TEST REPORT

No. I16Z42044-EMC01

for

TCL Communication Ltd.

HSUPA/HSDPA/UMTS Tri Band/GSM Quad Band/LTE Tri Band mobile phone

Model Name: 4044W, 4044N

FCC ID: 2ACCJN011

with

Hardware Version: 03

Software Version: C4N

Issued Date: 2016-12-16

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

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

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REPORT HISTORY

Report Number	Revision	Description	Issue Date
I16Z42044-EMC01	Rev.0	1st edition	2016-12-16

CONTENTS

1. Test Laboratory

1.1. Testing Location

Location 1: 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℃

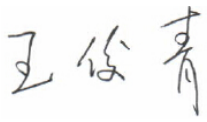
Relative Humidity: 20-75%

1.3. Project data

Testing Start Date: 2016-11-07

Testing End Date: 2016-11-15

1.4. Signature

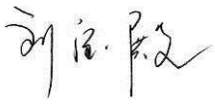


Wang Junqing

(Prepared this test report)

Qu Pengfei

(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.
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
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
City:	Shanghai
Postal Code:	201203
Country:	P. R. China
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	HSUPA/HSDPA/UMTS Tri Band/GSM Quad Band/LTE Tri Band mobile phone
Model Name	4044W, 4044N
FCC ID	2ACCJN011
Extreme vol. Limits	3.5VDC to 4.2VDC (nominal: 3.7VDC)

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	/	03	C4N

*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	/	/
AE4	Charger	/	/
AE5	Charger	/	/

AE1

Model	TLi013C1
Manufacturer	BYD
Capacitance	1350 mAh
Nominal voltage	3.7 V

AE4

Model	WUS550mA5V00-02
Manufacturer	BYD
Length of cable	114cm

AE5

Model	S003AWU0500055
Manufacturer	Tenpao
Length of cable	116cm

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

3.4. EUT set-ups

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

Note: HSUPA/HSDPA/UMTS Tri Band/GSM Quad Band/LTE Tri Band mobile phone 4044W, 4044N manufactured by TCL Communication Ltd. added a travel charger. According to the declaration of changes, the following test items and test modes were performed:

Test Item	Mode or Feature
Conducted Continuous Emission	New Charger

Other results are cited from the initial model. The report number for initial model is I16Z42016-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	10-1-15 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	1	The test is performed in test location 1 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	1
2	Conducted Emission	15.107(a)	B.2	P	1

7. Test Equipments Utilized

NO.	Description	TYPE	SERIES NUMBER	MANUFACTURE	CAL DUE DATE	CALIBRATION INTERVAL
1	Test Receiver	ESU26	100235	R&S	2017-03-02	1 year
2	Test Receiver	ESCI 7	100344	R&S	2017-07-05	1 year
3	Universal Radio Communication Tester	CMW500	143008	R&S	2016-12-09	1 year
4	Universal Radio Communication Tester	CMW500	155415	R&S	2017-01-11	1 year
5	LISN	ENV216	101200	R&S	2017-07-10	1 year
6	EMI Antenna	VULB 9163	9163-301	Schwarzbeck	2017-12-16	3 years
7	EMI Antenna	3115	6914	ETS-Lindgren	2016-12-15	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.

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
17658.000	46.7	-13.0	41.2	18.5	H
17619.750	46.6	-14.9	41.2	20.3	V
17718.000	46.5	-13.0	41.2	18.3	V
17616.750	46.5	-14.9	41.2	20.2	H
17642.250	46.5	-13.0	41.2	18.3	H
17629.500	46.5	-14.9	41.2	20.2	H

Charging Mode/Peak detector

Frequency(MHz)	Result(dBμV/m)	G_{PL} (dB)	G_A (dB/m)	P_{Mea}(dBμV)	Polarity
17651.250	58.9	-13.0	41.2	30.7	H
17557.500	58.8	-14.9	41.2	32.5	H
17550.750	58.8	-14.9	41.2	32.5	H
17579.250	58.5	-14.9	41.2	32.2	V
17556.000	58.5	-14.9	41.2	32.2	V
17636.250	58.4	-13.0	41.2	30.2	V

Sample calculation: Peak detector, 17557.500MHz

Result =P_{Mea} (32.518dBμV)+ G_A (41.2dB/m)+ G_{PL}(-14.9 dB) =58.8dBμV/m

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
17268.000	47.8	-14.0	41.2	20.6	H
17632.500	47.7	-13.0	41.1	19.6	V
17614.500	47.7	-13.2	41.1	19.8	V
17640.000	47.7	-13.0	41.1	19.6	H
17616.000	47.6	-13.2	41.1	19.7	V
17634.750	47.6	-13.0	41.1	19.5	H

Charging Mode/Peak detector

Frequency(MHz)	Result(dBμV/m)	G_{PL} (dB)	G_A (dB/m)	P_{Mea}(dBμV)	Polarity
17619.000	60.0	-13.2	41.1	32.1	V
17587.500	59.9	-13.5	41.1	32.3	H
17295.000	59.8	-14.0	41.2	32.6	H
17555.250	59.6	-13.9	41.2	32.3	H
17625.000	59.6	-13.1	41.1	31.6	V
17654.250	59.4	-13.1	41.1	31.4	V

Sample calculation: Peak detector, 17619.000MHz

Result =P_{Mea} (32.1dBμV)+ G_A (41.1dB/m)+ G_{PL}(-13.2 dB) =60.0dBμV/m

Charging Mode, Set.1

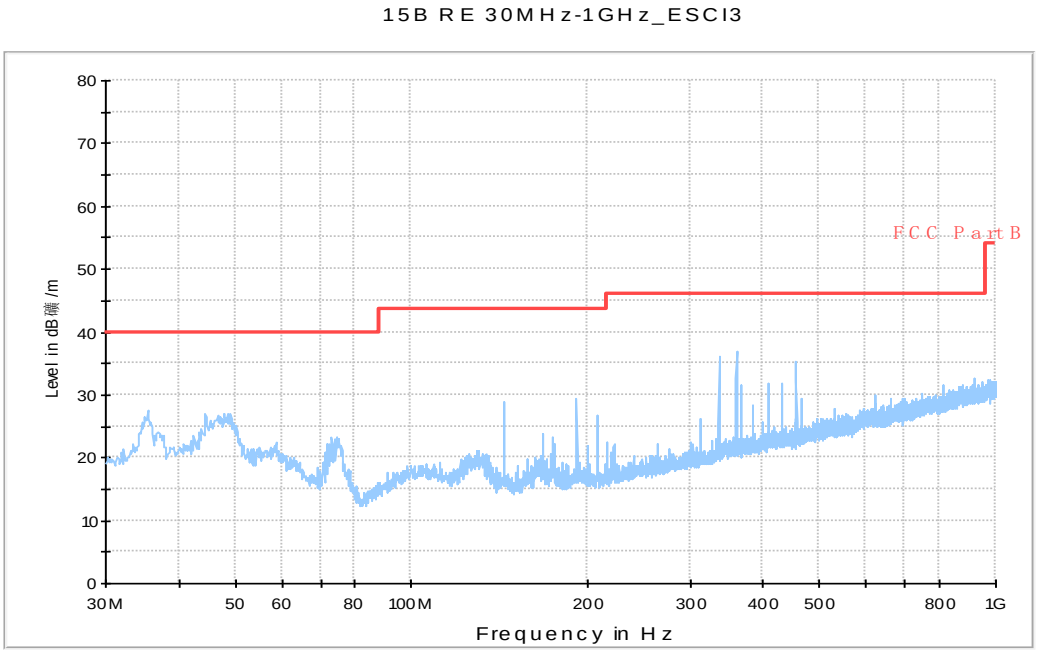


Figure A.1 Radiated Emission from 30MHz to 1GHz

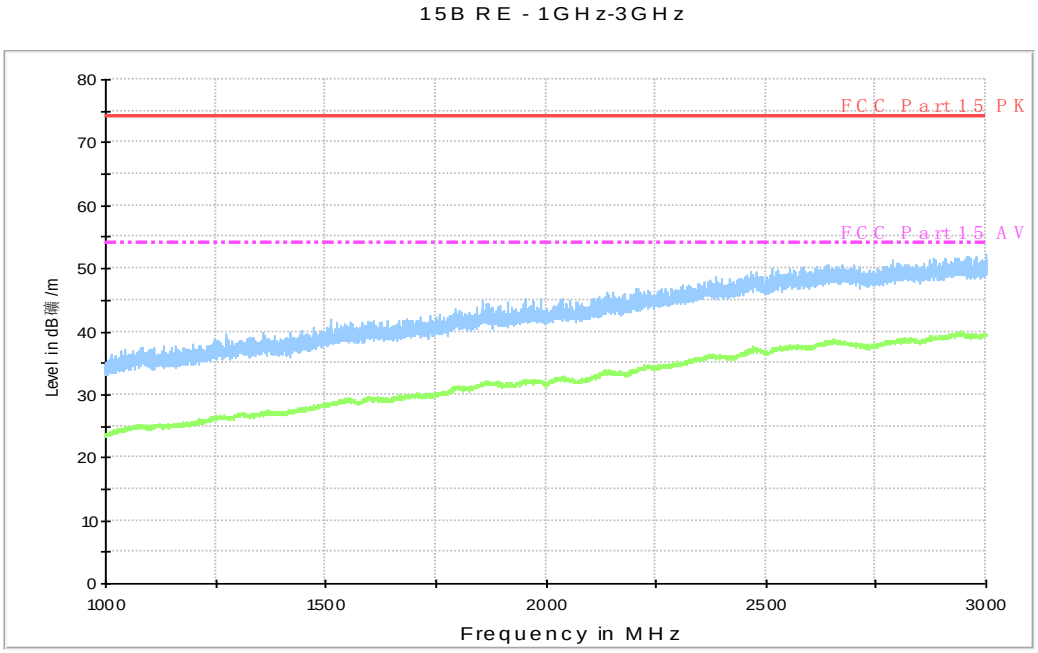


Figure A.2 Radiated Emission from 1GHz to 3GHz

15b RE - 3GHz-18GHz

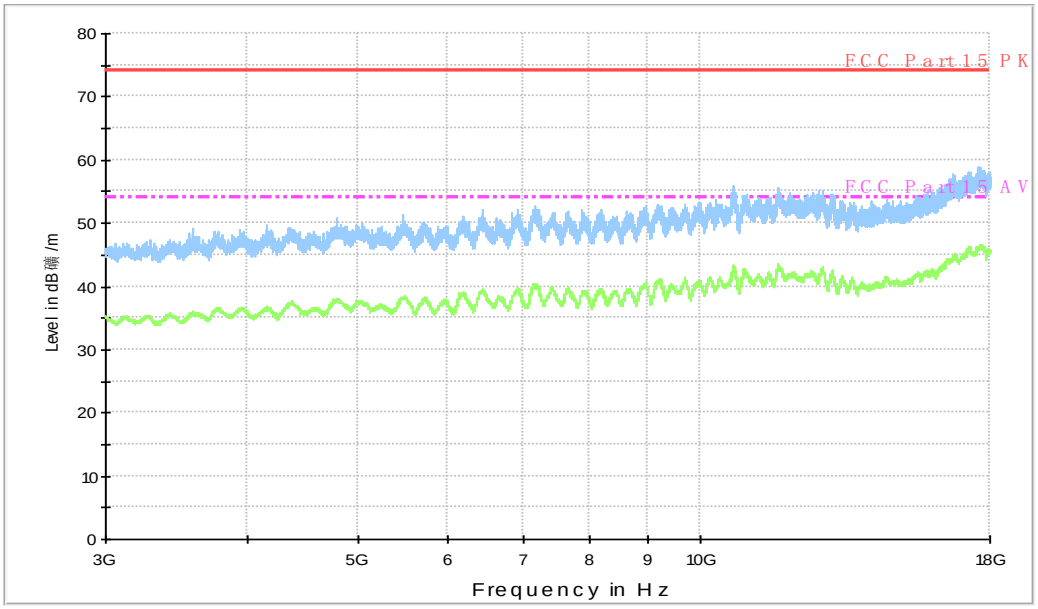


Figure A.3 Radiated Emission from 3GHz to 18GHz

Charging Mode, Set.2

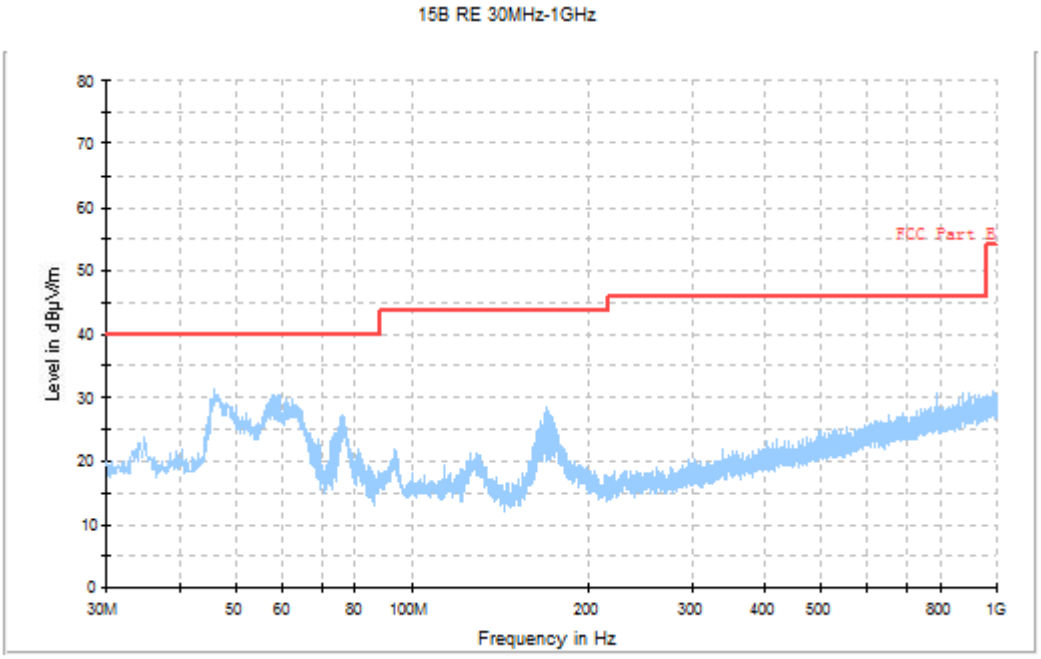


Figure A.4 Radiated Emission from 30MHz to 1GHz

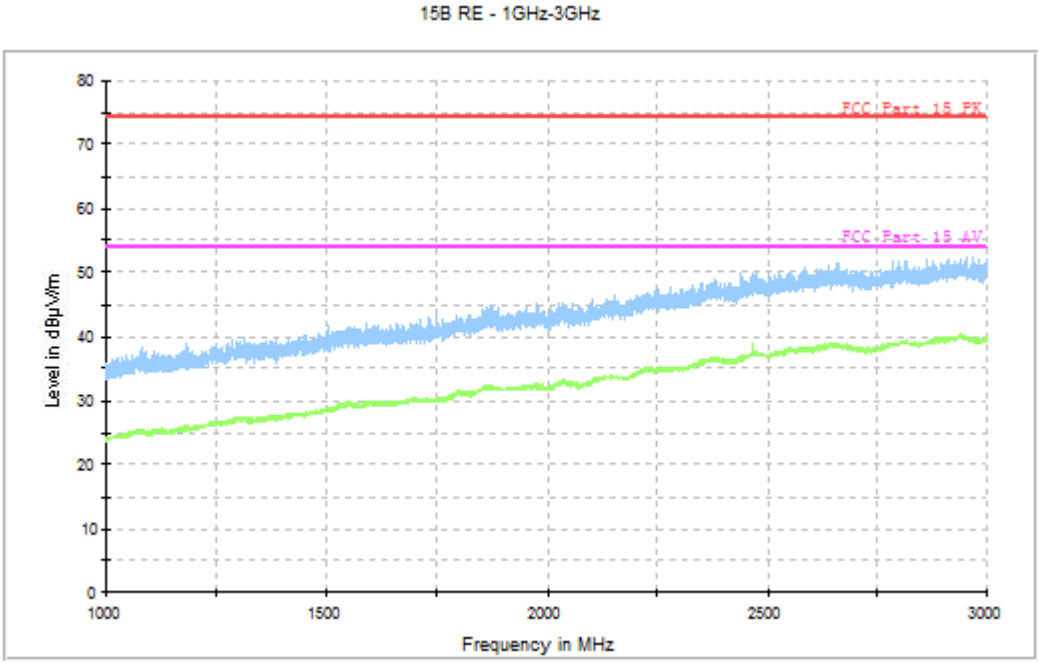


Figure A.5 Radiated Emission from 1GHz to 3GHz

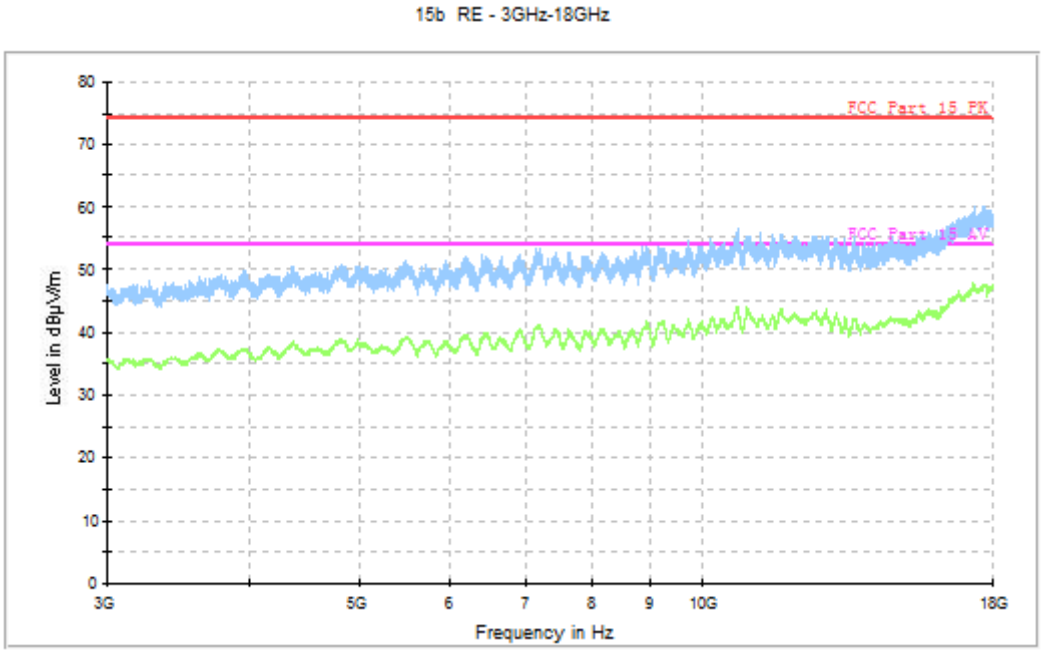


Figure A.6 Radiated Emission from 3GHz to 18GHz

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.1

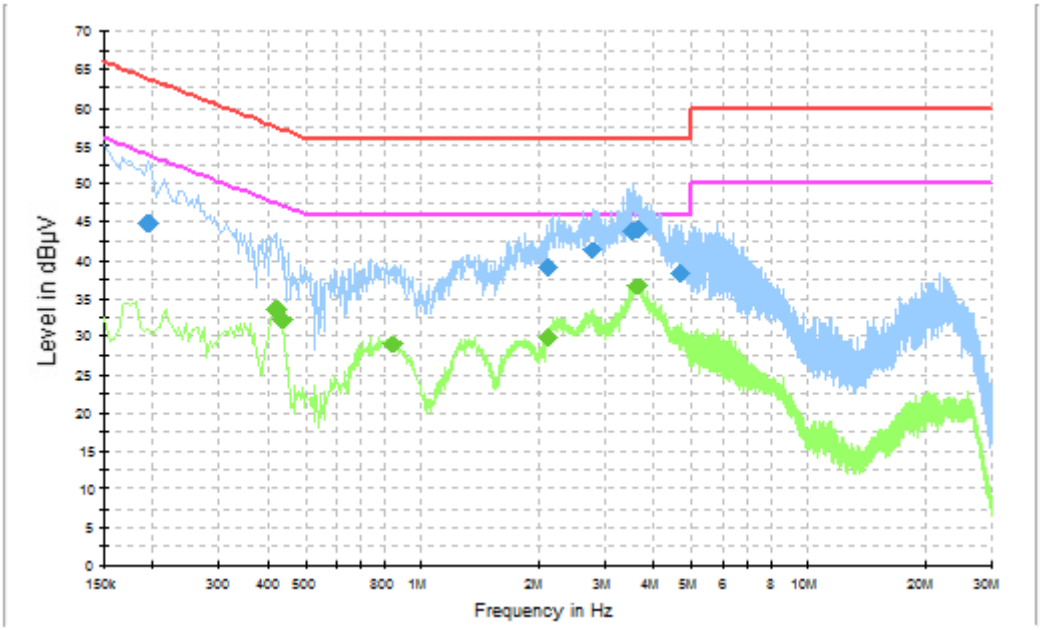


Figure A.7 Conducted Emission

Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.195000	44.9	2000.0	9.000	On	L1	10.3	19.0	63.8
2.116500	39.0	2000.0	9.000	On	L1	10.4	17.0	56.0
2.755500	41.3	2000.0	9.000	On	L1	10.4	14.7	56.0
3.529500	43.9	2000.0	9.000	On	L1	10.4	12.1	56.0
3.628500	44.1	2000.0	9.000	On	L1	10.4	11.9	56.0
4.695000	38.3	2000.0	9.000	On	L1	10.5	17.7	56.0

Final Result 2

Frequency (MHz)	CAverage (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.420000	33.5	2000.0	9.000	On	N	10.4	14.0	47.4
0.433500	32.2	2000.0	9.000	On	N	10.4	15.0	47.2
0.834000	29.1	2000.0	9.000	On	N	10.4	16.9	46.0
2.116500	29.9	2000.0	9.000	On	L1	10.4	16.1	46.0
3.588000	36.6	2000.0	9.000	On	L1	10.4	9.4	46.0
3.633000	36.6	2000.0	9.000	On	L1	10.4	9.4	46.0

Charging Mode, Set.2

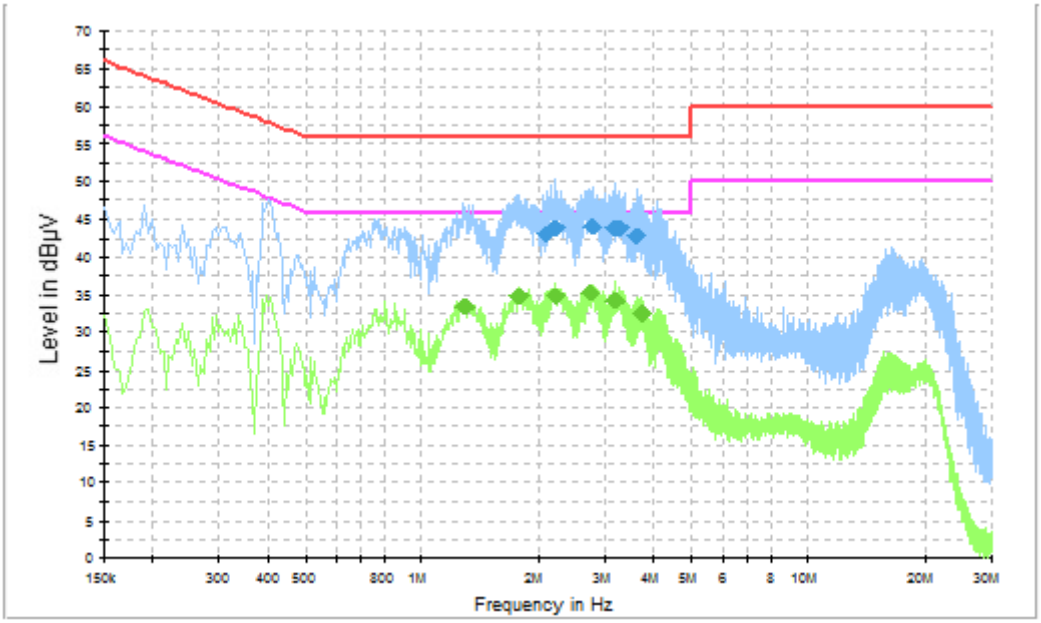


Figure A.7 Conducted Emission

Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
2.098500	43.0	2000.0	9.000	On	L1	10.4	13.0	56.0
2.229000	43.9	2000.0	9.000	On	L1	10.4	12.1	56.0
2.773500	44.0	2000.0	9.000	On	L1	10.4	12.0	56.0
3.156000	43.9	2000.0	9.000	On	L1	10.4	12.1	56.0
3.232500	43.8	2000.0	9.000	On	L1	10.4	12.2	56.0
3.597000	42.8	2000.0	9.000	On	L1	10.4	13.2	56.0

Final Result 2

Frequency (MHz)	CAverage (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
1.293000	33.4	2000.0	9.000	On	L1	10.3	12.6	46.0
1.783500	34.8	2000.0	9.000	On	L1	10.4	11.2	46.0
2.229000	34.8	2000.0	9.000	On	L1	10.4	11.2	46.0
2.715000	35.1	2000.0	9.000	On	L1	10.4	10.9	46.0
3.174000	34.2	2000.0	9.000	On	L1	10.4	11.8	46.0
3.714000	32.6	2000.0	9.000	On	L1	10.4	13.4	46.0

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