TEST REPORT
No. I20Z61079-EMC01

TCL Communication Ltd.

GSM/UMTS/LTE Mobile phone

Model Name: 5002B

FCC ID: 2ACCJH118

with

Hardware Version: PIO

Software Version: v3C7K

Issued Date: 2020-07-17

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
I20Z61079-EMC01	Rev.0	1st edition	2020-07-17

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 (BDA)

Address: No.18A, Kangding Street, Beijing Economic-Technology Development Area, Beijing, P. R. China 100176

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: 2019-11-07

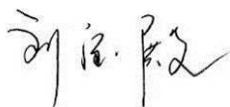Testing End Date: 2020-07-15

1.5. Signature

Li Yan

(Prepared this test report)

Zhang Ying

(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:	5/F, Building 22E, 22 Science Park East Avenue,Hong Kong Science Park, Shatin, NT, Hong Kong
City:	/
Postal Code:	/
Country:	/
Contact:	Gong Zhizhou
Email:	zhizhou.gong@tcl.com
Telephone:	0086-755-36611722

2.2. Manufacturer Information

Company Name:	TCL Communication Ltd.
Address:	5/F, Building 22E, 22 Science Park East Avenue,Hong Kong Science Park, Shatin, NT, Hong Kong
City:	/
Postal Code:	/
Country:	/
Contact:	Gong Zhizhou
Email:	zhizhou.gong@tcl.com
Telephone:	0086-755-36611722

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

3.1. About EUT

Description   GSM/UMTS/LTE Mobile phone
Model Name   5002B
FCC ID   2ACCJH118
Extreme vol. Limits   3.5VDC to 4.4VDC (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, CAICT.

3.2. Internal Identification of EUT used during the test

EUT ID*	SN or IMEI	HW Version	SW Version
EUT5	/	/	/
EUT51	355632150200088	PIO	v3C7K

*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	Battery	/	/
AE3	Charger	/	/
AE4	Charger	/	/
AE5	USB cable	/	/
AE6	USB cable	/	/
AE7	Headset	/	/
AE8	Headset	/	/
AE9	Headset	/	No test
AE10	Headset	/	No test

AE1
  Model   CAB2880001C1,
  Manufacturer   BYD
  Capacitance   3000mAh
  Nominal voltage   /
AE2
  Model   CAB2880000C7
  Manufacturer   VK
  Capacitance   3000mAh
  Nominal voltage   /
AE3
  Model   CBA0058AGAC5
  Manufacturer   PUAN

Length of cable /
AE4
  Model CBA0058AGAC7
  Manufacturer CHENYANG
  Length of cable /
AE5
  Model CDA3122005C8
  Manufacturer PUAN
  Length of cable /
AE6
  Model CDA3122005C1
  Manufacturer JUWEI
  Length of cable /
AE7
  Model CCB0046A10C4
  Manufacturer Meihao
  Length of cable /
AE8
  Model CCB0046A10C1
  Manufacturer Juwei
  Length of cable /
AE9
  Model CCB0049A10C1
  Manufacturer Juwei
  Length of cable /
AE10
  Model CCB0049A10C4
  Manufacturer Meihao
  Length of cable /

Note: The USB cables are shielded.

3.4. <u>General Description</u>

The device contains receivers which tune and operate between 30MHz-960MHz in the following bands: GSM850, WCDMA Band 5, LTE Band 5, LTE Band 13, and LTE BAND 17.

3.5. EUT set-ups

EUT set-up No.	Combination of EUT and AE	Remarks
Set.1	EUT5+ AE1/AE2 +AE3+ AE5/AE6	Charger+ MP3+GPS
Set.2	EUT5+ AE1/AE2 +AE4+ AE5/AE6	Charger+CAMERA
Set.3	EUT5+ AE1/AE2 +AE5/AE6+AE7/AE8	USB mode+ FM
Set.11	EUT51+ AE1 + AE3 + AE5	Charger+Camera+GSM850
Set.12	EUT51+ AE1 + AE5 + AE8	USB mode+ MP4+LTEB5

Note:

5002B is a variant product based on 5002A, according to the declaration of changes provided by the applicant and FCC KDB publication 178919 D01; the following items are tested on Set.11, Set.12.

Mode or Feature	EUT set-up No	Test Item
Charger+Camera+GSM850	Set.11	Radiated Emission
USB mode+ MP4+LTEB5	Set.12	Radiated Emission

Other results share the initial model. The initial model report number is I19Z62042-EMC01.

For detail differences between two models please refer the Declaration of Changes document.

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	2019
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×17 meters×10 meters) did not exceed following limits along the EMC testing:

Temperature	Min. = 15 ℃, Max. = 35 ℃
Relative humidity	Min. = 15 %, Max. = 75 %
Shielding effectiveness	0.014MHz - 1MHz, >60dB; 1MHz - 1000MHz, >90dB.
Electrical insulation	> 2 MΩ
Ground system resistance	< 4Ω
Normalised site attenuation (NSA)	**<** ± 4 dB, 3m/10m distance, from 30 to 1000 MHz
Site voltage standing-wave ratio (S_{VSWR})	Between 0 and 6 dB, from 1GHz to 18GHz
Uniformity of field strength	Between 0 and 6 dB, from 80 to 6000 MHz

Semi-anechoic chamber SAC-2 (10 meters×6.7meters×6.1meters) did not exceed following limits along the EMC testing:

Temperature	Min. = 15 ℃, Max. = 35 ℃
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, from 30 to 1000 MHz
Site voltage standing-wave ratio (S_{VSWR})	Between 0 and 6 dB, from 1GHz to 18GHz
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 ℃, Max. = 35 ℃
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
	BR	Re-use test data from basic model report.

Items	Test Name	Clause in FCC rules	Section in this report	Verdict	Test Location
1	Radiated Emission	15.109(a)	A.1	P	**CTTL(BDA) CTTL(Huayuan North Road)**
2	Conducted Emission	15.107(a)	A.2	BR	**CTTL(BDA)**

7. <u>Test Equipment Utilized</u>

NO.	Description	TYPE	SERIES NUMBER	MANUFACTURE	CAL DUE DATE	CALIBRATION INTERVAL
1	Test Receiver	ESU26	100376	R&S	2020-10-30	1 year
2	Test Receiver	ESCI	100766	R&S	2020-03-20	1 year
3	Universal Radio Communication Tester	CMW500	127406	R&S	2020-01-19	1 year
4	Universal Radio Communication Tester	CMW500	159408	R&S	2020-03-03	1 year
5	LISN	ENV216	101459	R&S	2020-04-10	1 year
6	EMI Antenna	VULB9163	9163-514	Schwarzbeck	2020-02-03	1 year
7	EMI Antenna	3117	00119021	ETS-Lindgren	2020-01-04	1 year
8	Signal Generator	SMF100A	101295	R&S	2020-11-06	1 year
9	EMI Antenna	VULB 9163	483	Schwarzbeck	2020-09-17	1 year
10	EMI Antenna	3117	00139065	ETS-Lindgren	2020-11-15	1 year
11	Test Receiver	ESU26	100235	Rohde & Schwarz	2021-03-05	1 year
12	Printer	P1606dn	VNC3L52122	HP	N/A	N/A
13	Keyboard	KU-1601	2048361	Lenovo	N/A	N/A
14	Mouse	EMS-537A	8021S3MC	Lenovo	N/A	N/A
15	Keyboard	L100	CN0RH6596589 07ATOI40	DELL	N/A	N/A
16	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

Note: The test equipment listed in line 9-10 is used this time. Other equipment was before Cal Due Date when used.

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(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
T The MS is operating in the USB mode and 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 the Section 3.4, are investigated. Only the worst case emissions are reported.
The model of the PC is Lenovo M4000e-17, and the serial number of the PC is M706RMW2. 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.
Limit (10m) = limit (3m) + 20(log (3/10))

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：5.40dB, 1GHz-18GHz：4.32dB, *k*=2.

Measurement results

Charger+Camera+GSM850 /Average detector Set.11

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)
17902.533	48.9	-5.7	43.4	11.238	54.0	5.1	H
17963.733	48.7	-5.4	33.8	20.316	54.0	5.3	H
17959.767	48.3	-5.4	43.4	10.316	54.0	5.7	V
17985.267	48.2	-5.4	43.4	10.216	54.0	5.8	H
17947.300	48.2	-5.4	43.4	10.216	54.0	5.8	H
17997.733	48.2	-5.4	43.4	10.216	54.0	5.8	H

Charger+Camera+GSM850 /Peak detector Set.11

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)
17969.400	58.0	-5.4	43.4	20.016	74.0	16.0	H
17985.833	57.8	-5.4	33.8	29.416	74.0	16.2	H
17999.433	57.2	-5.4	43.4	19.216	74.0	16.8	V
17971.667	57.0	-5.4	43.4	19.016	74.0	17.0	H
17960.900	56.8	-5.4	43.4	18.816	74.0	17.2	H
17960.333	56.5	-5.4	43.4	18.516	74.0	17.5	H

USB mode+ MP4+LTE Band5 /Average detector Set.12

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)
17975.633	49.1	-5.4	43.4	11.116	54.0	4.9	H
17956.367	48.7	-5.4	33.8	20.316	54.0	5.3	H
17993.767	48.6	-5.4	43.4	10.616	54.0	5.4	V
17979.033	48.5	-5.4	43.4	10.516	54.0	5.5	H
17990.933	48.4	-5.4	43.4	10.416	54.0	5.6	H
17973.933	48.3	-5.4	43.4	10.316	54.0	5.7	H

USB mode+ MP4+LTE Band5 /Peak detector Set.12

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)
17962.033	57.4	-5.4	43.4	19.416	74.0	16.6	H
17994.900	57.0	-5.4	33.8	28.616	74.0	17.0	H
17998.300	56.9	-5.4	43.4	18.916	74.0	17.1	V
17943.333	56.8	-5.4	43.4	18.816	74.0	17.2	H
17877.600	56.6	-5.7	43.4	18.938	74.0	17.4	H
17871.367	56.6	-5.7	43.4	18.938	74.0	17.4	H

Reference Result

Charging Mode+ MP3+GNSS /Average detector Set.1

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)
17985.500	39.0	-25.8	41.3	23.53	54.0	15.0	V
17978.000	38.8	-25.9	41.3	23.31	54.0	15.2	V
17976.000	38.7	-25.9	41.3	23.31	54.0	15.3	V
17982.000	38.7	-25.8	41.3	23.28	54.0	15.3	V
17969.500	38.7	-25.9	41.3	23.32	54.0	15.3	V
17966.500	38.7	-25.9	41.3	23.32	54.0	15.3	V

Charging Mode+ MP3+GNSS /Peak detector Set.1

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)
17889.000	51.2	-26.2	41.3	36.14	74.0	22.8	H
17382.500	51.1	-26.5	41.3	36.35	74.0	22.9	H
17896.500	51.0	-26.2	41.3	35.90	74.0	23.0	H
17960.500	50.9	-25.9	41.3	35.55	74.0	23.1	V
17965.000	50.8	-25.9	41.3	35.38	74.0	23.2	V
17612.000	50.7	-26.5	41.2	35.90	74.0	23.3	V

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

Charging Mode+ CAMERA /Average detector Set.2

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)
17969.000	38.8	-25.9	41.3	23.43	54.0	15.2	H
17984.000	38.8	-25.8	41.3	23.31	54.0	15.2	V
17985.500	38.8	-25.8	41.3	23.29	54.0	15.2	V
17988.000	38.7	-25.8	41.3	23.26	54.0	15.3	V
17935.500	38.7	-26.0	41.3	23.45	54.0	15.3	V
17989.000	38.7	-25.8	41.3	23.23	54.0	15.3	V

Charging Mode+ CAMERA /Peak detector Set.2

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)
17885.500	51.1	-26.2	41.3	36.09	74.0	22.9	V
17077.500	51.1	-26.2	41.6	35.68	74.0	22.9	V
17852.500	51.0	-26.4	41.3	36.14	74.0	23.0	H
17948.500	51.0	-26.0	41.3	35.67	74.0	23.0	V
17979.500	50.9	-25.8	41.3	35.45	74.0	23.1	H
17511.000	50.9	-26.3	41.2	36.01	74.0	23.1	H

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

USB Mode +FM /Average detector Set.3

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)
17979.000	38.85	-25.8	41.3	23.41	54.0	15.1	V
17980.500	38.84	-25.8	41.3	23.38	54.0	15.2	V
17938.500	38.82	-26.0	41.3	23.55	54.0	15.2	V
17988.500	38.80	-25.8	41.3	23.33	54.0	15.2	V
17988.000	38.80	-25.8	41.3	23.32	54.0	15.2	V
17970.500	38.80	-25.9	41.3	23.39	54.0	15.2	V

USB Mode +FM /Peak detector Set.3

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)
3584.000	51.94	-35.2	33.2	53.96	74.0	22.1	H
3590.000	51.85	-35.2	33.2	53.89	74.0	22.1	H
17108.500	51.14	-26.0	41.6	35.56	74.0	22.9	H
17908.000	51.13	-26.1	41.3	36.00	74.0	22.9	V
17953.000	50.91	-26.0	41.3	35.58	74.0	23.1	V
17966.500	50.86	-25.9	41.3	35.47	74.0	23.1	H

Note:

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

Measurement result

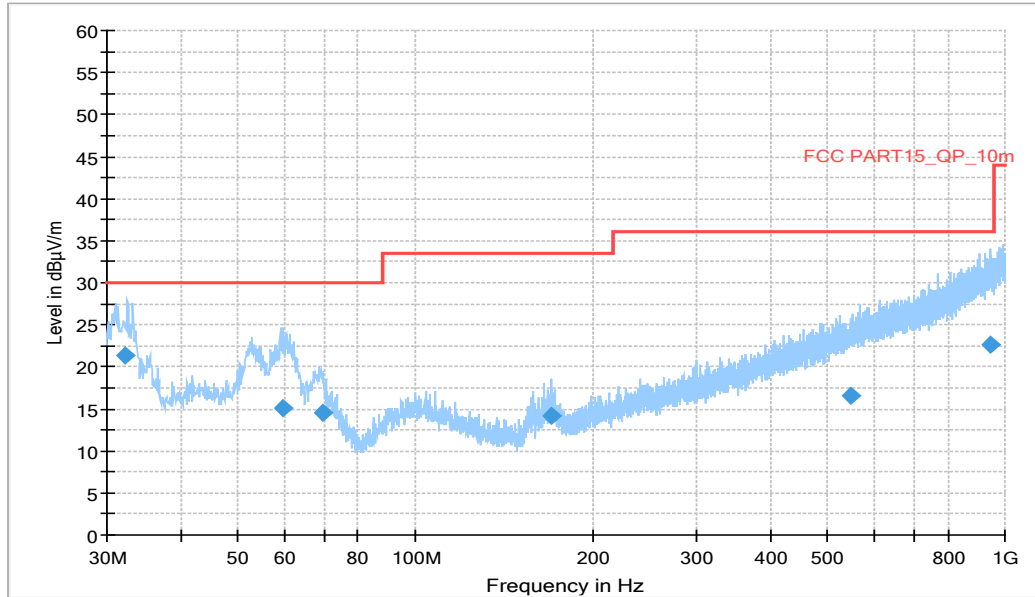**Charger+Camera+GSM850, Set.11**

Full Spectrum

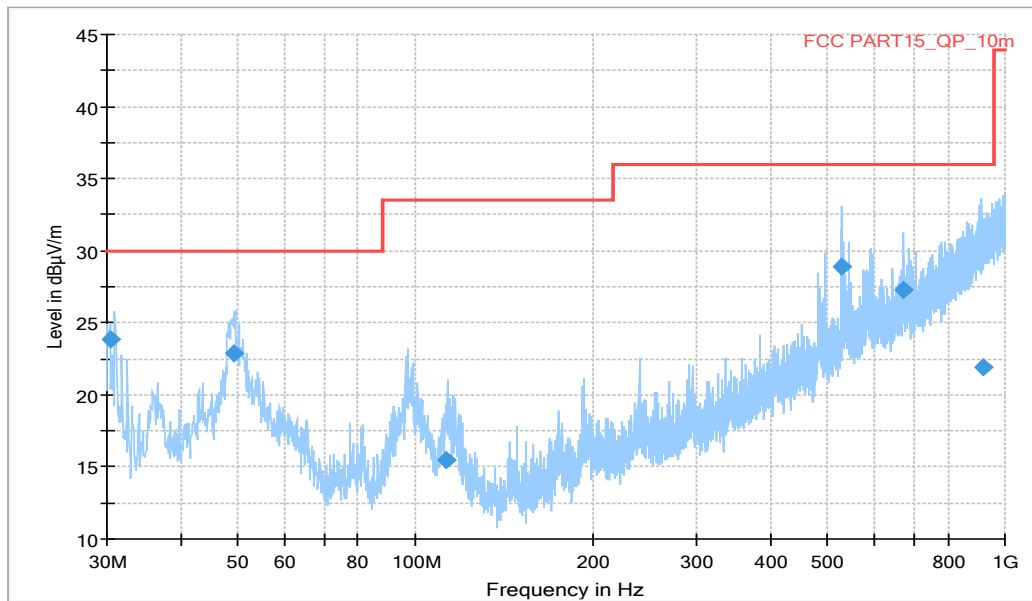**Figure A.1 Radiated Emission from 30MHz to 1GHz**

Final Result 1

Frequency	QuasiPeak	Height	Polarization	Azimuth	Margin	Limit
(MHz)	(dBµV/m)	(cm)		(deg)	(dB)	(dBµV/m)
32.102000	21.30	214.0	V	16.0	8.70	30.00
59.580000	15.16	125.0	V	153.0	14.84	30.00
69.909000	14.51	187.0	V	-28.0	15.49	30.00
170.75600	14.10	110.0	V	120.0	19.42	33.50
548.78800	16.61	184.0	V	182.0	19.41	36.00
947.74000	22.56	103.0	H	-28.0	13.46	36.00

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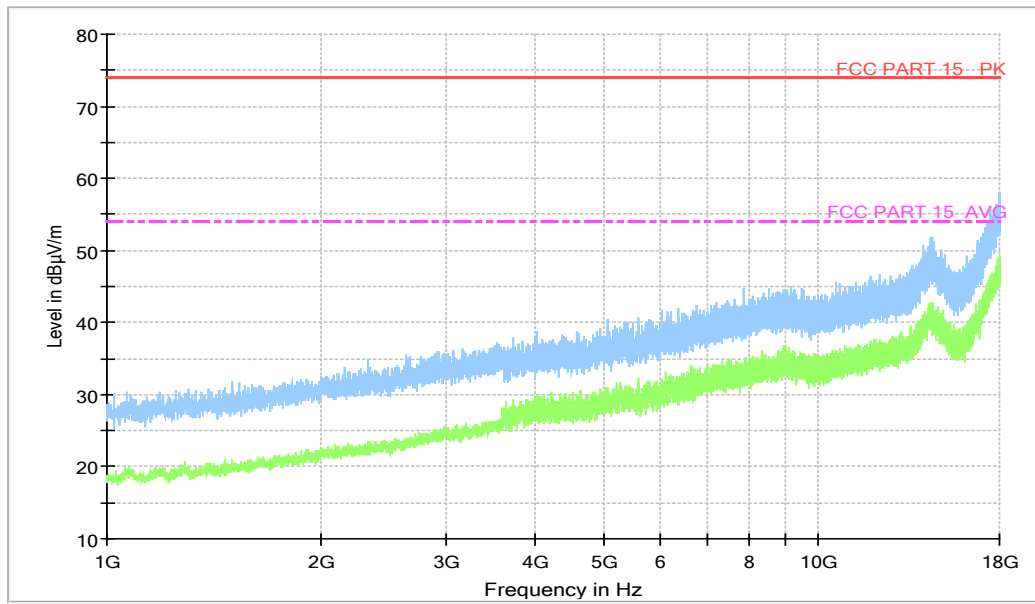
Figure A.2 Radiated Emission from 1GHz to 18GHz

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USB mode+ MP4+LTE B5, Set.12

Full Spectrum

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

Final Result 1

Frequency (MHz)	QuasiPeak (dBμV/m)	Height (cm)	Polarization	Azimuth (deg)	Margin (dB)	Limit (dBμV/m)
30.370000	23.90	102.0	V	270.0	6.10	30.00
49.294000	22.89	114.0	V	266.0	7.11	30.00
113.13800	15.43	177.0	V	163.0	18.09	33.50
528.95000	28.92	225.0	V	-3.0	7.10	36.00
673.88600	27.24	200.0	V	-19.0	8.78	36.00
915.48500	21.89	115.0	H	300.0	14.13	36.00

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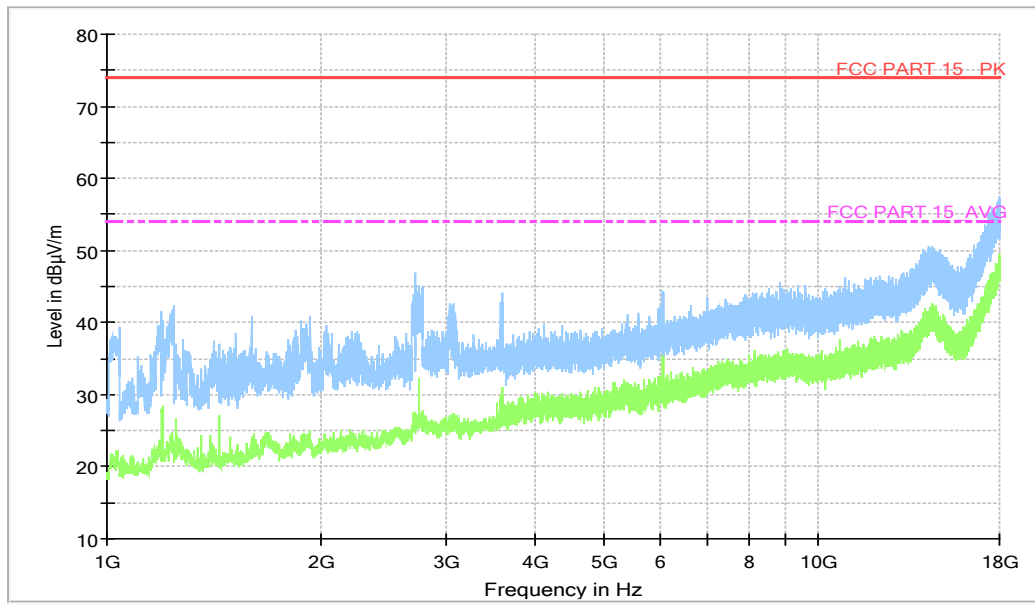
Figure A.4 Radiated Emission from 1GHz to 18GHz

Reference Result
Charging Mode + MP3+GNSS, Set.1

15B RE 30MHz-1GHz
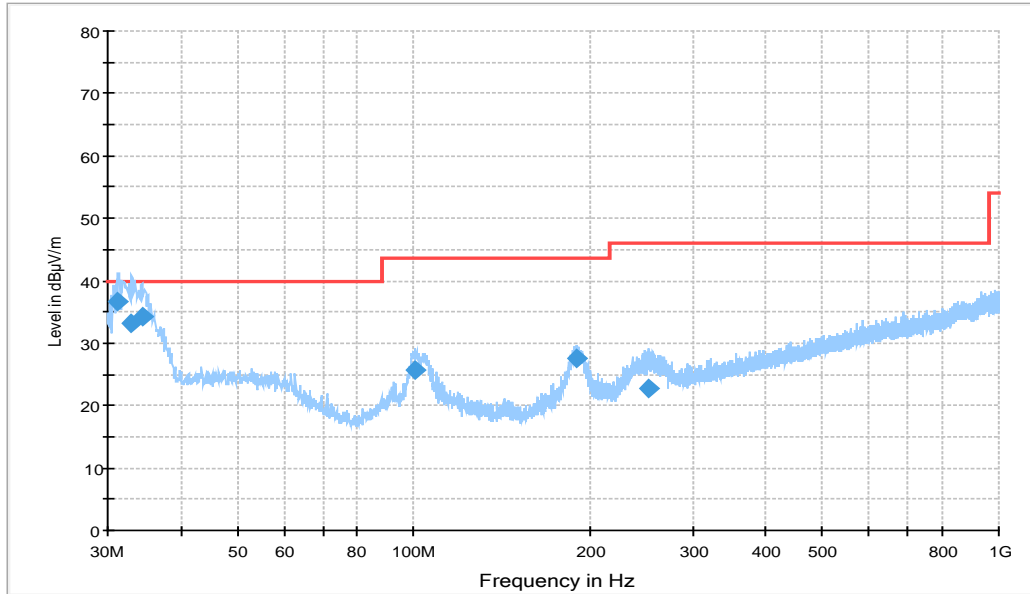
Note: the spike（98MHz）is coming from FM signal source.

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

Final Result 1

Frequency (MHz)	QuasiPeak (dBμV/m)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
31.261000	36.6	100.0	V	124.0	-0.8	3.4	40.0
33.007000	33.1	100.0	V	55.0	-0.5	6.9	40.0
34.365000	34.2	100.0	V	135.0	-0.3	5.8	40.0
100.61600	25.6	100.0	V	211.0	-0.9	17.9	43.5
189.66200	27.5	100.0	H	203.0	-2.2	16.0	43.5
251.35400	22.8	125.0	H	69.0	0.4	23.2	46.0

15B RE - 1GHz-3GHz
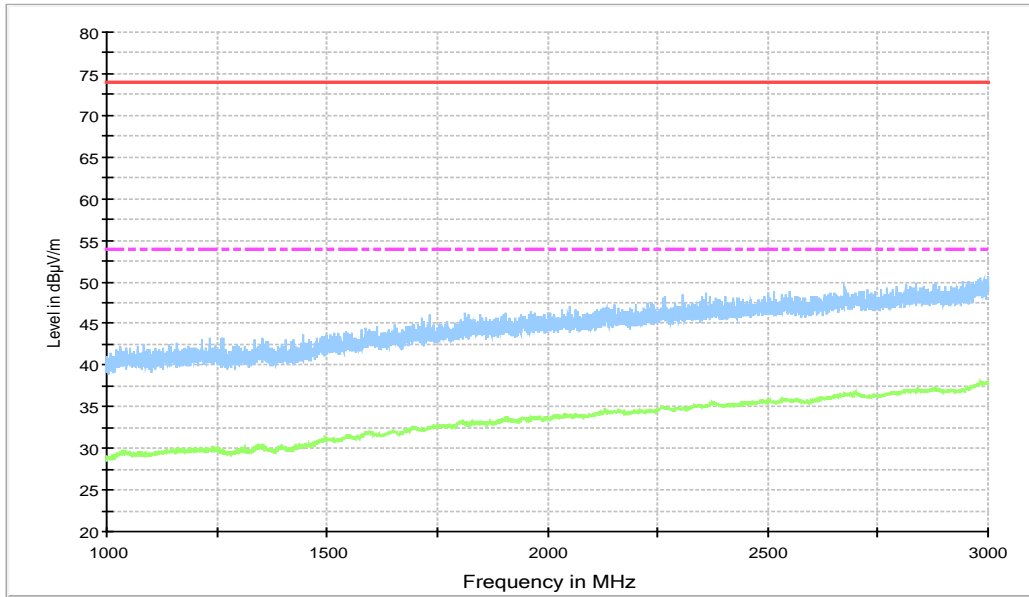
Figure A.6 Radiated Emission from 1GHz to 3GHz
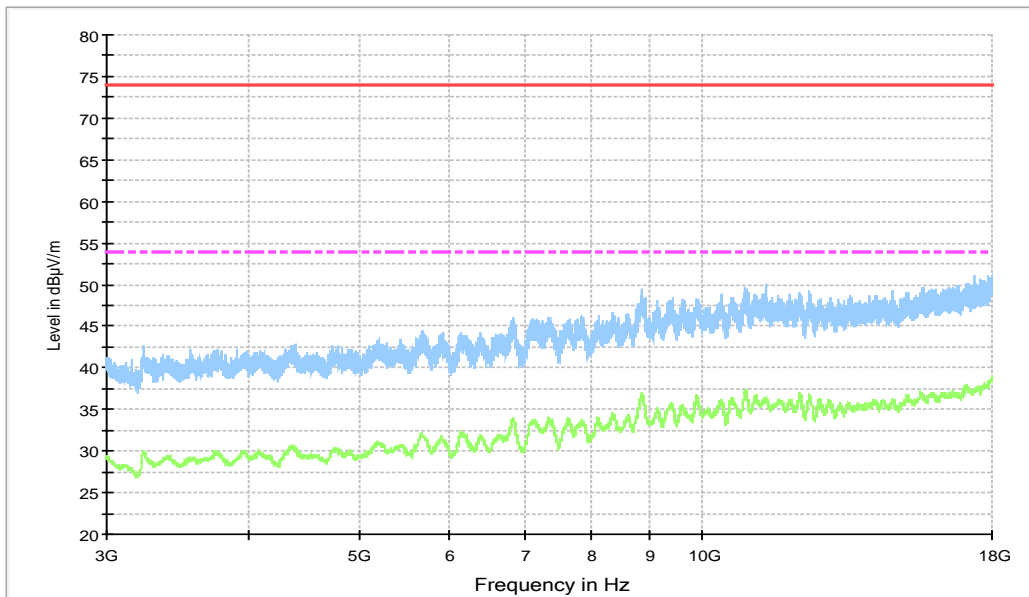
15b RE - 3GHz-18GHz

Figure A.7 Radiated Emission from 3GHz to 18GHz

Note: The measurement results showed here are worst cases of the combinations of different USB cables.
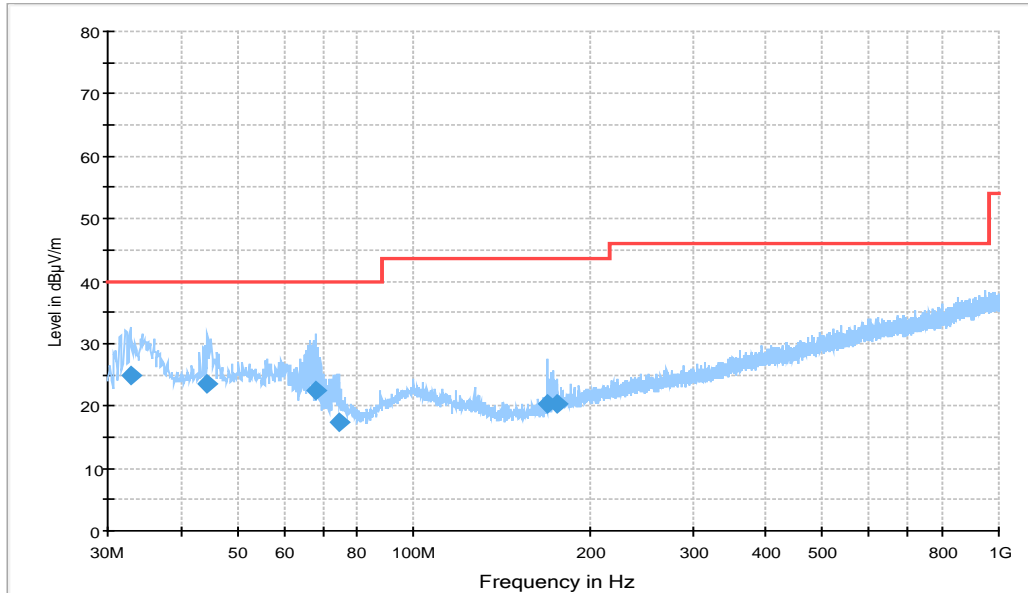
Charging Mode+ CAMERA, Set.2

15B RE 30MHz-1GHz

Figure A.8 Radiated Emission from 30MHz to 1GHz

Final Result 1

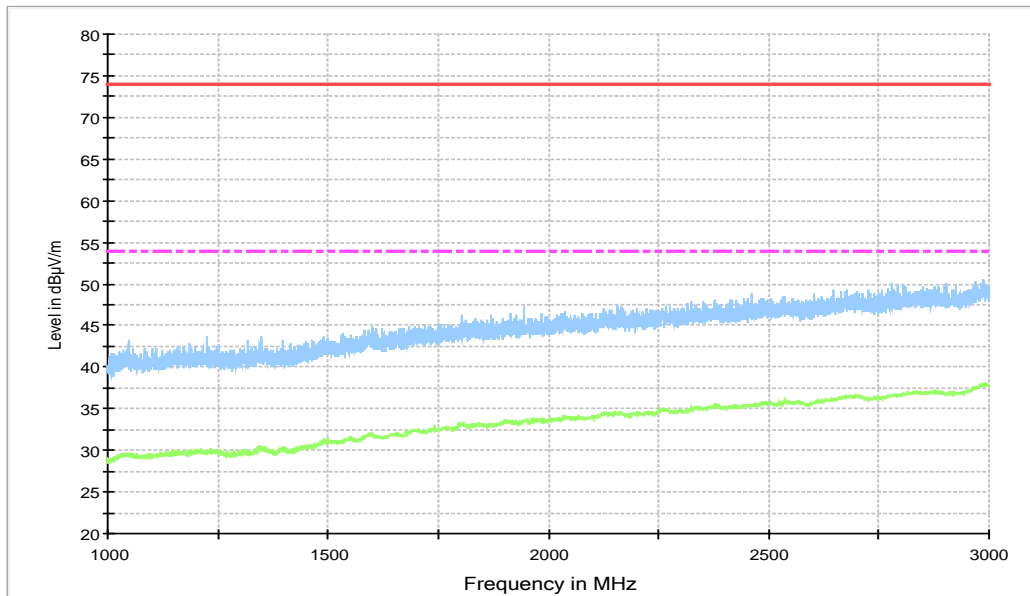| Frequency (MHz)	QuasiPeak (dBμV/m)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
32.813000	24.9	100.0	V	118.0	-0.5	15.1	40.0
44.453000	23.5	100.0	V	110.0	0.7	16.5	40.0
67.830000	22.4	100.0	V	-38.0	-3.4	17.6	40.0
74.523000	17.5	100.0	V	225.0	-5.0	22.5	40.0
169.58300	20.3	100.0	V	4.0	-3.3	23.2	43.5
175.98500	20.5	100.0	V	14.0	-3.0	23.0	43.5

15B RE - 1GHz-3GHz

Figure A.9 Radiated Emission from 1GHz to 3GHz
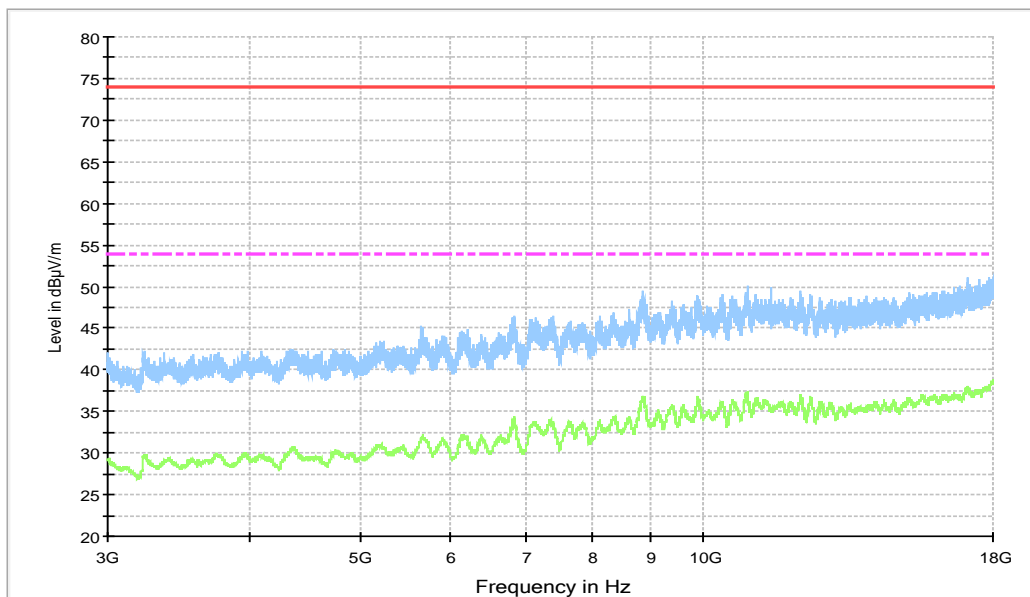
15b RE - 3GHz-18GHz

Figure A.10 Radiated Emission from 3GHz to 18GHz

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

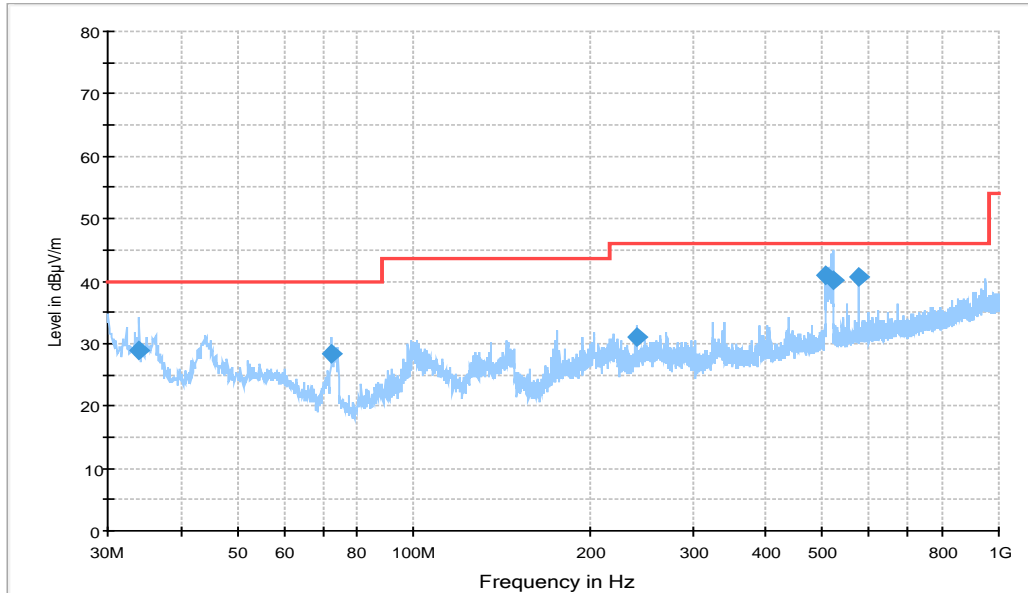**USB Mode +FM, Set.3**

15B RE 30MHz-1GHz

Figure A.11 Radiated Emission from 30MHz to 1GHz

Final Result 1

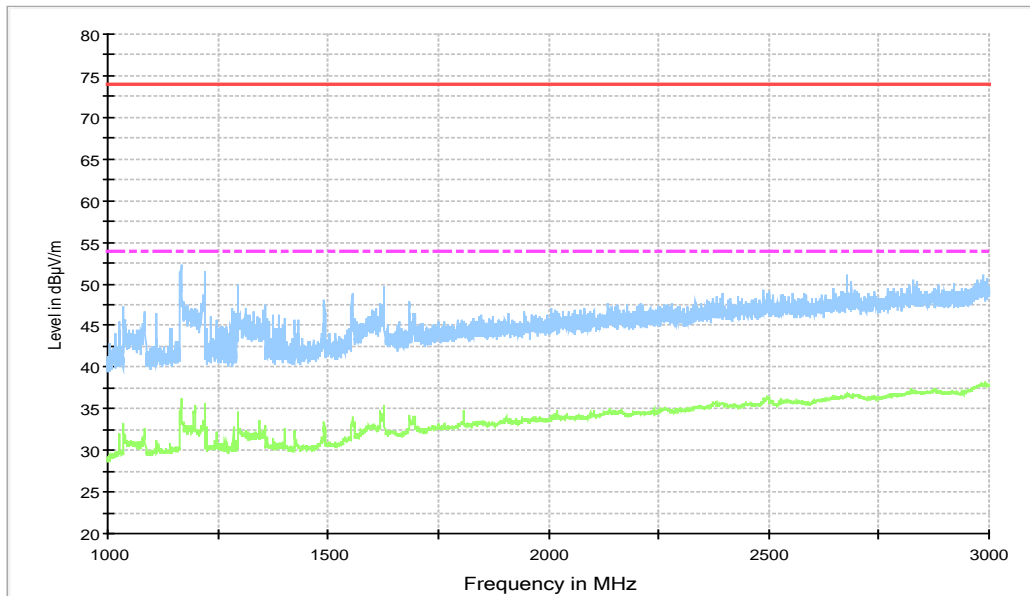| Frequency (MHz)	QuasiPeak (dBµV/m)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
33.880000	29.0	100.0	V	301.0	-0.4	11.0	40.0
72.292000	28.4	100.0	V	-11.0	-4.7	11.6	40.0
240.00500	31.1	100.0	H	63.0	0.4	14.9	46.0
506.94900	41.0	100.0	V	-18.0	7.3	5.0	46.0
519.85000	40.2	100.0	V	0.0	7.5	5.8	46.0
576.01300	40.7	119.0	H	45.0	8.7	5.3	46.0

15B RE - 1GHz-3GHz

Figure A.12 Radiated Emission from 1GHz to 3GHz
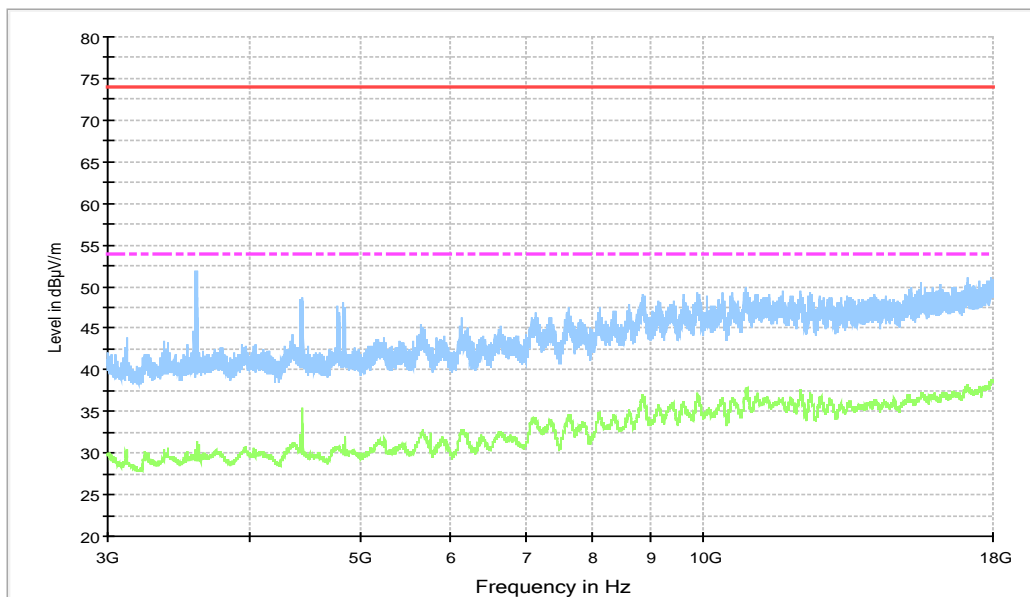
15b RE - 3GHz-18GHz

Figure A.13 Radiated Emission from 3GHz to 18GHz

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

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. During the charging mode (set.1) the EUT is keeping on playing MP3 and the GNSS application is started up. During the charging mode (set.2) the camera is keeping on taking photos. During the USB mode the FM application is started up. The model of the PC is Lenovo M4000e-17, and the serial number of the PC is M706RMW2. 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*= 3.10 dB, *k*=2.

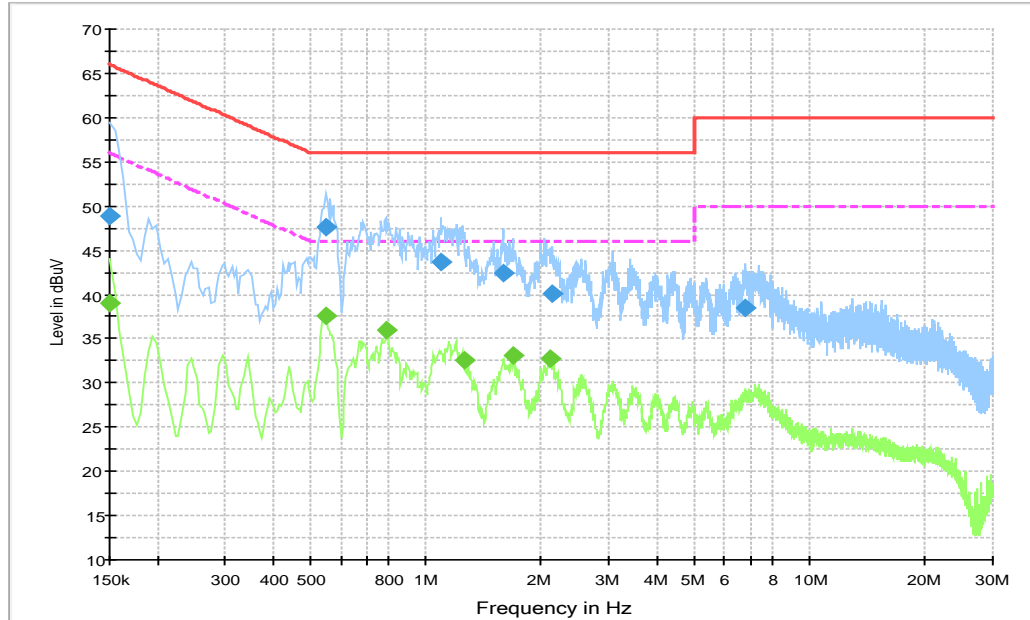**Charging Mode +MP3+GNSS, Set.1**

Figure A.14 Conducted Emission

Final Result 1

Frequency (MHz)	QuasiPeak (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.150000	48.9	10000.0	9.000	On	N	28.9	17.1	66.0
0.550500	47.6	10000.0	9.000	On	L1	20.0	8.4	56.0
1.095000	43.6	10000.0	9.000	On	L1	19.9	12.4	56.0
1.594500	42.4	10000.0	9.000	On	L1	19.8	13.6	56.0
2.125500	40.1	10000.0	9.000	On	L1	19.8	15.9	56.0
6.823500	38.4	10000.0	9.000	On	L1	19.9	21.6	60.0

Final Result 2

Frequency (MHz)	Average (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.150000	39.0	10000.0	9.000	On	L1	28.9	17.0	56.0
0.550500	37.5	10000.0	9.000	On	L1	20.0	8.5	46.0
0.793500	36.0	10000.0	9.000	On	L1	19.9	10.0	46.0
1.257000	32.6	10000.0	9.000	On	L1	19.8	13.4	46.0
1.684500	33.1	10000.0	9.000	On	L1	19.8	12.9	46.0
2.098500	32.7	10000.0	9.000	On	L1	19.8	13.3	46.0

Note: The measurement results showed here are worst cases of the combinations of different USB cables.
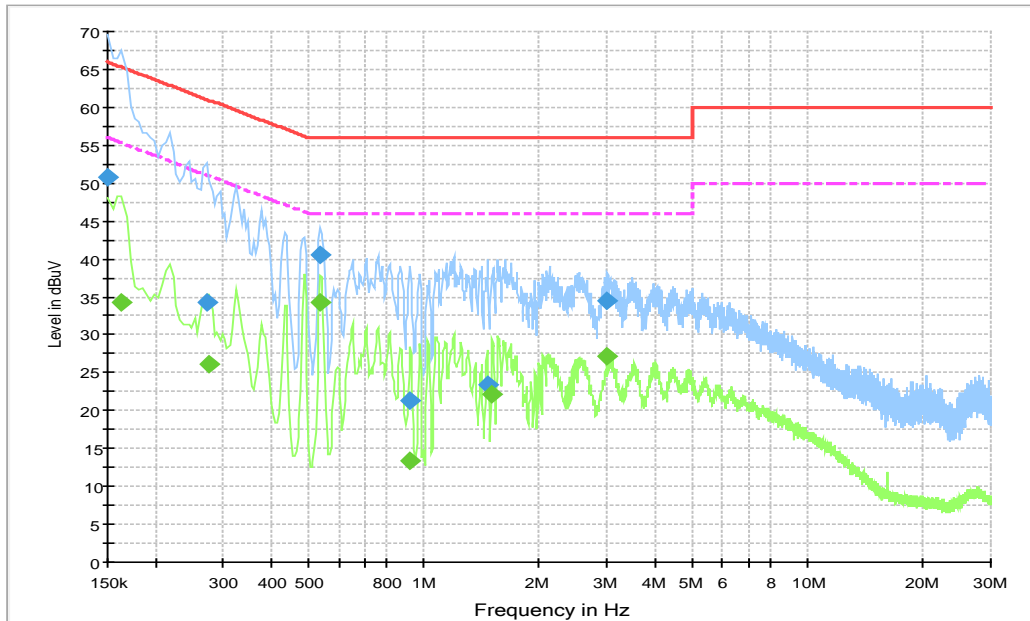
. **Charging Mode + CAMERA, Set.2**

Figure A.15 Conducted Emission

Final Result 1

Frequency (MHz)	QuasiPeak (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.150000	50.8	10000.0	9.000	On	L1	28.9	15.2	66.0
0.271500	34.2	10000.0	9.000	On	N	19.9	26.8	61.1
0.537000	40.5	10000.0	9.000	On	L1	20.0	15.5	56.0
0.924000	21.3	10000.0	9.000	On	L1	19.9	34.7	56.0
1.464000	23.3	10000.0	9.000	On	L1	19.8	32.7	56.0
3.012000	34.5	10000.0	9.000	On	L1	19.8	21.5	56.0

Final Result 2

Frequency (MHz)	Average (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.163500	34.2	10000.0	9.000	On	L1	26.3	21.1	55.3
0.276000	26.2	10000.0	9.000	On	L1	20.0	24.7	50.9
0.537000	34.3	10000.0	9.000	On	L1	20.0	11.7	46.0
0.924000	13.4	10000.0	9.000	On	L1	19.9	32.6	46.0
1.509000	22.1	10000.0	9.000	On	L1	19.8	23.9	46.0
3.007500	27.2	10000.0	9.000	On	L1	19.8	18.8	46.0

Note: The measurement results showed here are worst cases of the combinations of different USB cables.
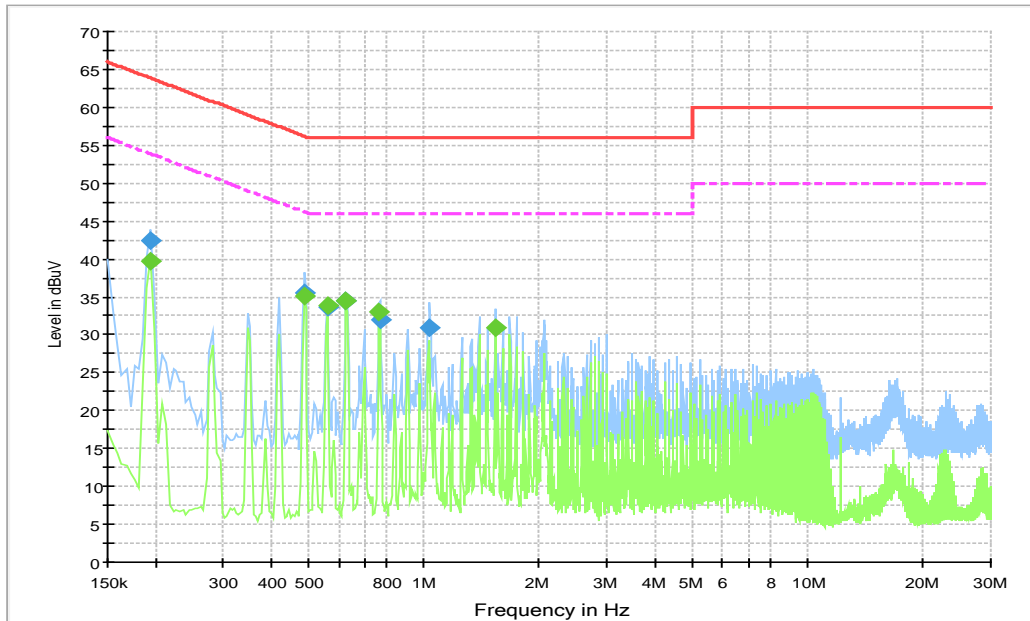
.**USB Mode +FM, Set.3**

Figure A.16 Conducted Emission

Final Result 1

Frequency (MHz)	QuasiPeak (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.195000	42.3	10000.0	9.000	On	L1	20.8	21.5	63.8
0.487500	35.6	10000.0	9.000	On	N	20.0	20.6	56.2
0.559500	33.6	10000.0	9.000	On	N	20.0	22.4	56.0
0.627000	34.5	10000.0	9.000	On	L1	20.0	21.5	56.0
0.771000	32.0	10000.0	9.000	On	N	19.9	24.0	56.0
1.036500	30.9	10000.0	9.000	On	N	19.9	25.1	56.0

Final Result 2

Frequency (MHz)	Average (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.195000	39.7	10000.0	9.000	On	L1	20.8	14.1	53.8
0.487500	35.0	10000.0	9.000	On	N	20.0	11.2	46.2
0.559500	33.8	10000.0	9.000	On	N	20.0	12.2	46.0
0.627000	34.5	10000.0	9.000	On	N	20.0	11.5	46.0
0.766500	33.1	10000.0	9.000	On	N	19.9	12.9	46.0
1.536000	31.0	10000.0	9.000	On	L1	19.8	15.0	46.0

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

ANNEX B: Persons involved in this testing

Test Item	Tester
Radiated Emission	Zhao Wenhui Wang Huan
Conducted Emission	Guo Qian

END OF REPORT