TEST REPORT

No. I17Z60633-EMC01

for

CDMA/EVDO/GSM/UMTS/LTE Mobile phone

Model Name: 5049S

FCC ID: 2ACCJB083

with

Hardware Version: PIO

Software Version: v5G1H

Issued Date: 2017-05-31

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

CTTL,Telecommunication Technology Labs, Academy of Telecommunication Research, MIIT

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REPORT HISTORY

Report Number	Revision	Description	Issue Date
I17Z60633-EMC01	Rev.0	1st edition	2017-05-31

CONTENTS

1. Test Laboratory

1.1. Testing Location

Location YZ: CTTL(kangding Road)

Address: No. A18, Kangding Road, Yizhuang, Beijing, P. R. China 100176

1.2. Testing Environment

Normal Temperature: 15-35℃

Relative Humidity: 20-75%

1.3. Project data

Testing Start Date: 2017-04-06

Testing End Date: 2017-05-17

1.4. Signature

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(Prepared this test report)

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(Reviewed this test report)

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(Approved this test report)

2. Client Information

2.1. Applicant 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
City:	Shanghai
Postal Code:	201203
Country:	P. R. China
Contact Person:	Gong Zhizhou
Contact Email	zhizhou.gong@tcl.com
Telephone:	0086-21-31363544
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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
City:	Shanghai
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Country:	P. R. China
Contact Person:	Gong Zhizhou
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Telephone:	0086-21-31363544
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3. Equipment Under Test (EUT) and Ancillary Equipment (AE)

3.1. About EUT

Description	CDMA/EVDO/GSM/UMTS/LTE Mobile phone
Model Name	5049S
FCC ID	2ACCJB083
Extreme vol. Limits	3.5VDC to 4.2VDC (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	355471080105525	PIO	v5G1H

*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	/	/
AE3	Travel charger	/	/
AE5	USB cable	/	/

AE1

Model	TLp029C1
SN	CAC2900001C1
Manufacturer	BYD
Capacitance	2900 mAh
Nominal voltage	3.85V

AE3

Model	CBA0058AGAC2
Manufacturer	TENPAO
Length of cable	/

AE5

Model	CDA3122005C1
Manufacturer	Juwei
Length of cable	99cm

*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.2	EUT1+ AE1+ AE3+ AE5	Charger
Set.3	EUT1+ AE1+ AE5	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	2015 Edition
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

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	YZ	The test is performed in test location YZ 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)	B.1	P	YZ
2	Conducted Emission	15.107(a)	B.2	P	YZ

7. Test Equipments Utilized

NO.	Description	TYPE	SERIES NUMBER	MANUFACTURE	CAL DUE DATE	CALIBRATION INTERVAL
1	Test Receiver	ESU26	100376	R&S	2017-11-30	1 year
2	Test Receiver	ESCI 7	100948	R&S	2017-07-05	1 year
3	Universal Radio Communication Tester	CMW500	127406	R&S	2018-02-19	1 year
4	Universal Radio Communication Tester	CMW500	155415	R&S	2018-02-15	1 year
5	LISN	ESH2-Z5	829991/012	R&S	2018-05-10	1 year
6	EMI Antenna	VULB 9163	9163-514	Schwarzbeck	2017-11-24	3 years
7	EMI Antenna	3117	00139065	ETS-Lindgren	2017-09-21	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.2:

Charging Mode/Average detector

Frequency(MHz)	Result(dBμV/m)	G_{PL} (dB)	G_A (dB/m)	P_{Mea}(dBμV)	Polarity
17808.750	41.6	-23.0	41.0	23.610	V
17811.000	41.4	-23.0	41.0	23.438	H
17797.500	41.3	-23.2	41.0	23.569	V
17813.250	41.3	-23.0	40.9	23.429	H
17816.250	41.3	-23.1	40.9	23.445	H
17812.500	41.3	-23.0	40.9	23.361	V

Charging Mode/Peak detector

Frequency(MHz)	Result(dBμV/m)	G_{PL} (dB)	G_A (dB/m)	P_{Mea}(dBμV)	Polarity
17805.750	53.4	-23.1	41.0	35.488	H
17054.250	52.9	-25.5	41.4	37.118	V
17799.750	52.7	-23.2	41.0	34.860	H
17824.500	52.5	-23.2	40.9	34.801	V
17817.000	52.5	-23.1	40.9	34.642	V
17802.750	52.4	-23.1	41.0	34.535	H

Sample calculation: Peak detector, 17802.750MHz

Result =P_{Mea} (34.535dBμV)+ G_A (41.0dB/m)+ G_{PL}(-23.1 dB) =52.4dBμV/m

Measurement results for Set.3:

USB Mode/Average detector

Frequency(MHz)	Result(dBμV/m)	G_{PL} (dB)	G_A (dB/m)	P_{Mea}(dBμV)	Polarity
17809.500	41.5	-23.0	41.0	23.495	H
17799.750	41.4	-23.2	41.0	23.580	H
17808.000	41.4	-23.0	41.0	23.443	V
17817.750	41.4	-23.1	40.9	23.517	V
17804.250	41.3	-23.1	41.0	23.426	V
17807.250	41.3	-23.0	41.0	23.376	H

USB Mode/Peak detector

Frequency(MHz)	Result(dBμV/m)	G_{PL} (dB)	G_A (dB/m)	P_{Mea}(dBμV)	Polarity
17792.250	53.3	-23.3	41.0	35.597	V
17817.750	52.9	-23.1	40.9	35.028	H
17730.000	52.6	-24.3	41.0	35.888	V
17815.500	52.5	-23.1	40.9	34.598	H
17810.250	52.5	-23.0	41.0	34.500	V
17804.250	52.4	-23.1	41.0	34.528	V

Sample calculation: Peak detector, 17810.250MHz

Result =P_{Mea} (34.500dBμV)+ G_A (41.0dB/m)+ G_{PL}(-23.0 dB) =52.5dBμV/m

Charging Mode, Set.2

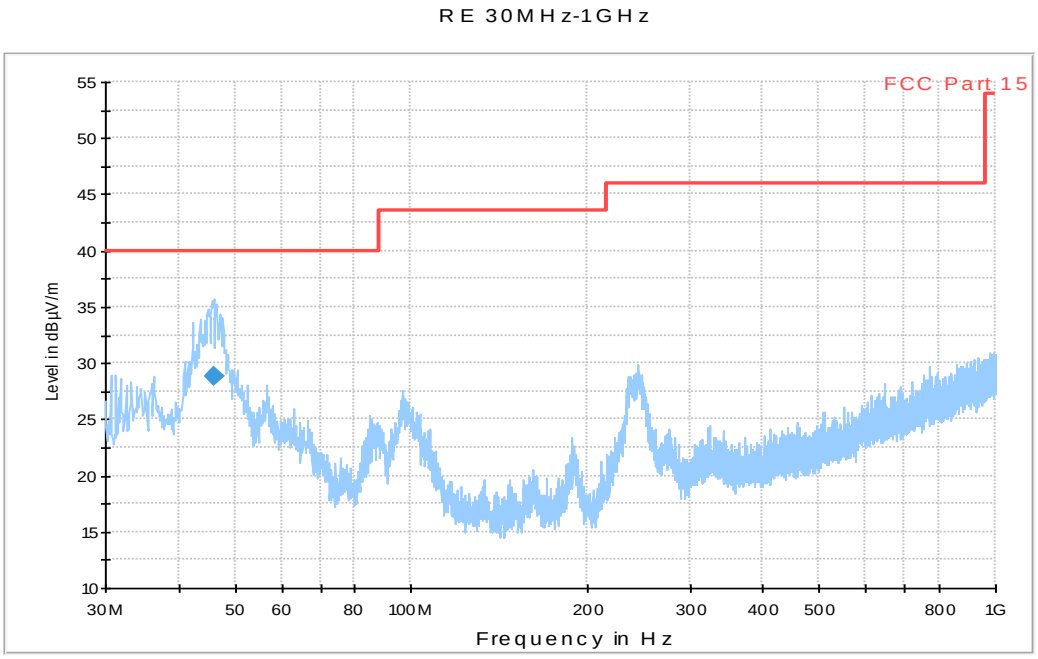

Figure A.1 Radiated Emission from 30MHz to 1GHz

Final Result 1

Frequency	QuasiPeak	Height	Polarization	Azimuth	Corr.	Margin	Limit
45.908000	28.9	120.0	V	0.0	-17.7	11.1	40.0

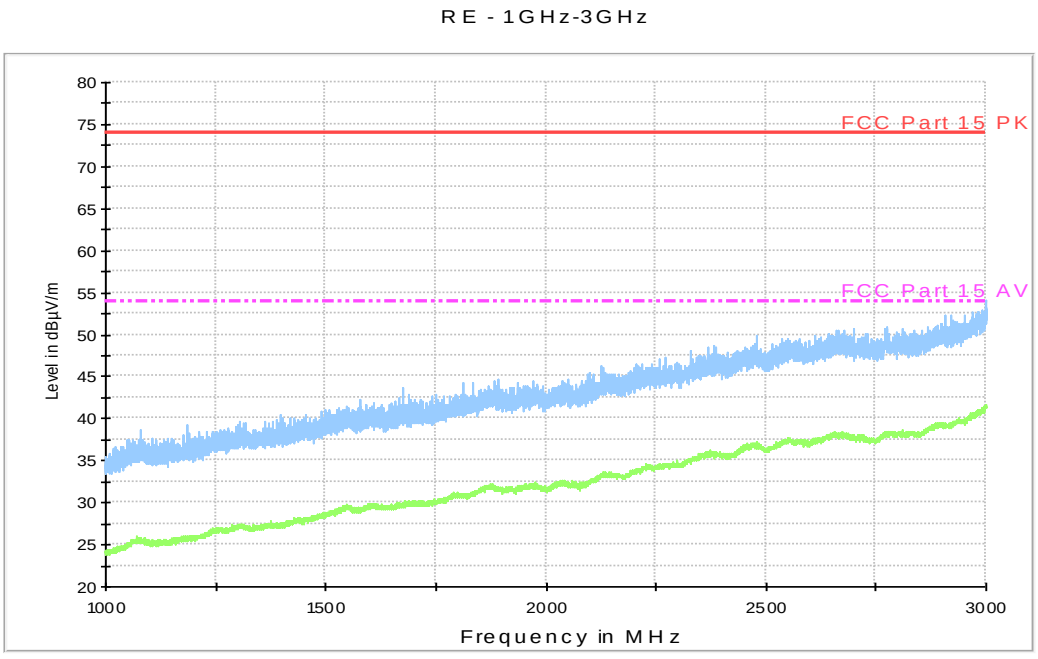

Figure A.2 Radiated Emission from 1GHz to 3GHz

15b RE - 3GHz-18GHz

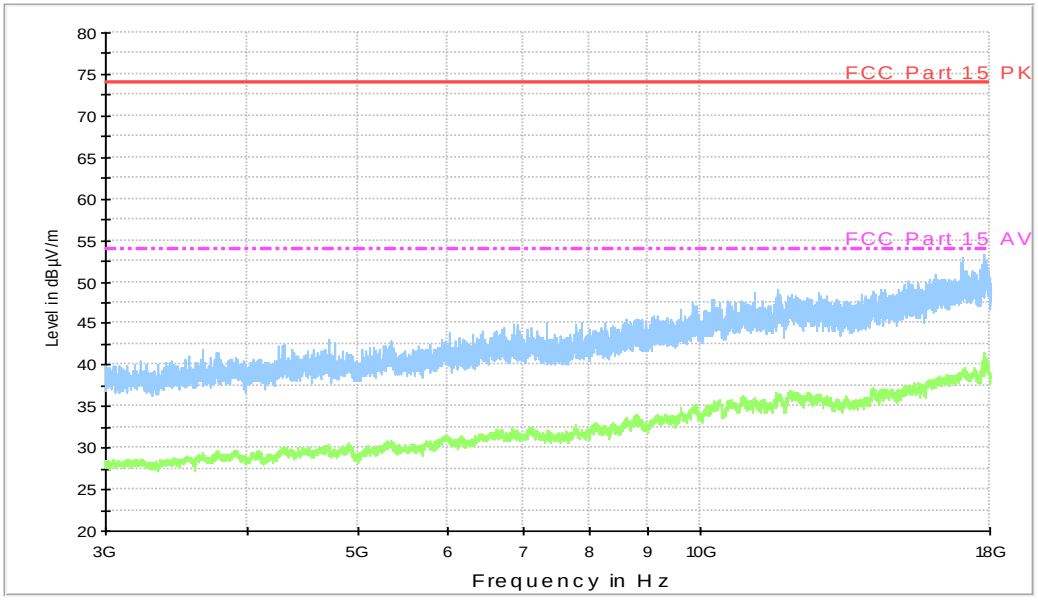

Figure A.3 Radiated Emission from 3GHz to 18GHz

USB Mode, Set.3

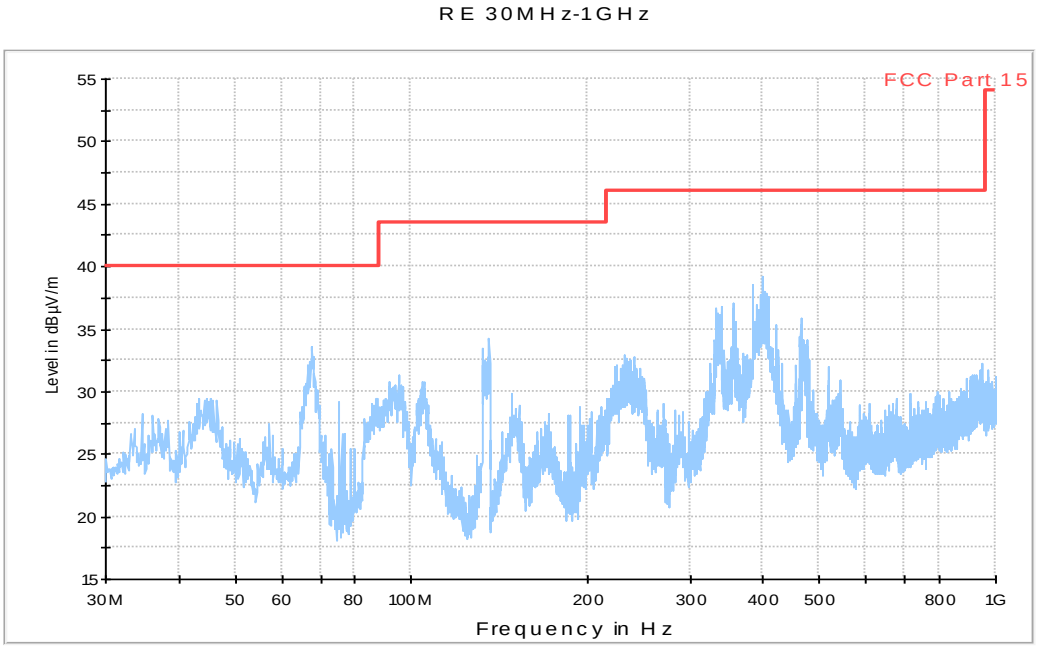

Figure A.4 Radiated Emission from 30MHz to 1GHz

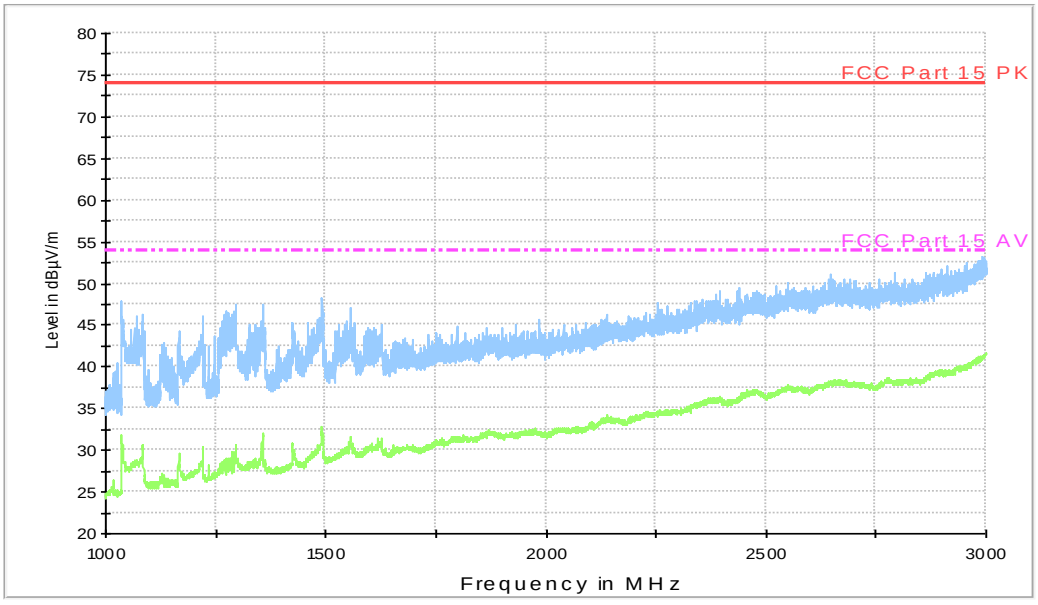

Figure A.5 Radiated Emission from 1GHz to 3GHz

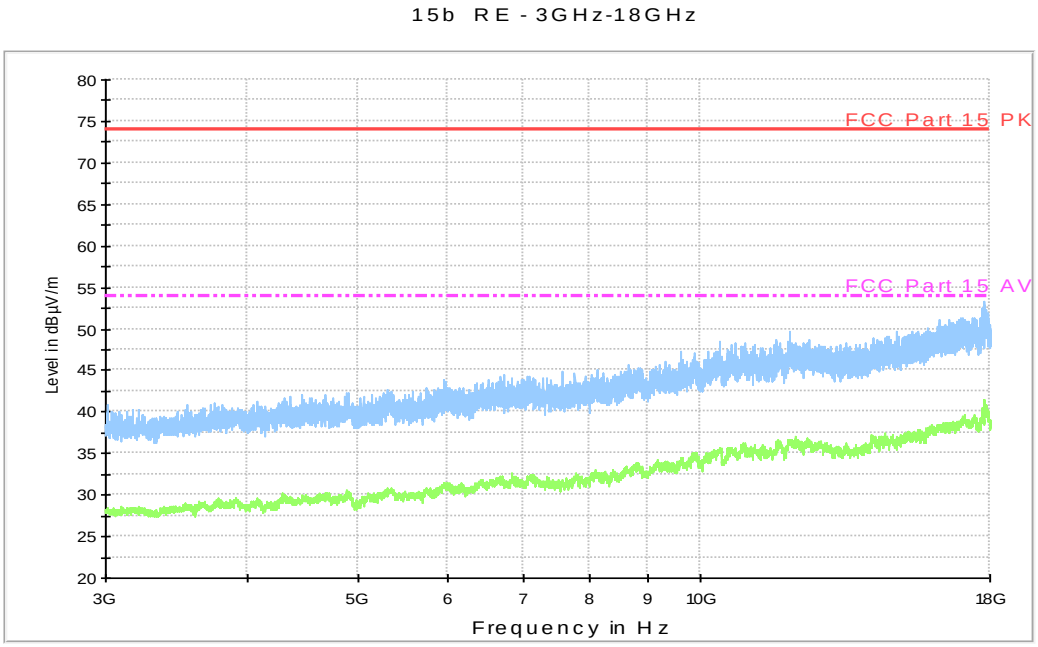

Figure A.6 Radiated Emission from 3GHz to 18GHz

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 charging mode. During the test MS is connected to a charger in the case of charging mode.

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*= 3.38dB, *k*=2.

Charging Mode, Set.2

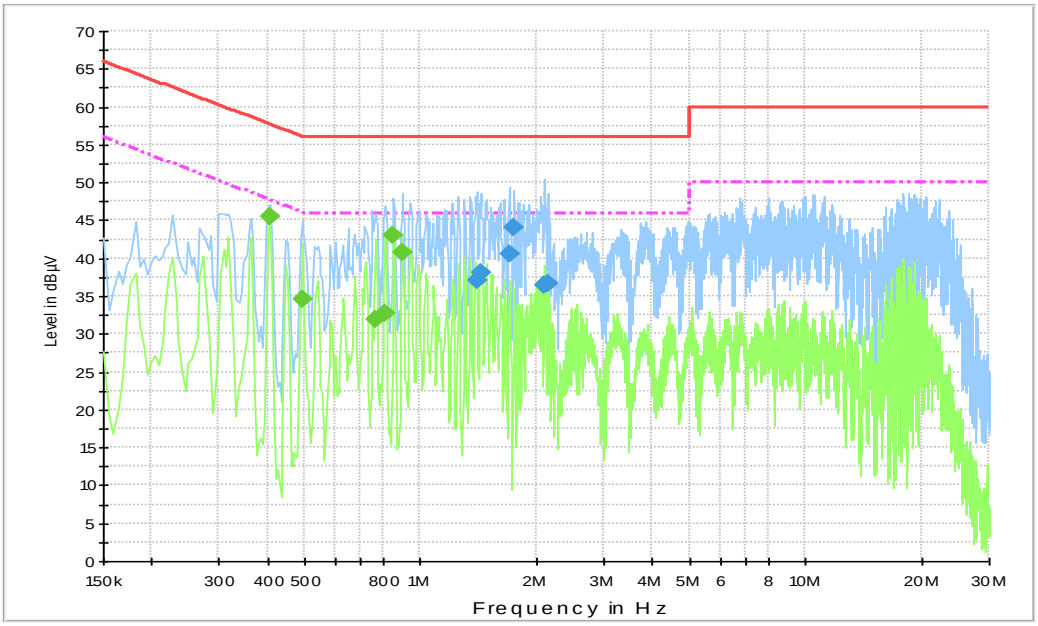

Figure A.7 Conducted Emission

Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
1.401000	37.1	2000.0	9.000	On	N	10.3	18.9	56.0
1.437000	38.2	2000.0	9.000	On	N	10.3	17.8	56.0
1.698000	40.6	2000.0	9.000	On	L1	10.2	15.4	56.0
1.752000	44.0	2000.0	9.000	On	L1	10.2	12.0	56.0
2.098500	36.4	2000.0	9.000	On	L1	10.3	19.6	56.0
2.148000	36.6	2000.0	9.000	On	L1	10.3	19.4	56.0

Final Result 2

Frequency (MHz)	CAverage (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.406500	45.5	2000.0	9.000	On	N	10.3	2.2	47.7
0.492000	34.6	2000.0	9.000	On	N	10.3	11.5	46.1
0.766500	31.9	2000.0	9.000	On	N	10.3	14.1	46.0
0.807000	32.8	2000.0	9.000	On	N	10.3	13.2	46.0
0.852000	43.0	2000.0	9.000	On	N	10.3	3.0	46.0
0.897000	40.7	2000.0	9.000	On	N	10.3	5.3	46.0

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

USB Mode, Set.3

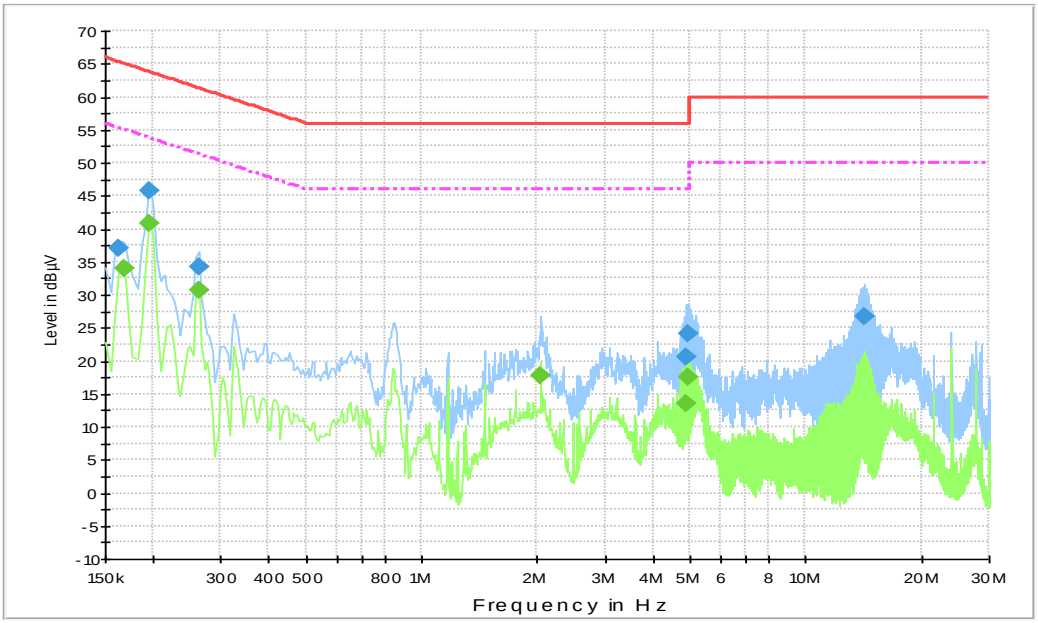

Figure A.7 Conducted Emission

Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.163500	37.1	2000.0	9.000	On	L1	10.2	28.2	65.3
0.195000	45.8	2000.0	9.000	On	L1	10.2	18.1	63.8
0.262500	34.1	2000.0	9.000	On	L1	10.2	27.2	61.4
4.888500	20.6	2000.0	9.000	On	L1	10.4	35.4	56.0
4.951500	24.2	2000.0	9.000	On	L1	10.4	31.8	56.0
14.199000	26.8	2000.0	9.000	On	N	10.8	33.2	60.0

Final Result 2

Frequency (MHz)	CAverage (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.168000	34.0	2000.0	9.000	On	L1	10.2	21.1	55.1
0.195000	40.8	2000.0	9.000	On	N	10.3	13.1	53.8
0.262500	30.8	2000.0	9.000	On	L1	10.2	20.6	51.4
2.044500	17.8	2000.0	9.000	On	N	10.4	28.2	46.0
4.888500	13.6	2000.0	9.000	On	L1	10.4	32.4	46.0
4.951500	17.5	2000.0	9.000	On	L1	10.4	28.5	46.0

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

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