



TEST REPORT

No. I17Z60153-EMC01

for

TCL Communication Ltd.

GSM Quad band/UMTS 3 Band/LTE 4 Band Mobile phone

Model Name: A574BL

FCC ID: 2ACCJB079

with

Hardware Version: PIO

Software Version: vG48

Issued Date: 2017-03-22

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

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REPORT HISTORY

Report Number	Revision	Description	Issue Date
I17Z60153-EMC01	Rev.0	1 st edition	2017-03-22

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1. Test Laboratory

1.1. Testing Location

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°C

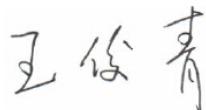
Relative Humidity: 20-75%

1.3. Project data

Testing Start Date: 2017-03-14

Testing End Date: 2017-03-19

1.4. Signature



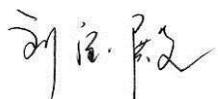
Wang Junqing

(Prepared this test report)



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Deputy Director of the laboratory

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2. Client Information

2.1. Applicant Information

Company Name: TCL Communication Ltd.
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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,
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/UMTS 3 Band/LTE 4 Band Mobile phone
Model Name	A574BL
FCC ID	2ACCJB079
Extreme vol. Limits	3.5VDC to 4.35VDC (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	014913000000305	PIO	vG48

*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	/	1760153BA002
AE2	Battery	/	/
AE3	Battery	/	/
AE4	Battery	/	/
AE5	USB Cable	/	1760153DC006
AE6	USB Cable	/	1760153DC001
AE7	Travel charger	/	1760153CH003
AE8	Travel charger	/	1760153CH006

AE1, AE2, AE3, AE4

Model	CAB2000088C1 (CAB2000089C1)
Manufacturer	BYD
Capacitance	2000mAh
Nominal voltage	3.8V

AE5, AE6

Model	CDA3122002C2 (CDA0000055C2)
Manufacturer	JUWEI
Length of cable	/

AE7, AE8

Model	CBA0058AGAC2 (CBA0058AGDC2)
Manufacturer	TENPAO
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+ AE5+ AE7	Charger
Set.2	EUT1+ AE1+ AE7	USB mode

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
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	Edition 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

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	ESU26	R&S	100376	2017-11-30	1 year
2	Test Receiver	ESCI	R&S	100766	2017-03-30	1 year
3	Universal Radio Communication Tester	CMW500	127406	R&S	2018-01-19	1 year
5	LISN	ESH2-Z5	R&S	829991/012	2017-04-11	1 year
6	EMI Antenna	VULB 9163	9163-514	Schwarzbeck	2017-11-24	3 years
7	EMI Antenna	3117	ETS-Lindgren	00139065	2017-09-21	3 years
8	PC	ThinkCenter M8500t-D428	DELL	NA24633922	N/A	N/A
9	Printer	HP LaserJet 1160	HP	CNM2D33740	N/A	N/A
10	Keyboard	SK-8825(L)	DELL	3095900	N/A	N/A
11	Mouse	MO-011	Lenovo	4420134	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 (μ 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:

$$\text{Result} = P_{\text{Mea}} + A_{RPL} = P_{\text{Mea}} + G_A + G_{PL}$$

Where

G_A : Antenna factor of receive antenna

G_{PL} : Path Loss

P_{Mea} : Measurement result on receiver.

Measurement uncertainty (worst case): $U = 4.3 \text{ dB}$, $k=2$.

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
17802.750	41.4	-23.1	41.0	23.594	54.0
17811.750	41.4	-23.0	41.0	23.436	54.0
17802.000	41.3	-23.1	41.0	23.486	54.0
17804.250	41.3	-23.1	41.0	23.450	54.0
17811.000	41.3	-23.0	41.0	23.371	54.0
17808.750	41.3	-23.0	41.0	23.343	54.0

Charging Mode/Peak detector

Frequency(MHz)	Result(dB μ V/m)	G_{PL} (dB)	G_A (dB/m)	P_{Mea} (dB μ V)	Polarity
17809.500	53.2	-23.0	41.0	35.272	74.0
17820.750	52.8	-23.1	40.9	35.009	74.0
17794.500	52.4	-23.2	41.0	34.647	74.0
17801.250	52.3	-23.1	41.0	34.476	74.0
17772.750	52.2	-23.6	41.0	34.855	74.0
17809.500	53.2	-23.0	41.0	35.272	74.0

Sample calculation: Peak detector, 17809.500MHz

$$\text{Result} = P_{\text{Mea}} (35.272 \text{ dB}\mu\text{V}) + G_A (41.0 \text{ dB/m}) + G_{PL} (-23.0 \text{ dB}) = 53.2 \text{ dB}\mu\text{V/m}$$

Measurement results for Set.2:
USB Mode/Average detector

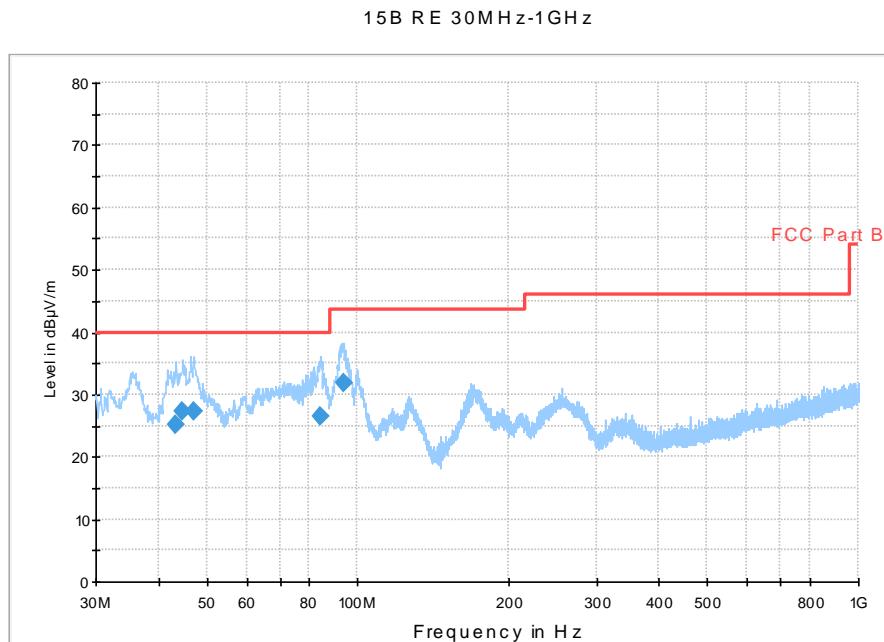
Frequency(MHz)	Result(dB μ V/m)	G _{PL} (dB)	G _A (dB/m)	P _{mea} (dB μ V)	Polarity
17804.250	41.6	-23.1	41.0	23.762	54.0
17806.500	41.3	-23.0	41.0	23.429	54.0
17808.000	41.3	-23.0	41.0	23.383	54.0
17810.250	41.3	-23.0	41.0	23.366	54.0
17805.750	41.3	-23.1	41.0	23.367	54.0
17793.750	41.3	-23.2	41.0	23.544	54.0

USB Mode/ Peak detector

Frequency(MHz)	Result(dB μ V/m)	G _{PL} (dB)	G _A (dB/m)	P _{mea} (dB μ V)	Polarity
17931.750	53.1	-24.6	40.9	36.867	74.0
17898.000	52.6	-24.2	40.9	35.893	74.0
17813.250	52.6	-23.0	40.9	34.685	74.0
17800.500	52.6	-23.1	41.0	34.764	74.0
17807.250	52.4	-23.0	41.0	34.469	74.0
17809.500	52.4	-23.0	41.0	34.410	74.0

Sample calculation: Peak detector, 17931.750MHz

 Result =P_{Mea} (36.867dB μ V) + G_A (40.9dB/m) + G_{PL} (-24.6 dB) =53.1dB μ V/m

Charging Mode, Set.1

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

Frequency (MHz)	QuasiPeak (dB μ V/m)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dB μ V/m)
43.289000	25.3	125.0	V	12.0	-18.0	14.7	40.0
44.744000	27.4	109.0	V	253.0	-17.8	12.6	40.0
46.975000	27.3	115.0	V	55.0	-17.8	12.7	40.0
84.611000	26.6	114.0	V	0.0	-22.5	13.4	40.0
93.826000	31.7	100.0	V	9.0	-19.7	11.8	43.5

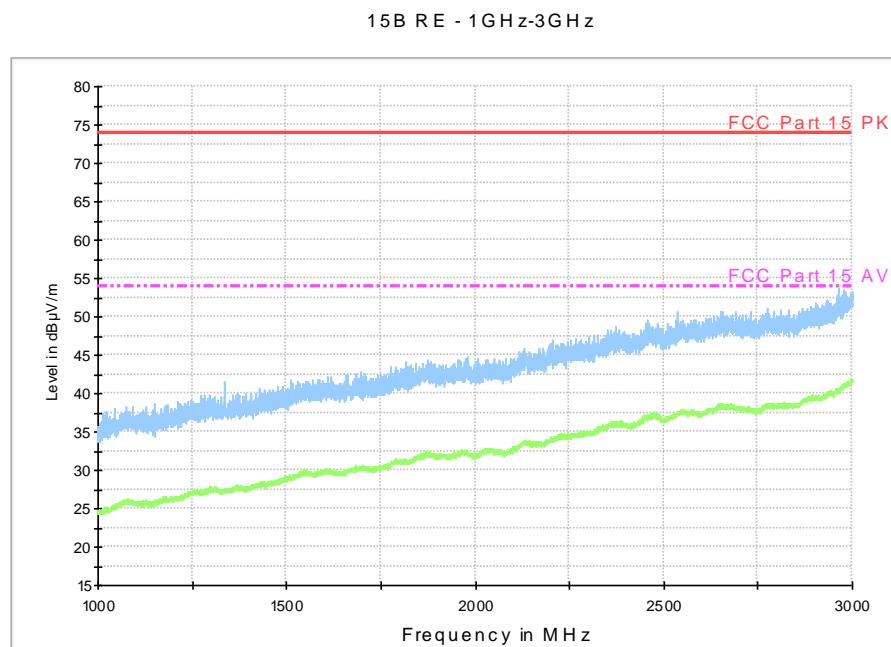


Figure A.2 Radiated Emission from 1GHz to 3GHz

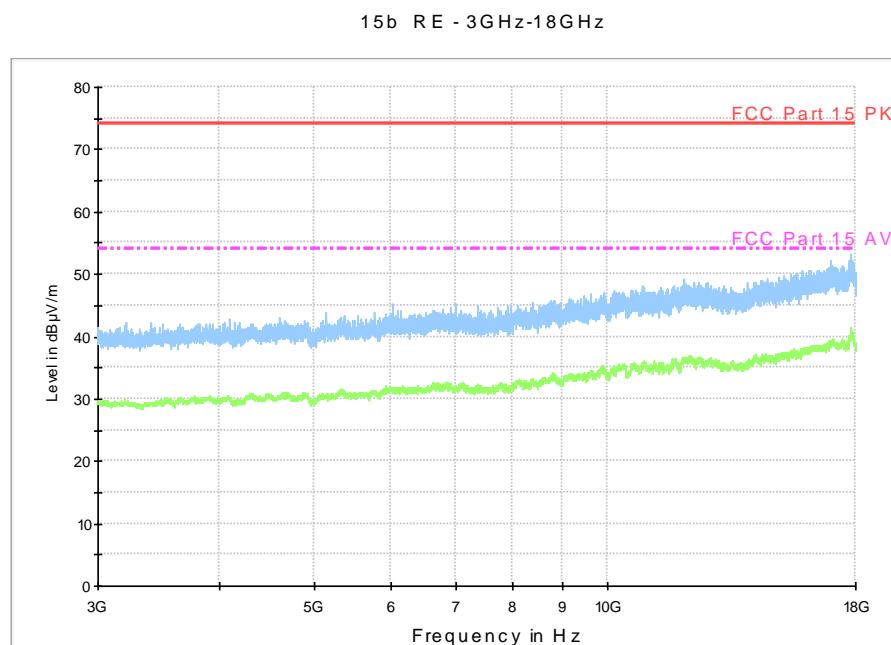
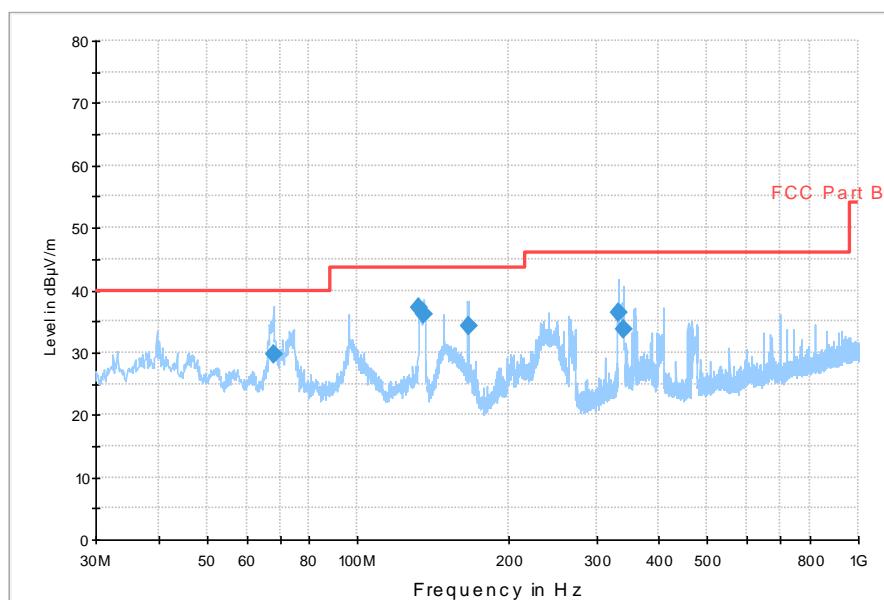


Figure A.3 Radiated Emission from 3GHz to 18GHz

USB Mode, Set.2

15B RE 30MHz-1GHz


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

Frequency (MHz)	QuasiPeak (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBuV/m)
67.830000	29.7	100.0	V	169.0	-21.6	10.3	40.0
132.432000	37.2	125.0	H	106.0	-21.4	6.3	43.5
136.021000	36.0	108.0	V	45.0	-20.9	7.5	43.5
166.382000	34.3	121.0	H	48.0	-21.4	9.2	43.5
331.573000	36.4	100.0	H	188.0	-14.5	9.6	46.0
340.303000	33.7	100.0	H	190.0	-13.9	12.3	46.0

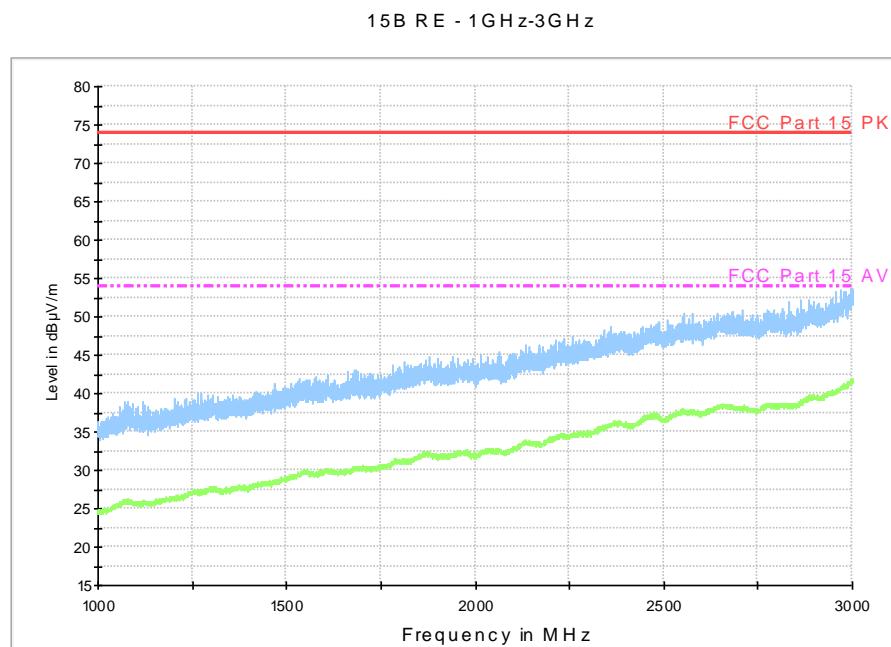


Figure A.5 Radiated Emission from 1GHz to 3GHz

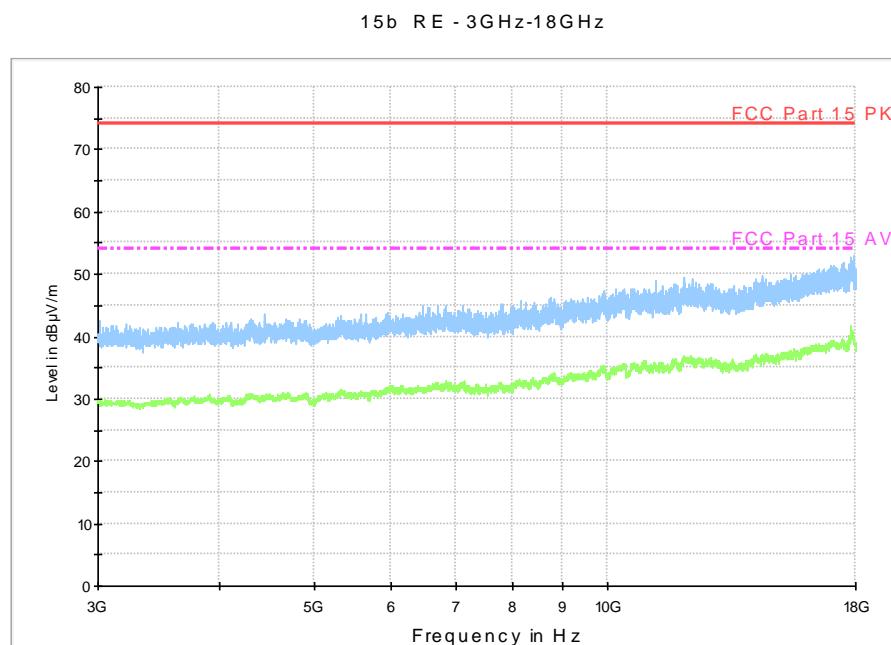


Figure A.6 Radiated Emission from 3GHz to 18GHz

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 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

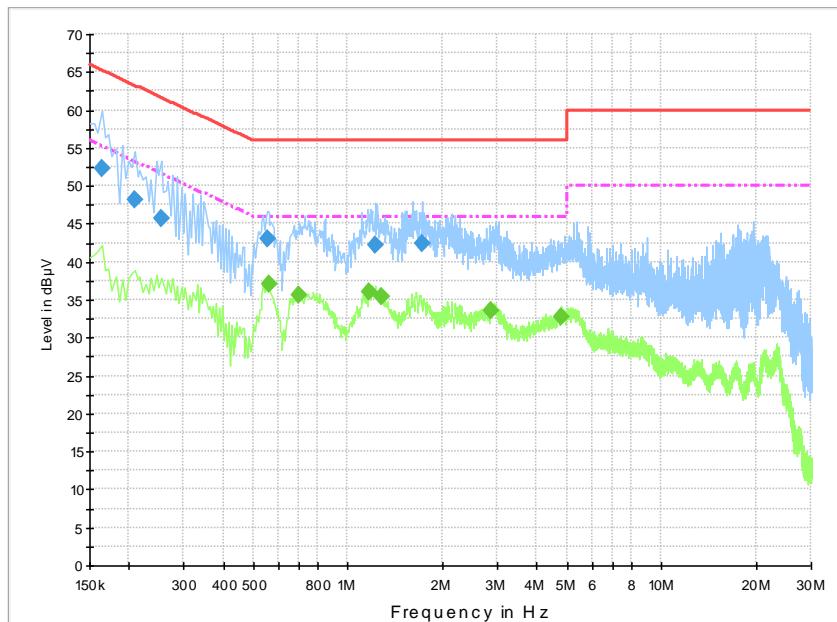


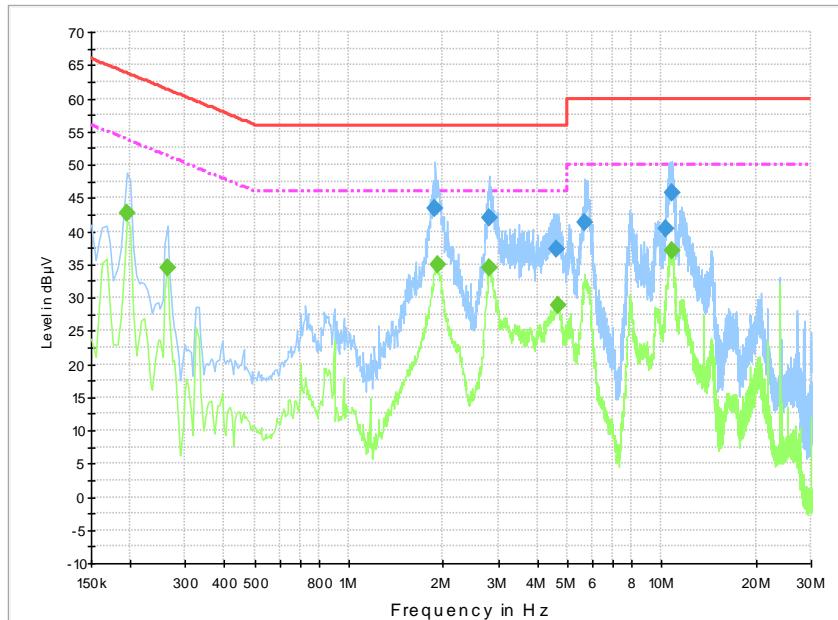
Figure A.7 Conducted Emission

Final Result 1

Frequency (MHz)	QuasiPeak (dBμV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.163500	52.4	GND	N	10.3	12.9	65.3
0.208500	48.2	GND	N	10.3	15.0	63.3
0.253500	45.7	GND	N	10.3	15.9	61.6
0.555000	43.0	GND	N	10.3	13.0	56.0
1.225500	42.2	GND	N	10.3	13.8	56.0
1.729500	42.4	GND	N	10.3	13.6	56.0

Final Result 2

Frequency (MHz)	Average (dBμV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.559500	37.1	GND	N	10.3	8.9	46.0
0.699000	35.7	GND	N	10.3	10.3	46.0
1.162500	36.1	GND	N	10.3	9.9	46.0
1.284000	35.4	GND	N	10.3	10.6	46.0
2.859000	33.6	GND	N	10.4	12.4	46.0
4.803000	32.8	GND	N	10.5	13.2	46.0

USB Mode, Set.2

Figure A.8 Conducted Emission
Final Result 1

Frequency (MHz)	QuasiPeak (dBμV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
1.887000	43.5	GND	N	10.3	12.5	56.0
2.796000	42.1	GND	N	10.4	13.9	56.0
4.627500	37.4	GND	N	10.5	18.6	56.0
5.671500	41.2	GND	N	10.5	18.8	60.0
10.351500	40.3	GND	N	10.6	19.7	60.0
10.797000	45.7	GND	N	10.6	14.3	60.0

Final Result 2

Frequency (MHz)	Average (dBμV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.195000	42.6	GND	N	10.3	11.2	53.8
0.262500	34.4	GND	N	10.3	16.9	51.4
1.914000	35.0	GND	N	10.3	11.0	46.0
2.805000	34.6	GND	N	10.4	11.4	46.0
4.650000	28.8	GND	N	10.4	17.2	46.0
10.725000	37.1	GND	N	10.6	12.9	50.0

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