



FCC 15B TEST REPORT

No. I20Z60705-EMC01

for

TCL Communication Ltd.

Tablet PC

Model Name: 9048S

FCC ID: 2ACCJB126

with

Hardware Version: 05

Software Version: 6F6A

Issued Date: 2020-06-22

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.

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.

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REPORT HISTORY

Report Number	Revision	Description	Issue Date
I20Z60705-EMC01	Rev.0	1 st edition	2020-06-22



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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: 2020-05-28

Testing End Date: 2020-06-22

1.4. Signature



An Hui

(Prepared this test report)



Zhang Ying

(Reviewed this test report)



Liu Baodian

(Approved this test report)



2. Client Information

2.1. Applicant Information

Company Name: TCL Communication Ltd.
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City: Hong Kong
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Country: China
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2.2. Manufacturer Information

Company Name: TCL Communication Ltd.
Address /Post: 5/F, Building 22E, 22 Science Park East Avenue, Hong Kong Science
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Country: China
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3. Equipment Under Test (EUT) and Ancillary Equipment (AE)

3.1. About EUT

Description	Tablet PC
Model Name	9048S
FCC ID	2ACCJB126

The Equipment under Test (EUT) is a model of Tablet PC with integrated antenna and inbuilt battery.

Manual and specifications of the EUT were provided to fulfil the test.

Samples undergoing test were selected by the client.

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	015759000002887	05	6F6A

*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	Charger	/	/
AE3	USB Cable	/	/
AE4	Headset	/	/

AE1

Model	TLp053C1
Manufacturer	BYD
Capacitance	/
Nominal voltage	/

AE2

Model	QC13US
Manufacturer	BYD
Capacitance	/
Nominal voltage	/

AE3

Model	CDA0000154C2
Manufacturer	SHENGHUA
Length of cable	/



AE4

Model	Headset
Manufacturer	/
Length of cable	/

*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	EUT2+ AE1 + AE2 + AE3	Charger+MP3+GNSS + GSM850 idle
Set.2	EUT2+ AE1 + AE2 + AE3	Charger+CAMERA + WCDMA850 idle
Set.3	EUT2+ AE1 + AE2 + AE3 + AE4	USB mode +FM + LTE FDD Band 5/12/13

Note:

The device contains receivers which tune and operate between 30MHz-960MHz in the following bands: GSM850, WCDMA850, LTE B5, LTE B12 and LTE B13.

The EUT was tested while operating in licensed band RX mode. All licensed band receivers are investigated. Only the worst case emissions are reported.

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	10-1-16 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	1/2/4	The test is performed in test location 1/2/4 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
2	Conducted Emission	15.107(a)	A.2	P	1

7. Test Equipments Utilized

NO.	Description	TYPE	SERIES NUMBER	MANUFACTURE	CAL DUE DATE	CALIBRATION INTERVAL
1	LISN	ENV216	101200	Rohde & Schwarz	1 year	2021-05-17
2	Test Receiver	ESCI 7	100344	Rohde & Schwarz	1 Year	2021-02-26
3	Universal Radio Communication Tester	CMW500	150344	R&S	1 Year	2020-11-17
4	Test Receiver	ESU26	100235	Rohde & Schwarz	1 Year	2021-03-03
5	BiLog Antenna	VULB9163	483	Schwarzbeck	1 Year	2020-09-17
6	Dual-Ridge Waveguide Horn Antenna	3115	6914	ETS-Lindgren	1 Year	2021-01-14
7	PC	M4000e-17	M706GWXD	Lenovo	N/A	N/A
8	Printer	P1606dn	VNC3L52122	HP	N/A	N/A

Note: The EMI Antenna with series number 167250 was used before Cal. Due Date.

Test Item	Test Software and Version	Software Vendor
Radiated Continuous Emission	EMC32 V9.01.0	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 and FM 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 charging mode. During the test MS is connected to a charger in the case of charging mode.

The EUT was tested while operating in licensed band Rx mode. All licensed band receivers that tune in the range of 30MHz-960MHz, as listed in Section 2.2, are investigated. Only the worst case emissions are reported.

All equipment is placed on the test table top and arranged in a typical configuration in accordance with ANSI C63.4-2014 and manipulated to obtain worst case emissions.

A.1.3 Measurement Limit

Frequency range (MHz)	Field strength limit ($\mu\text{V}/\text{m}$)		
	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): 30MHz-1GHz: 5.16dB, 1GHz-18GHz: 5.44dB, $k=2$.

Measurement results for Set.1:

Charger+MP3+GNSS + GSM850 idle

Frequency (MHz)	QuasiPeak (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)
34.739000	14.49	30.00	15.51	101.0	V	-26.0
59.802000	14.28	30.00	15.72	119.0	V	-19.0
88.426000	13.44	33.50	20.08	177.0	V	-20.0
181.976000	8.67	33.50	24.85	100.0	V	-22.0
220.453000	16.20	36.00	19.82	102.0	V	3.0
891.092000	21.56	36.00	14.46	182.0	V	-30.0

Charger+MP3+GNSS + GSM850 idle Average detector

Frequency (MHz)	Result (dB μ V/m)	G_{PL} (dB)	G_A (dB/m)	P_{Mea} (dB μ V)	Polarity	Limit (dB μ V/m)	Margin (dB)
17985.267	47.5	-25.5	43.4	29.602	H	54	6.5
17993.767	47.4	-25.5	43.4	29.502	H	54	6.6
17987.533	47.2	-25.5	43.4	29.302	V	54	6.8
17904.233	47.1	-25.7	43.4	29.442	H	54	6.9
17959.200	47.0	-25.5	43.4	29.102	H	54	7
17964.867	46.8	-25.5	43.4	28.902	H	54	7.2

Charger+MP3+GNSS + GSM850 idle Peak detector

Frequency (MHz)	Result (dB μ V/m)	G_{PL} (dB)	G_A (dB/m)	P_{Mea} (dB μ V)	Polarity	Limit (dB μ V/m)	Margin (dB)
17994.333	56.7	-25.5	43.4	38.802	H	74	17.3
17976.200	56.4	-25.5	43.4	38.502	H	74	17.6
17982.433	56.0	-25.5	43.4	38.102	V	74	18
17990.933	56.0	-25.5	43.4	38.102	H	74	18
17996.600	56.0	-25.5	43.4	38.102	H	74	18
17946.733	55.9	-25.5	43.4	38.002	H	74	18.1

Measurement results for Set.2:
Charger+CAMERA + WCDMA850 idle Mode QP detector

Frequency (MHz)	QuasiPeak (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)
34.522000	12.35	30.00	17.65	109.0	V	82.0
57.442000	12.91	30.00	17.09	185.0	V	-18.0
61.770000	15.03	30.00	14.97	182.0	V	21.0
88.764000	13.52	33.50	20.00	125.0	V	-30.0
201.588000	11.32	33.50	22.20	125.0	V	-22.0
217.196000	13.20	36.00	22.82	179.0	V	-25.0

Charger+CAMERA + WCDMA850 idle Mode /Average detector

Frequency (MHz)	Result (dB μ V/m)	GPL (dB)	G _A (dB/m)	P _{Mea} (dB μ V)	Polarity	Limit (dB μ V/m)	Margin (dB)
17984.700	47.5	-25.5	43.4	29.602	H	54	6.5
17994.333	47.2	-25.5	43.4	29.302	H	54	6.8
17981.300	46.8	-25.5	43.4	28.902	V	54	7.2
17971.667	46.8	-25.5	43.4	28.902	H	54	7.2
17989.233	46.7	-25.5	43.4	28.802	H	54	7.3
17962.033	46.7	-25.5	43.4	28.802	H	54	7.3

Charger+CAMERA + WCDMA850 idle Mode /Peak detector

Frequency (MHz)	Result (dB μ V/m)	GPL (dB)	G _A (dB/m)	P _{Mea} (dB μ V)	Polarity	Limit (dB μ V/m)	Margin (dB)
17994.333	57.0	-25.5	43.4	39.102	H	74	17
17890.633	55.5	-25.7	43.4	37.842	H	74	18.5
17962.033	55.5	-25.5	43.4	37.602	V	74	18.5
17991.500	55.3	-25.5	43.4	37.402	H	74	18.7
17967.133	55.1	-25.5	43.4	37.202	H	74	18.9
17983.567	55.0	-25.5	43.4	37.102	H	74	19

Measurement results for Set.3:
USB mode +FM + LTE FDD Band 5 Mode QP detector

Frequency (MHz)	QuasiPeak (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)
43.307000	16.45	30.00	13.55	125.0	V	74.0
100.154000	15.45	33.50	18.07	102.0	V	-10.0
216.605000	15.30	36.00	20.72	106.0	V	-13.0
322.820000	16.88	36.00	19.14	100.0	V	170.0
399.995000	26.89	36.00	9.13	103.0	V	170.0
501.803000	20.36	36.00	15.66	99.0	V	-23.0

USB mode +FM + LTE FDD Band 5 Mode Average detector

Frequency (MHz)	Result (dB μ V/m)	G _{PL} (dB)	G _A (dB/m)	P _{Mea} (dB μ V)	Polarity	Limit (dB μ V/m)	Margin (dB)
17892.333	47.2	-25.7	43.4	29.542	H	54	6.8
17976.200	46.9	-25.5	43.4	29.002	H	54	7.1
17873.067	46.9	-25.7	43.4	29.242	V	54	7.1
17952.400	46.7	-25.5	43.4	28.802	H	54	7.3
17997.733	46.6	-25.5	43.4	28.702	H	54	7.4
17952.967	46.6	-25.5	43.4	28.702	H	54	7.4

USB mode +FM + LTE FDD Band 5 Mode Peak detector

Frequency (MHz)	Result (dB μ V/m)	G _{PL} (dB)	G _A (dB/m)	P _{Mea} (dB μ V)	Polarity	Limit (dB μ V/m)	Margin (dB)
17982.433	55.8	-25.5	43.4	37.902	H	74	18.2
17980.167	55.8	-25.5	43.4	37.902	H	74	18.2
17986.400	55.7	-25.5	43.4	37.802	V	74	18.3
17934.833	55.7	-25.5	43.4	37.802	H	74	18.3
17988.100	55.3	-25.5	43.4	37.402	H	74	18.7
17997.167	55.2	-25.5	43.4	37.302	H	74	18.8

Sample calculation: Peak detector, 2244.967MHz

Result =P_{Mea} (59.5dB μ V)+ G_A (27.7dB/m)+ G_{PL}(-38.1 dB) =49.1 dB μ V/m

Charger+MP3+GNSS + GSM850 idle, Set.1

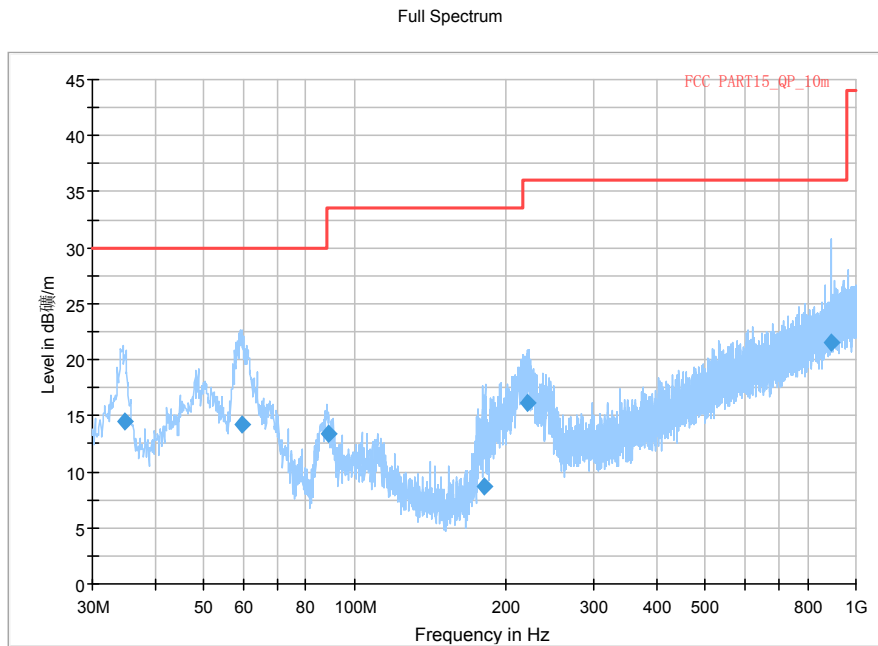


Figure A.1 Radiated Emission from 30MHz to 1GHz

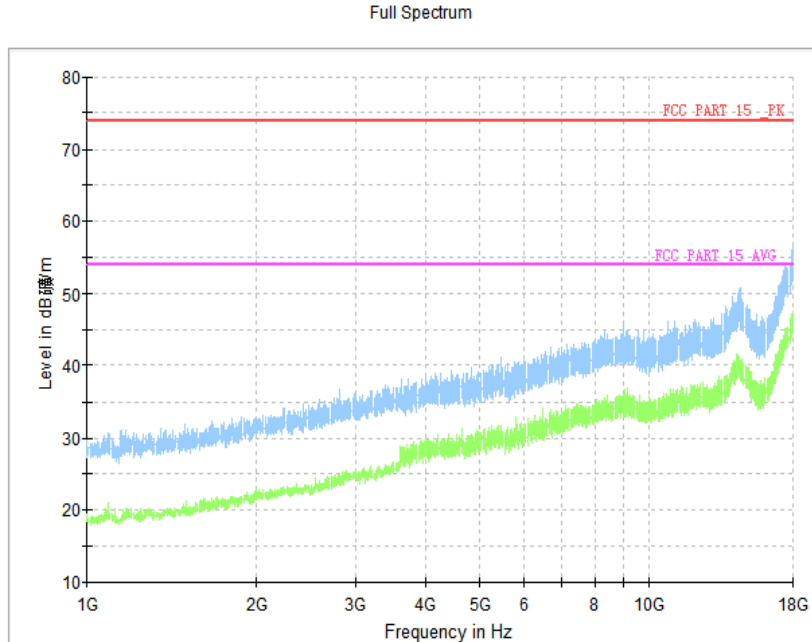


Figure A.2 Radiated Emission from 1GHz to 18GHz

Charger+CAMERA + WCDMA850 idle, Set.2

Full Spectrum

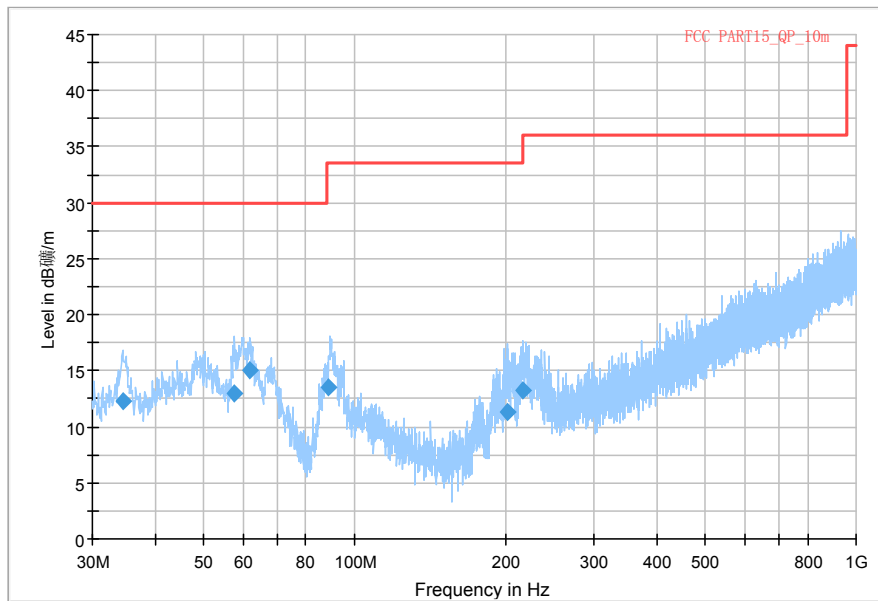


Figure A.3 Radiated Emission from 30MHz to 1GHz

Full Spectrum

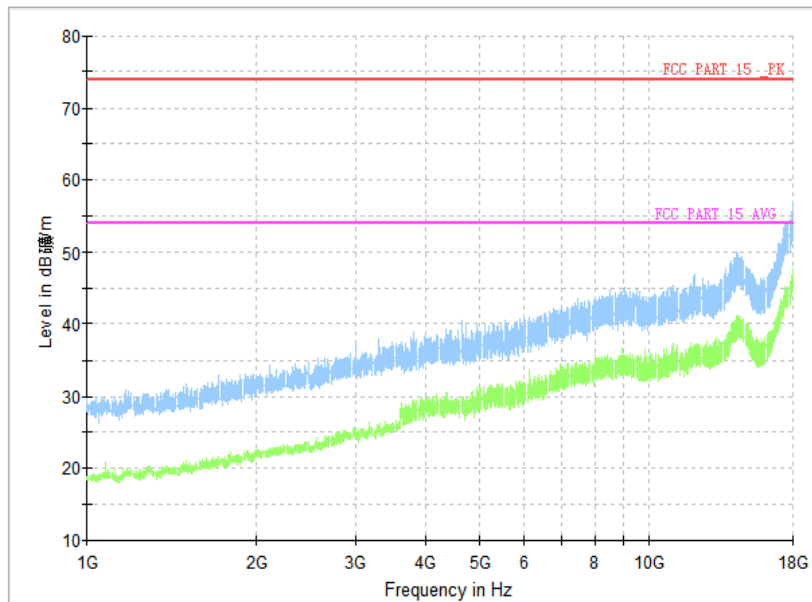


Figure A.4 Radiated Emission from 1GHz to 18GHz

USB mode +FM + LTE FDD Band 5, Set.3

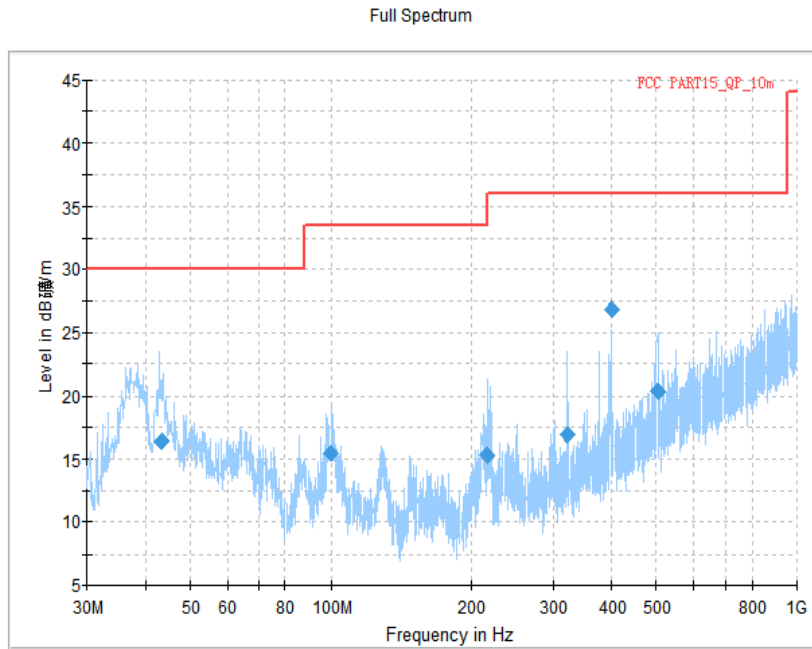


Figure A.5 Radiated Emission from 30MHz to 1GHz

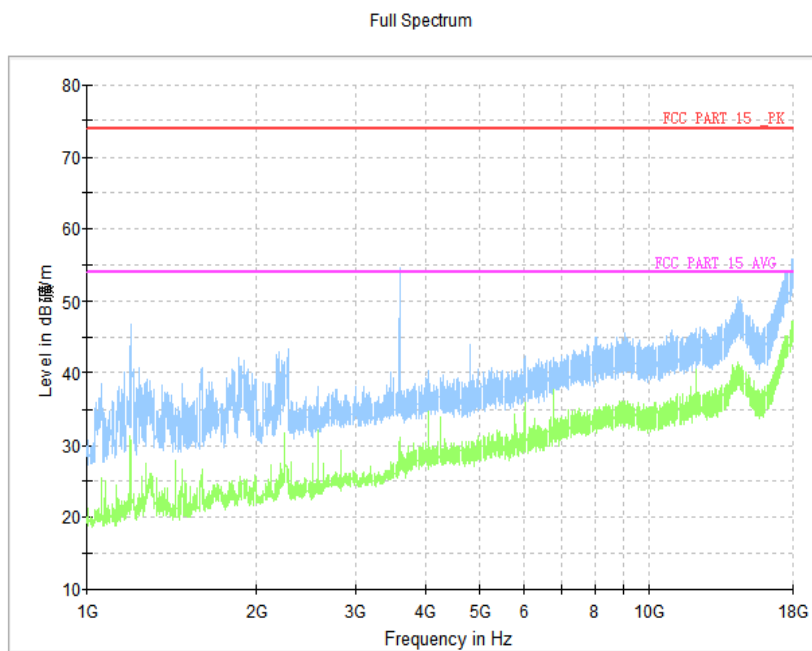


Figure A.6 Radiated Emission from 1GHz to 18GHz

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 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 (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: $U=3.08\text{dB}$, $k=2$.

Charger+MP3+GNSS + GSM850 idle, Set.1

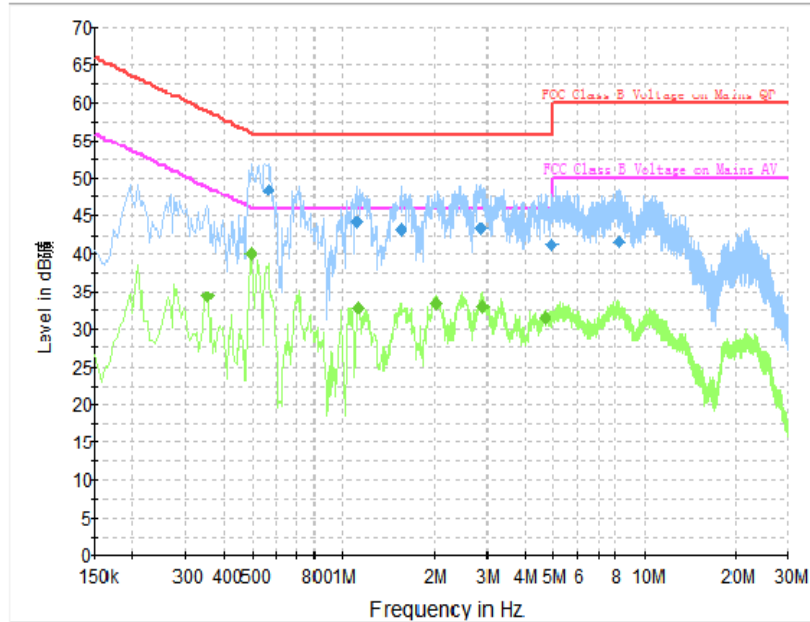


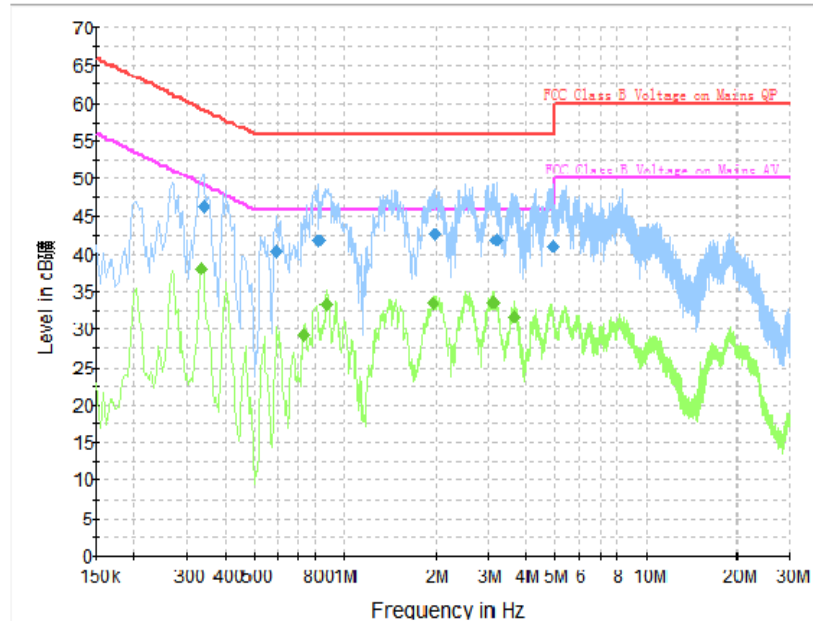
Figure A.11 Conducted Emission

Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.564000	48.5	N	20.0	7.5	56.0
1.099500	44.3	N	19.9	11.7	56.0
1.558500	43.2	N	19.9	12.8	56.0
2.886000	43.4	N	20.1	12.6	56.0
4.960500	41.3	N	20.6	14.7	56.0
8.308500	41.6	N	22.2	18.4	60.0

Final Result 2

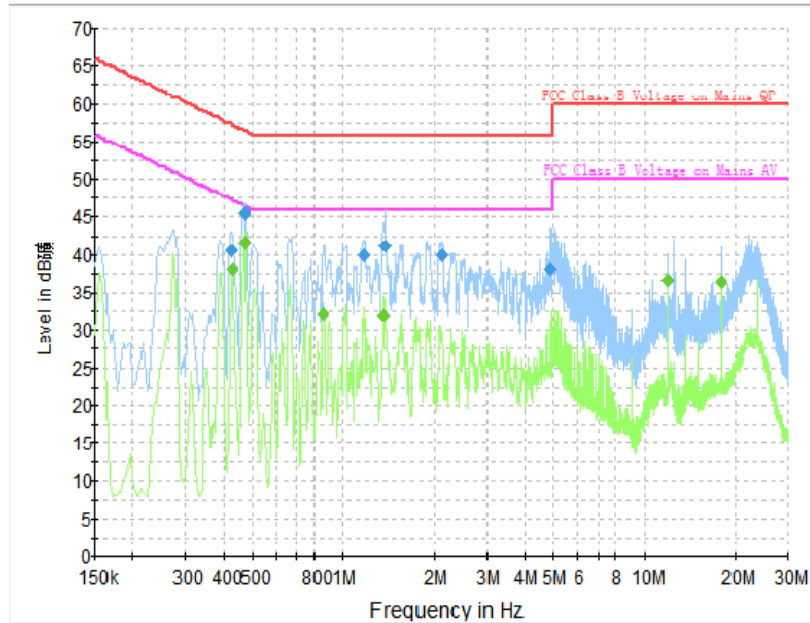
Frequency (MHz)	CAverage (dBµV)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.352500	34.4	N	19.9	14.5	48.9
0.492000	39.9	N	19.9	6.2	46.1
1.113000	32.8	N	19.9	13.2	46.0
2.031000	33.3	L1	20.1	12.7	46.0
2.890500	33.1	N	20.1	12.9	46.0
4.672500	31.6	L1	20.8	14.4	46.0

Charger+CAMERA + WCDMA850 idle, Set.2

Figure A.12 Conducted Emission
Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.339000	46.5	N	19.9	12.8	59.2
0.595500	40.4	N	20.0	15.6	56.0
0.825000	41.8	N	20.0	14.2	56.0
1.986000	42.6	L1	20.0	13.4	56.0
3.169500	41.9	N	20.2	14.1	56.0
4.929000	41.1	L1	20.8	14.9	56.0

Final Result 2

Frequency (MHz)	CAverage (dBµV)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.334500	38.2	L1	20.1	11.2	49.3
0.730500	29.2	N	20.0	16.8	46.0
0.865500	33.4	N	20.0	12.6	46.0
1.959000	33.5	N	19.9	12.5	46.0
3.111000	33.6	L1	20.3	12.4	46.0
3.637500	31.8	L1	20.5	14.2	46.0

USB mode +FM + LTE FDD Band 5, Set.3

Figure A.13 Conducted Emission
Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.424500	40.7	L1	20.1	16.7	57.4
0.469500	45.6	N	19.9	10.9	56.5
1.167000	39.9	L1	19.8	16.1	56.0
1.383000	41.3	L1	19.9	14.7	56.0
2.130000	40.0	L1	20.1	16.0	56.0
4.861500	38.2	N	20.5	17.8	56.0

Final Result 2

Frequency (MHz)	CAverage (dBµV)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.429000	38.1	L1	20.1	9.1	47.3
0.469500	41.6	N	19.9	4.9	46.5
0.856500	32.2	N	20.0	13.8	46.0
1.365000	32.1	N	19.9	13.9	46.0
11.962500	36.6	N	23.2	13.4	50.0
17.943000	36.5	N	24.8	13.5	50.0



ANNEX B: Persons involved in this testing

Test Item	Tester
Conducted Continuous Emission	Wang Huan
Radiated Continuous Emission	Yan Hanchen

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