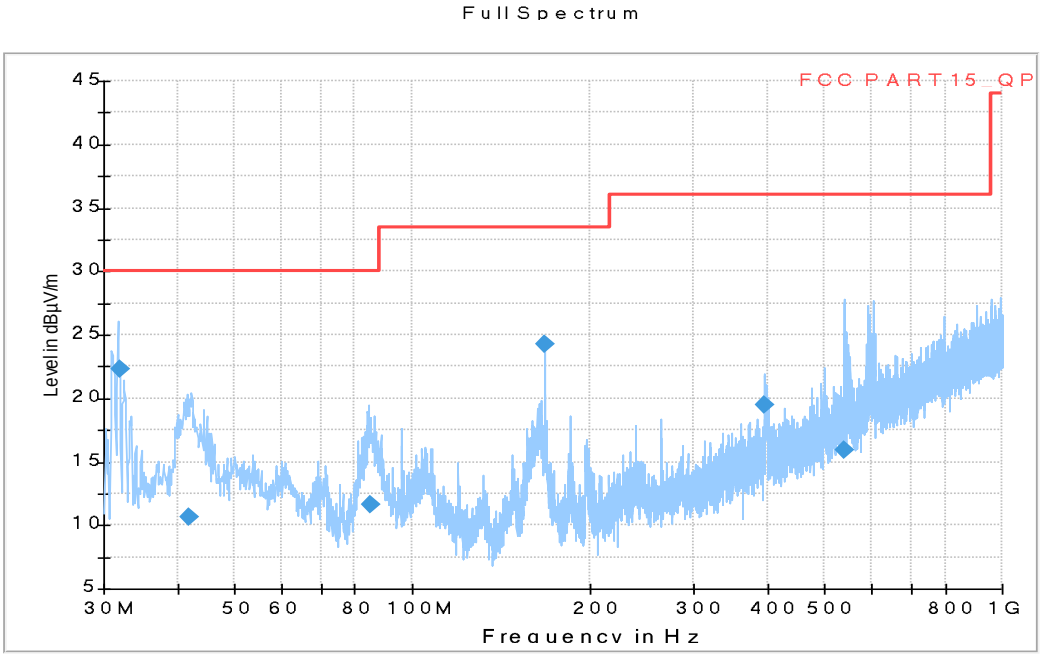


Fig A.3 Radiated Emission from 30MHz to 1GHz

Final_Result

Frequency (MHz)	QuasiPeak (dBµV /m)	Limit (dBµV /m)	Margin (dB)	Meas. Time	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)
31.889000	22.34	30.00	7.66	1000.0	120.000	100.0	V	64.0
41.783000	10.67	30.00	19.33	1000.0	120.000	325.0	V	21.0
84.957000	11.67	30.00	18.33	1000.0	120.000	125.0	V	30.0
167.971000	24.29	33.50	9.23	1000.0	120.000	125.0	V	157.0
396.669000	19.47	36.00	16.55	1000.0	120.000	107.0	V	60.0
541.536000	15.97	36.00	20.05	1000.0	120.000	325.0	V	30.0

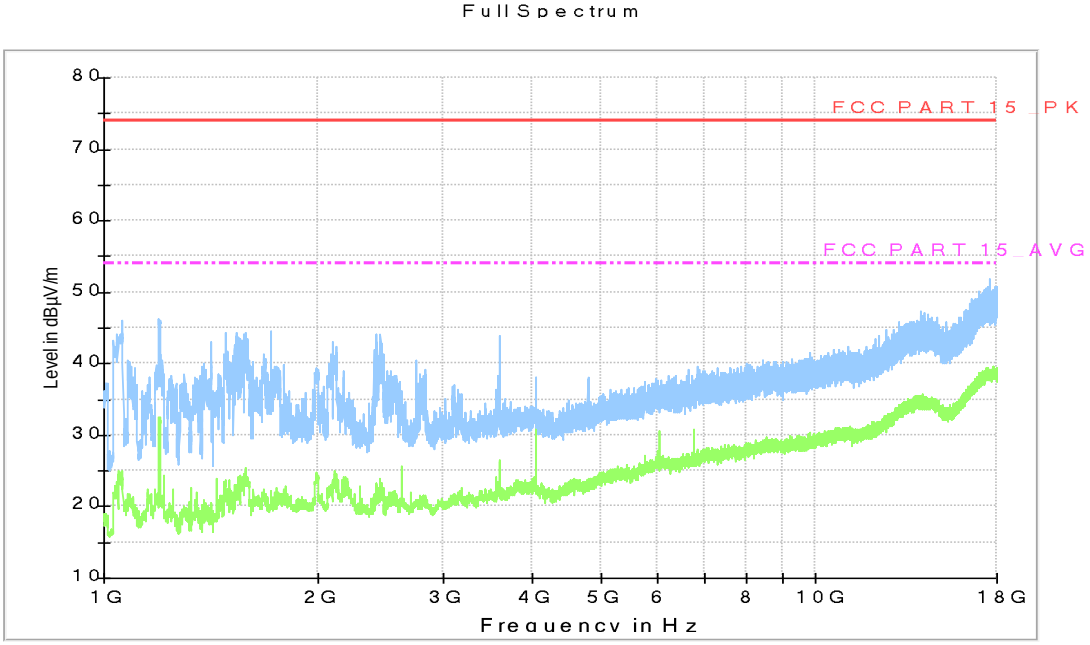


Fig A.4 Radiated Emission from 1GHz to 18GHz

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 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.

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

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*= 3.38 dB, *k*=2.

Charging Mode, Set.1

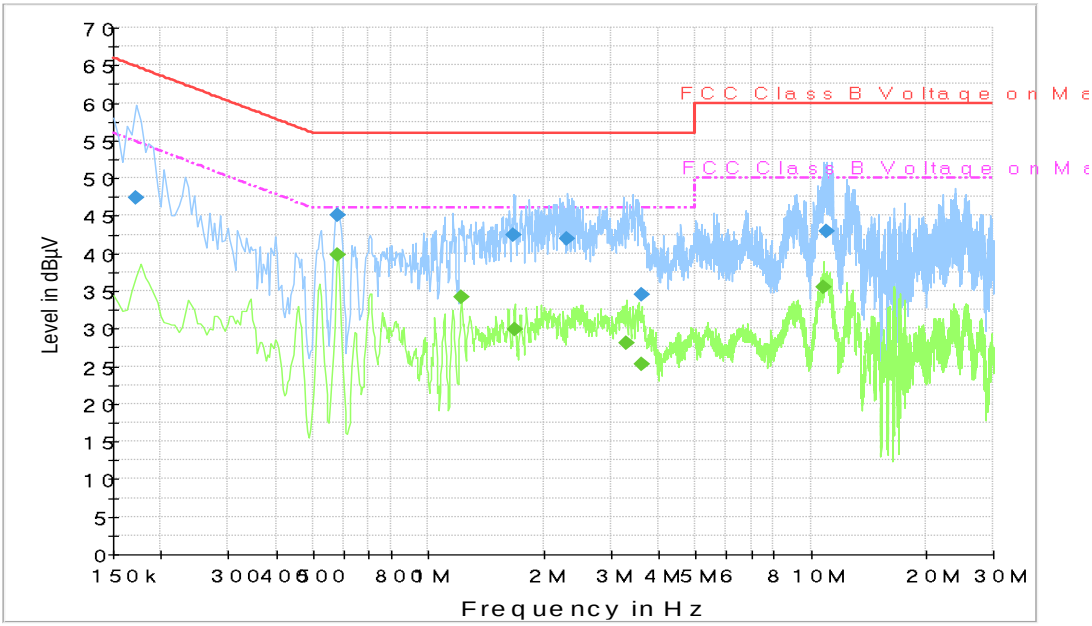


Fig A.5 Conducted Emission

Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.172500	47.4	2000.0	9.000	On	L1	25.8	17.4
0.577500	45.1	2000.0	9.000	On	N	19.8	10.9
1.671000	42.5	2000.0	9.000	On	L1	19.6	13.5
2.314500	41.9	2000.0	9.000	On	L1	19.6	14.1
3.606000	34.4	2000.0	9.000	On	L1	19.6	21.6
10.968000	42.9	2000.0	9.000	On	L1	19.7	17.1

Final Result 2

Frequency (MHz)	Average (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.582000	39.7	2000.0	9.000	On	N	19.8	6.3
1.216500	34.2	2000.0	9.000	On	N	19.6	11.8
1.680000	30.0	2000.0	9.000	On	L1	19.6	16.0
3.295500	28.1	2000.0	9.000	On	L1	19.6	17.9
3.606000	25.3	2000.0	9.000	On	L1	19.6	20.7
10.837500	35.5	2000.0	9.000	On	L1	19.7	14.5

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

USB Mode, Set.2

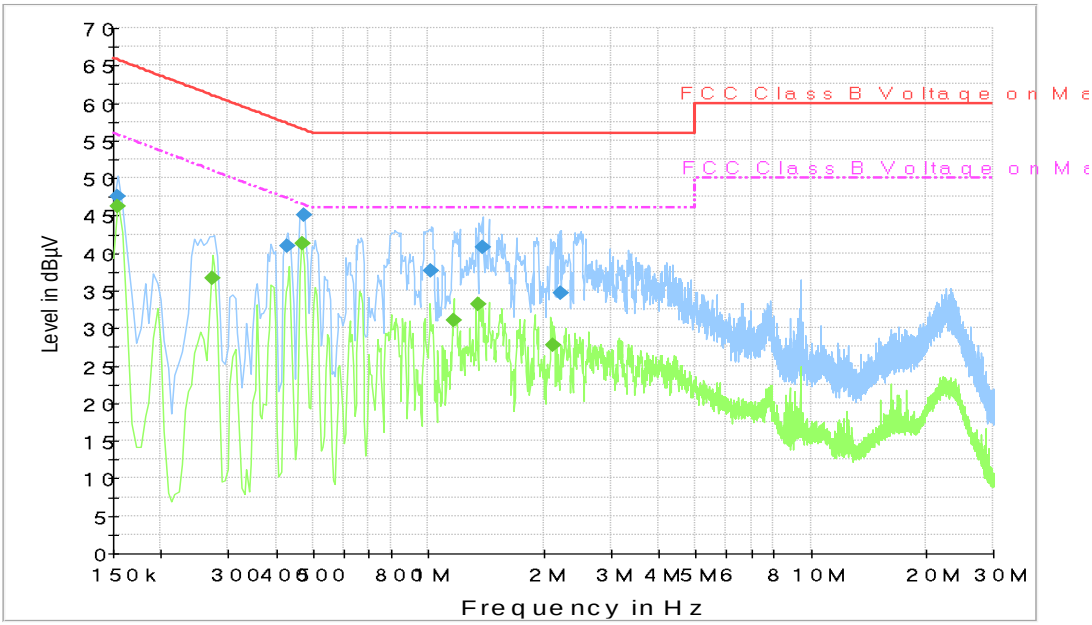


Fig A.6 Conducted Emission

Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.154500	47.6	2000.0	9.000	On	L1	29.7	18.2
0.429000	40.9	2000.0	9.000	On	L1	19.8	16.4
0.474000	45.1	2000.0	9.000	On	N	19.8	11.4
1.018500	37.6	2000.0	9.000	On	N	19.7	18.4
1.387500	40.8	2000.0	9.000	On	L1	19.6	15.2
2.211000	34.7	2000.0	9.000	On	N	19.6	21.3

Final Result 2

Frequency (MHz)	Average (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.154500	46.3	2000.0	9.000	On	L1	29.7	9.5
0.271500	36.7	2000.0	9.000	On	L1	19.8	14.4
0.469500	41.3	2000.0	9.000	On	N	19.8	5.2
1.162500	31.1	2000.0	9.000	On	L1	19.7	14.9
1.356000	33.1	2000.0	9.000	On	L1	19.6	12.9
2.130000	27.8	2000.0	9.000	On	N	19.6	18.2

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

ANNEX B: PERSONS INVOLVED IN THIS TESTING

Test Item	Test Software and Version	Software Vendor	Test operator
Conducted Emission	EMC32 V8.5.2	R&S	Wang Huan
Radiated Emission	EMC32 V9.01.00	R&S	Li Jinpeng

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