



TEST REPORT

No. I17Z61036-EMC02

for

TCL Communication Ltd.

GSM Quad-band/HSPA-UMTS Six-band/LTE 19-band mobile phone

Model Name: BBD100-1

FCC ID: 2ACCJN019

with

Hardware Version: 04

Software Version: AAN966

Issued Date: 2017-09-06



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.

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:

CTTL, Telecommunication Technology Labs, CAICT

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REPORT HISTORY

Report Number	Revision	Description	Issue Date
I17Z61036-EMC02	Rev.0	1 st edition	2017-9-6



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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℃

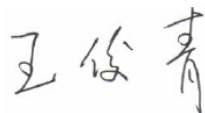
Relative Humidity: 20-75%

1.3. Project data

Testing Start Date: 2017-08-15

Testing End Date: 2017-09-04

1.4. Signature



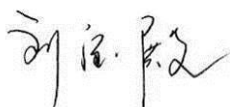
Wang Junqing

(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: TCL Communication Ltd.
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Pudong Area Shanghai, P.R. China. 201203
Contact Person: Gong Zhizhou
Contact Email zhizhou.gong@tcl.com
Telephone: 0086-21-31363544
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. 201203
Contact Person: Gong Zhizhou
Contact Email zhizhou.gong@tcl.com
Telephone: 0086-21-31363544
Fax: 0086-21-61460602

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

3.1. About EUT

Description	GSM Quad-band/HSPA-UMTS Six-band/LTE 19-band mobile phone
Model Name	BBD100-1
Marketing Name	/
FCC ID	2ACCJN019
Extreme vol. Limits	3.6VDC to 4.35VDC (nominal: 3.8VDC)

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

EUT ID*	SN or IMEI	HW Version	SW Version
EUT1	359265080003052	04	AAN966

*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	/	inbuilt
AE2	Charger	/	17TCT-CH-0976
AE3	Charger	/	17TCT-CH-0980
AE4	USB Cable	/	17TCT-DC-0133
AE5	USB Cable	/	17TCT-DC-0342
AE6	Charger	/	17TCT-CH-0984
AE7	Charger	/	/
AE8	Charger	/	/
AE9	Charger	/	/
AE10	Charger	/	/

AE1

Model	TLp038B1
Manufacturer	BYD
Capacitance	3860 mAh
Nominal voltage	3.85V

AE2, AE3, AE6

Model	QC10US(CBA0060AGHC1)
Manufacturer	BYD
Length of cable	/

AE4

Model	CDA0000113CF
Manufacturer	LUXSHARE
Length of cable	60cm



AE5

Model CDA0000113C1
 Manufacturer Juwei
 Length of cable 60cm

AE7

Model QC10EU(CBA0060AAHC1/CB0060AK5C1)
 Manufacturer BYD
 Length of cable /

AE8

Model QC10AR(CBA0060AH1C1)
 Manufacturer BYD
 Length of cable /

AE9

Model QC10UK(CBA0060ABHC1)
 Manufacturer BYD
 Length of cable /

AE10

Model QC10US(CBA0060AGHC1)
 Manufacturer BYD
 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

EUT set-up No.	Combination of EUT and AE	Remarks
Set.1	EUT1+ AE1+ AE2+ AE4/AE5	Charger
Set.2	EUT1+ AE1+ AE4/AE5	USB mode

Note: GSM Quad-band/HSPA-UMTS Six-band/LTE 19-band mobile phone BBD100-1 manufactured by TCL Communication Ltd. is a variant model based on BBD100-2 for conformance test. According to the declaration of changes, the following items are tested on Set.1 and Set.2.

Mode or Feature	EUT set-up No	Test Item
Charger mode	Set.1	Radiated Emission
USB Mode	Set.2	Radiated Emission

Other results are inherited from the initial model. The report number of initial model is I17Z60970-EMC01.



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(BDA)
2	Conducted Emission	15.107(a)	B.2	P	CTTL(BDA)

7. Test Equipments Utilized

NO.	Description	TYPE	SERIES NUMBER	MANUFACTURE	CAL DUE DATE	CALIBRATION INTERVAL
1	Test Receiver	ESU26	100235	R&S	2018-04-01	1 year
2	Test Receiver	ESCI 7	100344	R&S	2018-03-15	1 year
3	Universal Radio Communication Tester	CMW500	143008	R&S	2017-12-01	1 year
4	Universal Radio Communication Tester	CMW500	155415	R&S	2018-02-15	1 year
5	LISN	ENV216	101200	R&S	2018-08-03	1 year
6	EMI Antenna	VULB 9163	9163-301	Schwarzbeck	2017-12-16	3 years
7	EMI Antenna	3115	6914	ETS-Lindgren	2017-12-15	3 years
8	PC	OPTIPLEX 380	2X1YV2X	DELL	N/A	N/A
9	Printer	P1606dn	VNC3L52122	HP	N/A	N/A
10	Keyboard	L100	CN0RH6596589 07ATOI40	DELL	N/A	N/A
11	Mouse	M-UAE119	LZ935220ZRC	Lenovo	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 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 ($\mu\text{V/m}$)		
	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_{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
17964.300	43.5	-17.7	45.6	15.600	H
17961.467	43.4	-17.7	45.6	15.500	H
17970.533	43.1	-17.7	45.6	15.200	V
17974.500	43.0	-17.7	45.6	15.100	H
17980.167	43.0	-17.7	45.6	15.100	H
17879.300	43.0	-18.5	45.6	15.900	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
17883.267	54.8	-18.5	45.6	27.700	H
17980.167	54.4	-17.7	45.6	26.500	H
17904.233	54.3	-18.5	45.6	27.200	V
17779.000	54.2	-18.5	45.6	27.100	H
17961.467	54.0	-17.7	45.6	26.100	H
17850.967	53.9	-18.5	45.6	26.800	H

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
17974.500	44.2	-17.7	45.6	16.300	H
17985.550	44.2	-17.7	45.6	16.300	H
17885.250	44.2	-18.5	45.6	17.100	V
17929.450	44.2	-17.7	45.6	16.300	H
17958.350	44.1	-17.7	45.6	16.200	H
17920.950	44.1	-17.7	45.6	16.200	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
17950.700	55.3	-17.7	45.6	27.400	H
17988.950	54.5	-17.7	45.6	26.600	H
17959.200	54.4	-17.7	45.6	26.500	V
17989.800	54.1	-17.7	45.6	26.200	H
17977.050	54.1	-17.7	45.6	26.200	H
17967.700	54.0	-17.7	45.6	26.100	H

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

Charging Mode, Set.1

Normal RE_30M-1GHz_10m

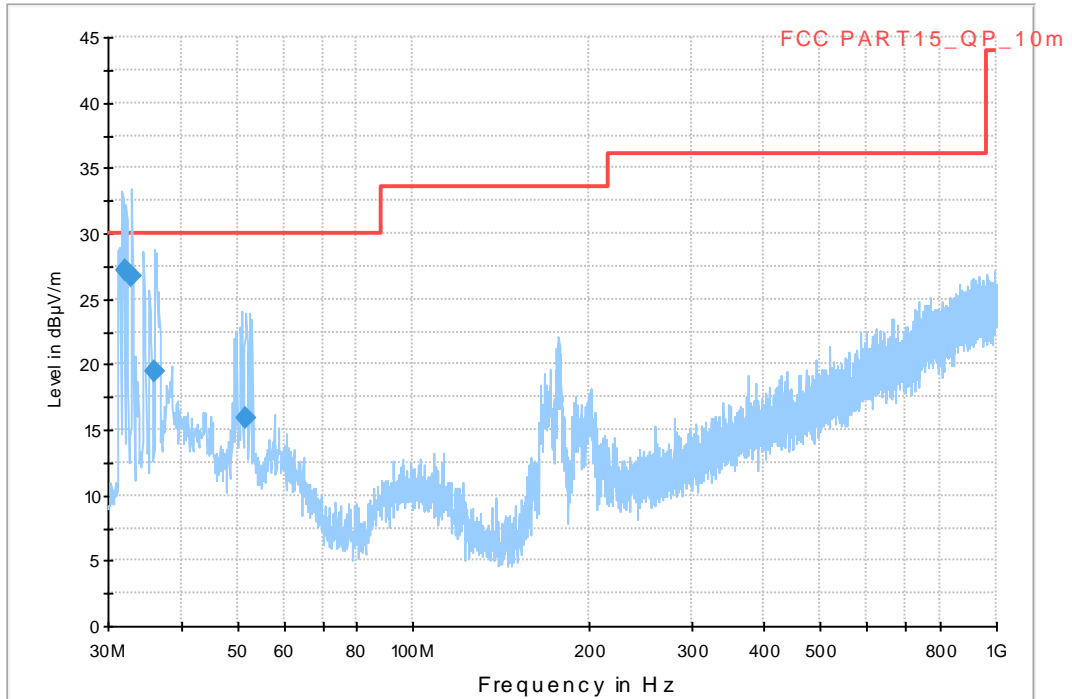


Fig A.1 Radiated Emission from 30MHz to 1GHz

Final Result 1

Frequency (MHz)	QuasiPeak (dBuV/m)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Margin (dB)	Limit (dBuV/m)
32.046000	27.1	120.000	303.0	V	30.0	2.9	30.0
32.910000	26.7	120.000	377.0	V	175.0	3.3	30.0
35.991000	19.4	120.000	383.0	V	20.0	10.6	30.0
51.552000	15.9	120.000	100.0	V	193.0	14.1	30.0

Normal RE_1G-18GHz_directly

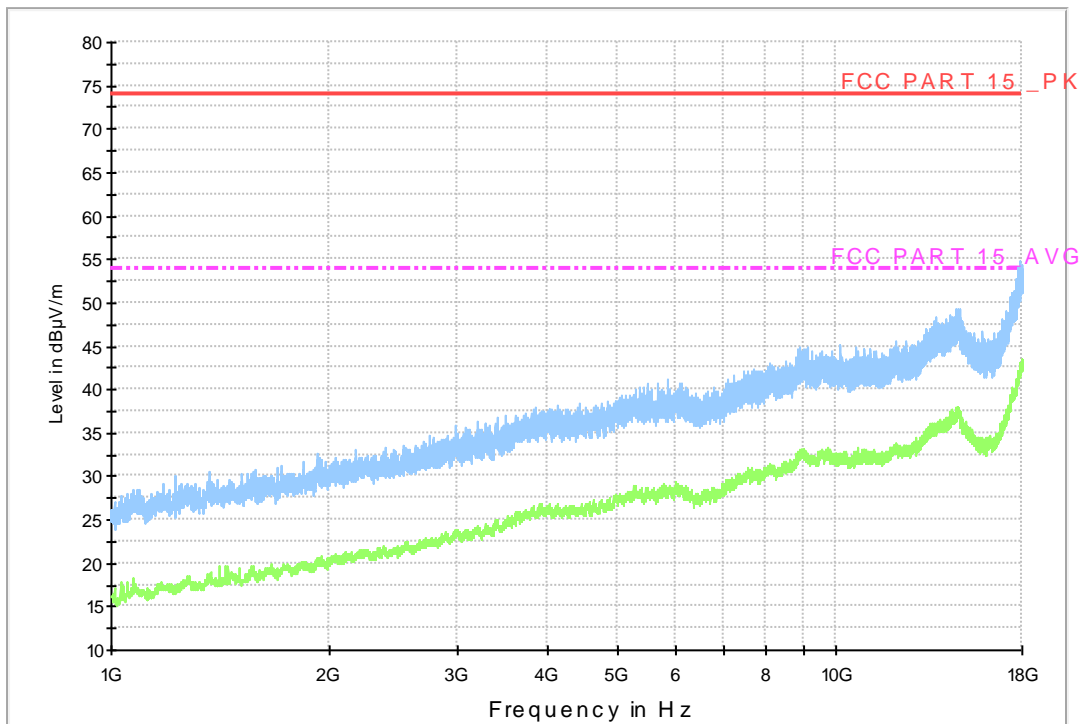


Fig A.2 Radiated Emission from 1GHz to 18GHz

USB Mode, Set.2

Normal RE_30M-1GHz_10m

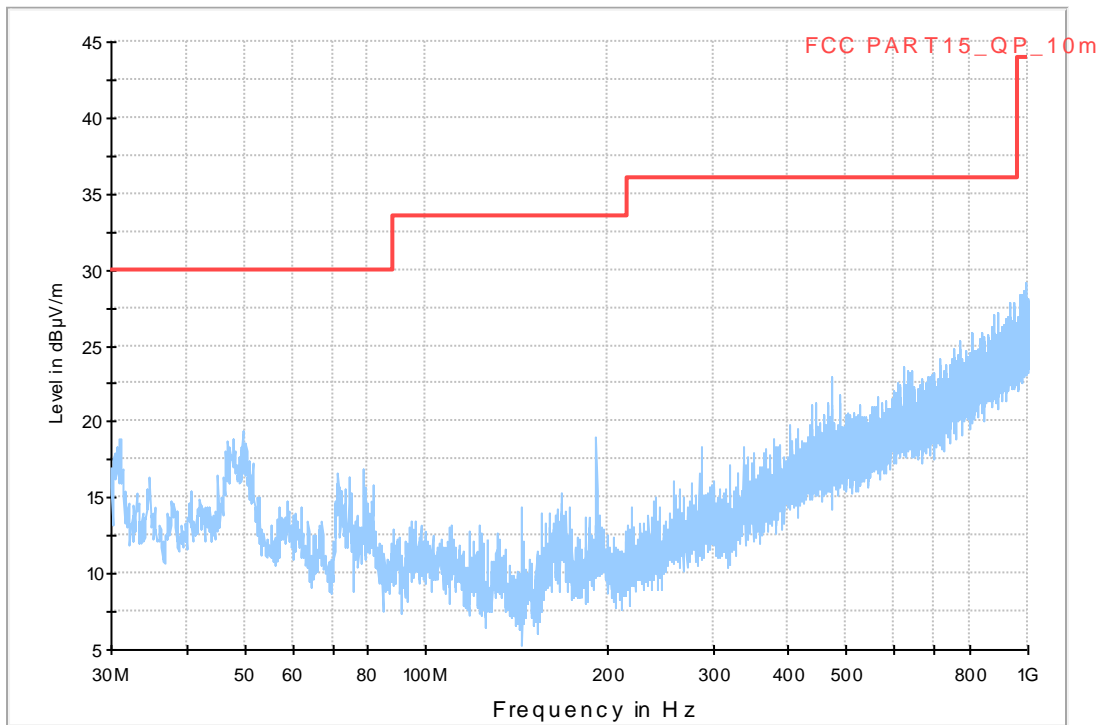


Fig A.3 Radiated Emission from 30MHz to 1GHz

Normal RE_1G-18GHz

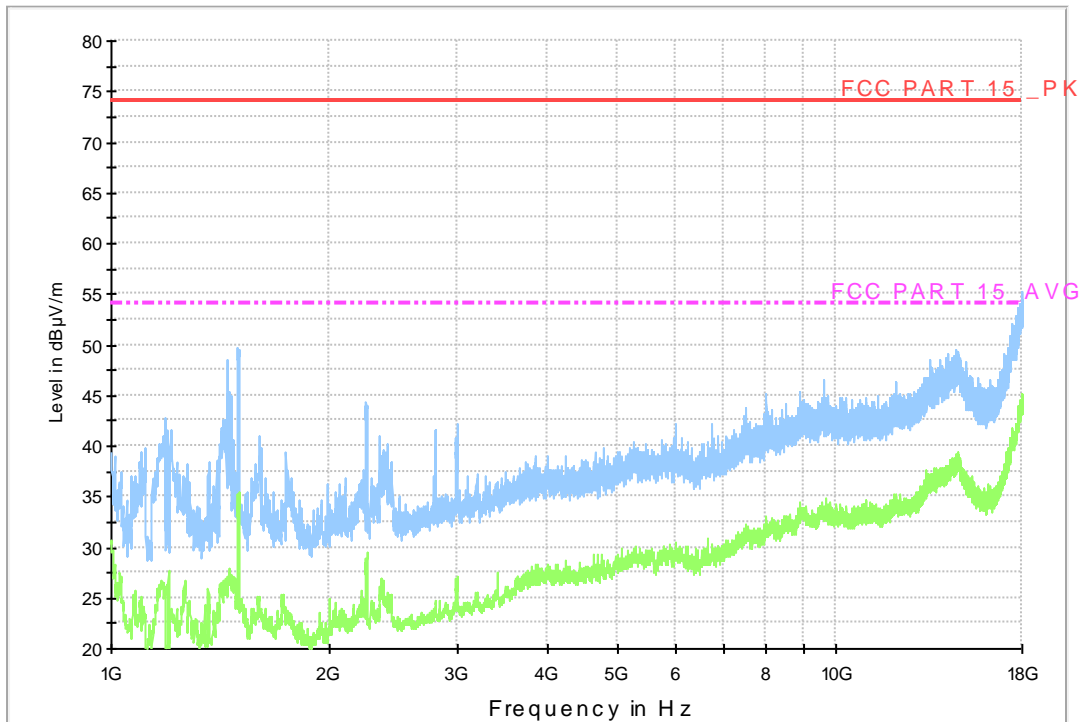


Fig A.4 Radiated Emission from 1GHz to 18GHz

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 (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: $U= 2.9$ dB, $k=2$.

Charging Mode, Set.1

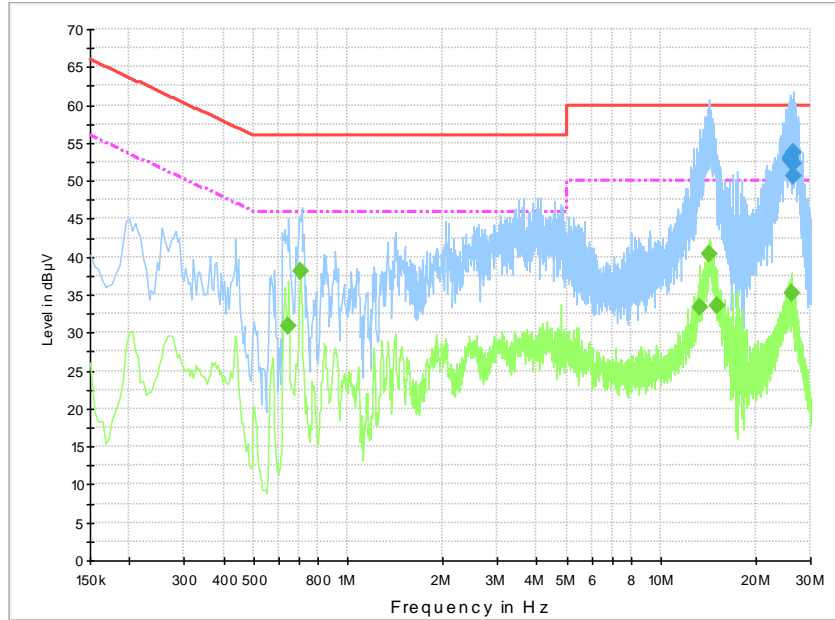


Fig A.5 Conducted Emission

Final Result 1

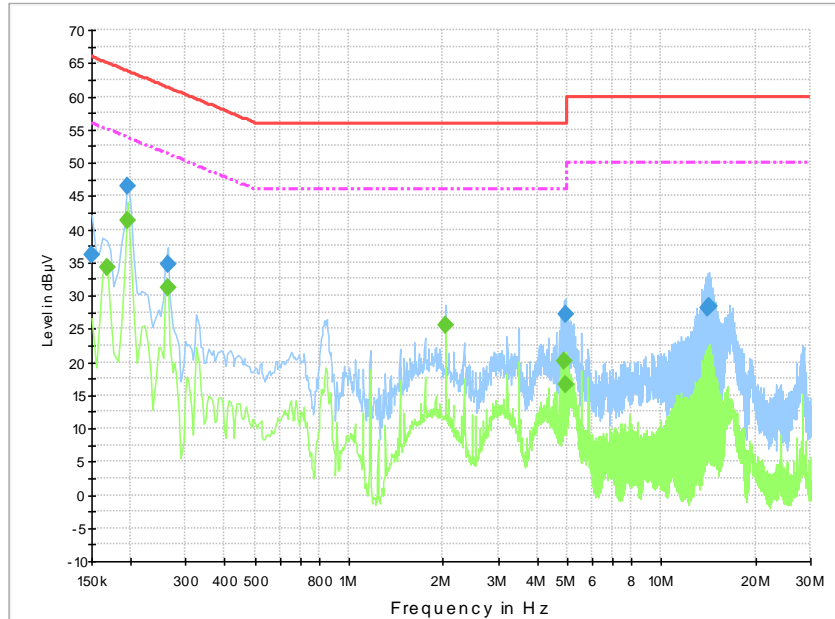
Frequency (MHz)	QuasiPeak (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
25.782000	52.9	GND	L1	11.4	7.1	60.0
25.876500	52.7	GND	L1	11.4	7.3	60.0
25.944000	53.1	GND	N	11.1	6.9	60.0
26.349000	52.2	GND	N	11.1	7.8	60.0
26.520000	53.8	GND	N	11.1	6.2	60.0
26.542500	50.7	GND	L1	11.4	9.3	60.0

Final Result 2

Frequency (MHz)	Average (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.645000	30.8	GND	L1	10.2	15.2	46.0
0.703500	38.0	GND	L1	10.2	8.0	46.0
13.285500	33.3	GND	L1	10.8	16.7	50.0
14.316000	40.4	GND	L1	10.8	9.6	50.0
15.148500	33.6	GND	L1	10.9	16.4	50.0
26.047500	35.1	GND	L1	11.4	14.9	50.0

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

USB Mode, Set.2



Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.150000	36.2	GND	L1	10.2	29.8	66.0
0.195000	46.4	GND	L1	10.2	17.4	63.8
0.262500	34.6	GND	L1	10.2	26.8	61.4
4.951500	27.3	GND	L1	10.3	28.7	56.0
14.073000	28.2	GND	N	10.8	31.8	60.0
14.203500	28.4	GND	N	10.8	31.6	60.0

Final Result 2

Frequency (MHz)	Average (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.168000	34.1	GND	L1	10.2	20.9	55.1
0.195000	41.4	GND	L1	10.2	12.5	53.8
0.262500	31.2	GND	L1	10.2	20.1	51.4
2.040000	25.6	GND	L1	10.2	20.4	46.0
4.888500	20.2	GND	L1	10.3	25.8	46.0
4.956000	16.6	GND	L1	10.3	29.4	46.0

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

ANNEX E: Accreditation Certificate

United States Department of Commerce
National Institute of Standards and Technology



Certificate of Accreditation to ISO/IEC 17025:2005

NVLAP LAB CODE: 600118-0

Telecommunication Technology Labs, CAICTBeijing
China

*is accredited by the National Voluntary Laboratory Accreditation Program for specific services,
listed on the Scope of Accreditation, for:*

Electromagnetic Compatibility & Telecommunications

*This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2005.
This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality
management system (refer to joint ISO-ILAC-IAF Communique dated January 2009).*

2016-09-29 through 2017-09-30

Effective Dates


For the National Voluntary Laboratory Accreditation Program*****END OF REPORT*****