



TEST REPORT

No. I21Z70342-EMC01

for

Samsung Electronics Co., Ltd.

Multi-band GSM/WCDMA/LTE phone with Bluetooth, WLAN

Model Name: SM-A037F/DS, SM-A037F

FCC ID: ZCASMA037F

with

Hardware Version: REV1.0

Software Version: A037F.001

Issued Date: 2021-07-13

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
I21Z70342-EMC01	Rev.0	1 st edition	2021-07-13

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

CONTENTS

1. TEST LABORATORY	4
1.1. INTRODUCTION & ACCREDITATION	4
1.2. TESTING LOCATION	4
1.3. TESTING ENVIRONMENT	4
1.4. PROJECT DATA	4
1.5. SIGNATURE.....	4
2. CLIENT INFORMATION	5
2.1. APPLICANT INFORMATION.....	5
2.2. MANUFACTURER INFORMATION.....	5
3. EQUIPMENT UNDER TEST (EUT) AND ANCILLARY EQUIPMENT (AE)	6
3.1. ABOUT EUT.....	6
3.2. INTERNAL IDENTIFICATION OF EUT USED DURING THE TEST	6
3.3. INTERNAL IDENTIFICATION OF AE USED DURING THE TEST.....	6
3.4. GENERAL DESCRIPTION	8
3.5. EUT SET-UPS	8
4. REFERENCE DOCUMENTS.....	9
4.1. REFERENCE DOCUMENTS FOR TESTING.....	9
5. LABORATORY ENVIRONMENT.....	10
6. SUMMARY OF TEST RESULTS.....	11
6.1. SUMMARY OF TEST RESULTS.....	11
6.2. STATEMENTS.....	11
7. TEST EQUIPMENTS UTILIZED.....	12
ANNEX A: MEASUREMENT RESULTS	13
ANNEX B: PERSONS INVOLVED IN THIS TESTING	39

1. Test Laboratory

1.1. Introduction & Accreditation

Telecommunication Technology Labs, CAICT is an ISO/IEC 17025:2017 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 ISCED accredited test laboratory (ISED#: 24849). 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

1.3. Testing Environment

Normal Temperature: 15-35°C

Relative Humidity: 20-75%

1.4. Project data

Testing Start Date: 2021-06-05

Testing End Date: 2021-07-05

1.5. Signature



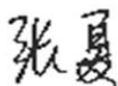
Li Yan

(Prepared this test report)



Zhang Ying

(Reviewed this test report)



Zhang Xia

Deputy Director of the laboratory

(Approved this test report)

2. Client Information

2.1. Applicant Information

Company Name: Samsung Electronics Co., Ltd.
Address: 19 Chapin Rd., Building D Pine Brook, NJ 07058
City: /
Postal Code: /
Country: /
Contact: Jenni Chun
Email: j1.chun@samsung.com
Telephone: +1-201-937-4203

2.2. Manufacturer Information

Company Name: Samsung Electronics. Co., Ltd.
Address: Samsung R5, Maetan dong 129, Samsung ro
Youngtong gu, Suwon city 443 742, Korea
City: /
Postal Code: /
Country: /
Contact: 조성훈(Sunghoon Cho)
Email: ggobi.cho@samsung.com
Telephone: +82-10-2722-4159

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

3.1. About EUT

Description	Multi-band GSM/WCDMA/LTE phone with Bluetooth, WLAN
Model Name	SM-A037F/DS, SM-A037F
FCC ID	ZCASMA037F
Extreme vol. Limits	3.6VDC to 4.4VDC (nominal: 4.0VDC)

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*	IMEI/SNI	HW Version	SW Version	Date of receipt
UT025a	2170258UT25a	/	/	2021.06.04

*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	Charger1	/	/
AE2	Charger2	/	/
AE3	Charger3	/	/
AE4	Charger4	/	/
AE5	Charger5	/	/
AE6	USB cable	/	/
AE7	Headset1	/	/
AE8	Headset2	/	/
AE9	battery	/	/
AE10	Charger6	/	No test
AE11	Charger7	/	No test
AE12	Charger8	/	No test
AE13	Charger9	/	No test
AE14	Charger10	/	No test

AE1

Model	EP-TA50JWE
Manufacturer	HAEM Co.,Ltd
Length of cable	/

AE2

Model	EP-TA50JWE
Manufacturer	RFTech Electronics(HuiZhou)Co.,LTD
Length of cable	/

AE3	
Model	EP-TA50UWE
Manufacturer	Dong Yang
Length of cable	/
AE4	
Model	EP-TA50UWE
Manufacturer	HAEM Co.,Ltd
Length of cable	/
AE5	
Model	EP-TA50UWE
Manufacturer	Salcomp
Length of cable	/
AE6	
Model	EP-DR140AWE
Manufacturer	Samsung Electronics Co., Ltd.
Length of cable	/
AE7	
Model	EHS61ASFWE
Manufacturer	DONGGUAN YOUNGBO ELECTRONICS CO.,LTD
Length of cable	/
AE8	
Model	EHS61ASFWE
Manufacturer	WATA ELECTRONICS CO.,LTD
Length of cable	/
AE9	
Type	Secondary Li-ion Battery
SN	HQ-50S
Manufacturer	SUCD(FUJIAN) Electronics Co.,Ltd
AE10	
Model	EP-TA50JWS
Manufacturer	HAEM Co.,Ltd
Length of cable	/
AE11	
Model	EP-TA50JWS
Manufacturer	RFTech Electronics(HuiZhou)Co.,LTD
Length of cable	/
AE12	
Model	EP-TA50UWS
Manufacturer	Dong Yang
Length of cable	/
AE13	
Model	EP-TA50JWE
Manufacturer	Dong Yang
Length of cable	/

AE14

Model EP-TA50UWE
Manufacturer RFTech Electronics(HuiZhou)Co.,LTD
Length of cable /

Note: The USB cables are shielded.

3.4. General Description

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

3.5. EUT set-ups

EUT set-up No.	Combination of EUT and AE	Remarks
Set.1	UT25a + AE1 + AE6+ AE7	Charger1+ Rear Camera+ Headset1
Set.2	UT25a + AE2 + AE6	Charger2+MP4+RX mode
Set.3	UT25a + AE3 + AE6	Charger3+Front Camera+ RX mode
Set.4	UT25a + AE4 + AE6+ AE7	Charger4+FM+Headset1
Set.5	UT25a + AE5 + AE6+ AE8	Charger5+FM+Headset2
Set.6	UT25a + AE6 + AE8	USB SD TO PC +MP3 +RX mode+ Headset2

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-2 (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, 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 °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

6.1. 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	BR	CTTL(BDA)
2	Conducted Emission	15.107(a)	A.2	BR	CTTL(BDA)

6.2. Statements

SM-A037F/DS,SM-A037F is a variant product based on SM-A037M/DS,SM-A037M(FCC ID: ZCASMA037M), according to the declaration of changes provided by the applicant and FCC KDB publication 484596 D01; all results share the initial model.

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

The initial report number is I21Z70258-EMC01.

The only difference between SM-A037F and SM-A037F/DS is Dual SIM slot rack and Single SIM slot rack.

7. Test Equipments Utilized

NO.	Description	TYPE	SERIES NUMBER	MANUFACTURE	CAL DUE DATE	CALIBRATION INTERVAL
1	Test Receiver	ESU26	100376	R&S	2021-09-04	1 year
2	Test Receiver	ESCI	100766	R&S	2022-03-16	1 year
3	LISN	ENV216	101459	R&S	2022-03-09	1 year
4	BiLog Antenna	VULB9163	9163-482	Schwarzbeck	2021-11-04	1 year
5	EMI Antenna	3117	00139065	ETS-Lindgren	2021-10-11	1 year
6	Universal Radio Communication Tester	CMW500	159408	R&S	2022-03-08	1 year
7	Signal Generator	SMBV100A	R&S	260613	2022-01-06	1 Year
8	Printer	P1606dn	VNC3L52122	HP	N/A	N/A
9	Keyboard	KU-1601	2048361	Lenovo	N/A	N/A
10	Mouse	EMS-537A	8021S3MC	Lenovo	N/A	N/A
11	PC	M4000e-17	M706RMW2	Lenovo	N/A	N/A

Test Item	Test Software and Version	Software Vendor
Radiated Continuous Emission	EMC32 V9.01.00	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 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 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, charging mode, MP4, CAMERA, FM, SD and License RX band 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 FM radio mode radiated testing was performed with the Low/Mid/High channel. Only the worst cases 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.

Note: I/O information: Printer – USB, Mouse – PS/2, Keyboard – USB.

A.1.3 Measurement Limit

Frequency range (MHz)	Field strength limit ($\mu\text{V/m}$)		
	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/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:

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

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 for Set.1:

Charger1+ Rear Camera /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)
17994.000	43.57	-22.8	41.3	25.04	54.0	10.4	V
17986.500	43.55	-22.8	41.3	25.05	54.0	10.5	V
17985.500	43.51	-22.8	41.3	25.01	54.0	10.5	V
17981.500	43.46	-22.8	41.3	24.95	54.0	10.5	H
17980.500	43.46	-22.8	41.3	24.95	54.0	10.5	V
17987.500	43.46	-22.8	41.3	24.96	54.0	10.5	V

Charger1+ Rear Camera /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)
17989.000	55.6	-22.8	41.3	37.06	74.0	18.4	V
17043.000	55.5	-23.0	41.7	36.90	74.0	18.5	V
17855.500	55.5	-22.5	41.3	36.77	74.0	18.5	V
17001.000	55.3	-23.0	41.7	36.67	74.0	18.7	H
17907.500	55.3	-22.6	41.3	36.67	74.0	18.7	V
17033.500	55.3	-23.0	41.7	36.65	74.0	18.7	V

Measurement results for Set.2:
Charger2+ MP4 + RX mode GSM850/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)
17984.000	43.59	-22.8	41.3	25.08	54.0	10.4	V
17977.500	43.54	-22.8	41.3	25.02	54.0	10.5	V
17978.000	43.52	-22.8	41.3	25.01	54.0	10.5	V
17989.000	43.52	-22.8	41.3	25.01	54.0	10.5	V
17905.000	43.48	-22.6	41.3	24.83	54.0	10.5	V
17985.000	43.46	-22.8	41.3	24.96	54.0	10.5	V

Charger2+ MP4+ RX mode GSM850 /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)
17952.000	55.68	-22.7	41.3	37.11	74.0	18.3	H
17694.500	55.64	-22.2	41.2	36.56	74.0	18.4	V
17734.500	55.43	-22.3	41.2	36.44	74.0	18.6	V
17992.000	55.37	-22.8	41.3	36.85	74.0	18.6	V
17756.500	55.34	-22.3	41.3	36.39	74.0	18.7	V
17634.500	55.33	-22.0	41.2	36.13	74.0	18.7	V

Measurement results for Set.3:
Charger3+ Front Camera+ RX mode WCDMA B5 /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)
17987.500	43.55	-22.8	41.3	25.05	54.0	10.4	V
17988.500	43.53	-22.8	41.3	25.02	54.0	10.5	V
17979.000	43.49	-22.8	41.3	24.98	54.0	10.5	V
17980.500	43.48	-22.8	41.3	24.97	54.0	10.5	V
17982.000	43.46	-22.8	41.3	24.95	54.0	10.5	V
17986.000	43.46	-22.8	41.3	24.95	54.0	10.5	H

Charger3+ Front Camera+ RX mode WCDMA B5 /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)
16999.500	56.6	-23.0	41.7	37.91	74.0	17.4	V
16960.500	56.0	-23.0	41.7	37.38	74.0	18.0	V
17866.000	55.6	-22.5	41.3	36.87	74.0	18.4	H
17918.000	55.6	-22.7	41.3	36.93	74.0	18.4	V
16970.500	55.4	-23.0	41.7	36.69	74.0	18.6	H
17606.500	55.2	-22.2	41.2	36.22	74.0	18.8	H

Measurement results for Set.4:
Charger4+ Headset1+FM 98MHz /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)
17982.500	43.65	-22.8	41.3	25.14	54.0	10.4	V
17989.500	43.63	-22.8	41.3	25.12	54.0	10.4	V
17985.000	43.54	-22.8	41.3	25.03	54.0	10.5	H
17986.500	43.53	-22.8	41.3	25.03	54.0	10.5	V
17983.500	43.53	-22.8	41.3	25.02	54.0	10.5	V
17981.000	43.50	-22.8	41.3	24.99	54.0	10.5	V

Charger4+ Headset1+ FM 98MHz /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)
17989.500	55.9	-22.8	41.3	37.42	74.0	18.1	H
17985.000	55.6	-22.8	41.3	37.14	74.0	18.4	H
17962.000	55.6	-22.7	41.3	37.03	74.0	18.4	V
17966.000	55.5	-22.8	41.3	36.96	74.0	18.5	V
17636.000	55.5	-22.0	41.2	36.30	74.0	18.5	V
16931.000	55.5	-23.0	41.7	36.80	74.0	18.5	V

Measurement results for Set.5
Charger5+ Headset2+ FM 88MHz /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)
17985.500	43.52	-22.8	41.3	25.01	54.0	10.5	V
17990.000	43.50	-22.8	41.3	24.99	54.0	10.5	V
17986.000	43.50	-22.8	41.3	25.00	54.0	10.5	H
17981.000	43.50	-22.8	41.3	24.99	54.0	10.5	V
17988.000	43.46	-22.8	41.3	24.96	54.0	10.5	V
17989.500	43.45	-22.8	41.3	24.94	54.0	10.6	V

Charger5+ Headset2+ FM 88MHz /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)
17102.500	56.1	-23.0	41.6	37.51	74.0	17.9	H
17086.000	56.1	-23.0	41.6	37.48	74.0	17.9	V
17939.000	55.8	-22.7	41.3	37.19	74.0	18.2	V
17935.500	55.7	-22.7	41.3	37.11	74.0	18.3	V
17132.000	55.6	-23.0	41.6	37.07	74.0	18.4	V
16907.000	55.6	-23.0	41.6	36.98	74.0	18.4	H

Measurement results for Set.6:
USB (SD) mode+ RX mode LTE B5 /Average detector

Frequency (MHz)	Measurement Result (dB μ V/m)	Cable loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dB μ V)	Limit (dB μ V/m)	Margin (dB)	Antenna Pol. (H/V)
17984.500	43.74	-22.8	41.3	25.23	54.0	10.3	V
17988.500	43.72	-22.8	41.3	25.22	54.0	10.3	V
17987.000	43.70	-22.8	41.3	25.20	54.0	10.3	V
17985.000	43.70	-22.8	41.3	25.19	54.0	10.3	V
17978.000	43.66	-22.8	41.3	25.14	54.0	10.3	V
17989.500	43.65	-22.8	41.3	25.14	54.0	10.3	V

USB (SD) mode + RX mode LTE B5 /Peak detector

Frequency (MHz)	Measurement Result (dB μ V/m)	Cable loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dB μ V)	Limit (dB μ V/m)	Margin (dB)	Antenna Pol. (H/V)
17599.500	56.9	-22.2	41.2	37.96	74.0	17.1	H
17986.000	56.8	-22.8	41.3	38.34	74.0	17.2	V
17501.500	56.0	-22.9	41.2	37.65	74.0	18.0	V
17809.000	55.9	-22.4	41.3	37.07	74.0	18.1	V
17975.500	55.9	-22.8	41.3	37.33	74.0	18.1	V
17961.000	55.8	-22.7	41.3	37.29	74.0	18.2	V

Charger1+ Rear Camera, Set.1

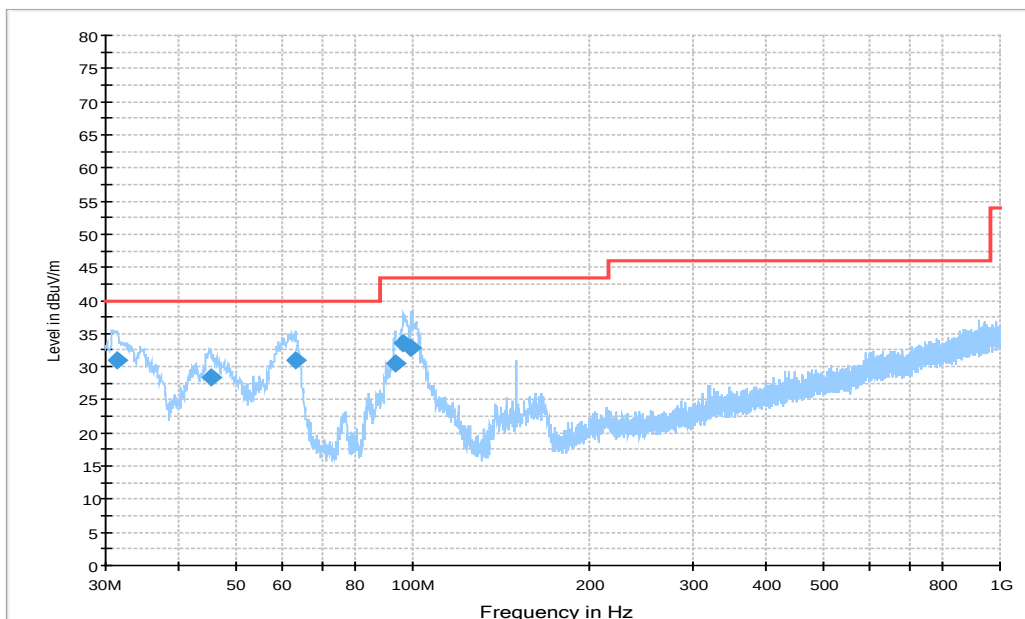


Figure A.1 Radiated Emission from 30MHz to 1GHz

Final Result 1

Frequency (MHz)	QuasiPeak (dBμV/m)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
31.455000	31.0	100.0	V	135.0	-2.7	9.0	40.0
45.229000	28.3	100.0	V	30.0	-0.6	11.7	40.0
63.077000	30.9	100.0	V	270.0	-2.2	9.1	40.0
93.244000	30.6	100.0	V	180.0	-3.3	12.9	43.5
96.639000	33.5	100.0	V	180.0	-2.6	10.0	43.5
99.549000	32.9	100.0	V	180.0	-1.9	10.6	43.5

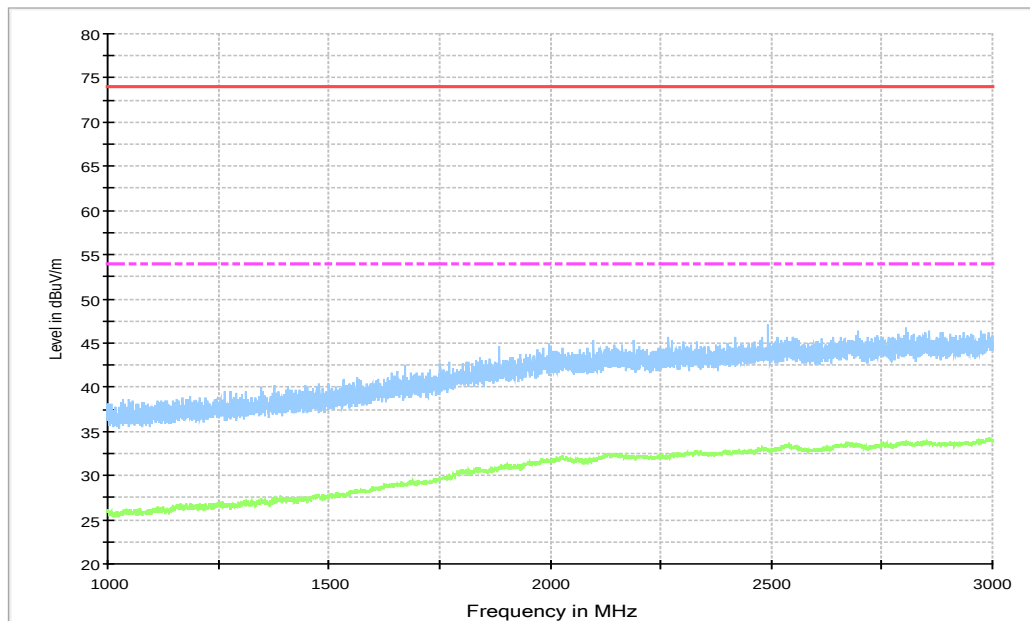


Figure A.2 Radiated Emission from 1GHz to 3GHz

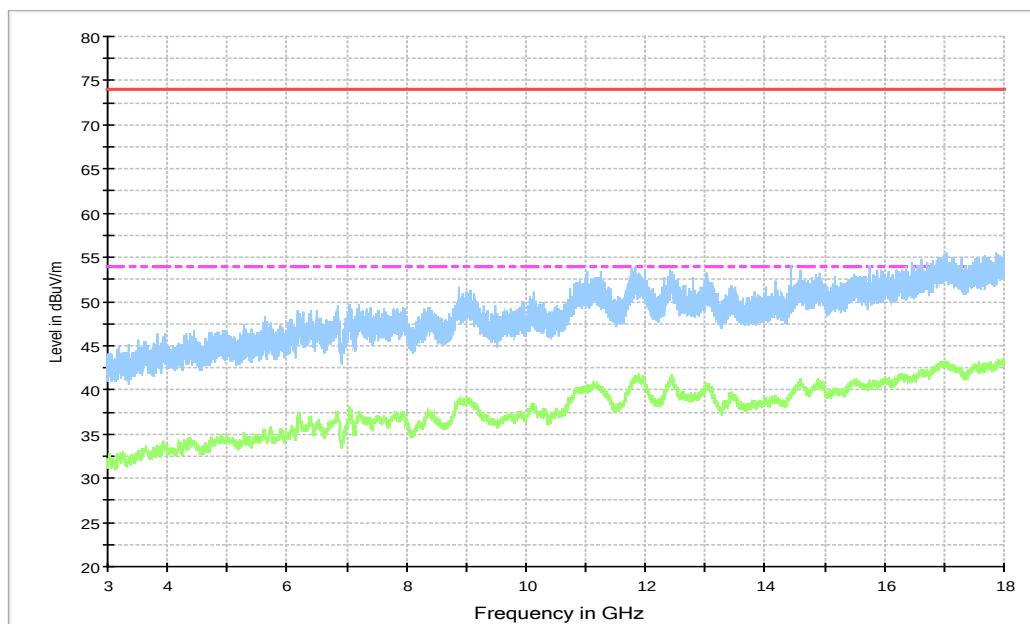


Figure A.3 Radiated Emission from 3GHz to 18GHz

Charger2+ MP4+ RX mode GSM850, Set.2

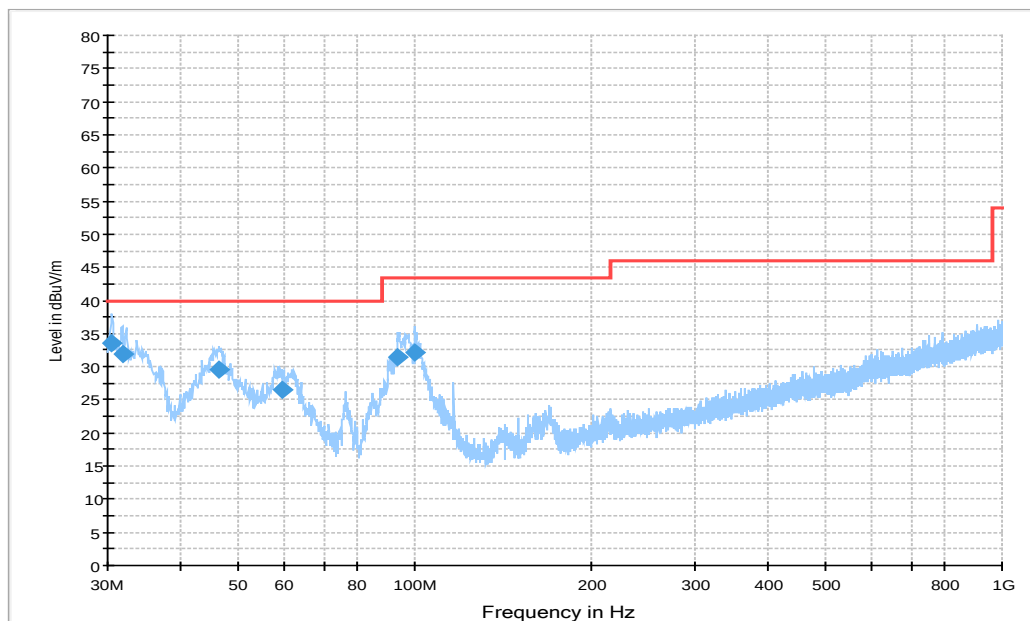


Figure A.4 Radiated Emission from 30MHz to 1GHz

Final Result 1

Frequency (MHz)	QuasiPeak (dB μ V/m)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dB μ V/m)
30.388000	33.6	100.0	V	-31.0	-3.0	6.4	40.0
31.843000	32.0	100.0	V	285.0	-2.6	8.0	40.0
46.490000	29.6	100.0	V	149.0	-0.5	10.4	40.0
59.585000	26.6	113.0	V	270.0	-1.0	13.4	40.0
93.729000	31.4	113.0	V	240.0	-3.2	12.1	43.5
99.937000	32.1	100.0	V	270.0	-1.9	11.4	43.5

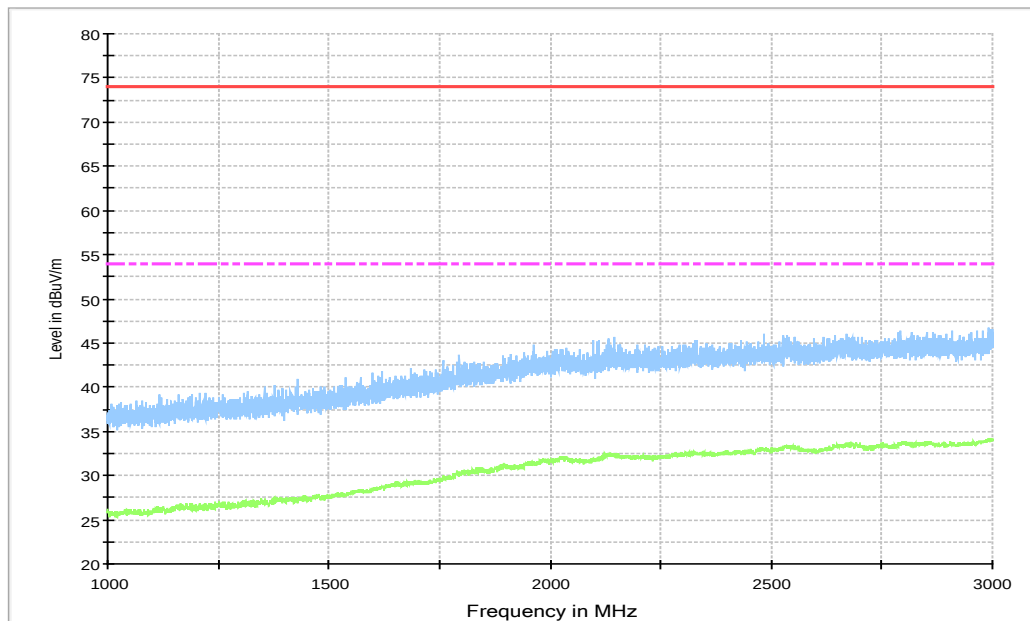


Figure A.5 Radiated Emission from 1GHz to 3GHz

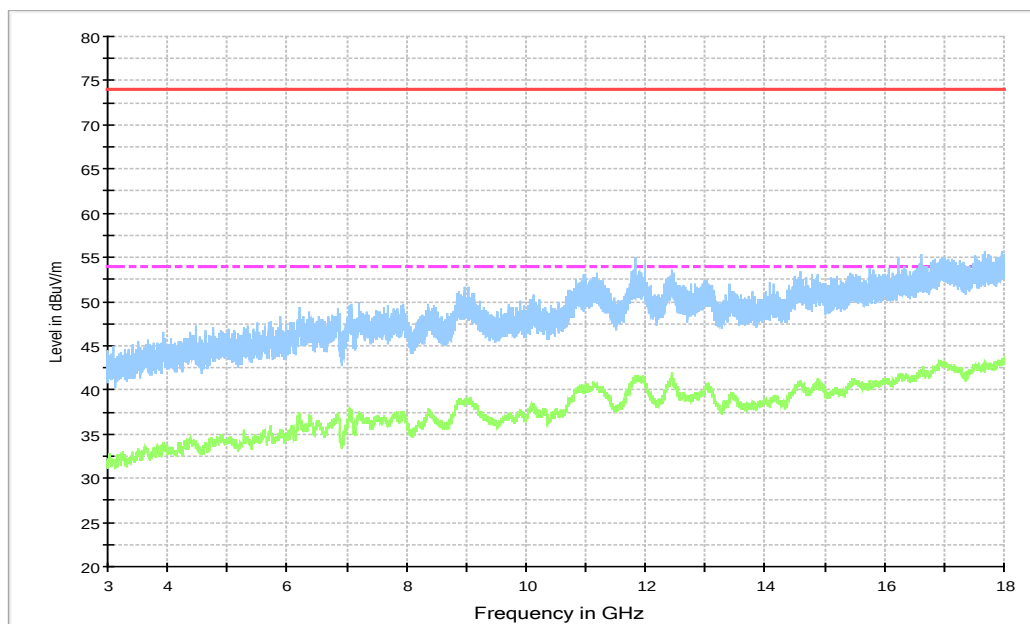


Figure A.6 Radiated Emission from 3GHz to 18GHz

Charger3+ Front Camera+ RX mode WCMDA B5, Set.3

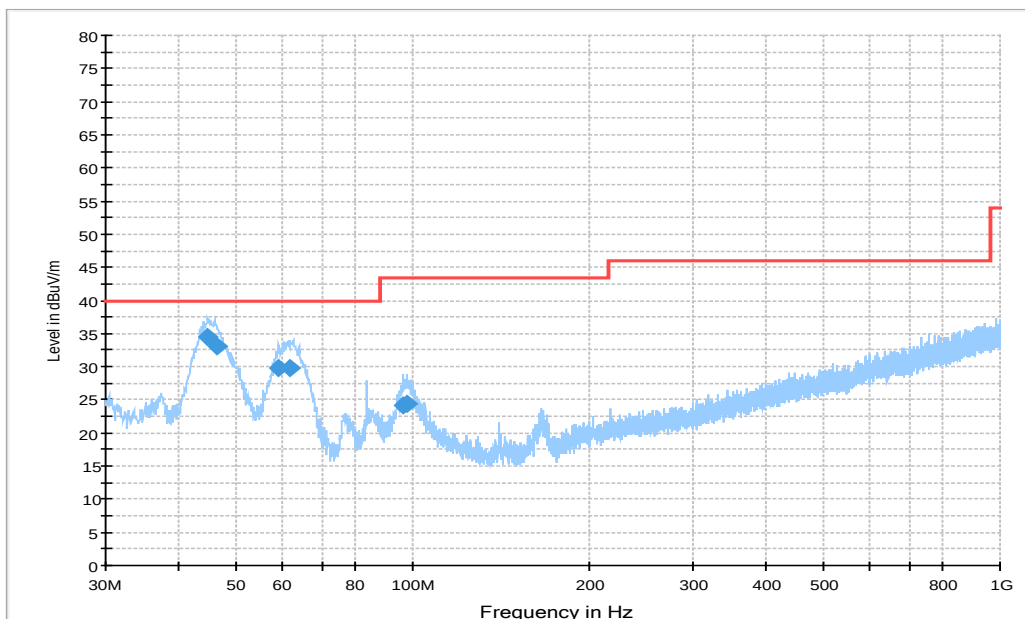


Figure A.7 Radiated Emission from 30MHz to 1GHz

Final Result 1

Frequency (MHz)	QuasiPeak (dBμV/m)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
44.744000	34.5	100.0	V	135.0	-0.6	5.5	40.0
46.490000	33.1	112.0	V	75.0	-0.5	6.9	40.0
59.197000	29.8	100.0	V	315.0	-0.9	10.2	40.0
61.816000	29.9	100.0	V	225.0	-1.7	10.1	40.0
95.960000	24.3	100.0	V	225.0	-2.7	19.2	43.5
97.803000	24.3	113.0	V	225.0	-2.3	19.2	43.5

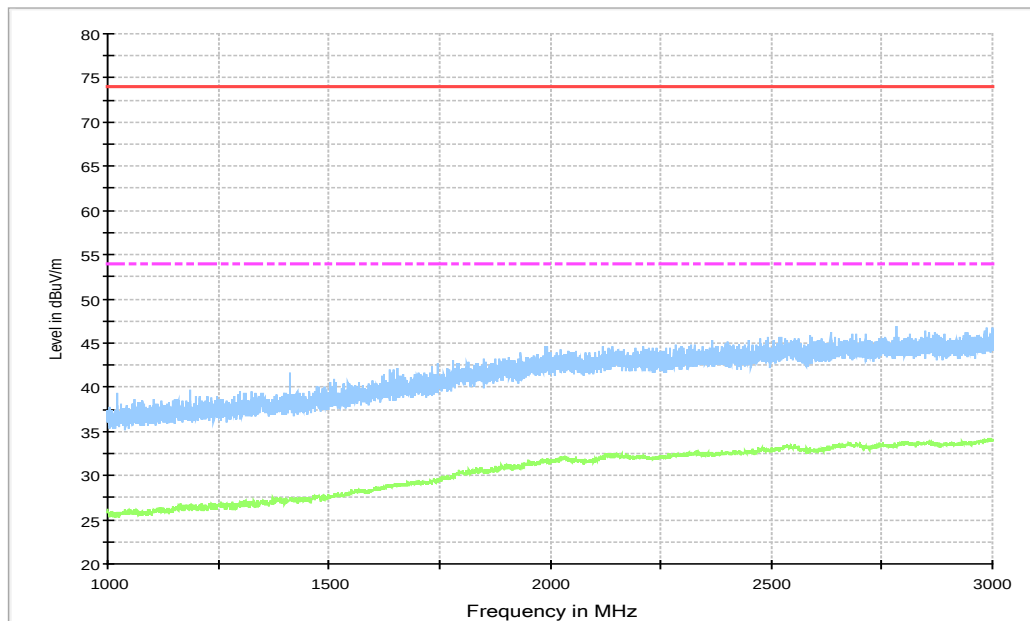


Figure A.8 Radiated Emission from 1GHz to 3GHz

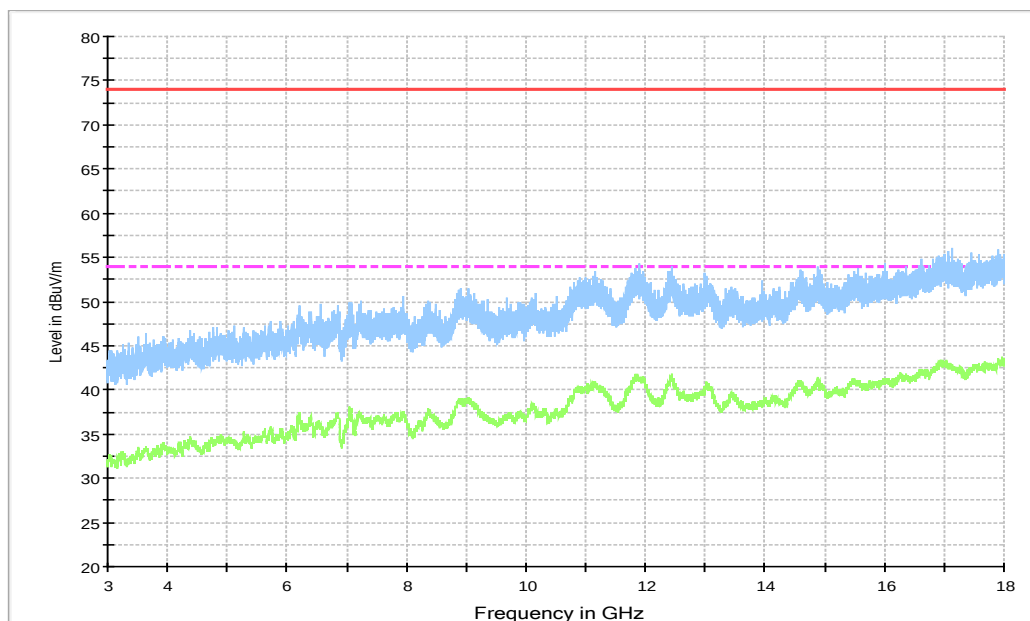


Figure A.9 Radiated Emission from 3GHz to 18GHz

Charger4+ Headset1+ FM 98MHz, Set.4

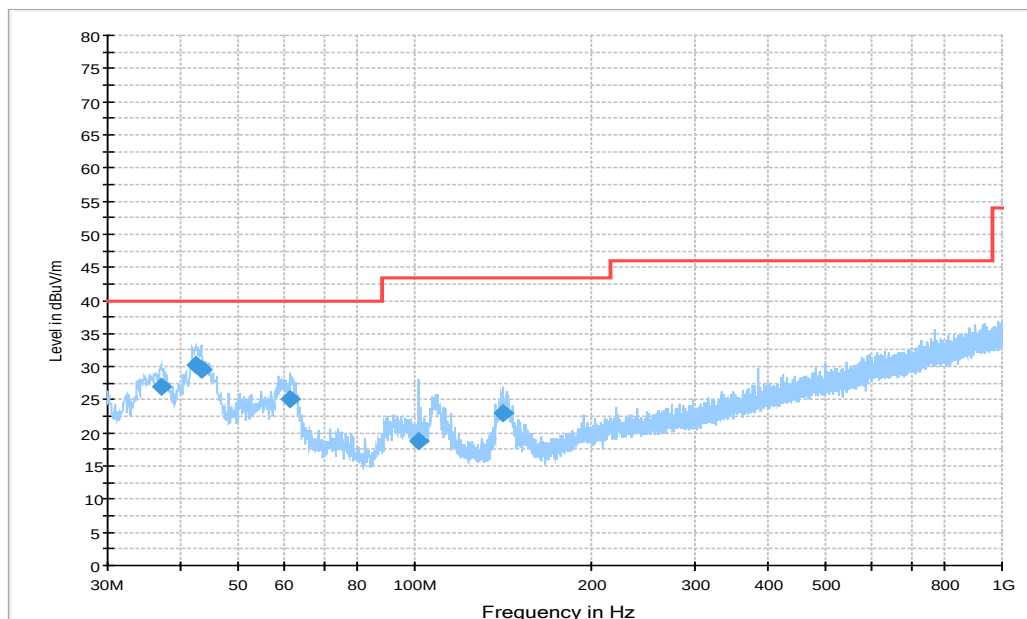


Figure A.10 Radiated Emission from 30MHz to 1GHz

Final Result 1

Frequency (MHz)	QuasiPeak (dBμV/m)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
36.984000	27.0	100.0	V	135.0	-1.3	13.0	40.0
42.319000	30.2	100.0	V	-15.0	-0.6	9.8	40.0
43.289000	29.6	113.0	V	45.0	-0.6	10.4	40.0
61.428000	25.1	100.0	V	225.0	-1.6	14.9	40.0
101.78000	18.8	100.0	V	150.0	-2.0	24.7	43.5
140.96800	23.1	100.0	V	90.0	-5.7	20.4	43.5

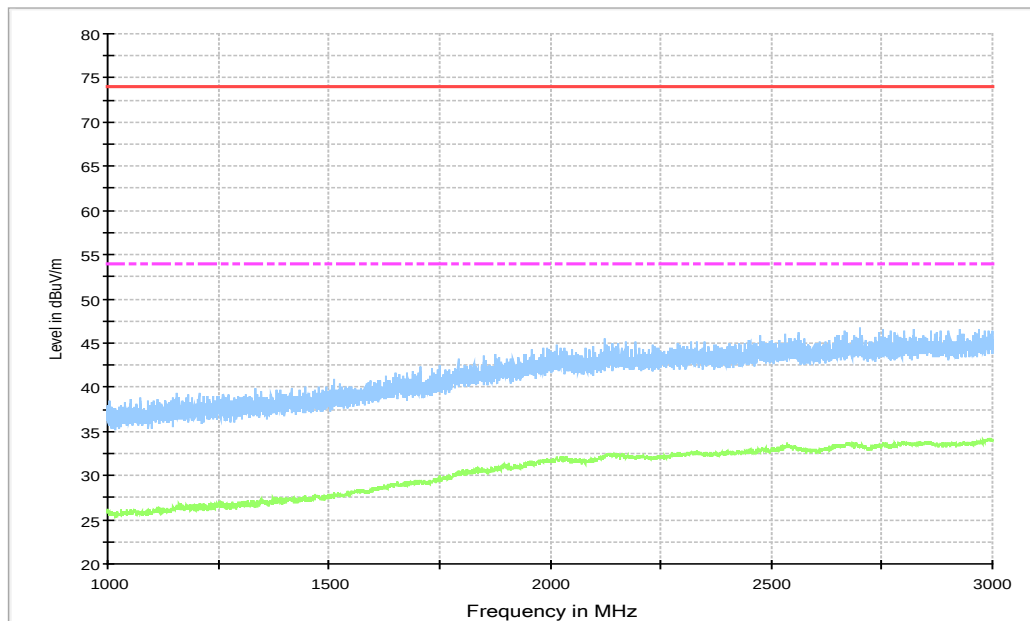


Figure A.11 Radiated Emission from 1GHz to 3GHz

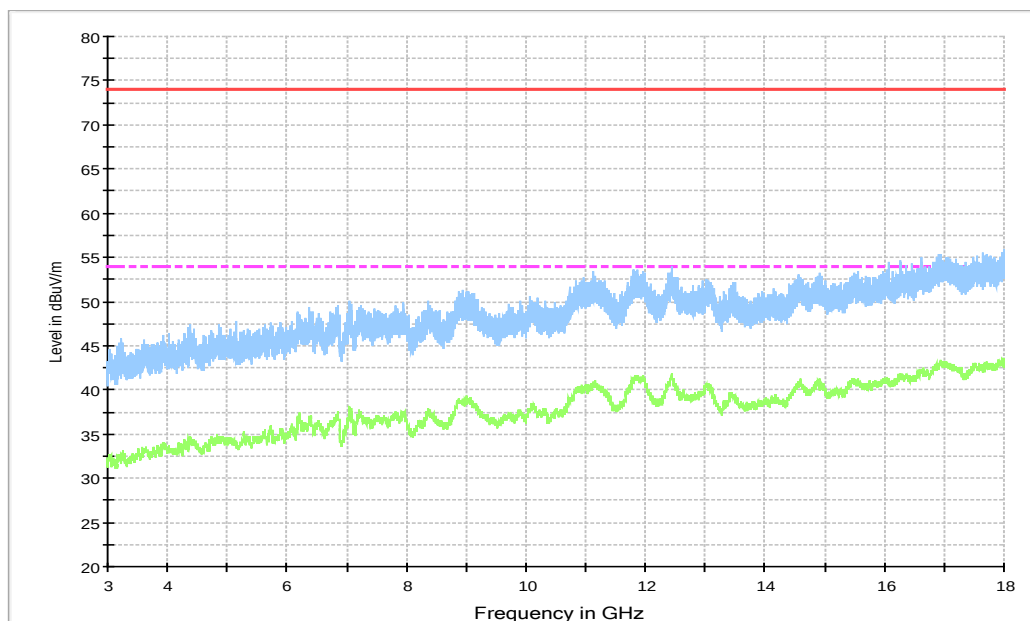


Figure A.12 Radiated Emission from 3GHz to 18GHz

Charger5+ Headset2+ FM 88MHz, Set.7

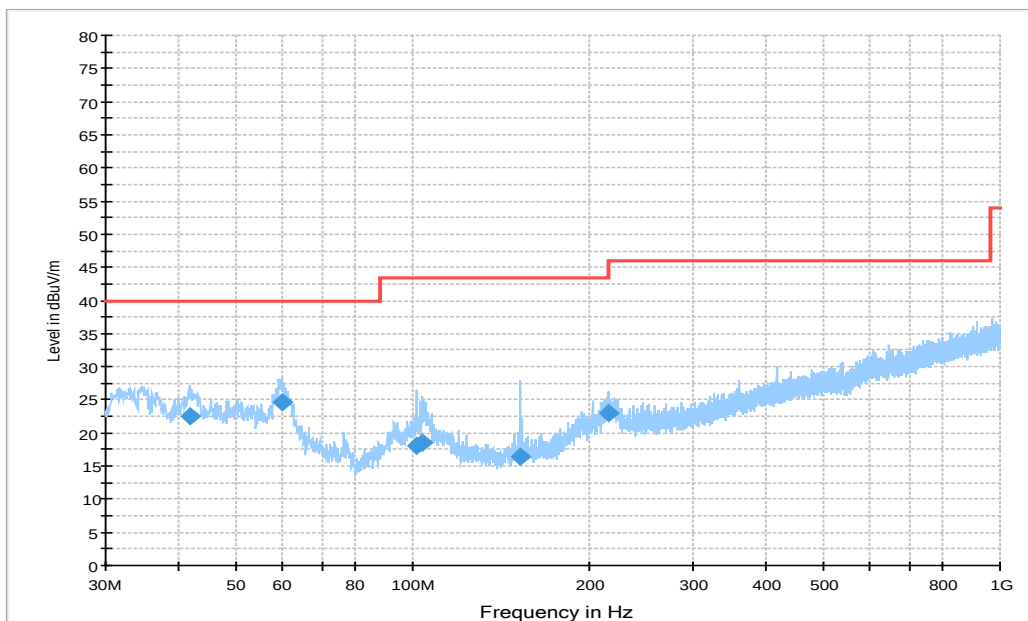


Figure A.13 Radiated Emission from 30MHz to 1GHz

Final Result 1

Frequency (MHz)	QuasiPeak (dBμV/m)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
41.640000	22.6	100.0	V	210.0	-0.6	17.4	40.0
59.876000	24.6	100.0	V	255.0	-1.0	15.4	40.0
101.48900	18.2	100.0	H	210.0	-2.0	25.3	43.5
103.81700	18.6	113.0	V	210.0	-2.1	24.9	43.5
152.12300	16.4	125.0	H	74.0	-5.5	27.1	43.5
215.56100	23.1	100.0	H	195.0	-1.6	20.4	43.5

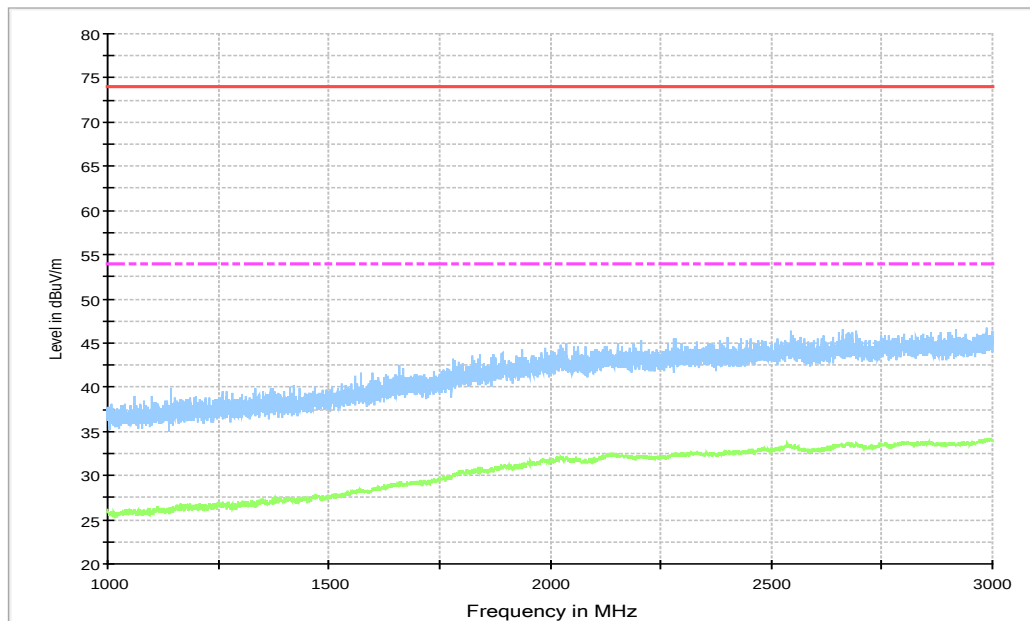


Figure A.14 Radiated Emission from 1GHz to 3GHz

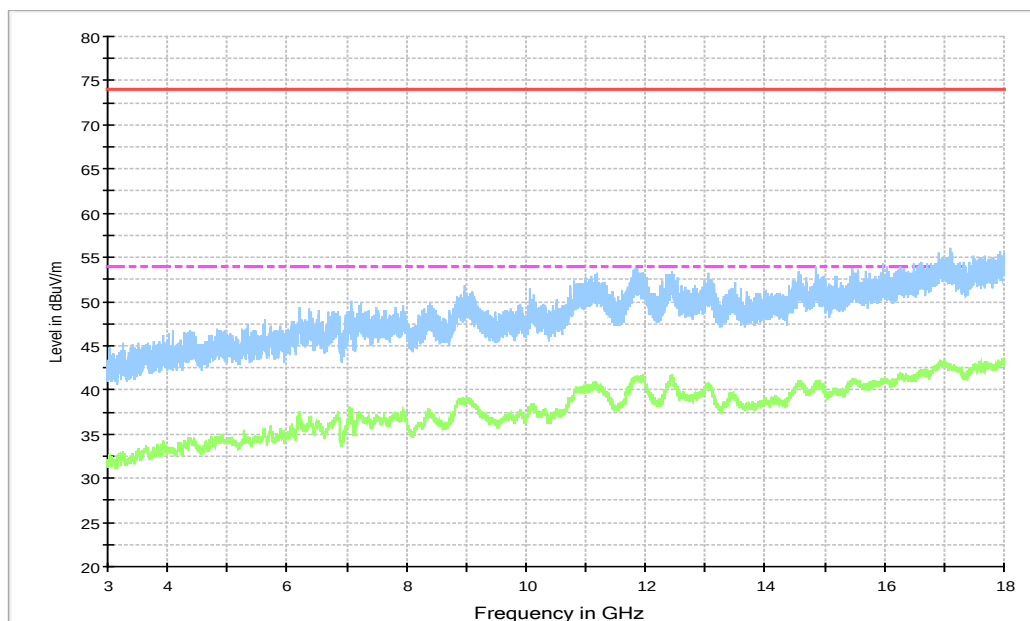


Figure A.15 Radiated Emission from 3GHz to 18GHz

USB (SD) mode+ RX mode LTE B5, Set.6

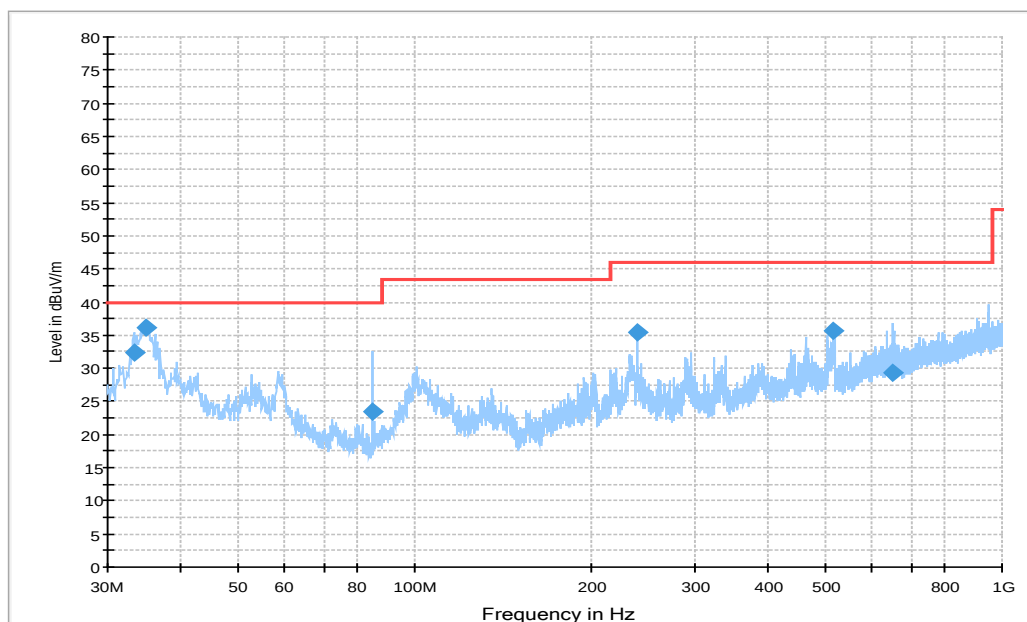


Figure A.16 Radiated Emission from 30MHz to 1GHz

Final Result 1

Frequency (MHz)	QuasiPeak (dBμV/m)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
33.298000	32.4	100.0	V	225.0	-2.2	7.6	40.0
34.753000	36.0	100.0	V	285.0	-1.9	4.0	40.0
84.902000	23.5	125.0	H	300.0	-5.6	16.5	40.0
240.00500	35.3	113.0	H	104.0	-0.6	10.7	46.0
517.52200	35.7	125.0	V	-31.0	6.3	10.3	46.0
651.67300	29.3	100.0	H	0.0	8.7	16.7	46.0

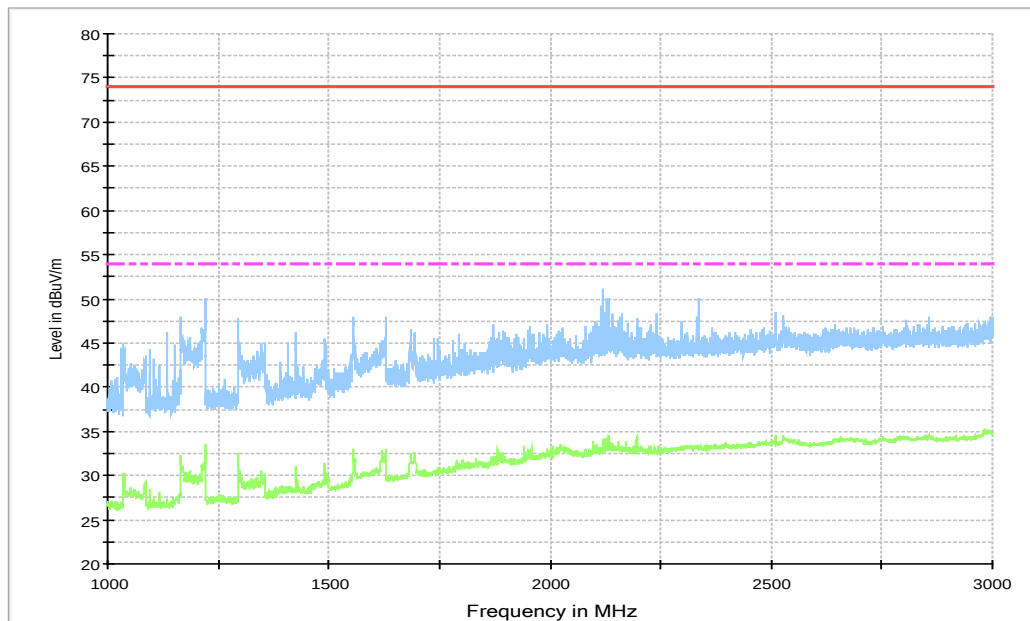


Figure A.17 Radiated Emission from 1GHz to 3GHz

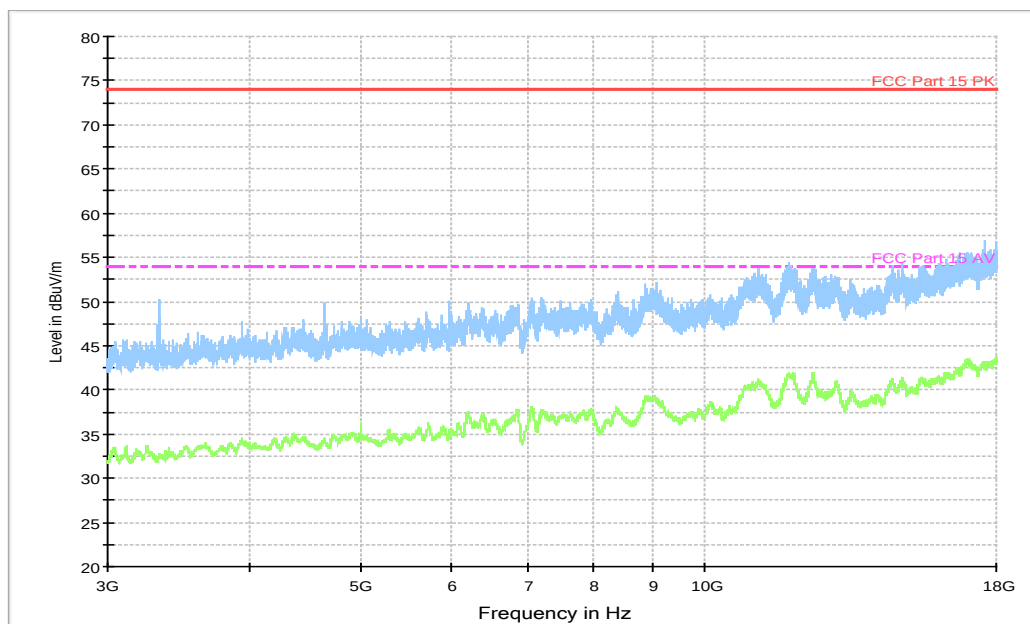


Figure A.18 Radiated Emission from 3GHz to 18GHz

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, charging mode, MP4, CAMERA and SD mode.

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, $k=2$.

Charger1+ Rear Camera, Set.1

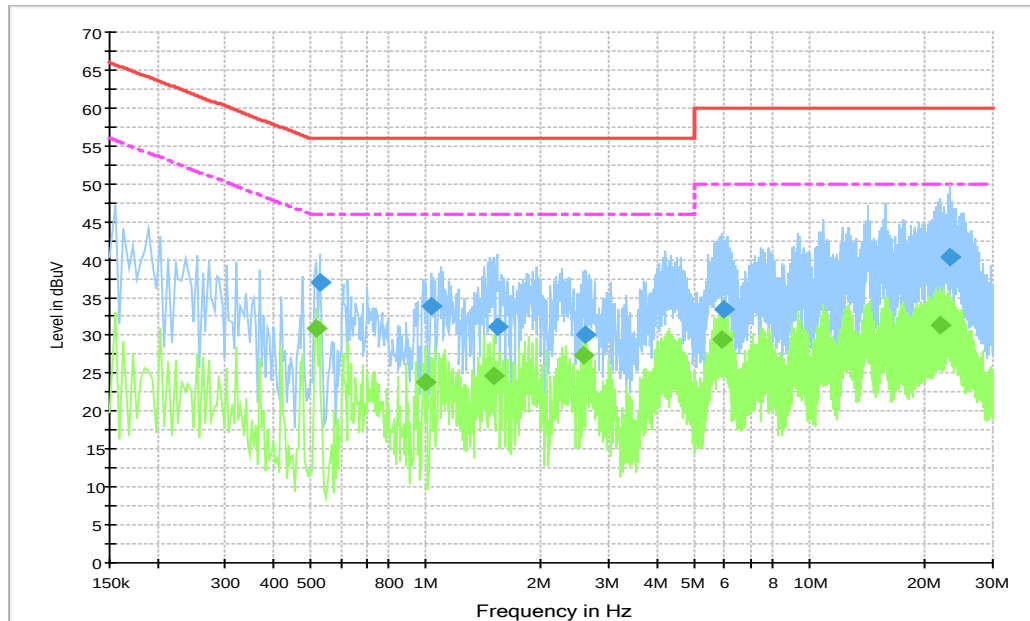


Figure A.19 Conducted Emission

Final Result 1

Frequency (MHz)	QuasiPeak (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.528000	37.0	1000.0	9.000	On	L1	19.8	19.0	56.0
1.032000	33.9	1000.0	9.000	On	L1	19.6	22.1	56.0
1.531500	31.1	1000.0	9.000	On	L1	19.7	24.9	56.0
2.616000	30.0	1000.0	9.000	On	N	19.6	26.0	56.0
5.946000	33.4	1000.0	9.000	On	N	19.6	26.6	60.0
23.217000	40.4	1000.0	9.000	On	L1	19.8	19.6	60.0

Final Result 2

Frequency (MHz)	Average (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.519000	30.9	1000.0	9.000	On	L1	19.8	15.1	46.0
1.000500	23.8	1000.0	9.000	On	L1	19.7	22.2	46.0
1.500000	24.7	1000.0	9.000	On	L1	19.7	21.3	46.0
2.575500	27.3	1000.0	9.000	On	L1	19.7	18.7	46.0
5.923500	29.4	1000.0	9.000	On	L1	19.7	20.6	50.0
21.988500	31.3	1000.0	9.000	On	L1	19.8	18.7	50.0

. Charger2+MP4, Set.2

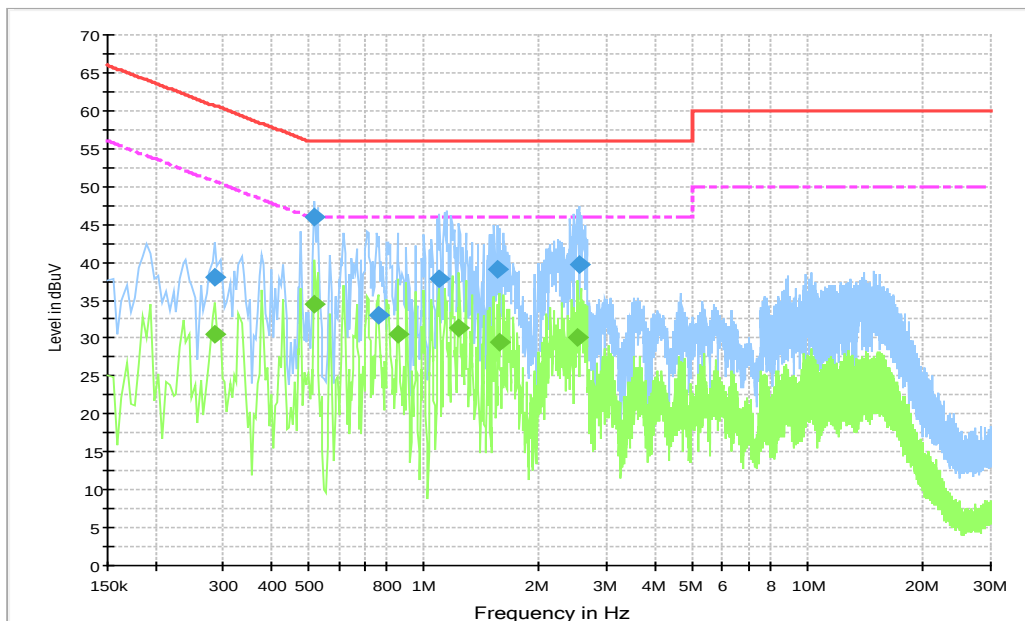


Figure A.20 Conducted Emission

Final Result 1

Frequency (MHz)	QuasiPeak (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.285000	38.1	1000.0	9.000	On	L1	19.7	22.6	60.7
0.519000	45.9	1000.0	9.000	On	L1	19.8	10.1	56.0
0.766500	33.0	1000.0	9.000	On	N	19.7	23.0	56.0
1.099500	37.9	1000.0	9.000	On	L1	19.7	18.1	56.0
1.558500	39.2	1000.0	9.000	On	L1	19.7	16.8	56.0
2.548500	39.6	1000.0	9.000	On	L1	19.6	16.4	56.0

Final Result 2

Frequency (MHz)	Average (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.285000	30.5	1000.0	9.000	On	L1	19.7	20.2	50.7
0.519000	34.4	1000.0	9.000	On	N	19.8	11.6	46.0
0.852000	30.6	1000.0	9.000	On	L1	19.7	15.4	46.0
1.234500	31.3	1000.0	9.000	On	L1	19.7	14.7	46.0
1.567500	29.4	1000.0	9.000	On	L1	19.7	16.6	46.0
2.517000	30.1	1000.0	9.000	On	L1	19.6	15.9	46.0

Charger3+Front Camera, Set.3

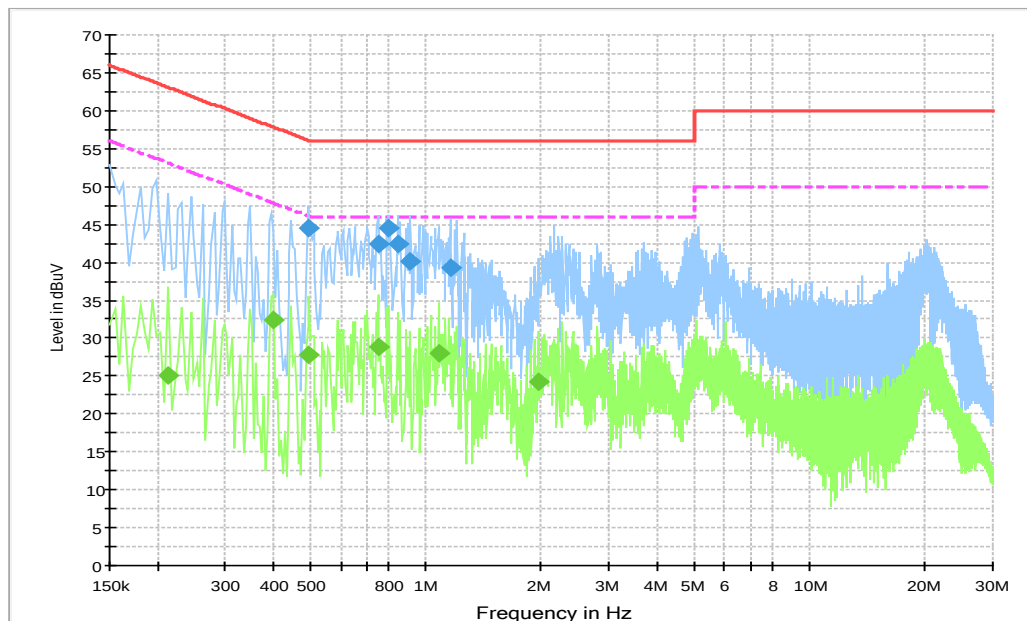


Figure A.21 Conducted Emission

Final Result 1

Frequency (MHz)	QuasiPeak (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.492000	44.6	1000.0	9.000	On	N	19.8	11.6	56.1
0.753000	42.4	1000.0	9.000	On	N	19.7	13.6	56.0
0.802500	44.4	1000.0	9.000	On	N	19.7	11.6	56.0
0.843000	42.4	1000.0	9.000	On	N	19.7	13.6	56.0
0.910500	40.1	1000.0	9.000	On	N	19.7	15.9	56.0
1.158000	39.3	1000.0	9.000	On	N	19.6	16.7	56.0

Final Result 2

Frequency (MHz)	Average (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.213000	25.2	1000.0	9.000	On	L1	19.7	27.9	53.1
0.402000	32.4	1000.0	9.000	On	N	19.8	15.4	47.8
0.496500	27.7	1000.0	9.000	On	N	19.8	18.3	46.1
0.753000	28.8	1000.0	9.000	On	N	19.7	17.2	46.0
1.077000	27.9	1000.0	9.000	On	L1	19.7	18.1	46.0
1.963500	24.3	1000.0	9.000	On	L1	19.7	21.7	46.0

Charger4, Set.4

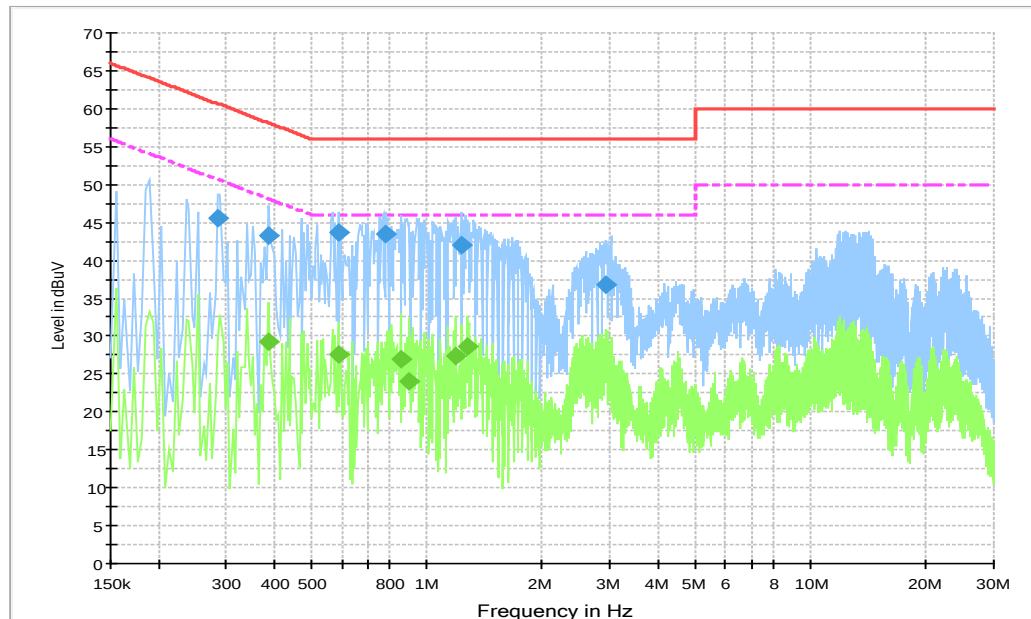


Figure A.22 Conducted Emission

Final Result 1

Frequency (MHz)	QuasiPeak (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.285000	45.5	1000.0	9.000	On	N	19.7	15.2	60.7
0.388500	43.4	1000.0	9.000	On	N	19.7	14.7	58.1
0.586500	43.7	1000.0	9.000	On	N	19.7	12.3	56.0
0.784500	43.4	1000.0	9.000	On	N	19.7	12.6	56.0
1.234500	42.0	1000.0	9.000	On	N	19.6	14.0	56.0
2.922000	36.7	1000.0	9.000	On	L1	19.6	19.3	56.0

Final Result 2

Frequency (MHz)	Average (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.388500	29.2	1000.0	9.000	On	L1	19.7	18.9	48.1
0.586500	27.5	1000.0	9.000	On	L1	19.7	18.5	46.0
0.852000	27.0	1000.0	9.000	On	L1	19.7	19.0	46.0
0.901500	24.1	1000.0	9.000	On	N	19.6	21.9	46.0
1.185000	27.4	1000.0	9.000	On	L1	19.6	18.6	46.0
1.275000	28.5	1000.0	9.000	On	L1	19.7	17.5	46.0

Charger5, Set.5

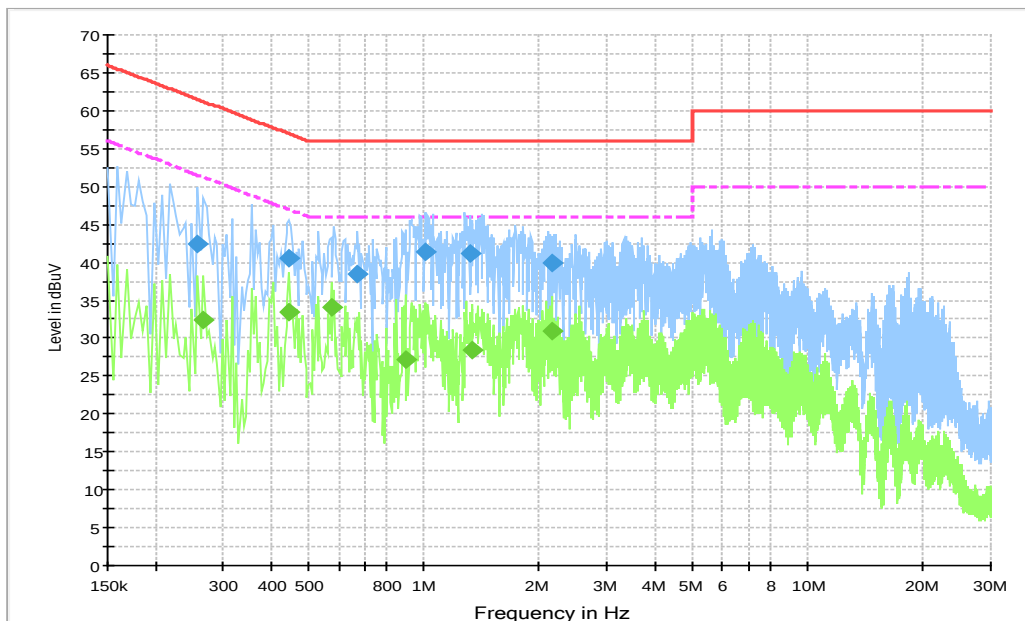


Figure A.23 Conducted Emission

Final Result 1

Frequency (MHz)	QuasiPeak (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.258000	42.4	1000.0	9.000	On	N	19.7	19.1	61.5
0.447000	40.5	1000.0	9.000	On	L1	19.8	16.5	56.9
0.672000	38.5	1000.0	9.000	On	L1	19.7	17.5	56.0
1.014000	41.3	1000.0	9.000	On	N	19.6	14.7	56.0
1.320000	41.1	1000.0	9.000	On	L1	19.7	14.9	56.0
2.161500	39.9	1000.0	9.000	On	L1	19.7	16.1	56.0

Final Result 2

Frequency (MHz)	Average (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.267000	32.5	1000.0	9.000	On	N	19.7	18.7	51.2
0.447000	33.4	1000.0	9.000	On	L1	19.8	13.5	46.9
0.573000	34.0	1000.0	9.000	On	L1	19.8	12.0	46.0
0.897000	27.2	1000.0	9.000	On	L1	19.6	18.8	46.0
1.338000	28.5	1000.0	9.000	On	N	19.6	17.5	46.0
2.161500	30.9	1000.0	9.000	On	L1	19.7	15.1	46.0

USB (SD) mode, Set.6

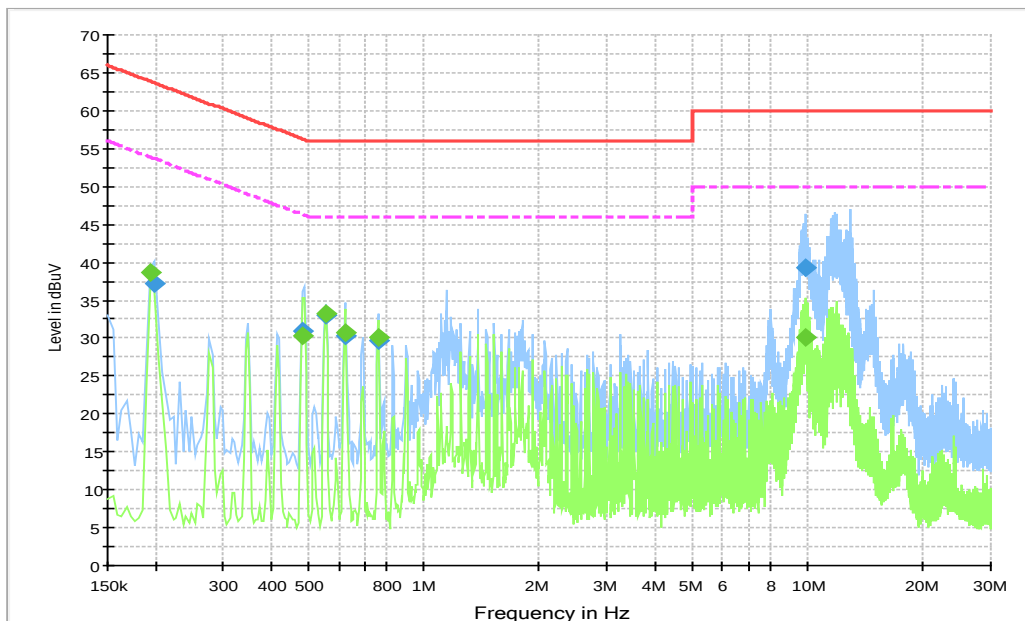


Figure A.24 Conducted Emission

Final Result 1

Frequency (MHz)	QuasiPeak (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.199500	37.2	1000.0	9.000	On	L1	19.6	26.4	63.6
0.483000	31.0	1000.0	9.000	On	L1	19.8	25.3	56.3
0.555000	33.0	1000.0	9.000	On	L1	19.8	23.0	56.0
0.622500	30.2	1000.0	9.000	On	N	19.7	25.8	56.0
0.762000	29.6	1000.0	9.000	On	N	19.7	26.4	56.0
9.874500	39.3	1000.0	9.000	On	N	19.7	20.7	60.0

Final Result 2

Frequency (MHz)	Average (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.195000	38.6	1000.0	9.000	On	N	19.6	15.3	53.8
0.483000	30.2	1000.0	9.000	On	N	19.8	16.1	46.3
0.555000	33.2	1000.0	9.000	On	L1	19.8	12.8	46.0
0.622500	30.7	1000.0	9.000	On	L1	19.7	15.3	46.0
0.762000	30.1	1000.0	9.000	On	L1	19.7	15.9	46.0
9.924000	30.1	1000.0	9.000	On	L1	19.7	19.9	50.0

ANNEX B: Persons involved in this testing

Test Item	Tester
Radiated Emission	Zhao Wenhui
Conducted Emission	Guo Qian

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