TEST REPORT

No. I22Z60033-EMC01

for

TCL Communication Ltd.

GSM/UMTS/LTE mobile phone

Model Name: 4058W

FCC ID: 2ACCJN059

with

Hardware Version: 03

Software Version: KE26

Issued Date: 2022-02-17

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
I22Z60033-EMC01	Rev.0	1st edition	2022-02-17

Note: the latest revision of the test report supersedes all previous version.

CONTENTS

1. Test Laboratory

1.1. Introduction & Accreditation

Telecommunication Technology Labs, CAICT is an ISO/IEC 17025:2005 accredited test laboratory under NATIONAL VOLUNTARY LABORATORY ACCREDITATION PROGRAM (NVLAP) with lab code 600118-0, and is also an FCC accredited test laboratory (CN5017), and ISED accredited test laboratory (CN0066). The detail accreditation scope can be found on NVLAP website.

1.2. Testing Location

CTTL (huayuan North Road)

Address: No. 52, Huayuan North Road, Haidian District, Beijing, P. R. China100191

1.3. Testing Environment

Normal Temperature: 15-35° C

Relative Humidity: 20-75%

1.4. Project data

Testing Start Date: 2022-01-30

Testing End Date: 2022-02-11

1.5. Signature

Zhang Ying

(Prepared this test report)

An Hui

(Reviewed this test report)

Zhang Xia

Deputy Director of the laboratory

(Approved this test report)

2. Client Information

2.1. Applicant Information

Company Name:	TCL Communication Ltd.
Address/Post:	5/F, Building 22E, 22 Science Park East Avenue, Hong Kong Science Park, Shatin, NT
City:	Hong Kong
Postal Code:	201203
Country:	China
Contact Person:	Peter yang
Contact Email:	peter.yang@tcl.com
Telephone:	+86 755 3664 5759
Fax:	+86 755 3661 2000-81722

2.2. Manufacturer Information

Company Name:	TCL Communication Ltd.
Address/Post:	5/F, Building 22E, 22 Science Park East Avenue, Hong Kong Science Park, Shatin, NT
City:	Hong Kong
Postal Code:	201203
Country:	China
Contact Person:	Peter yang
Contact Email:	peter.yang@tcl.com
Telephone:	+86 755 3664 5759
Fax:	+86 755 3661 2000-81722

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

3.1. About EUT

Description	GSM/UMTS/LTE mobile phone
Model Name	4058W
FCC ID	2ACCJN059
Extreme vol. Limits	3.8VDC to 4.4VDC (nominal: 3.5VDC)

Note: Components list, please refer to documents of the manufacturer; it is also included in the original test record of CTTL, Telecommunication Technology Labs, CAICT.

3.2. Internal Identification of EUT used during the test

EUT ID*	SN or IMEI	HW Version	SW Version
EUT1	016157000201616	03	KE26

*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
AE3	Battery	TLi017C7	inbuilt
AE4	Charger	UC11US	PUAN
AE5	Charger	UC11US	Chenyang
AE9	USB Cable	CDA0000162C2	/

AE3

Model	Tli017C7
Manufacturer	veken
Capacity	1780mAh
Voltage	3.8V

AE4

Model	UC11US
Manufacturer	PUAN

AE5

Model	UC11US
Manufacturer	Chenyang

AE9

Model	CDA0000162C2
Manufacturer	Shenghua

*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.3-1	EUT1 + AE3 + AE4 + AE9	Charger
Set.3-2	EUT1 + AE3 + AE5 + AE9	Charger
Set.4	EUT1 + AE3 + AE9	USB + Camera

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	2020
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 (10 meters×6.7meters×6.1meters) 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, 3m 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 6000 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	LISN	ENV216	101200	R&S	2022-05-30	1 Year
2	Test Receiver	ESCI 7	100344	R&S	2022-02-23	1 year
3	Test Receiver	ENV216	101200	R&S	2022-02-23	1 year
4	EMI Antenna	VULB 9163	1223	Schwarzbeck	2022-03-22	1 Year
5	EMI Antenna	3115	6914	ETS-Lindgren	2022-02-03	1 year
6	PC	OPTIPLEX 380	2X1YV2X	DELL	N/A	N/A
7	Printer	P1606dn	VNC3L52122	HP	N/A	N/A
8	Keyboard	L100	CN0RH659658907ATOI40	DELL	N/A	N/A
9	Mouse	M-UAE119	LZ935220ZRC	Lenovo	N/A	N/A

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 3/10 meters 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 EUT was tested while operating in licensed band Rx mode with FM/Camera/MP3. All licensed band receivers that tune in the range of 30MHz-960MHz, as listed in section 3.4, are investigated. Only the worst case emissions are reported.

The model of the PC is M4000E-17, and the serial number of the PC is M706GWXD. 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 (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/3MHz	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): U = 5.54 dB, k=2.

Measurement results for Set.3-1, GSM850 idle, charger UC11(PUAN):

Note: This was the worst case for GSM850MHz/WCDMA850MHz/LTE band 12/13/26/71 with charger.

Charging Mode/QP detector

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)
40.379000	15.72	29.54	13.82	175.0	V	-9.0
59.973000	9.95	29.54	19.59	125.0	V	281.0
106.630000	7.73	33.06	25.33	183.0	V	30.0
188.498000	16.31	33.06	16.75	125.0	V	-10.0
227.686000	13.20	35.56	22.36	95.0	V	-10.0
760.022000	18.64	35.56	16.92	225.0	H	10.0

Charging Mode/Average detector

Frequency (MHz)	Measurement Result (dBµV/m)	Cable loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBµV)	Limit (dBµV/m)	Margin (dB)	Antenna Pol. (H/V)
17925.200	44.1	-29.4	46.7	26.8	54.0	9.9	H
17976.540	43.8	-29.1	46.7	26.2	54.0	10.2	V
17973.480	43.7	-29.1	46.7	26.1	54.0	10.3	H
17957.840	43.7	-28.9	46.7	26.0	54.0	10.3	H
17968.720	43.7	-29.1	46.7	26.1	54.0	10.3	H
17944.920	43.7	-28.9	46.7	26.0	54.0	10.3	V

Charging Mode/Peak detector

Frequency (MHz)	Measurement Result (dBµV/m)	Cable loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBµV)	Limit (dBµV/m)	Margin (dB)	Antenna Pol. (H/V)
17787.500	56.0	-29.9	46.0	39.9	74.0	18.0	V
17926.900	55.5	-29.4	46.7	38.2	74.0	18.5	H
17408.060	55.4	-29.4	44.4	40.5	74.0	18.6	H
17976.540	55.2	-29.1	46.7	37.6	74.0	18.8	H
17968.720	55.2	-29.1	46.7	37.6	74.0	18.8	V

17936.420	55.2	-29.4	46.7	37.9	74.0	18.8	V

Measurement results for Set.3-2, WCDMA 850 idle, charger UC11(Chenyang):

Note: This was the worst case for GSM850MHz/WCDMA850MHz/LTE band 12/13/26/71 with charger.

Charging Mode/QP detector

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)
45.035000	9.96	29.54	19.58	275.0	H	100.0
100.131000	8.26	33.06	24.80	282.0	V	261.0
110.025000	8.38	33.06	24.68	202.0	V	-30.0
185.200000	7.94	33.06	25.12	202.0	V	-10.0
229.917000	14.19	35.56	21.37	125.0	V	62.0
625.095000	25.81	35.56	9.75	283.0	V	191.0

Charging Mode/Average detector

Frequency (MHz)	Measurement Result (dBµV/m)	Cable loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBµV)	Limit (dBµV/m)	Margin (dB)	Antenna Pol. (H/V)
17978.580	44.0	-29.1	46.7	26.4	54.0	10.0	V
17909.900	43.9	-29.3	46.0	27.3	54.0	10.1	H
18000.000	43.9	-29.2	47.0	26.1	54.0	10.1	H
17988.780	43.8	-29.1	46.7	26.2	54.0	10.2	H
17973.480	43.8	-29.1	46.7	26.2	54.0	10.2	V
17962.260	43.7	-29.1	46.7	26.1	54.0	10.3	V

Charging Mode/Peak detector

Frequency (MHz)	Measurement Result (dBµV/m)	Cable loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBµV)	Limit (dBµV/m)	Margin (dB)	Antenna Pol. (H/V)
17879.0	55.8	-29.4	46.0	39.2	74.0	18.2	V
17929.9	55.3	-29.4	46.7	38.0	74.0	18.7	V
17951.4	55.3	-28.9	46.7	37.6	74.0	18.7	H
17951.6	55.1	-28.9	46.7	37.4	74.0	18.9	H
17987.8	55.0	-29.1	46.7	37.4	74.0	19.0	V
17969.1	55.0	-29.1	46.7	37.4	74.0	19.0	H

Measurement results for Set.4, USB + Camera:

USB Mode/QP detector

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)
30.776000	28.23	29.54	1.31	95.0	V	281.0
102.556000	20.19	33.06	12.87	175.0	V	280.0
148.631000	18.87	33.06	14.19	95.0	V	-10.0
215.949000	21.04	33.06	12.02	203.0	V	152.0
450.010000	28.45	35.56	7.11	325.0	V	80.0
578.729000	27.74	35.56	7.82	225.0	V	-10.0

USB Mode/Average detector

Frequency (MHz)	Measurement Result (dBµV/m)	Cable loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBµV)	Limit (dBµV/m)	Margin (dB)	Antenna Pol. (H/V)
17968.720	44.1	-29.1	46.7	26.5	54.0	9.9	H
17957.160	44.0	-28.9	46.7	26.3	54.0	10.0	V
17985.040	44.0	-29.1	46.7	26.4	54.0	10.0	V
17952.740	44.0	-28.9	46.7	26.3	54.0	10.0	V
17934.720	44.0	-29.4	46.7	26.7	54.0	10.0	V
17954.440	43.9	-28.9	46.7	26.2	54.0	10.1	V

USB Mode/Peak detector

Frequency (MHz)	Measurement Result (dBµV/m)	Cable loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBµV)	Limit (dBµV/m)	Margin (dB)	Antenna Pol. (H/V)
17912.620	56.6	-29.3	46.0	40.0	74.0	17.4	H
17924.180	56.0	-29.4	46.7	38.7	74.0	18.0	H
17992.520	55.8	-29.1	46.7	38.2	74.0	18.2	V
17949.340	55.2	-28.9	46.7	37.5	74.0	18.8	H
17957.500	55.1	-28.9	46.7	37.4	74.0	18.9	H
17906.840	55.1	-29.3	46.0	38.5	74.0	18.9	V

Measurement results for Set.3-1, GSM850 idle, charger UC11(PUAN):

Note: This was the worst case for GSM850MHz/WCDMA850MHz/LTE band 12/13/26/71 with charger.

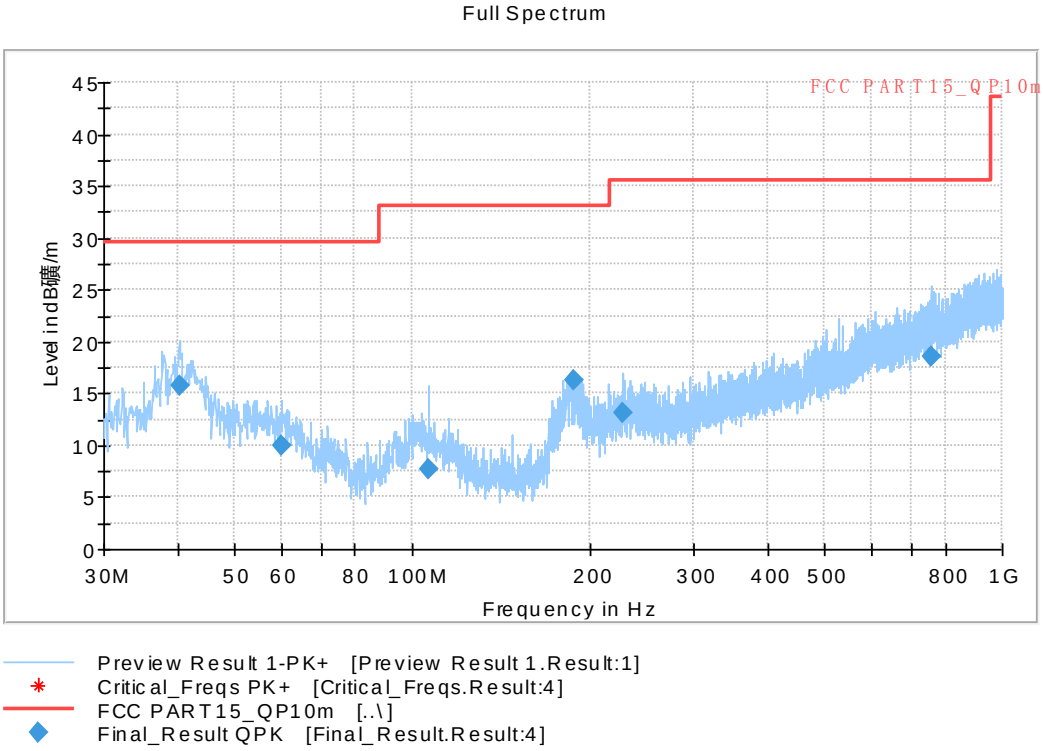

Fig A.1 Radiated Emission from 30MHz to 1GHz

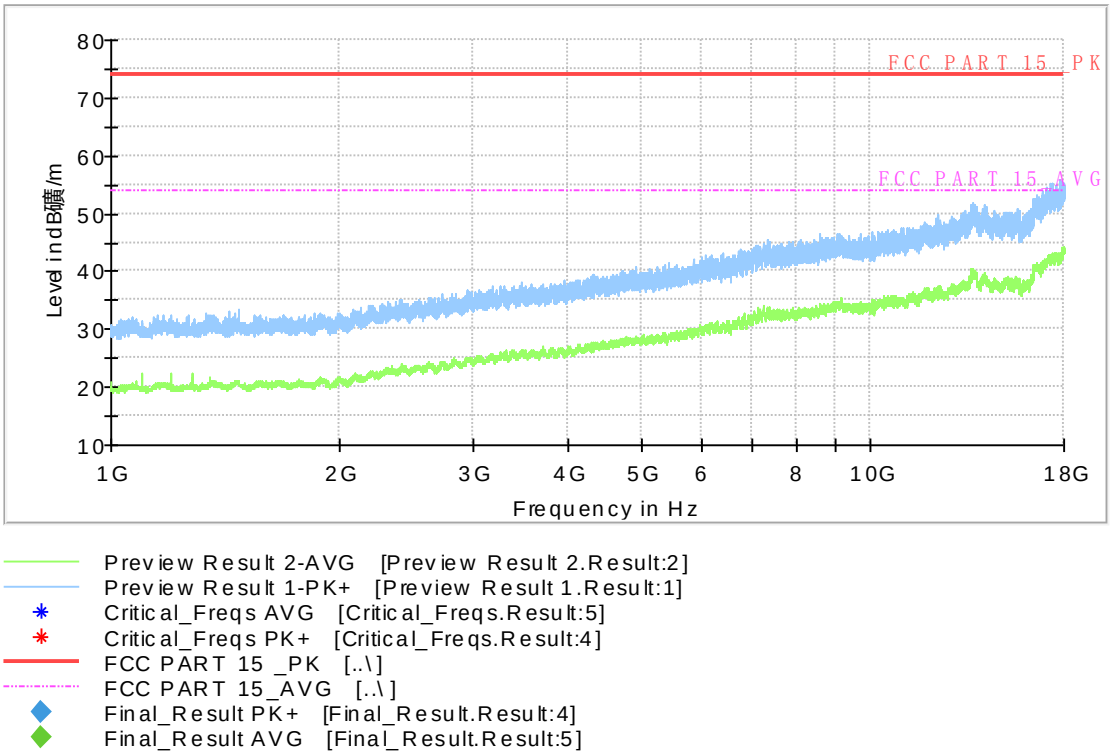

Fig A.2 Radiated Emission from 1GHz to 18GHz

Measurement results for Set.3-2, WCDMA 850 idle, charger UC11(Chenyang):

Note: This was the worst case for GSM850MHz/WCDMA850MHz/LTE band 12/13/26/71 with charger.

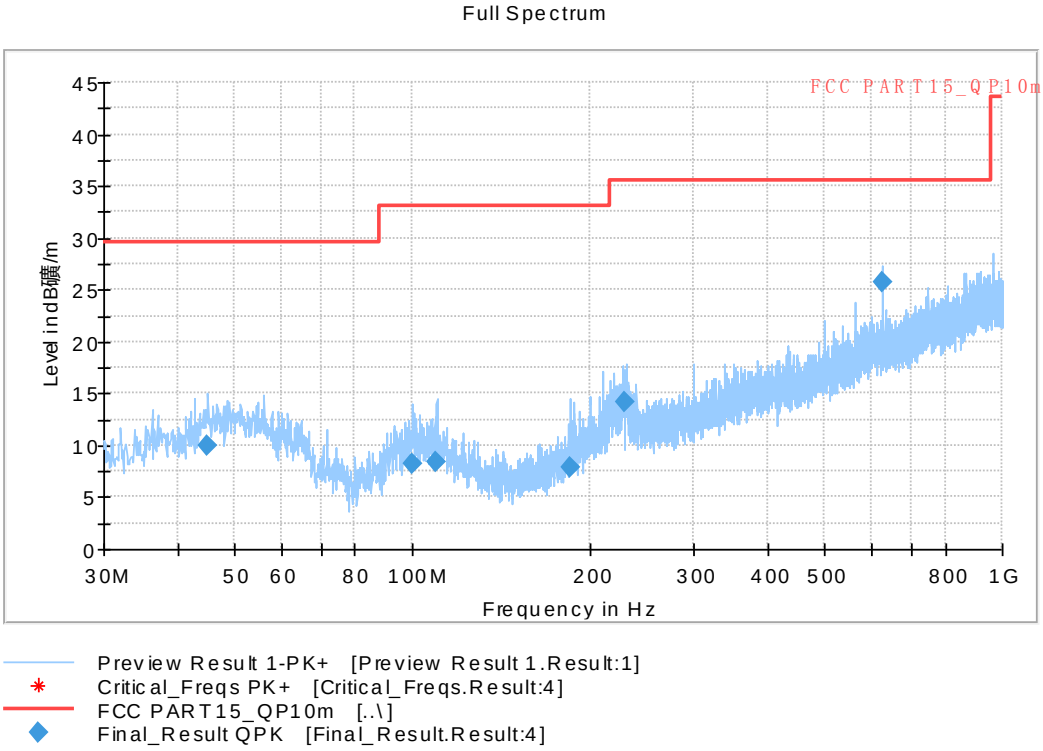

Fig A.3 Radiated Emission from 30MHz to 1GHz

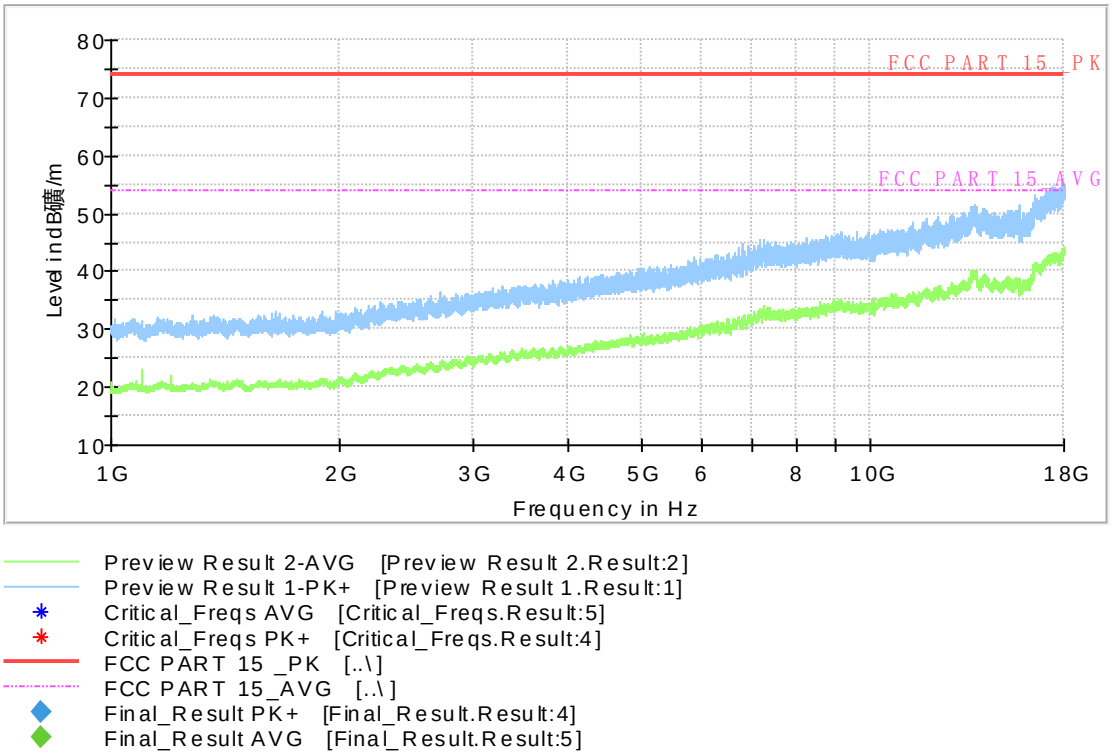

Fig A.4 Radiated Emission from 1GHz to 18GHz

Measurement results for Set.4, USB + Camera:

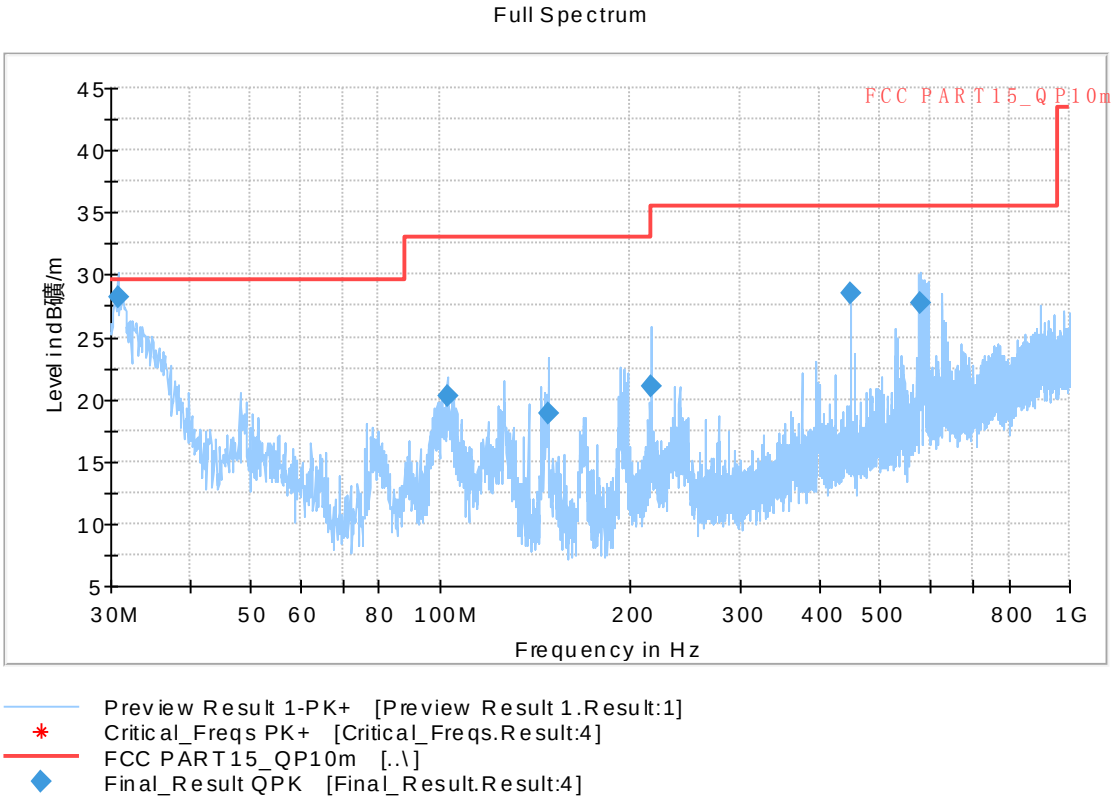

Fig A.5 Radiated Emission from 30MHz to 1GHz

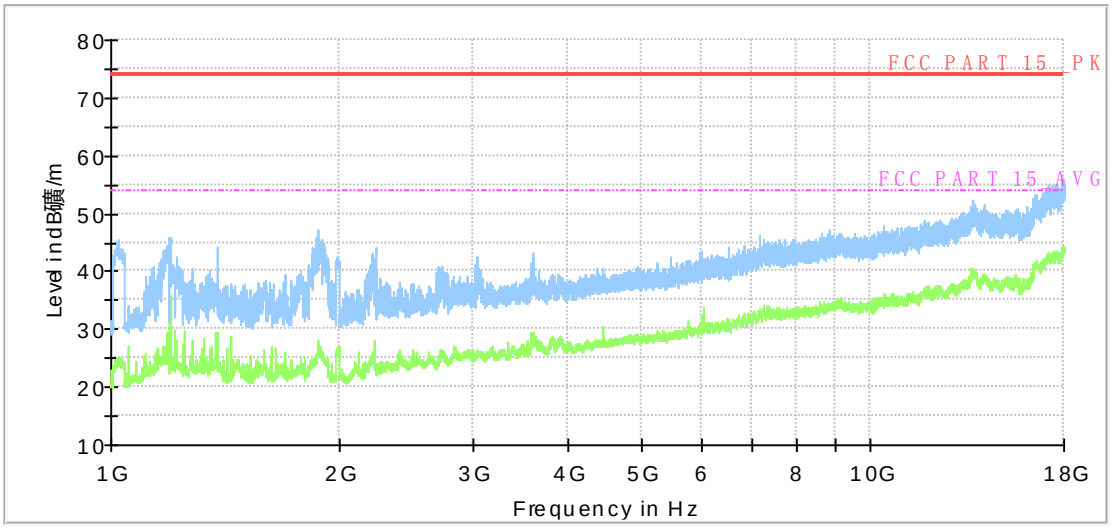

Fig A.6 Radiated Emission from 1GHz to 18GHz

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 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 M4000E-17, and the serial number of the PC is M706GWXD. 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 (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*= 3.08 dB, *k*=2.

Measurement results for Set.3-1, GSM850 idle, charger UC11(PUAN):

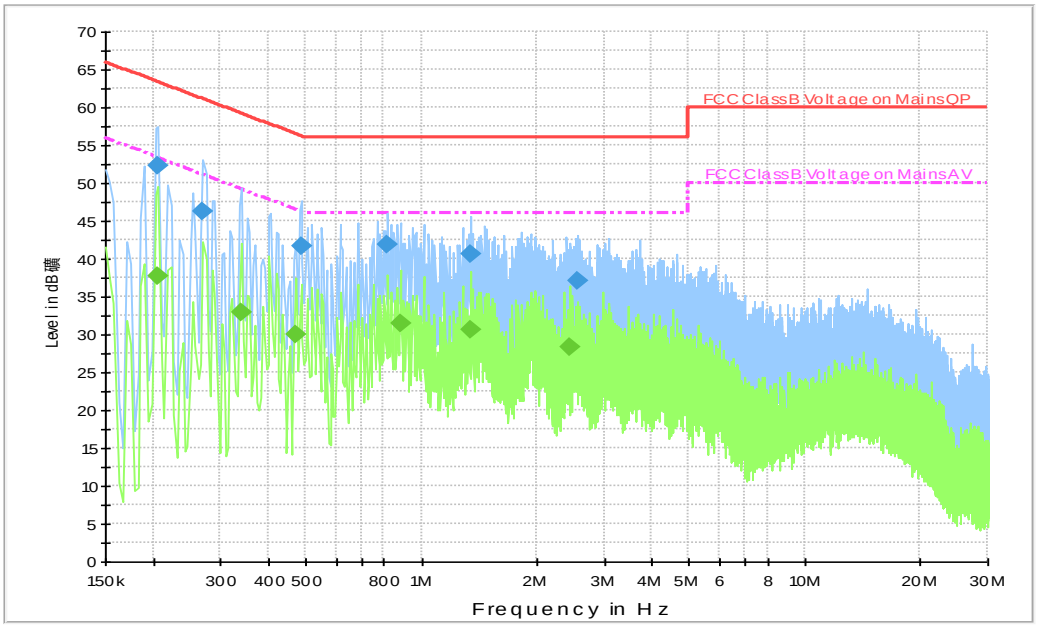

Fig A.7 Conducted Emission

Final Result 1

Frequency (MHz)	QuasiPeak (dBuV)	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.206000	52.3	L1	20.0	11.1	63.4
0.270000	46.3	L1	20.0	14.8	61.1
0.486000	41.6	N	20.0	14.6	56.2
0.818000	41.9	L1	19.6	14.1	56.0
1.342000	40.5	L1	19.5	15.5	56.0
2.554000	37.1	L1	19.5	18.9	56.0

Final Result 2

Frequency (MHz)	Average (dBuV)	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.206000	37.7	L1	20.0	15.6	53.4
0.338000	32.9	L1	20.0	16.4	49.3
0.470000	30.0	L1	19.9	16.5	46.5
0.882000	31.5	L1	19.6	14.5	46.0
1.346000	30.6	L1	19.5	15.4	46.0
2.454000	28.4	L1	19.5	17.6	46.0

Measurement results for Set.3-2, WCDMA 850 idle, charger UC11(Chenyang):

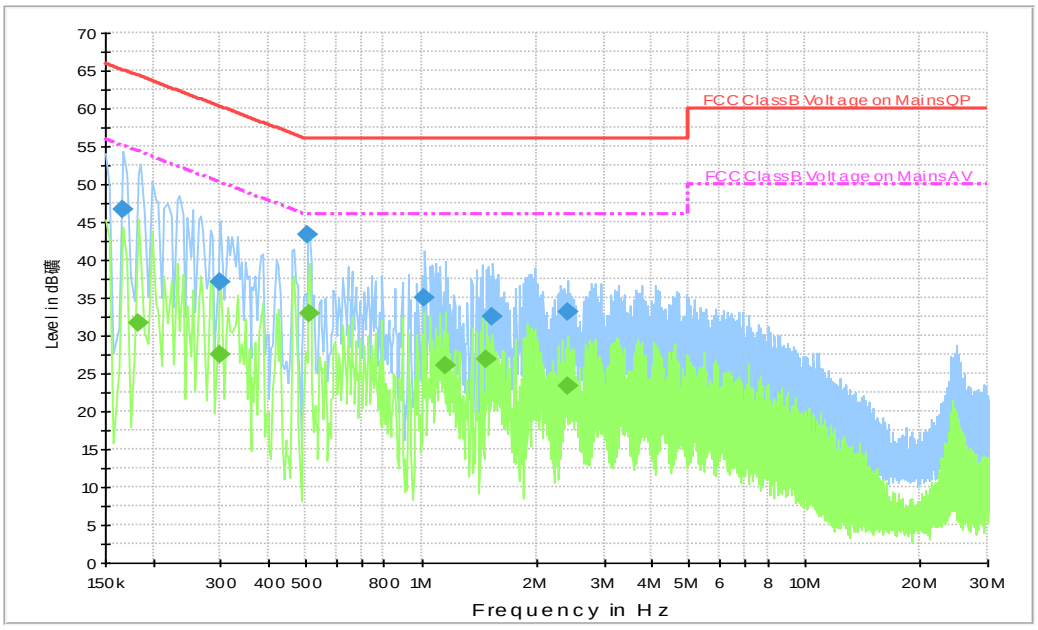

Fig A.8 Conducted Emission

Final Result 1

Frequency (MHz)	QuasiPeak (dBuV)	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.166000	46.7	L1	20.0	18.4	65.2
0.298000	37.2	L1	20.0	23.1	60.3
0.506000	43.3	L1	19.9	12.7	56.0
1.022000	35.0	L1	19.6	21.0	56.0
1.538000	32.5	L1	19.5	23.5	56.0
2.418000	33.0	L1	19.5	23.0	56.0

Final Result 2

Frequency (MHz)	Average (dBuV)	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.182000	31.7	L1	20.0	22.6	54.4
0.298000	27.4	L1	20.0	22.9	50.3
0.510000	32.9	L1	19.9	13.1	46.0
1.154000	26.1	L1	19.6	19.9	46.0
1.474000	26.9	L1	19.5	19.1	46.0
2.418000	23.4	L1	19.5	22.6	46.0

Measurement results for Set.4, USB + Camera:

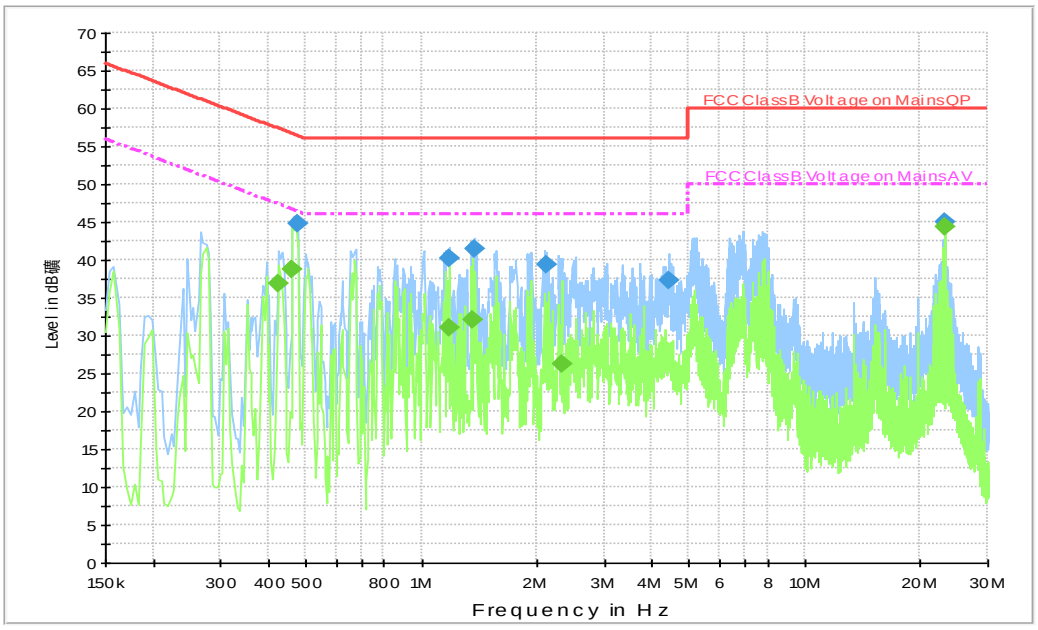

Fig A.9 Conducted Emission

Final Result 1

Frequency (MHz)	QuasiPeak (dBuV)	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.474000	44.9	N	20.0	11.6	56.4
1.182000	40.2	L1	19.5	15.8	56.0
1.382000	41.5	L1	19.5	14.5	56.0
2.126000	39.4	N	19.8	16.6	56.0
4.426000	37.3	N	19.7	18.7	56.0
23.126000	44.9	L1	19.9	15.1	60.0

Final Result 2

Frequency (MHz)	Average (dBuV)	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.426000	37.0	L1	19.9	10.4	47.3
0.462000	38.7	L1	19.9	7.9	46.7
1.182000	30.9	L1	19.5	15.1	46.0
1.358000	32.1	L1	19.5	13.9	46.0
2.330000	26.3	N	19.8	19.7	46.0
23.126000	44.3	L1	19.9	5.7	50.0

ANNEX B: PERSONS INVOLVED IN THIS TESTING

Test Item	Test Software and Version	Software Vendor	Test operator
Conducted Emission	EMC32 V8.5.2	R&S	Ding Zai
Radiated Emission	EMC32 V9.01.00	R&S	Meng Qingbo

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