TEST REPORT

No. I17Z61234-EMC01

for

Huawei Technologies Co., Ltd.

Smart Phone

SLA-L23

with

FCC ID: QISSLA-L23

Hardware Version: 3.18.31

Software Version: SLA-L23C900B121

Issued Date:2017-08-22

TESTING
NVLAP LAB CODE 600118-0

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

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: cttl_terminals@caict.ac.cn, website: www.caict.ac.cn

REPORT HISTORY

Report Number	Revision	Description	Issue Date
I17Z61234-EMC01	Rev.0	1st edition	2017-08-22

CONTENTS

1. Test Laboratory

1.1. Testing Location

Location: 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

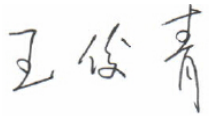
Relative Humidity: 20-75%

1.3. Project data

Testing Start Date: 2017-08-10

Testing End Date: 2017-08-15

1.4. Signature

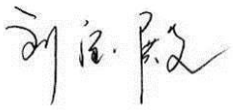


Wang Junqing

(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:	Huawei Technologies Co., Ltd.
Address:	Huawei Base, Bantian, Longgang District, Shenzhen 518129, P.R. China
City:	Shenzhen
Postal Code:	518129
Country:	China
Telephone:	0086-0755-28970299
Fax:	0086-0755-89650226

2.2. Manufacturer Information

Company Name:	Huawei Technologies Co., Ltd.
Address:	Huawei Base, Bantian, Longgang District, Shenzhen 518129, P.R. China
City:	Hong Kong
Postal Code:	/
Country:	China
Telephone:	+86-10-57877542
Fax:	+86-10-58863425

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

3.1. About EUT

Description	Smart Phone
Model Name	SLA-L23
FCC ID	QISSLA-L23
Extreme vol. Limits	3.6VDC to 4.4VDC (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	865548030021606/ 865548030023057	3.18.31	SLA-L23C900B121

*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	Battery	/	/
AE3	Charger	/	/
AE4	Charger	/	/
AE5	Charger	/	/
AE14	USB Cable	/	/
AE15	USB Cable	/	/
AE16	USB Cable	/	/

AE1

Model	HB405979ECW
Manufacturer	Sunwoda Electronic Co., Ltd.
Capacitance	2920 mAh
Nominal voltage	3.82 V

AE2

Model	HB405979ECW
Manufacturer	Huizhou Desay Battery Co., Ltd.
Capacitance	2920 mAh
Nominal voltage	3.82 V

AE3

Model	HW-050100U01
Manufacturer	HUIZHOU BYD ELECTRONIC CO., LTD.
Length of cable	/

AE4

Model	HW-050100U01
Manufacturer	Phihong Technology Co., Ltd.
Length of cable	/

AE5

Model	HW-050100U01
Manufacturer	Shenzhen Huntkey Electric Co., Ltd.
Length of cable	/

AE14

Model	/
Manufacturer	LiXun
Length of cable	95cm

AE15

Model	/
Manufacturer	FuShiKang
Length of cable	95cm

AE16

Model	/
Manufacturer	HongLin
Length of cable	95cm

*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+AE3+AE14	Charger
Set.3	EUT1+ AE1+AE4+AE14	Charger
Set.5	EUT1+ AE1+AE5+AE14	Charger
Set.25	EUT1+ AE14	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 M
Ground system resistance	< 4
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 M
Ground system resistance	< 4

6. SUMMARY OF TEST RESULTS

Abbreviations used in this clause:		
Verdict Column	P	Pass
	NA	Not applicable
	F	Fail
Location Column	huayuan North Road	The test is performed in test location huayuan North Road which is described in section 1.1 of this report

Items	Test Name	Clause in FCC rules	Section in this report	Verdict	Test Location
1	Radiated Emission	15.109(a)	A.1	P	1

7. Test Equipments Utilized

NO.	Description	TYPE	SERIES NUMBER	MANUFACTURE	CAL DUE DATE	CALIBRATION INTERVAL
1	Test Receiver	ESU26	100235	R&S	2018-03-01	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	CN0RH659658907ATOI40	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 (charging mode of MS) at distances of 3 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 charging mode. During the test MS is connected to a charger in the case of charging mode.

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): 30MHz-1GHz：4.86dB, 1GHz-18GHz：5.26dB, *k*=2.

Measurement results for Set.1:

Charging Mode/Average detector

Frequency(MHz)	Result(dBμV/m)	G_{PL} (dB)	G_A (dB/m)	P_{Mea}(dBμV)	Polarity
17979.600	43.5	-17.7	45.6	15.600	H
17962.600	43.3	-17.7	45.6	15.400	V
17959.767	43.3	-17.7	45.6	15.400	V
17967.133	43.3	-17.7	45.6	15.400	H
17980.733	43.2	-17.7	45.6	15.300	V
17952.967	43.2	-17.7	45.6	15.300	H

Charging Mode/Peak detector

Frequency(MHz)	Result(dBμV/m)	G_{PL} (dB)	G_A (dB/m)	P_{Mea}(dBμV)	Polarity
17981.300	55.2	-17.7	45.6	27.300	H
17975.067	54.7	-17.7	45.6	26.800	H
17901.400	54.4	-18.5	45.6	27.300	V
17884.967	54.2	-18.5	45.6	27.100	V
17973.933	54.2	-17.7	45.6	26.300	V
17888.367	54.1	-18.5	45.6	27.000	H

Sample calculation: Peak detector, 17884.967MHz

Result =P_{Mea} (27.1dBμV)+ G_A (45.6dB/m)+ G_{PL}(-18.5 dB) =54.2dBμV/m

Measurement results for Set.3:

Charging Mode/Average detector

Frequency(MHz)	Result(dBμV/m)	G_{PL} (dB)	G_A (dB/m)	P_{Mea}(dBμV)	Polarity
17971.667	43.5	-17.7	45.6	15.600	V
17982.433	43.2	-17.7	45.6	15.300	H
17954.667	43.1	-17.7	45.6	15.200	H
17988.667	43.1	-17.7	45.6	15.200	H
17981.300	43.1	-17.7	45.6	15.200	V
17963.167	43.1	-17.7	45.6	15.200	H

Charging Mode/Peak detector

Frequency(MHz)	Result(dBμV/m)	G_{PL} (dB)	G_A (dB/m)	P_{Mea}(dBμV)	Polarity
17875.900	54.6	-18.5	45.6	27.500	V
17993.200	54.5	-17.7	45.6	26.600	V
17993.767	54.2	-17.7	45.6	26.300	V
17874.767	54.1	-18.5	45.6	27.000	H
17962.033	54.1	-17.7	45.6	26.200	H
17951.267	54.0	-17.7	45.6	26.100	H

Sample calculation: Peak detector, 17962.033MHz

Result =P_{Mea} (26.2dBμV)+ G_A (45.6dB/m)+ G_{PL}(-17.7 dB) =54.1dBμV/m

Measurement results for Set.5:

Charging Mode/Average detector

Frequency(MHz)	Result(dBμV/m)	G_{PL} (dB)	G_A (dB/m)	P_{Mea}(dBμV)	Polarity
17979.600	43.1	-17.7	45.6	15.200	V
17990.933	43.0	-17.7	45.6	15.100	H
17997.167	43.0	-17.7	45.6	15.100	H
17976.200	43.0	-17.7	45.6	15.100	H
17965.433	43.0	-17.7	45.6	15.100	V
17948.433	43.0	-17.7	45.6	15.100	V

Charging Mode/Peak detector

Frequency(MHz)	Result(dBμV/m)	G_{PL} (dB)	G_A (dB/m)	P_{Mea}(dBμV)	Polarity
17971.667	55.2	-17.7	45.6	27.300	H
17854.367	54.5	-18.5	45.6	27.400	H
17872.500	54.5	-18.5	45.6	27.400	V
17839.633	54.4	-18.5	45.6	27.300	V
17890.067	54.4	-18.5	45.6	27.300	V
17657.167	54.2	-18.9	45.6	27.500	H

Sample calculation: Peak detector, 17890.067MHz

Result =P_{Mea} (27.3dBμV)+ G_A (45.6dB/m)+ G_{PL}(-18.5 dB) =54.4dBμV/m

Measurement results for Set.25:

USB Mode/Average detector

Frequency(MHz)	Result(dBμV/m)	G_{PL} (dB)	G_A (dB/m)	P_{Mea}(dBμV)	Polarity
17879.300	43.9	-18.5	45.6	16.800	H
17851.250	43.6	-18.5	45.6	16.500	H
17974.500	43.6	-17.7	45.6	15.700	V
17963.450	43.6	-17.7	45.6	15.700	H
17965.150	43.6	-17.7	45.6	15.700	H
17954.100	43.5	-17.7	45.6	15.600	H

USB Mode/Peak detector

Frequency(MHz)	Result(dBμV/m)	G_{PL} (dB)	G_A (dB/m)	P_{Mea}(dBμV)	Polarity
17994.050	55.0	-17.7	45.6	27.100	H
17848.700	54.4	-18.5	45.6	27.300	V
17940.500	54.3	-17.7	45.6	26.400	V
17966.000	54.3	-17.7	45.6	26.400	H
17954.100	54.1	-17.7	45.6	26.200	V
17785.800	53.8	-18.5	45.6	26.700	H

Sample calculation: Peak detector, 17954.100MHz
Result =P_{Mea} (26.2dBμV)+ G_A (45.6dB/m)+ G_{PL}(-17.7 dB) =54.1dBμV/m

Note: The measurement results of Set.1, Set.3, Set.5 and Set.25 showed here are worst cases of the combinations of different batteries and USB cables.

Charging Mode, Set.1

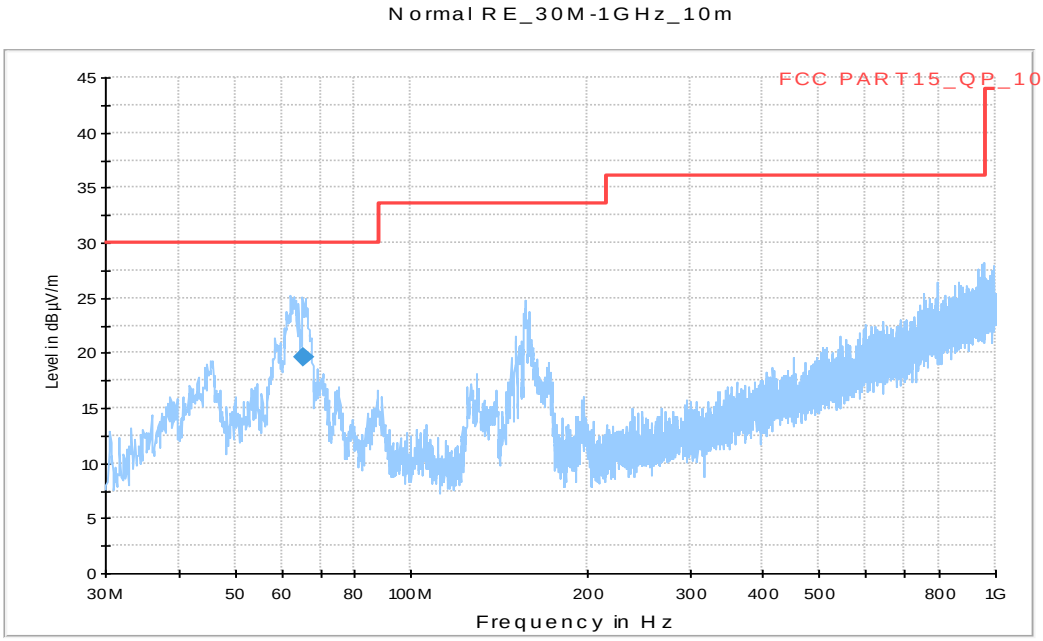


Figure A.1 Radiated Emission from 30MHz to 1GHz

Final Result 1

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)
65.331000	19.6	30.00	10.4	1000.	120.000	100.0	V	30.0

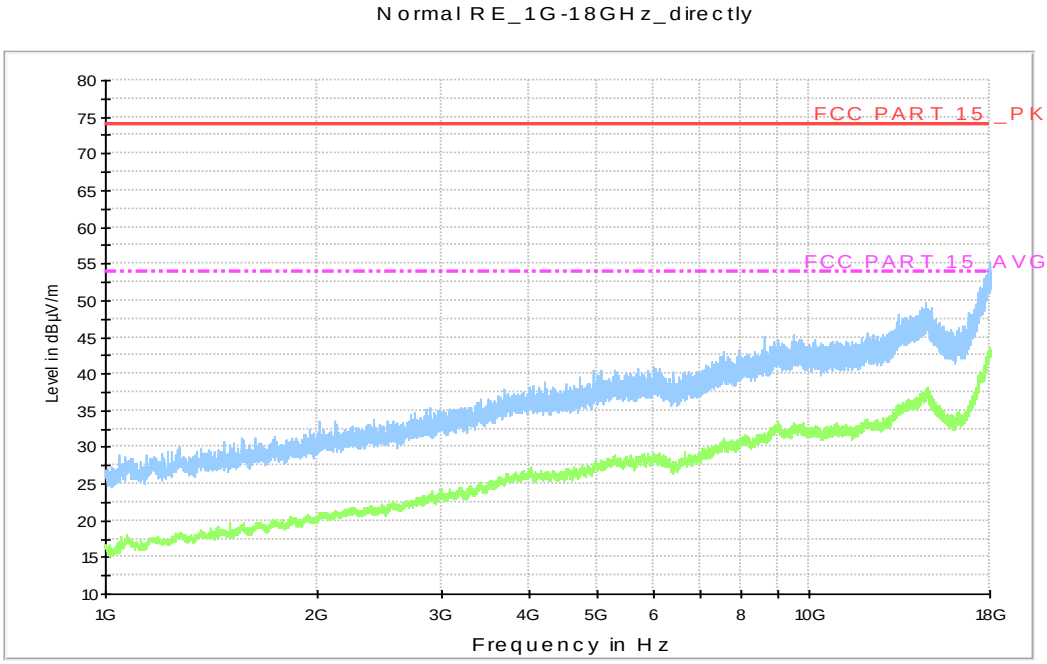


Figure A.2 Radiated Emission from 1GHz to 18GHz

Charging Mode, Set.3

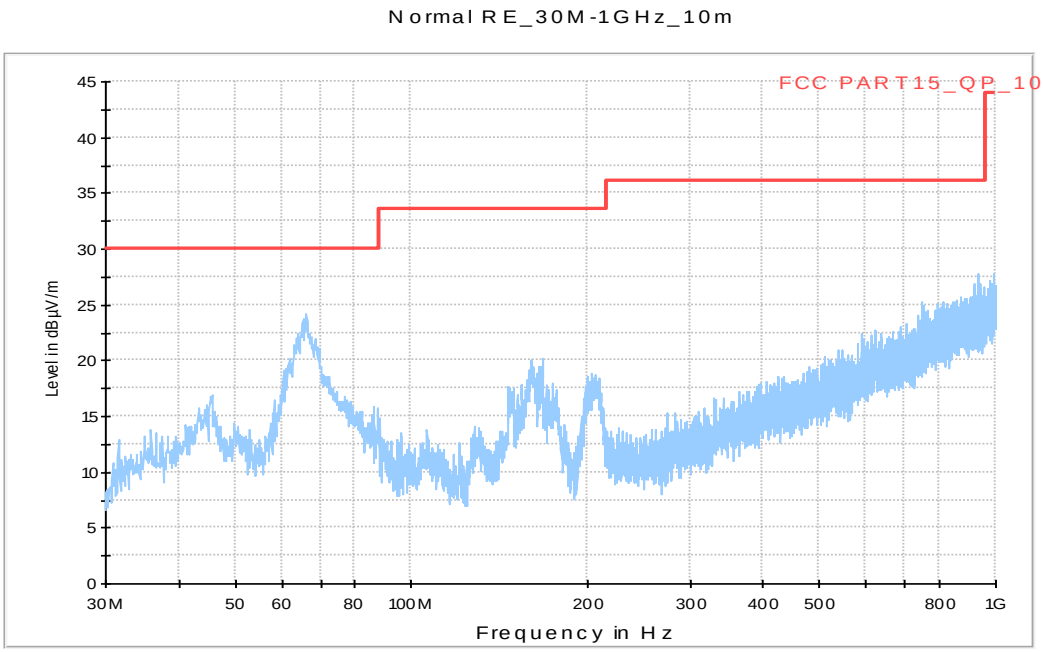


Figure A.3 Radiated Emission from 30MHz to 1GHz

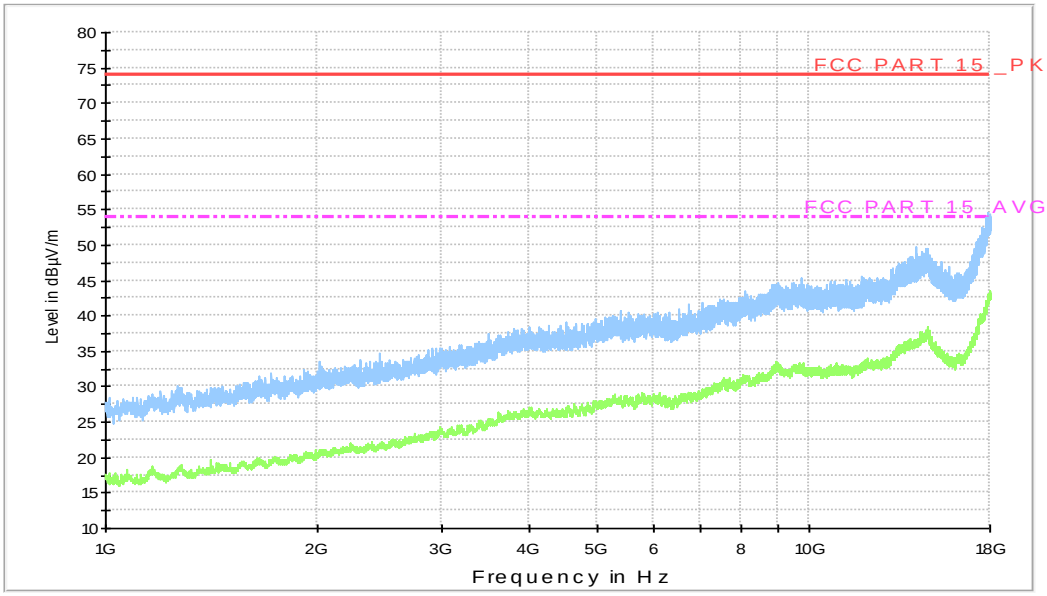


Figure A.4 Radiated Emission from 1GHz to 18GHz

Charging Mode, Set.5

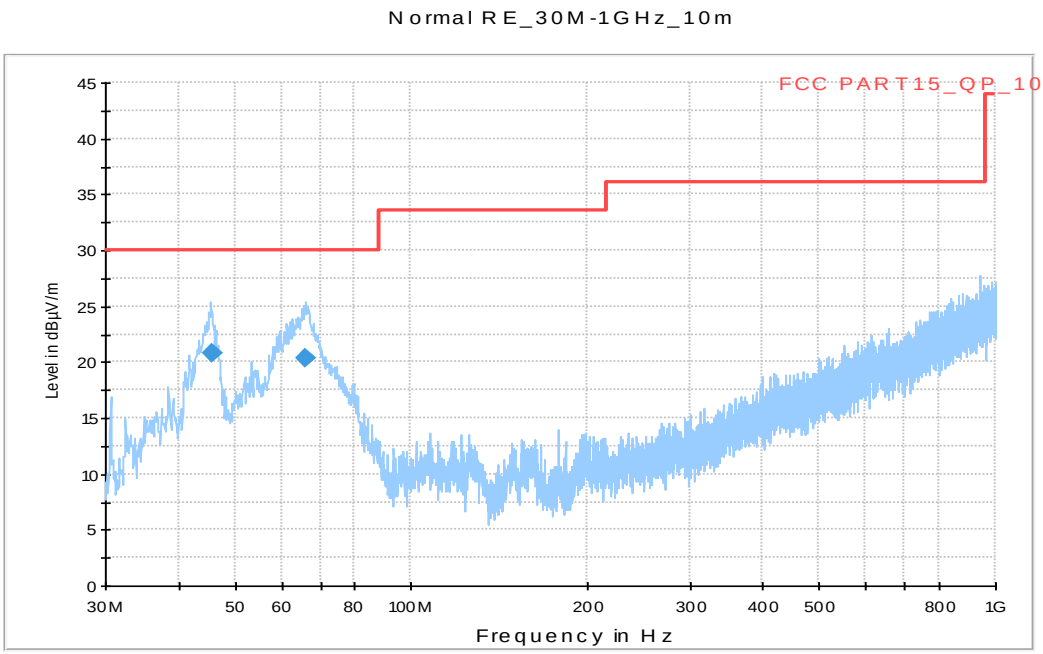


Figure A.5 Radiated Emission from 30MHz to 1GHz

Final Result 1

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)
45.603000	20.9	30.00	9.1	1000.	120.000	325.0	V	30.0
66.167000	20.4	30.00	9.6	1000.	120.000	100.0	V	30.0

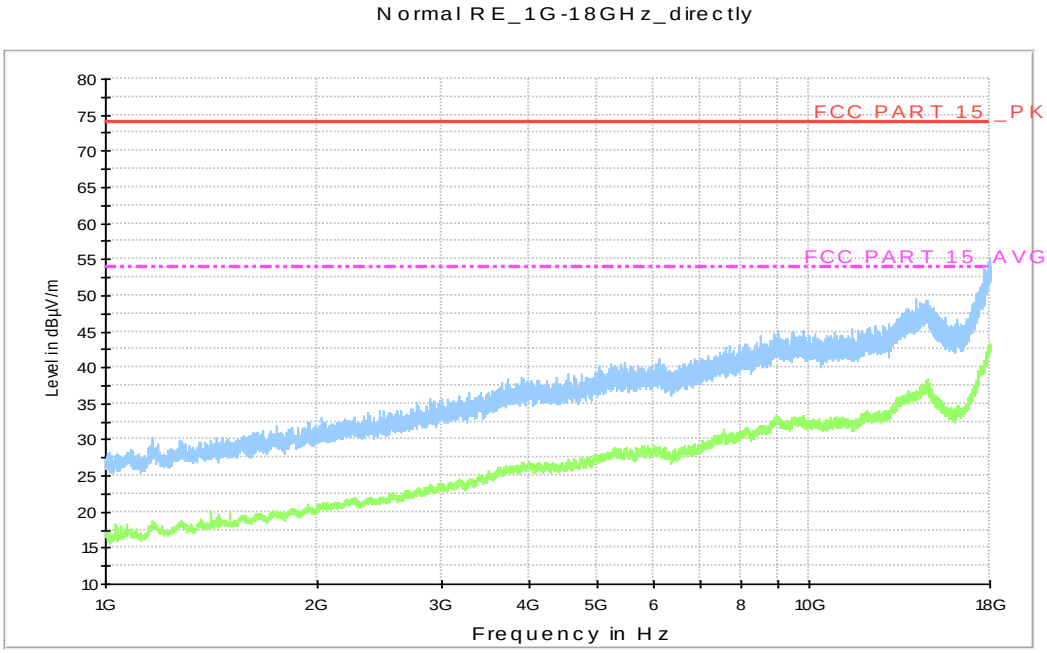


Figure A.6 Radiated Emission from 1GHz to 18GHz

USB Mode, Set.25

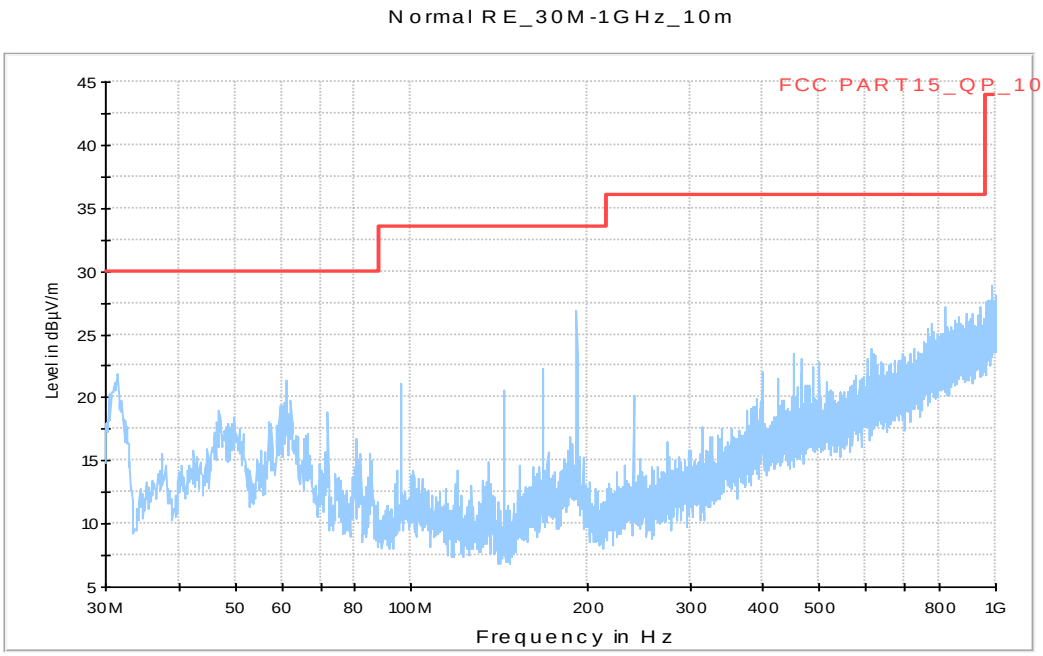


Figure A.7 Radiated Emission from 30MHz to 1GHz

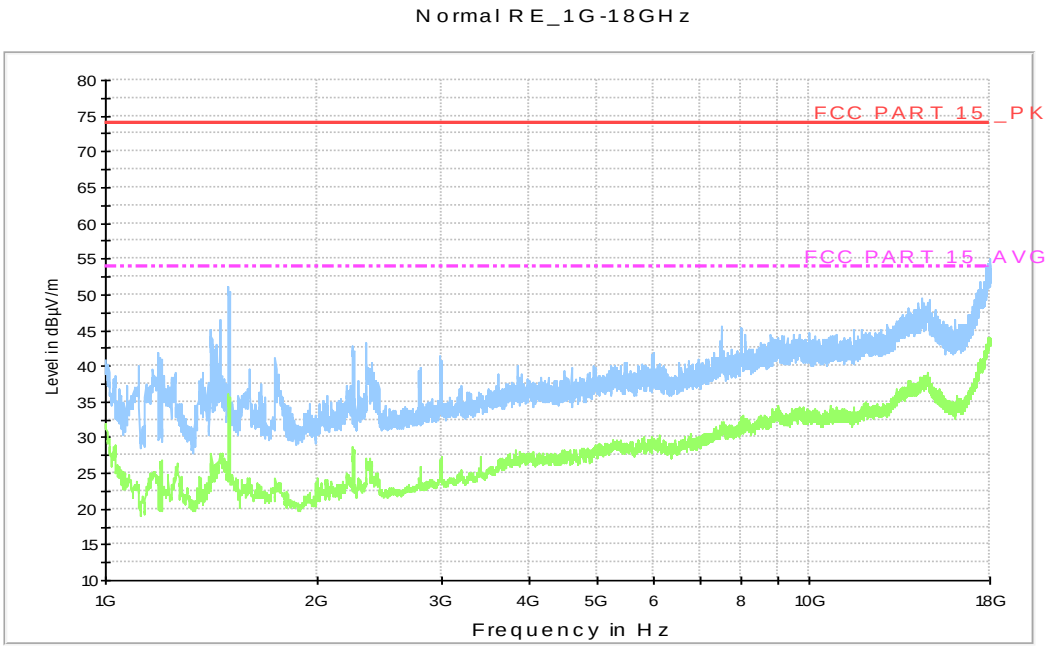


Figure A.8 Radiated Emission from 1GHz to 18GHz

United States Department of Commerce
National Institute of Standards and Technology

NVLAP®

Certificate of Accreditation to ISO/IEC 17025:2005

NVLAP LAB CODE: 600118-0

Telecommunication Technology Labs, CAICT
Beijing
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*****