



TEST REPORT

No. I20Z70165-EMC03

for

Samsung Electronics. Co., Ltd.

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

Model Name: SM-T505

FCC ID: ZCASMT505

with

Hardware Version: REV1.0

Software Version: T505.001

Issued Date: 2020-6-30

Note:

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REPORT HISTORY

Report Number	Revision	Description	Issue Date
I20Z70165-EMC03	Rev.0	1 st edition	2020-06-30

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

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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

1.3. Testing Environment

Normal Temperature: 15-35°C
Relative Humidity: 20-75%

1.4. Project data

Testing Start Date: 2020-06-01
Testing End Date: 2020-06-25

1.5. Signature



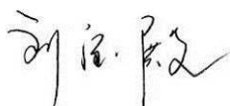
Li Yan

(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: 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: R5, A Tower 22 Floor A-1, (Maetan dong) 129, Samsung-ro, Yeongtong-gu, Suwon-Si, Gyeonggi-do 16677, Korea
City: /
Postal Code: /
Country: /
Contact: JP KIM
Email: jp426.kim@samsung.com
Telephone: +82-10-4376-0326

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

3.1. About EUT

Description	Multi-band GSM/WCDMA/LTE Tablet with Bluetooth, WLAN
Model Name	SM-T505
FCC ID	ZCASMT505
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*	IME/SNI	HW Version	SW Version	Date of receipt
UT02a	2070165UT16a	REV1.0	T505.001	2020.05.27

*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	Charger	/	/
AE4	Charger	/	/
AE5	USB Cable	/	/
AE6	USB Cable	/	/
AE7	Charger	/	No test
AE8	Charger	/	No test
AE9	Charger	/	No test
AE10	Charger	/	No test
AE11	Charger	/	No test
AE12	Charger	/	No test
AE13	USB Cable	/	No test
AE14	USB Cable	/	No test
AE15	Headset	/	/

AE1

Model	SCUD-WT-N19
Manufacturer	SCUD(Fujian) Electronics Co., Ltd
Capacitance	/
Nominal voltage	/

AE2

Model	EP-TA50JWE
Manufacturer	R.F.Tech
Length of cable	/

AE3		
Model	EP-TA50JWE	
Manufacturer	DONGWON	
Length of cable	/	
AE4		
Model	EP-TA50RWS	
Manufacturer	DONG YANG	
Length of cable	/	
AE5		
Model	EP-DT725BWE	
Manufacturer	R.F.Tech	
Length of cable	/	
AE6		
Model	EP-DT725BWE	
Manufacturer	KSD	
Length of cable	/	
AE7		
Model	EP-TA50JWS	
Manufacturer	R.F.Tech	
Length of cable	/	
AE8		
Model	EP-TA50EWE	
Manufacturer	R.F.Tech	
Length of cable	/	
AE9		
Model	EP-TA50JWS	
Manufacturer	DONGWON	
Length of cable	/	
AE10		
Model	EP-TA50EWE	
Manufacturer	DONGWON	
Length of cable	/	
AE11		
Model	EP-TA50EWE(Chile)	
Manufacturer	DONGWON	
Length of cable	/	
AE12		
Model	EP-TA50EWE(Chile)	
Manufacturer	DONG YANG	
Length of cable	/	
AE13		
Model	EP-DT725BWZ	
Manufacturer	R.F.Tech	
Length of cable	/	

AE14

Model	EP-DT725BWZ
Manufacturer	KSD
Length of cable	/

AE15

Model	GH59-15060A
Manufacturer	ALMUS 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, LTE BAND 5, LTE BAND 12, LTE BAND 17, LTE BAND 18, and LTE BAND19.

3.5. EUT set-ups

EUT set-up No.	Combination of EUT and AE	Remarks
Set.1	UT02a + AE1 + AE2+ AE5+ AE15	Charger+MP3
Set.2	UT02a + AE1 + AE3+ AE6+ AE15	Charger+ Rear Camera
Set.3	UT02a + AE1 + AE4+ AE5	Charger+ MP4
Set.4	UT02a + AE1 + AE5/6+ AE15	USB mode(SD TO PC)+Front Camera
Set.5	UT02a + AE1 + AE2+ AE5	license RX mode

4. Reference Documents

4.1. Reference Documents for testing

The following documents listed in this section are referred for testing.

Reference	Title	Version
FCC Part 15, Subpart B	Radio frequency devices - Unintentional Radiators	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 °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	< 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 °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

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)
2	Conducted Emission	15.107(a)	A.2	P	CTTL(BDA)

7. Test Equipments Utilized

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	Test Receiver	100766	ESCI	2021-03-11	1 year
3	Universal Radio Communication Tester	CMW500	127406	R&S	2021-02-18	1 year
5	LISN	ENV216	825562/028	R&S	2020-09-05	1 year
6	BiLog Antenna	VULB9163	9163-482	Schwarzbeck	2020-09-16	1 year
7	EMI Antenna	3117	00139065	ETS-Lindgren	2020-11-10	1 year
8	Signal Generator	SMF100A	101295	R&S	2020-11-06	1 year
9	Test Receiver	ESU26	100376	R&S	2020-10-30	1 year
10	Printer	P1606dn	VNC3L52122	HP	N/A	N/A
11	Keyboard	KU-1601	2048361	Lenovo	N/A	N/A
12	Mouse	EMS-537A	8021S3MC	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, MP3, MP4, CAMERA, 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 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 ($\mu\text{V/m}$)		
	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:

Charging Mode+ MP3 /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)
17700.000	39.93	-22.2	41.2	20.87	54.0	14.1	V
17704.500	39.89	-22.2	41.2	20.84	54.0	14.1	V
17791.000	39.86	-22.4	41.3	20.99	54.0	14.1	V
17704.000	39.82	-22.2	41.2	20.77	54.0	14.2	V
17785.500	39.81	-22.4	41.3	20.93	54.0	14.2	H
17692.500	39.81	-22.2	41.2	20.73	54.0	14.2	H

Charging Mode+ MP3 /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)
17871.500	52.9	-22.6	41.3	34.22	74.0	21.1	H
17690.500	52.9	-22.2	41.2	33.78	74.0	21.1	V
17733.500	52.2	-22.3	41.2	33.24	74.0	21.8	H
16933.000	52.2	-23.0	41.7	33.55	74.0	21.8	V
16527.000	51.9	-23.2	41.4	33.73	74.0	22.1	H
17732.500	51.9	-22.3	41.2	32.91	74.0	22.1	V

Measurement results for Set.2:
Charging Mode+ 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)
17692.000	39.95	-22.2	41.2	20.87	54.0	14.1	V
17645.000	39.86	-22.1	41.2	20.68	54.0	14.1	V
17702.500	39.84	-22.2	41.2	20.79	54.0	14.2	V
17697.500	39.84	-22.2	41.2	20.77	54.0	14.2	H
17646.000	39.81	-22.1	41.2	20.63	54.0	14.2	H
17768.500	39.78	-22.3	41.3	20.87	54.0	14.2	V

Charging Mode+ 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)
16417.500	53.1	-23.1	41.3	34.85	74.0	20.9	H
17798.000	52.2	-22.4	41.3	33.30	74.0	21.8	V
16987.500	52.1	-23.0	41.7	33.46	74.0	21.9	H
16932.000	52.1	-23.0	41.7	33.45	74.0	21.9	V
16579.000	52.1	-23.3	41.4	33.91	74.0	21.9	H
17791.000	52.0	-22.4	41.3	33.14	74.0	22.0	H

Measurement results for Set.3:
Charger+ MP4 /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)
17701.500	39.94	-22.2	41.2	20.88	54.0	14.1	V
17694.000	39.94	-22.2	41.2	20.86	54.0	14.1	V
17689.500	39.85	-22.2	41.2	20.77	54.0	14.1	V
17691.500	39.82	-22.2	41.2	20.74	54.0	14.2	V
17687.500	39.81	-22.1	41.2	20.72	54.0	14.2	H
17708.000	39.80	-22.2	41.2	20.75	54.0	14.2	H

Charger+ MP4 /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)
17707.000	52.7	-22.2	41.2	33.70	74.0	21.3	H
16623.500	52.6	-23.3	41.5	34.46	74.0	21.4	H
17600.500	52.2	-22.2	41.2	33.17	74.0	21.8	V
17555.500	52.1	-22.5	41.2	33.43	74.0	21.9	H
17021.000	52.1	-23.0	41.7	33.45	74.0	21.9	V
17909.000	52.1	-22.6	41.3	33.43	74.0	21.9	V

Measurement results for Set.4:
USB (SD) mode +Front Camera /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)
17700.500	40.04	-22.2	41.2	20.98	54.0	14.0	H
17764.000	39.81	-22.3	41.3	20.89	54.0	14.2	V
17699.500	39.80	-22.2	41.2	20.74	54.0	14.2	V
17716.000	39.79	-22.2	41.2	20.76	54.0	14.2	H
17691.000	39.78	-22.2	41.2	20.70	54.0	14.2	H
17772.000	39.77	-22.3	41.3	20.86	54.0	14.2	H

USB (SD) mode +Front Camera /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)
17630.000	53.14	-22.0	41.2	33.95	74.0	20.9	V
17110.500	52.94	-23.0	41.6	34.39	74.0	21.1	H
17086.500	52.75	-23.0	41.6	34.17	74.0	21.3	V
17639.500	52.73	-22.0	41.2	33.54	74.0	21.3	V
17685.000	52.59	-22.1	41.2	33.49	74.0	21.4	H
17763.500	52.50	-22.3	41.3	33.58	74.0	21.5	V

Charging Mode+ MP3, Set.1

15B RE 30MHz-1GHz

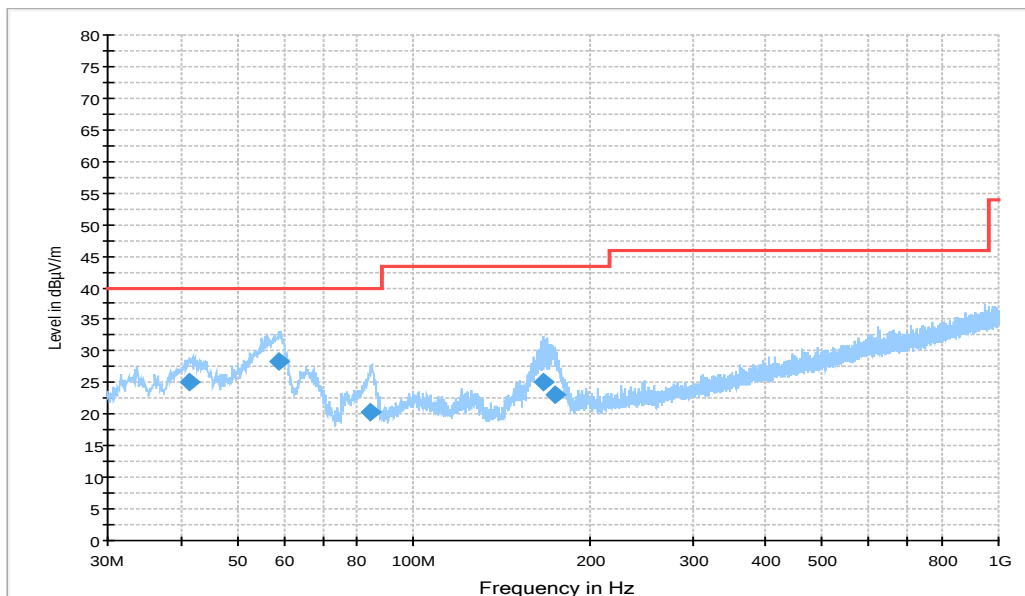


Figure A.1 Radiated Emission from 30MHz to 1GHz

Final Result 1

Frequency (MHz)	QuasiPeak (dBμV/m)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
41.446000	25.0	100.0	V	90.0	-0.2	15.0	40.0
58.809000	28.4	125.0	V	-12.0	-0.4	11.6	40.0
84.611000	20.3	118.0	V	173.0	-4.9	19.7	40.0
166.86700	25.1	100.0	V	3.0	-3.9	18.4	43.5
175.11200	23.0	110.0	V	196.0	-3.5	20.5	43.5
41.446000	25.0	100.0	V	90.0	-0.2	15.0	40.0

15B RE - 1GHz-3GHz

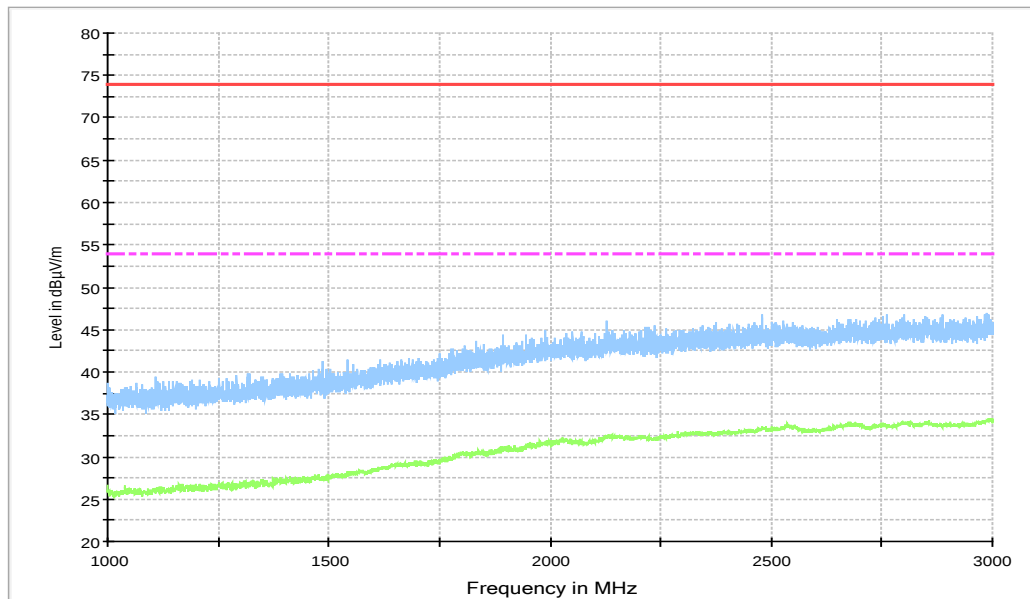


Figure A.2 Radiated Emission from 1GHz to 3GHz

15b RE - 3GHz-18GHz

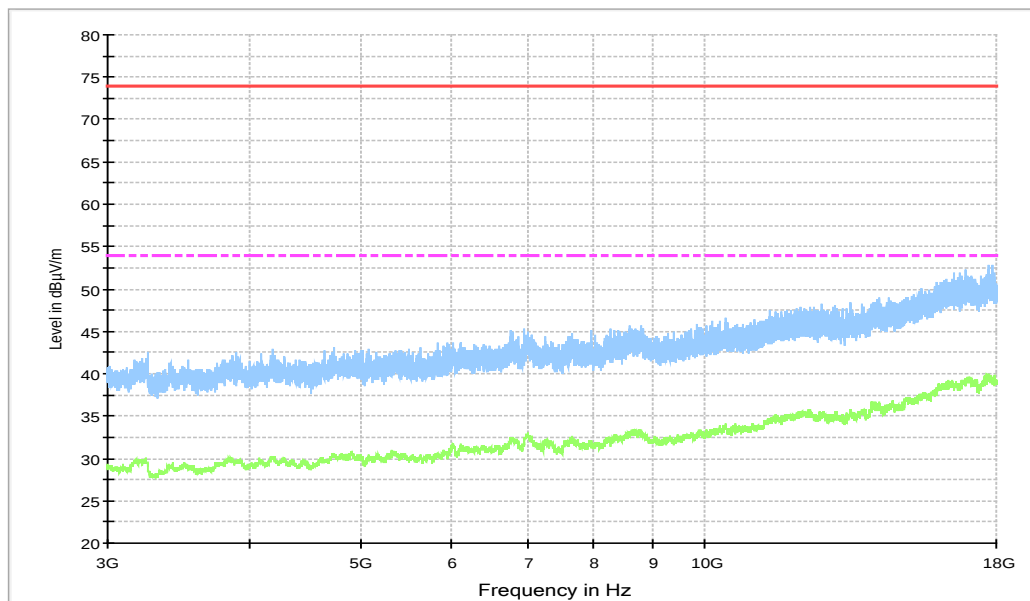


Figure A.3 Radiated Emission from 3GHz to 18GHz

Charger+ Rear Camera, Set.2

15B RE 30MHz-1GHz

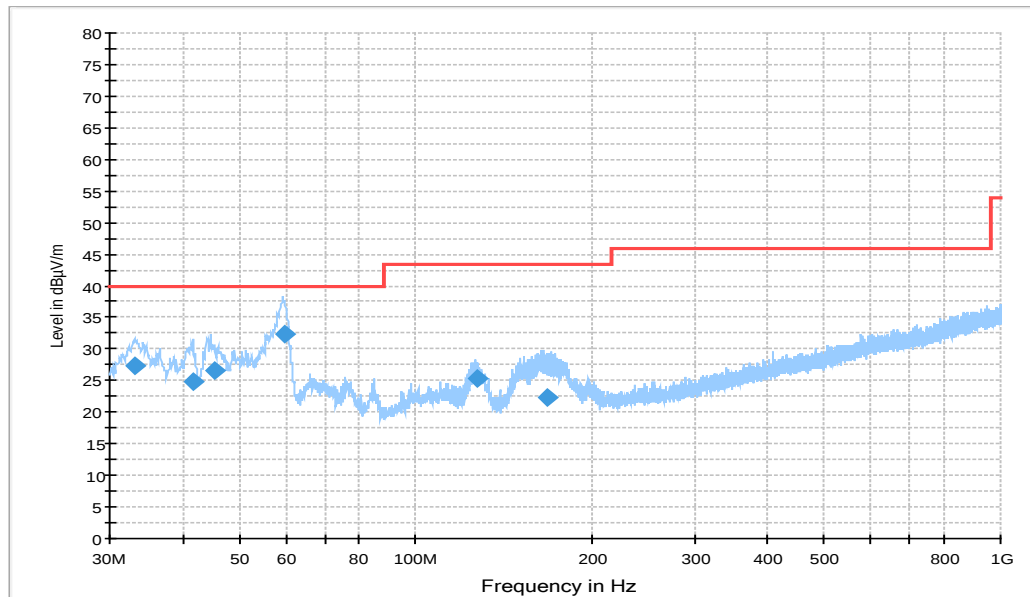


Figure A.4 Radiated Emission from 30MHz to 1GHz

Final Result 1

Frequency (MHz)	QuasiPeak (dBμV/m)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
33.104000	27.4	100.0	V	145.0	-1.4	12.6	40.0
41.640000	24.8	125.0	V	16.0	-0.2	15.2	40.0
45.326000	26.7	100.0	V	123.0	-0.1	13.3	40.0
59.682000	32.4	100.0	V	9.0	-0.4	7.6	40.0
127.87300	25.2	125.0	H	197.0	-4.1	18.3	43.5
167.64300	22.4	100.0	V	-8.0	-3.9	21.1	43.5

15B RE - 1GHz-3GHz

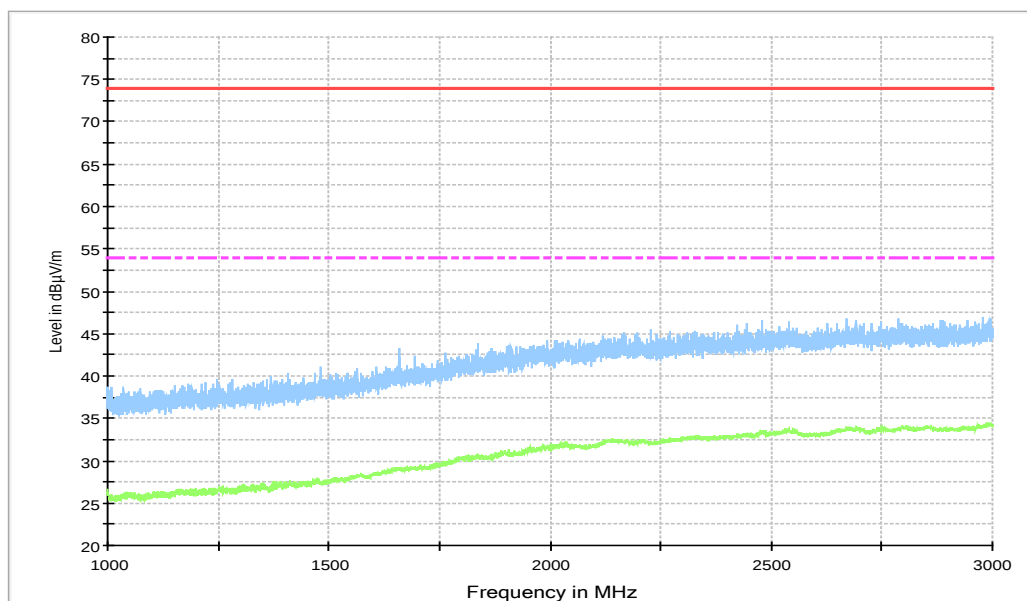


Figure A.5 Radiated Emission from 1GHz to 3GHz

15b RE - 3GHz-18GHz

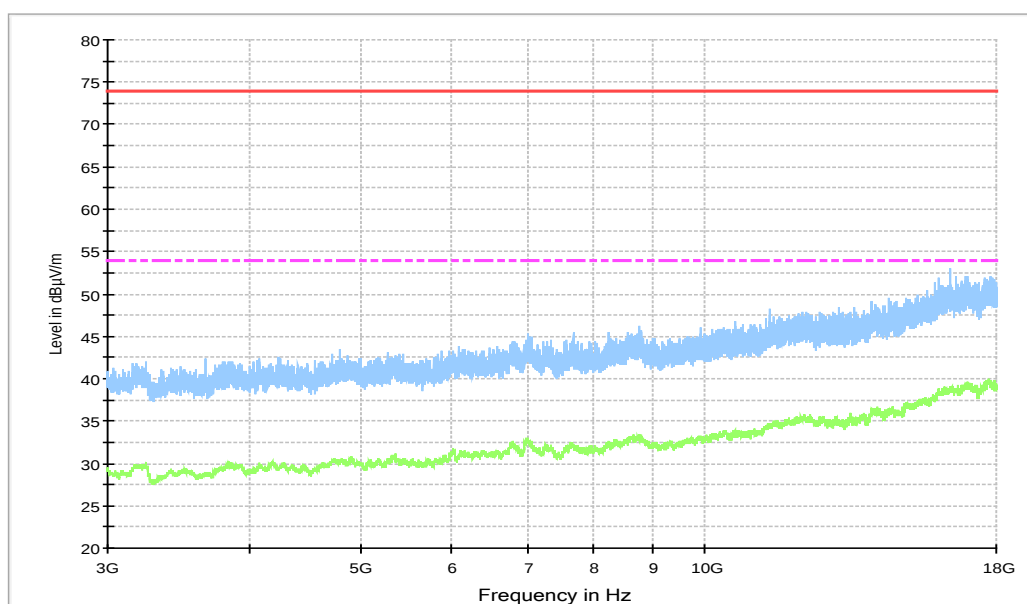


Figure A.6 Radiated Emission from 3GHz to 18GHz

Charger mode +MP4, Set.3

15B RE 30MHz-1GHz

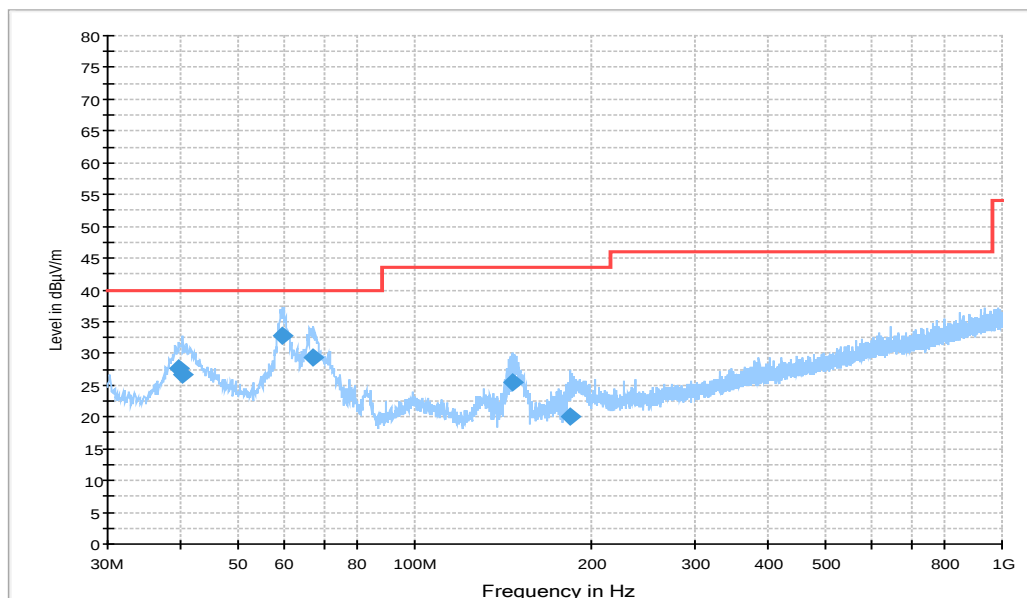


Figure A.7 Radiated Emission from 30MHz to 1GHz

Final Result 1

Frequency (MHz)	QuasiPeak (dBµV/m)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
39.603000	27.5	100.0	V	-14.0	-0.3	12.5	40.0
40.282000	26.8	110.0	V	21.0	-0.2	13.2	40.0
59.682000	32.9	100.0	V	7.0	-0.4	7.1	40.0
66.957000	29.3	100.0	V	18.0	-3.0	10.7	40.0
146.49700	25.4	100.0	V	101.0	-4.8	18.1	43.5
183.45400	19.9	100.0	V	45.0	-3.0	23.6	43.5

15B RE - 1GHz-3GHz

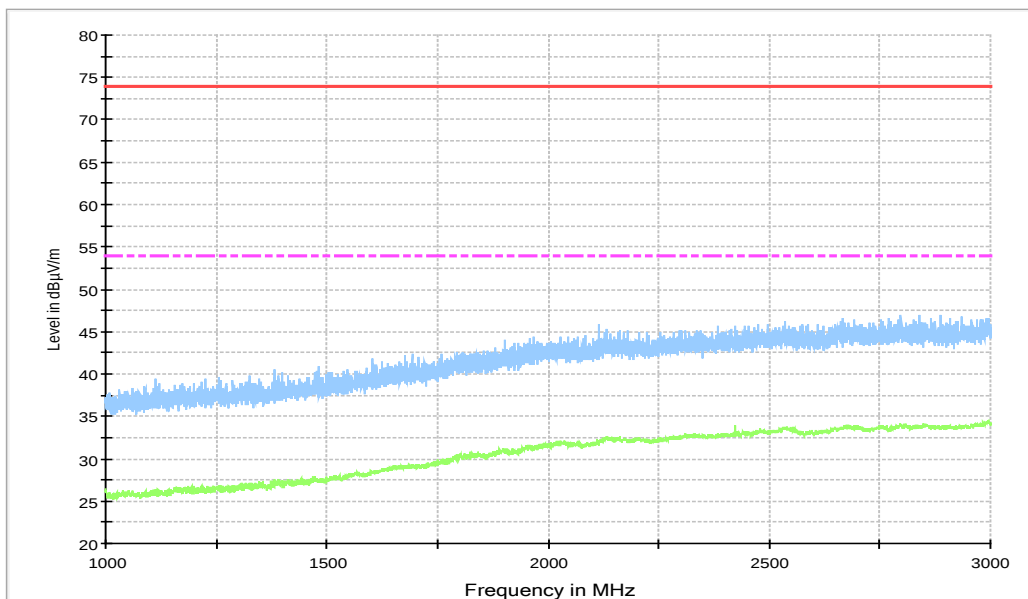


Figure A.8 Radiated Emission from 1GHz to 3GHz

15b RE - 3GHz-18GHz

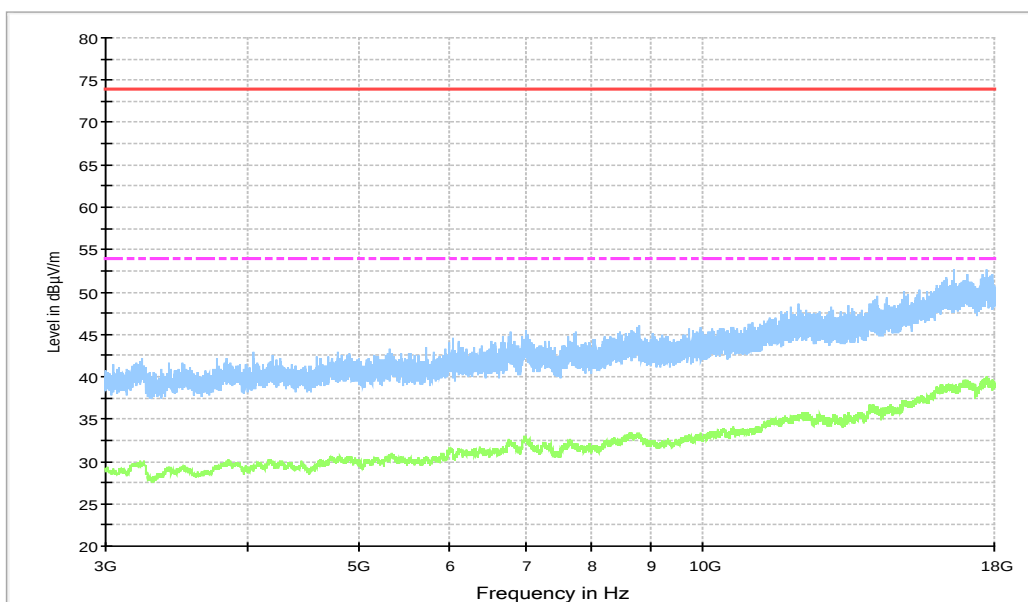


Figure A.9 Radiated Emission from 3GHz to 18GHz

USB (SD) mode +Front Camera, Set.4

15B RE 30MHz-1GHz

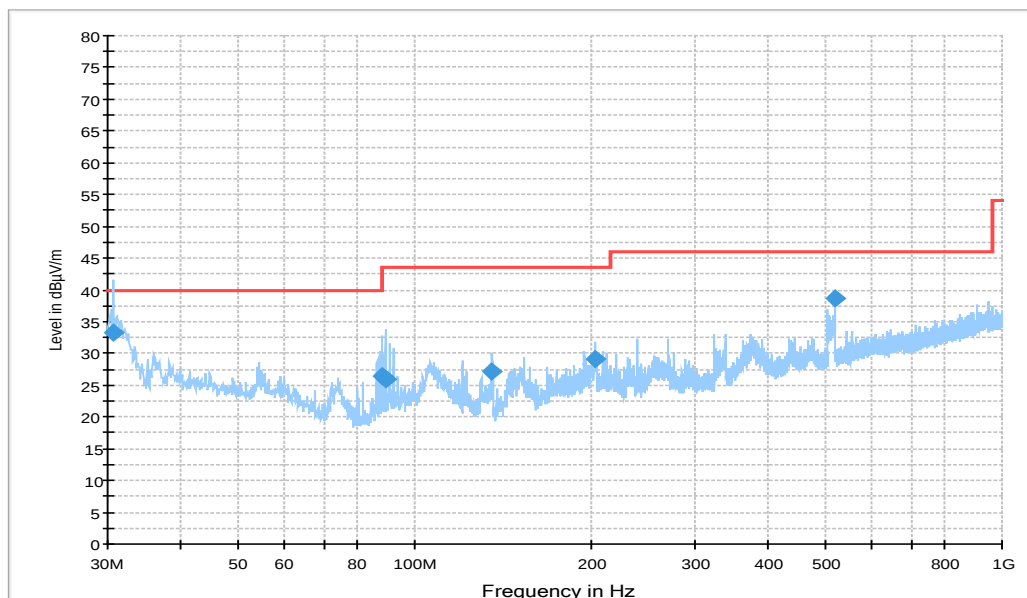


Figure A.10 Radiated Emission from 30MHz to 1GHz

Final Result 1

Frequency (MHz)	QuasiPeak (dBμV/m)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
30.679000	33.2	100.0	V	45.0	-1.9	6.8	40.0
87.812000	26.4	125.0	V	277.0	-3.9	13.6	40.0
89.073000	25.8	125.0	H	288.0	-3.5	17.7	43.5
135.43900	27.3	125.0	H	69.0	-4.7	16.2	43.5
203.33900	29.1	125.0	H	-4.0	-1.6	14.4	43.5
519.17100	38.6	125.0	V	-35.0	6.3	7.4	46.0

15B RE - 1GHz-3GHz

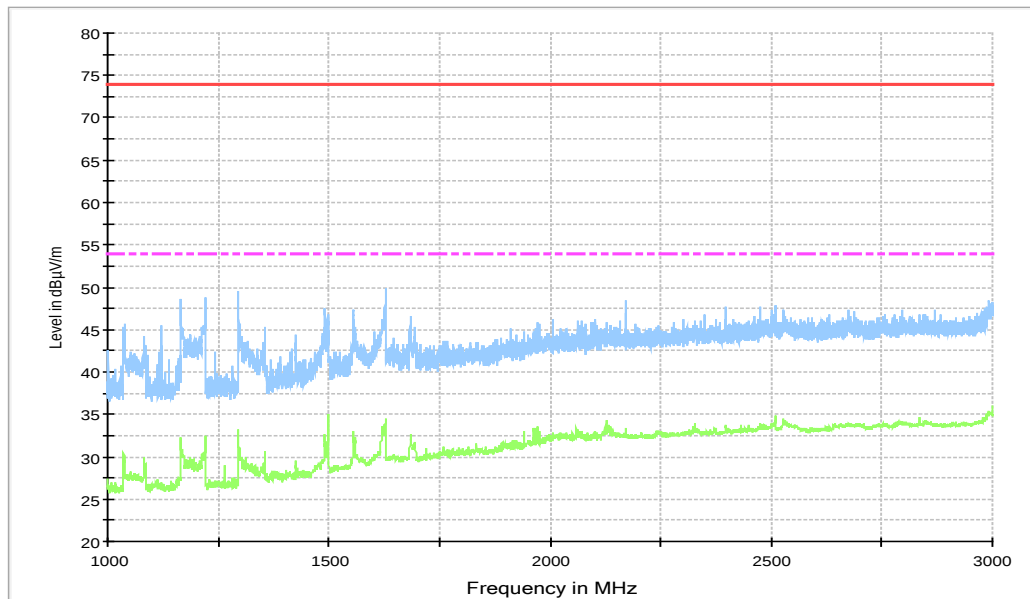


Figure A.11 Radiated Emission from 1GHz to 3GHz

15b RE - 3GHz-18GHz

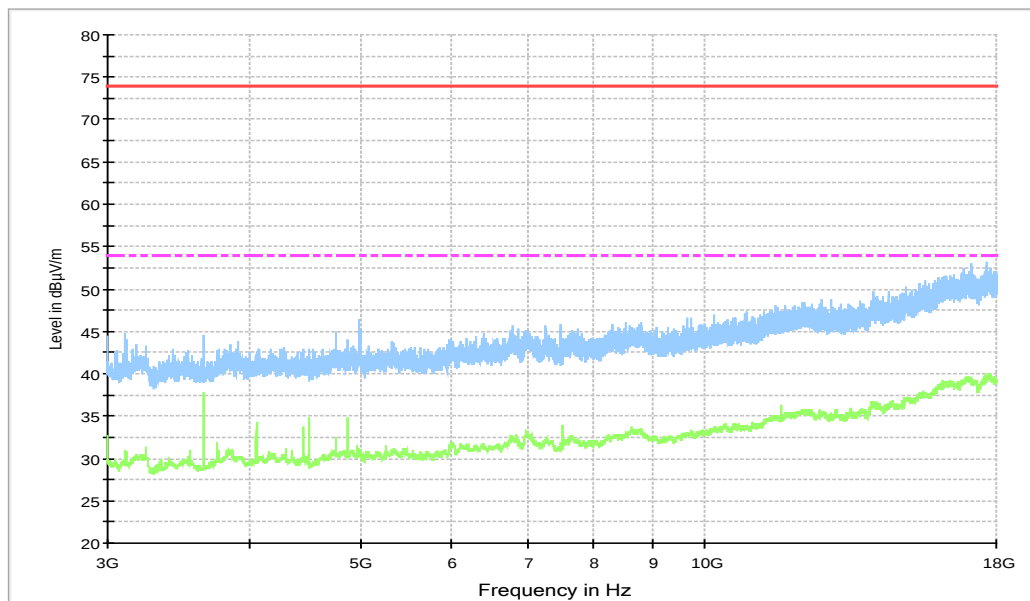


Figure A.12 Radiated Emission from 3GHz to 18GHz

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

License RX band mode, Set.5

GSM850MHz MID CHANNEL (881.6MHz)

15B RE 30MHz-1GHz

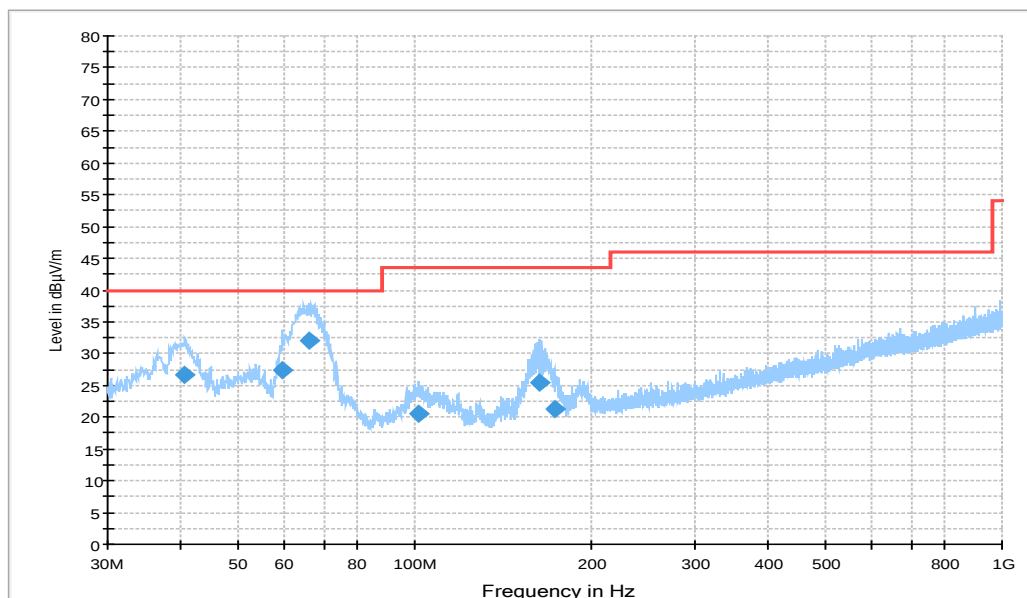


Figure A.13 Radiated Emission from 30MHz to 1GHz

Final Result 1

Frequency (MHz)	QuasiPeak (dBμV/m)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
40.670000	26.8	100.0	V	303.0	-0.2	13.2	40.0
59.585000	27.3	119.0	V	310.0	-0.4	12.7	40.0
66.084000	32.1	100.0	V	278.0	-2.7	7.9	40.0
101.78000	20.6	119.0	V	180.0	-1.1	22.9	43.5
163.47200	25.4	100.0	V	-7.0	-4.1	18.1	43.5
173.85100	21.3	100.0	V	0.0	-3.6	22.2	43.5

15B RE - 1GHz-3GHz

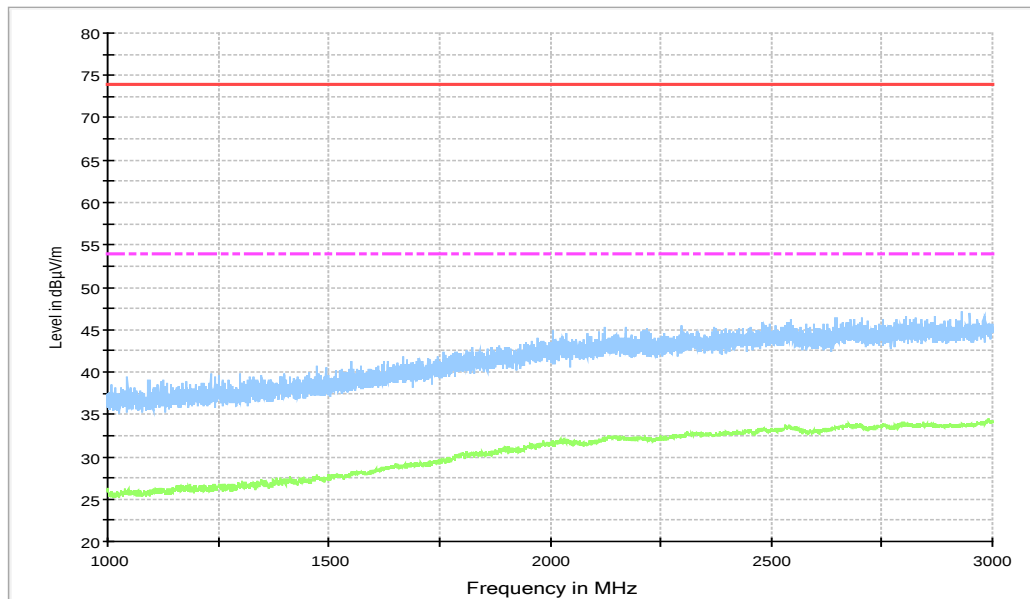


Figure A.14 Radiated Emission from 1GHz to 3GHz

15b RE - 3GHz-18GHz

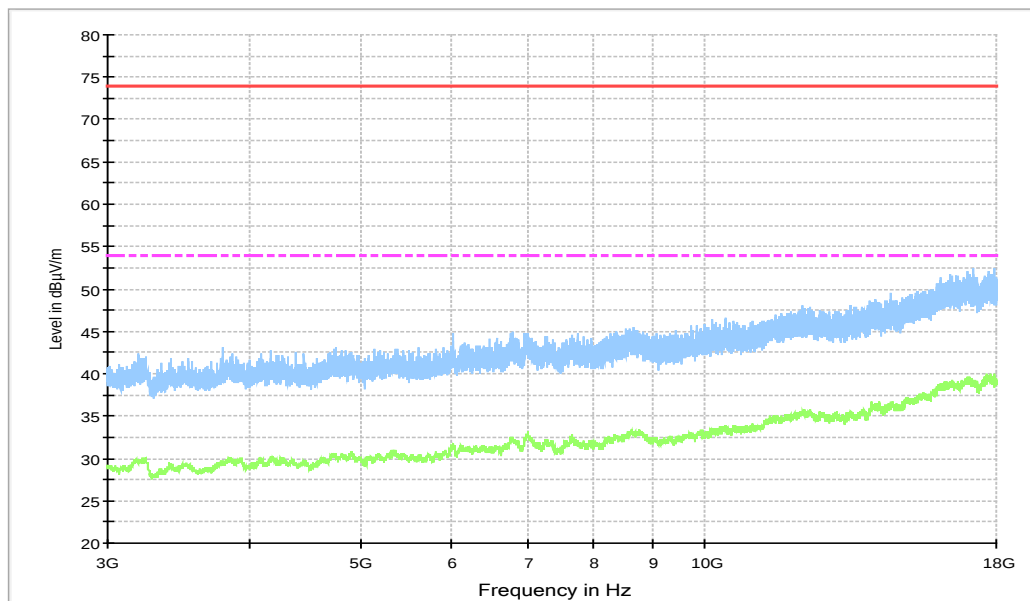


Figure A.15 Radiated Emission from 3GHz to 18GHz

WCDMA Band 5 MID CHANNEL (881.6MHz)

15B RE 30MHz-1GHz

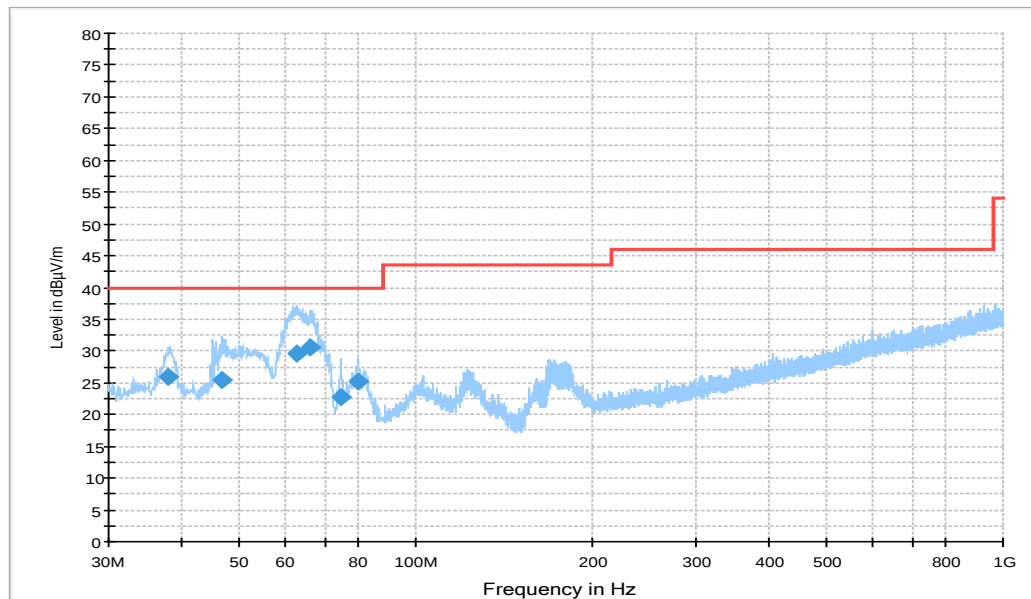


Figure A.16 Radiated Emission from 30MHz to 1GHz

Final Result 1

Frequency (MHz)	QuasiPeak (dBμV/m)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
37.857000	26.0	100.0	V	40.0	-0.6	14.0	40.0
46.781000	25.4	100.0	V	278.0	0.0	14.6	40.0
62.689000	29.6	100.0	V	293.0	-1.4	10.4	40.0
65.987000	30.5	110.0	V	274.0	-2.6	9.5	40.0
74.717000	22.9	100.0	V	299.0	-5.2	17.1	40.0
79.858000	25.1	125.0	V	291.0	-6.4	14.9	40.0

15B RE - 1GHz-3GHz

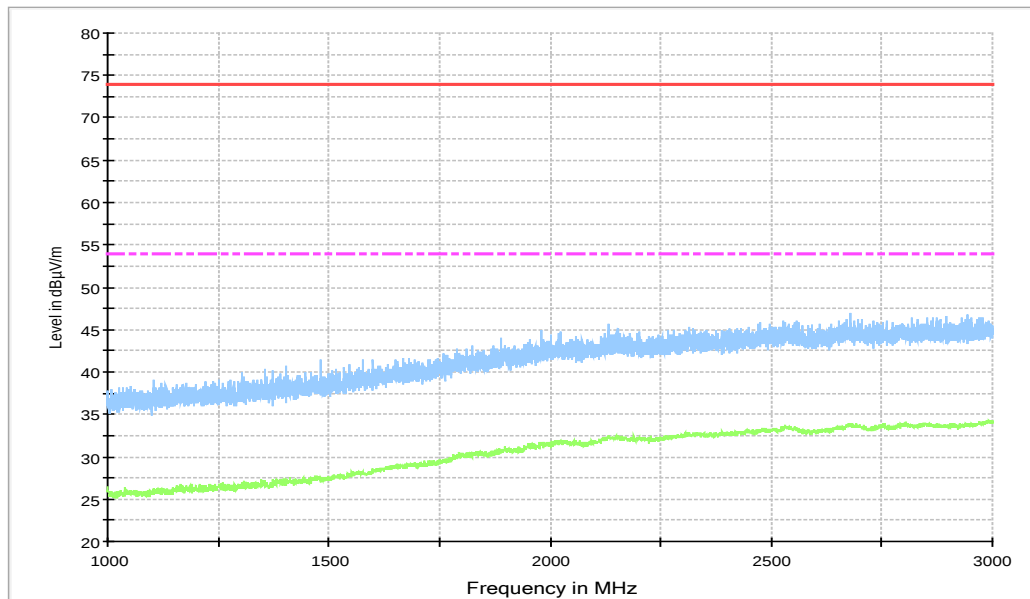


Figure A.17 Radiated Emission from 1GHz to 3GHz

15b RE - 3GHz-18GHz

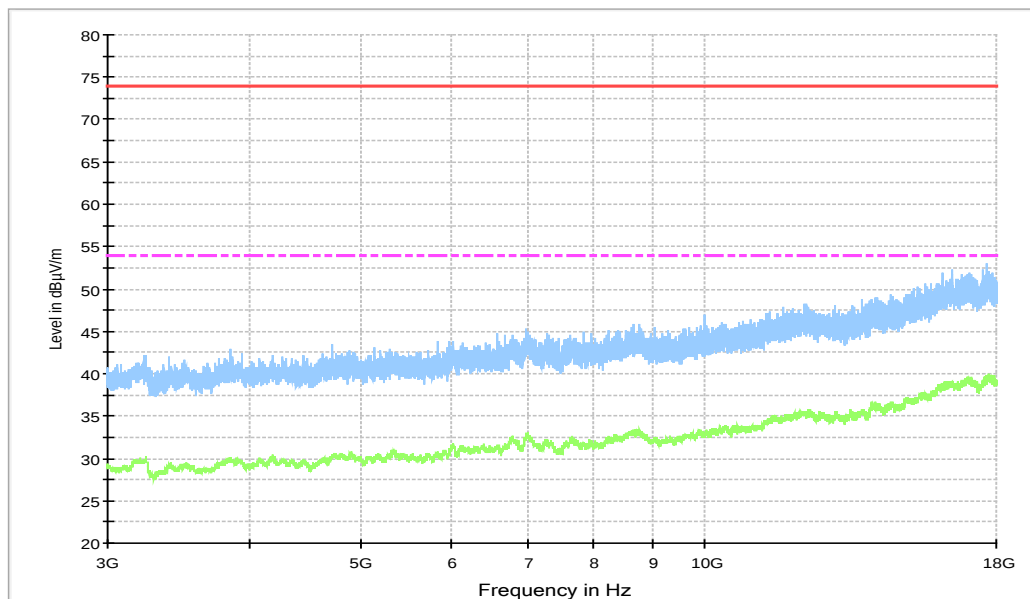


Figure A.18 Radiated Emission from 3GHz to 18GHz

LTE Band 12 MID CHANNEL (737.5MHz)

15B RE 30MHz-1GHz

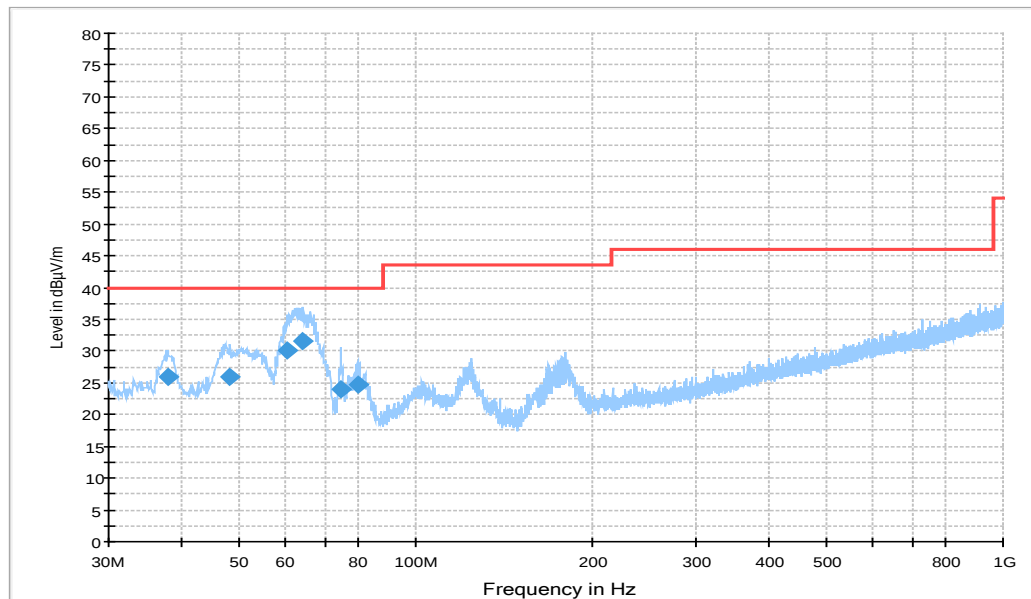


Figure A.19 Radiated Emission from 30MHz to 1GHz

Final Result 1

Frequency (MHz)	QuasiPeak (dBμV/m)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
37.857000	26.0	100.0	V	48.0	-0.6	14.0	40.0
48.333000	26.0	100.0	V	58.0	0.0	14.0	40.0
60.361000	30.0	100.0	V	242.0	-0.6	10.0	40.0
64.338000	31.5	100.0	V	270.0	-2.0	8.5	40.0
74.620000	23.9	119.0	V	270.0	-5.1	16.1	40.0
79.567000	24.6	125.0	V	298.0	-6.3	15.4	40.0

15B RE - 1GHz-3GHz

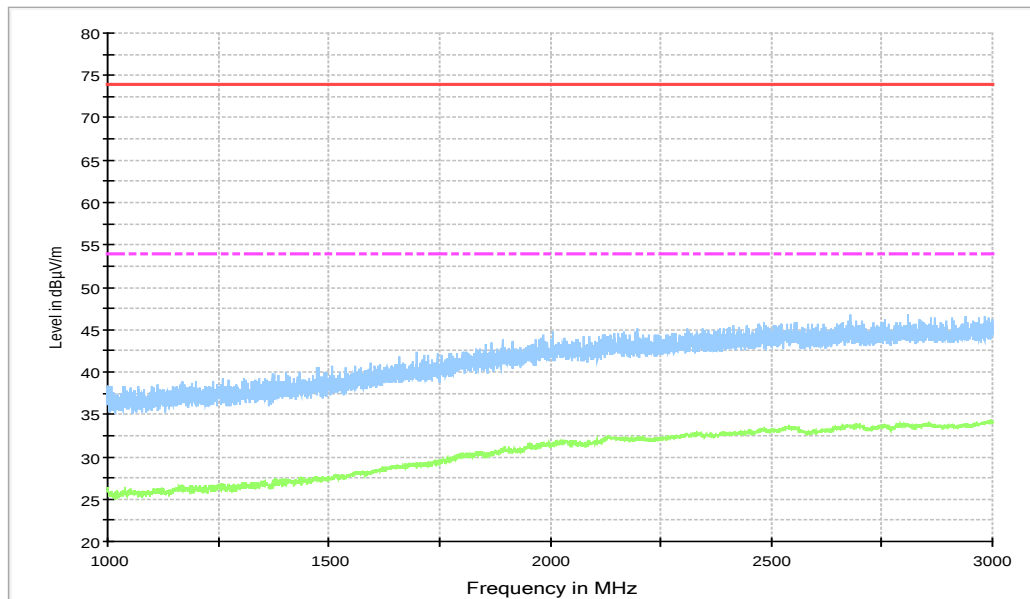


Figure A.20 Radiated Emission from 1GHz to 3GHz

15b RE - 3GHz-18GHz

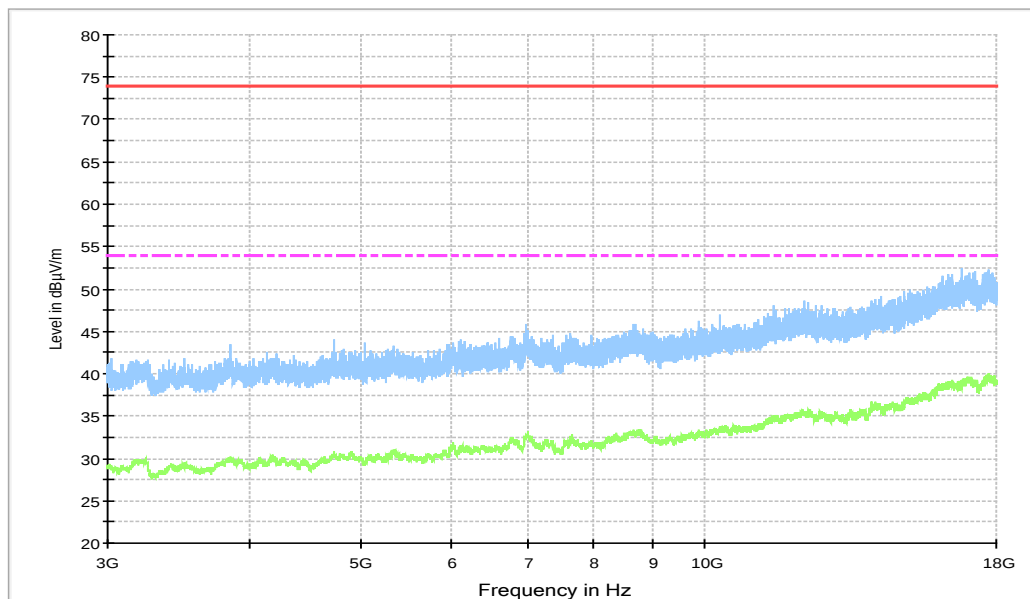


Figure A.21 Radiated Emission from 3GHz to 18GHz

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, MP3, MP4, CAMERA and SD mode.

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: $U = 3.10 \text{ dB}$, $k=2$.

Charger+MP3, Set.1

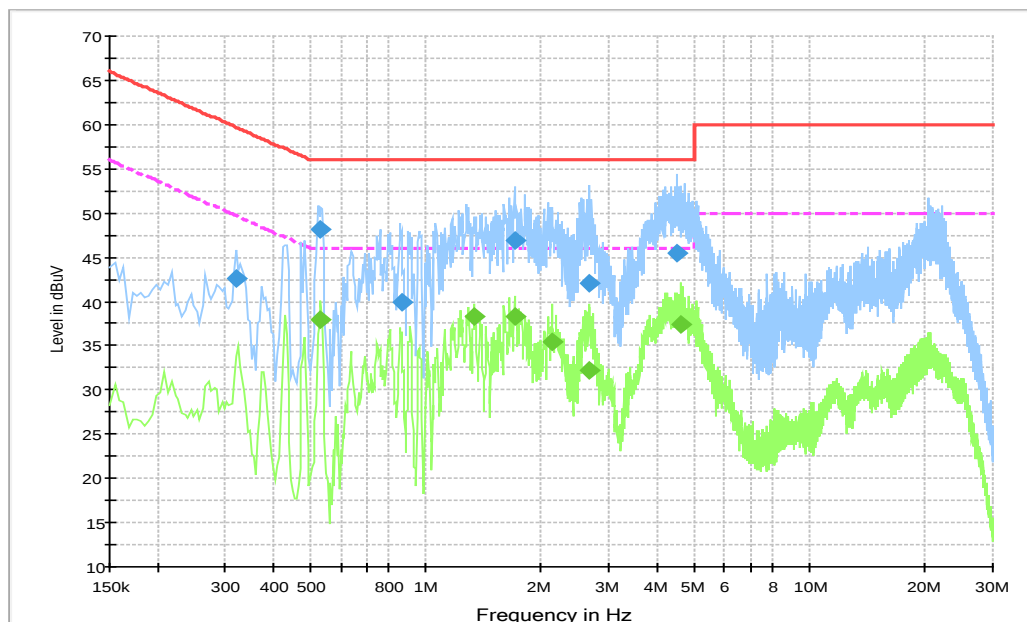


Figure A.22 Conducted Emission

Final Result 1

Frequency (MHz)	QuasiPeak (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.321000	42.6	10000.0	9.000	On	L1	19.9	17.1	59.7
0.532500	48.2	10000.0	9.000	On	L1	20.0	7.8	56.0
0.865500	39.8	10000.0	9.000	On	L1	19.8	16.2	56.0
1.702500	46.9	10000.0	9.000	On	L1	19.8	9.1	56.0
2.661000	42.1	10000.0	9.000	On	L1	19.8	13.9	56.0
4.519500	45.4	10000.0	9.000	On	L1	19.8	10.6	56.0

Final Result 2

Frequency (MHz)	Average (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.532500	37.9	10000.0	9.000	On	L1	20.0	8.1	46.0
1.333500	38.3	10000.0	9.000	On	L1	19.8	7.7	46.0
1.702500	38.4	10000.0	9.000	On	L1	19.8	7.6	46.0
2.134500	35.4	10000.0	9.000	On	L1	19.8	10.6	46.0
2.670000	32.2	10000.0	9.000	On	L1	19.8	13.8	46.0
4.627500	37.3	10000.0	9.000	On	L1	19.8	8.7	46.0

. Charger+ Rear Camera, Set.2

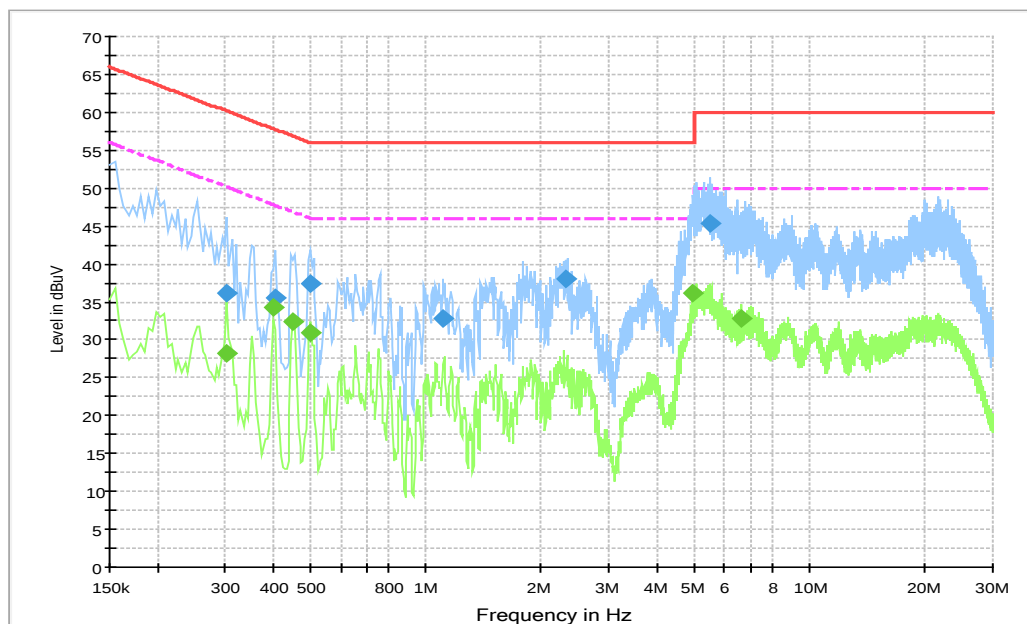


Figure A.23 Conducted Emission

Final Result 1

Frequency (MHz)	QuasiPeak (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.303000	36.1	10000.0	9.000	On	L1	20.0	24.0	60.2
0.406500	35.6	10000.0	9.000	On	L1	20.0	22.2	57.7
0.501000	37.4	10000.0	9.000	On	L1	20.0	18.6	56.0
1.108500	32.9	10000.0	9.000	On	L1	19.8	23.1	56.0
2.323500	38.0	10000.0	9.000	On	L1	19.8	18.0	56.0
5.487000	45.4	10000.0	9.000	On	L1	19.8	14.6	60.0

Final Result 2

Frequency (MHz)	Average (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.303000	28.2	10000.0	9.000	On	L1	20.0	21.9	50.2
0.402000	34.2	10000.0	9.000	On	L1	20.0	13.6	47.8
0.451500	32.4	10000.0	9.000	On	L1	20.0	14.5	46.8
0.501000	30.9	10000.0	9.000	On	L1	20.0	15.1	46.0
4.978500	36.1	10000.0	9.000	On	L1	19.8	9.9	46.0
6.607500	32.8	10000.0	9.000	On	L1	19.9	17.2	50.0

Charger+MP4, Set.3

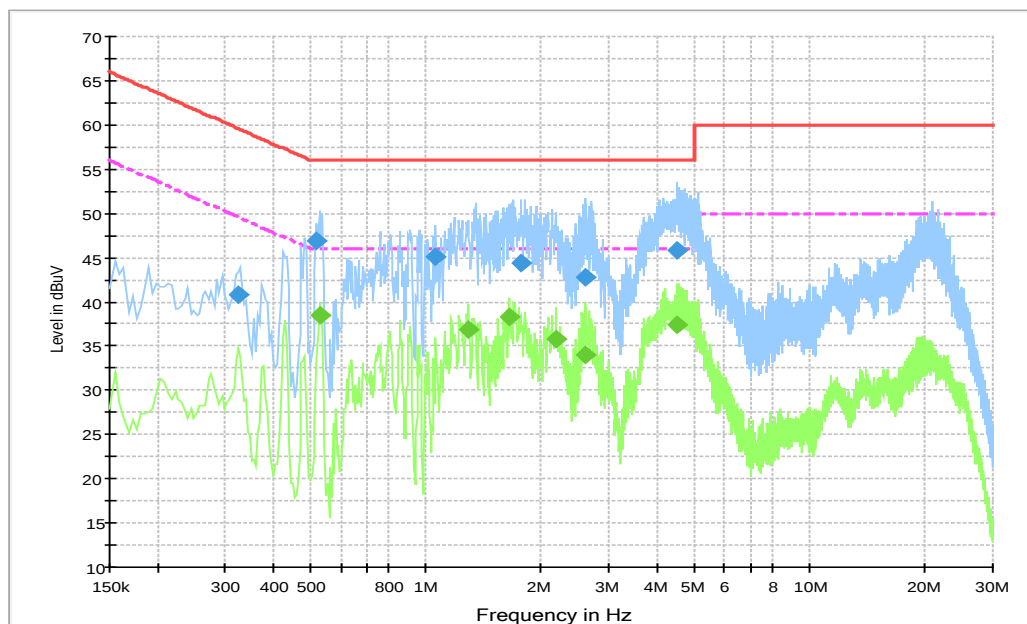


Figure A.24 Conducted Emission

Final Result 1

Frequency (MHz)	QuasiPeak (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.325500	40.8	10000.0	9.000	On	L1	19.9	18.7	59.6
0.519000	46.9	10000.0	9.000	On	L1	20.0	9.1	56.0
1.063500	45.1	10000.0	9.000	On	L1	19.8	10.9	56.0
1.774500	44.4	10000.0	9.000	On	L1	19.8	11.6	56.0
2.616000	42.7	10000.0	9.000	On	L1	19.8	13.3	56.0
4.519500	45.8	10000.0	9.000	On	L1	19.8	10.2	56.0

Final Result 2

Frequency (MHz)	Average (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.528000	38.5	10000.0	9.000	On	L1	20.0	7.5	46.0
1.288500	36.9	10000.0	9.000	On	L1	19.8	9.1	46.0
1.648500	38.2	10000.0	9.000	On	L1	19.8	7.8	46.0
2.184000	35.8	10000.0	9.000	On	L1	19.8	10.2	46.0
2.616000	33.9	10000.0	9.000	On	L1	19.8	12.1	46.0
4.519500	37.5	10000.0	9.000	On	L1	19.8	8.5	46.0

USB (SD) mode +Front Camera, Set.4

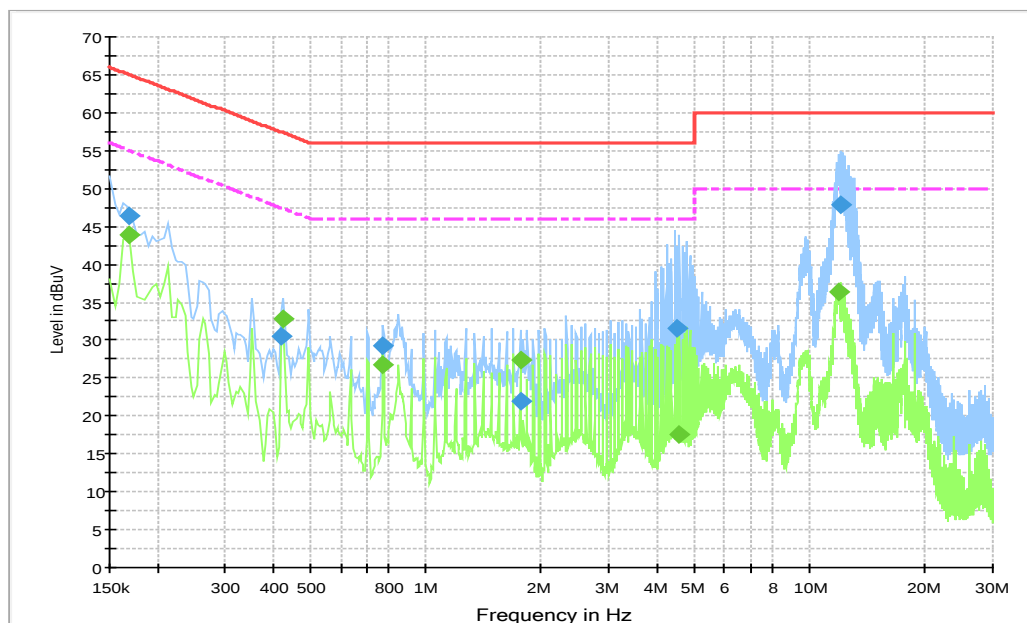


Figure A.25 Conducted Emission

Final Result 1

Frequency (MHz)	QuasiPeak (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.168000	46.5	10000.0	9.000	On	N	20.1	18.6	65.1
0.420000	30.6	10000.0	9.000	On	L1	20.0	26.9	57.4
0.775500	29.2	10000.0	9.000	On	L1	19.9	26.8	56.0
1.761000	22.0	10000.0	9.000	On	L1	19.8	34.0	56.0
4.519500	31.5	10000.0	9.000	On	N	19.8	24.5	56.0
11.998500	47.9	10000.0	9.000	On	L1	19.9	12.1	60.0

Final Result 2

Frequency (MHz)	Average (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.168000	44.0	10000.0	9.000	On	N	20.1	11.1	55.1
0.424500	32.8	10000.0	9.000	On	L1	20.0	14.6	47.4
0.775500	26.8	10000.0	9.000	On	N	19.9	19.2	46.0
1.765500	27.4	10000.0	9.000	On	L1	19.8	18.6	46.0
4.587000	17.5	10000.0	9.000	On	L1	19.8	28.5	46.0
11.850000	36.4	10000.0	9.000	On	L1	19.9	13.6	50.0

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

ANNEX B: Persons involved in this testing

Test Item	Tester
Radiated Emission	Zhao Wenhui,Li Zongliang,Yang Fei
Conducted Emission	Guo Qian

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