TEST REPORT

No. I20Z70015-EMC01

for

Samsung Electronics Co., Ltd.

Mobile phone

Model Name: SM-A115U

FCC ID: ZCASMA115U

with

Hardware Version: REV1.0

Software Version: A115U.001

Issued Date: 2020-04-29

Note:

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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
I20Z70015-EMC01	Rev.0	1st edition	2020-04-29

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

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

1.3. Testing Environment

Normal Temperature: 15-35°C

Relative Humidity: 20-75%

1.4. Project data

Testing Start Date: 2020-03-13

Testing End Date: 2020-04-14

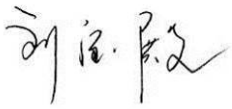
1.5. Signature

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:	+80-10-4376-0326

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

3.1. About EUT

Description	Mobile phone
Model Name	SM-A115U
FCC ID	ZCASMA115U
Extreme vol. Limits	3.5VDC to 4.4VDC (nominal: 3.85VDC)

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	3542223110084167	REV1.0	A115U.001

*EUT ID: is used to identify the test sample in the lab internally.

3.3. Internal Identification of AE used during the test

AE ID*	Description	SN	Remarks
AE1	Battery	/	/
AE2	Charger	/	/
AE3	USB Cable	/	/
AE4	Headset	/	/

AE1

Model	HQ-70N
Manufacturer	Ningde Amperex Technology Limited
Capacitance	3900mAh/4000mAh
Nominal voltage	3.82V

AE2

Model	EP-TA200
Manufacturer	RFTECH Co., Ltd.
Length of cable	/

AE3

Model	EP-DR140AWE
Manufacturer	LUXSHARE-ICT (VIETNAM) LIMITED
Length of cable	/

AE4

Model	EHS61ASFWE
Manufacturer	DONGGUAN YOUNGBO ELECTRONICS CO.,LTD
Length of cable	/

Note: The USB cables are shielded.

3.4. EUT set-ups

EUT set-up No.	Combination of EUT and AE	Remarks
Set.1	EUT1+ AE1 + AE2+ AE3+AE4	Charger+MP3+Camera (front preview)
Set.2	EUT1+ AE1 + AE2+ AE3+AE4	Charger+Camera (rear recording)
Set.3	EUT1+ AE1 + AE3+ AE4	USB mode +Mp4
Set.4	EUT1+ AE1 + AE3+ AE4	USB (SD) Data mode
Set.5	EUT1+ AE1 + AE2+ AE3	License RX mode

Note：

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 13, LTE BAND 17, LTE BAND 26, LTE BAND 71, and CDMA800.

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

4. Reference Documents

4.1. Reference Documents for testing

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

Reference	Title	Version
FCC Part 15, Subpart B	Radio frequency devices - Unintentional Radiators	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)**
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	ESCI	100766	2021-03-11	1 year
3	Universal Radio Communication Tester	CMW500	127406	R&S	2021-02-18	1 year
4	Universal Radio Communication Tester	CMU200	111792	R&S	2021-01-05	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	Printer	P1606dn	VNC3L52122	HP	N/A	N/A
10	Keyboard	KU-1601	2048361	Lenovo	N/A	N/A
11	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.

For License RX band mode, GSM850, WCDMA BAND 5 and LTE BAND 12 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.

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): 30MHz-1GHz：5.40dB, 1GHz-18GHz：4.32dB, *k*=2.

Measurement results for Set.1:

Charger+MP3+Camera (front preview) /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)
17098.000	42.50	-26.1	41.6	26.98	54.0	11.5	V
17089.500	42.47	-26.1	41.6	26.99	54.0	11.5	H
17385.500	42.45	-26.5	41.3	27.66	54.0	11.5	V
17935.000	42.44	-26.0	41.3	27.19	54.0	11.6	H
17887.000	42.41	-26.2	41.3	27.37	54.0	11.6	V
17884.000	42.40	-26.2	41.3	27.37	54.0	11.6	V

Charger+MP3+Camera (front preview) /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)
17964.000	55.5	-25.9	41.3	40.13	74.0	18.5	V
16425.000	55.1	-27.1	41.3	40.95	74.0	18.9	V
17356.000	55.0	-26.6	41.3	40.30	74.0	19.0	H
17745.500	54.9	-26.5	41.2	40.17	74.0	19.1	V
16793.000	54.8	-26.8	41.6	39.99	74.0	19.2	V
16716.500	54.7	-26.7	41.5	39.81	74.0	19.3	V

Measurement results for Set.2:

Charger+Camera (rear recording) /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)
17397.000	42.47	-26.5	41.3	27.65	54.0	11.5	V
17092.500	42.44	-26.1	41.6	26.95	54.0	11.6	V
17104.000	42.44	-26.0	41.6	26.89	54.0	11.6	H
17087.000	42.44	-26.1	41.6	26.98	54.0	11.6	V
17087.500	42.44	-26.1	41.6	26.97	54.0	11.6	H
17070.500	42.43	-26.3	41.6	27.05	54.0	11.6	V

Charger+Camera (rear recording) /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)
17756.500	55.29	-26.5	41.3	40.58	74.0	18.7	H
17151.500	54.94	-26.2	41.5	39.56	74.0	19.1	H
17950.500	54.86	-26.0	41.3	39.54	74.0	19.1	V
17605.000	54.59	-26.5	41.2	39.83	74.0	19.4	V
16819.500	54.55	-26.8	41.6	39.79	74.0	19.4	V
17189.500	54.52	-26.4	41.5	39.37	74.0	19.5	V

Measurement results for Set.3:

USB mode +Mp4 /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)
17089.000	42.31	-26.1	41.6	26.84	54.0	11.7	H
17087.000	42.22	-26.1	41.6	26.75	54.0	11.8	V
17097.000	42.19	-26.1	41.6	26.67	54.0	11.8	H
17899.000	42.16	-26.2	41.3	27.07	54.0	11.8	H
17098.000	42.16	-26.1	41.6	26.63	54.0	11.8	H
17926.500	42.15	-26.1	41.3	26.93	54.0	11.8	H

USB mode +Mp4 /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)
16971.000	55.4	-26.9	41.7	40.66	74.0	18.6	H
16835.000	55.1	-26.9	41.6	40.34	74.0	18.9	V
17084.500	55.1	-26.2	41.6	39.60	74.0	18.9	H
17364.500	55.0	-26.6	41.3	40.30	74.0	19.0	V
16558.000	54.9	-26.8	41.4	40.24	74.0	19.1	V
17368.500	54.9	-26.6	41.3	40.14	74.0	19.1	V

Measurement results for Set.4

USB (SD) Data 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)
17906.500	42.33	-26.2	41.3	27.20	54.0	11.7	V
17920.500	42.32	-26.1	41.3	27.13	54.0	11.7	V
17096.500	42.32	-26.1	41.6	26.80	54.0	11.7	H
17899.500	42.32	-26.2	41.3	27.22	54.0	11.7	V
17361.500	42.31	-26.6	41.3	27.58	54.0	11.7	V
17106.000	42.29	-26.0	41.6	26.72	54.0	11.7	V

USB (SD) Data 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)
17102.500	55.2	-26.0	41.6	39.65	74.0	18.8	V
17981.500	55.1	-25.8	41.3	39.68	74.0	18.9	V
17908.000	55.0	-26.1	41.3	39.91	74.0	19.0	H
16987.000	55.0	-26.8	41.7	40.14	74.0	19.0	V
17451.500	55.0	-26.3	41.2	40.04	74.0	19.0	V
17497.500	54.9	-26.3	41.2	40.02	74.0	19.1	H

Charger+MP3+Camera (front preview), Set.1

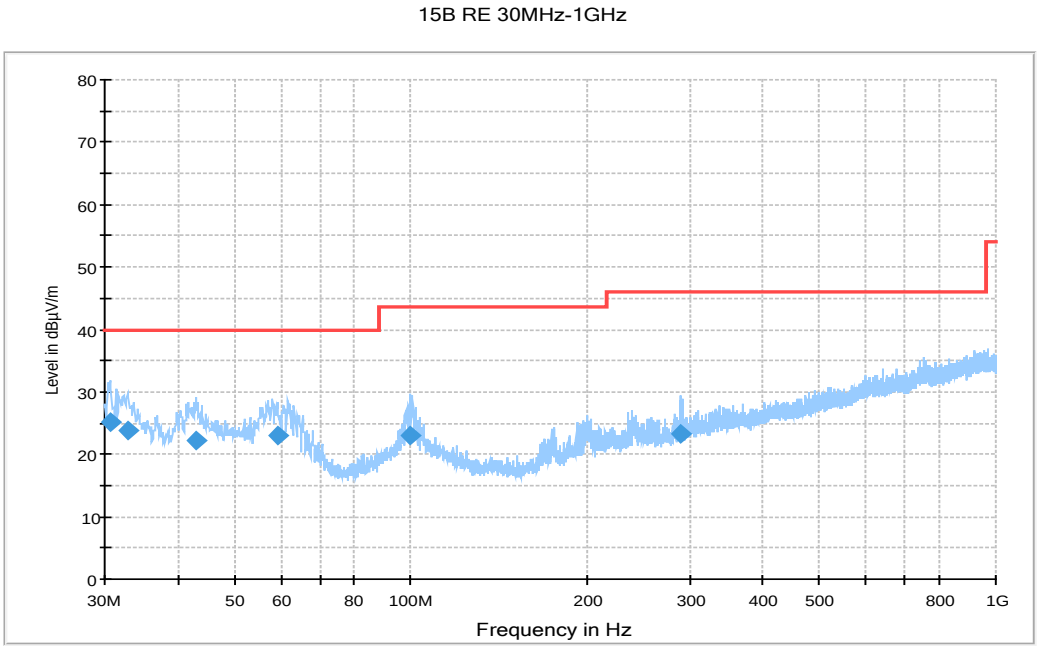


Figure A.1 Radiated Emission from 30MHz to 1GHz

Final Result 1

Frequency (MHz)	QuasiPeak (dBµV/m)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
30.582000	25.1	100.0	V	310.0	-3.3	14.9	40.0
32.813000	23.9	100.0	V	20.0	-3.0	16.1	40.0
42.998000	22.2	100.0	V	9.0	-0.2	17.8	40.0
59.197000	23.1	100.0	V	-38.0	-0.6	16.9	40.0
99.646000	22.9	119.0	V	242.0	-1.9	20.6	43.5
289.66900	23.4	100.0	H	290.0	0.5	22.6	46.0

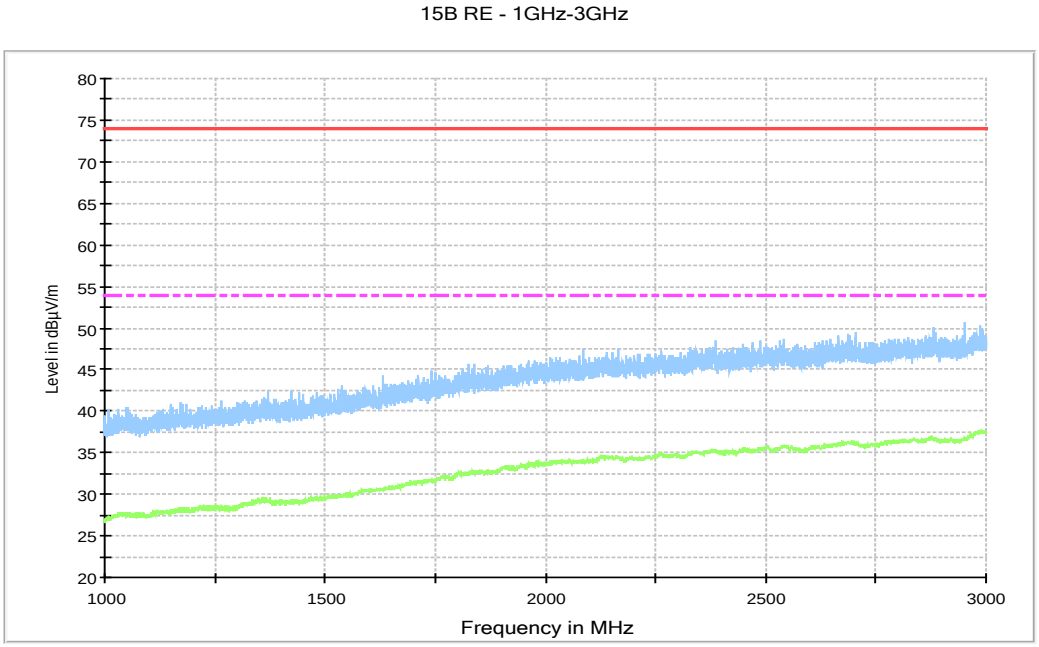


Figure A.2 Radiated Emission from 1GHz to 3GHz

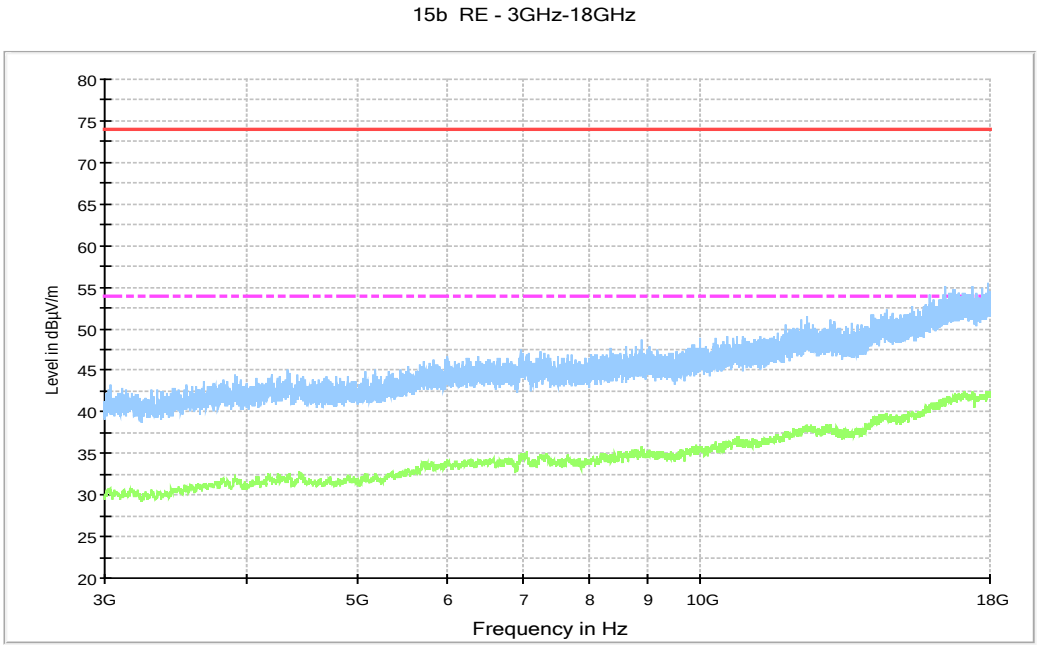


Figure A.3 Radiated Emission from 3GHz to 18GHz

Charger+Camera (rear recording), Set.2

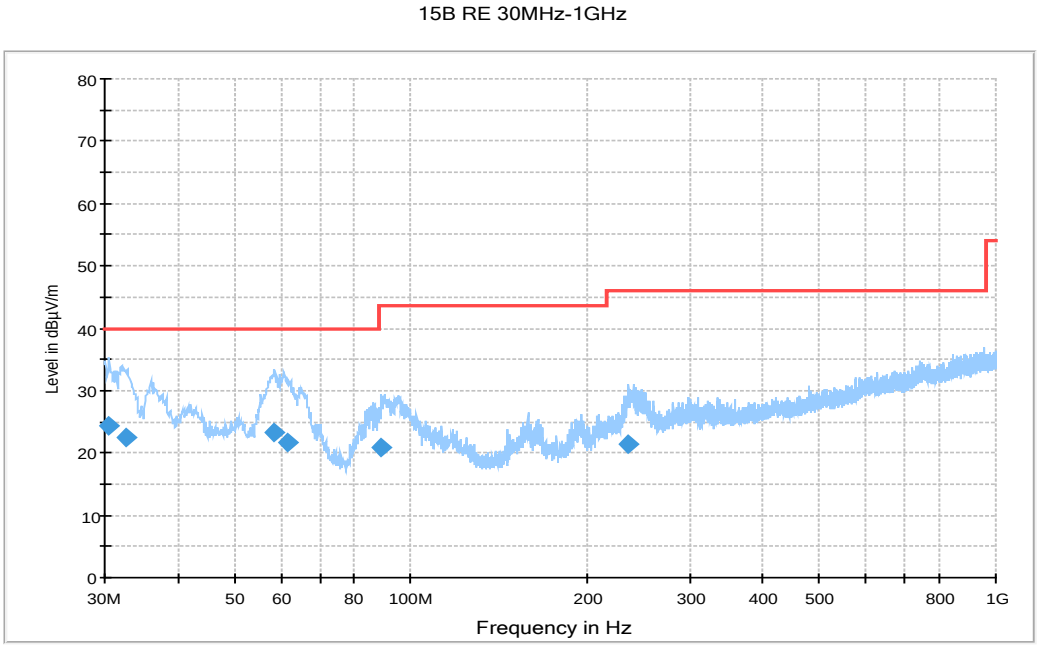


Figure A.4 Radiated Emission from 30MHz to 1GHz

Final Result 1

Frequency (MHz)	QuasiPeak (dBµV/m)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
30.485000	24.3	100.0	V	69.0	-3.3	15.7	40.0
32.716000	22.5	100.0	V	118.0	-3.0	17.5	40.0
58.615000	23.4	100.0	V	59.0	-0.3	16.6	40.0
61.816000	21.6	100.0	V	217.0	-1.3	18.4	40.0
89.073000	20.8	100.0	V	205.0	-4.1	22.7	43.5
236.12500	21.4	100.0	V	4.0	-0.8	24.6	46.0

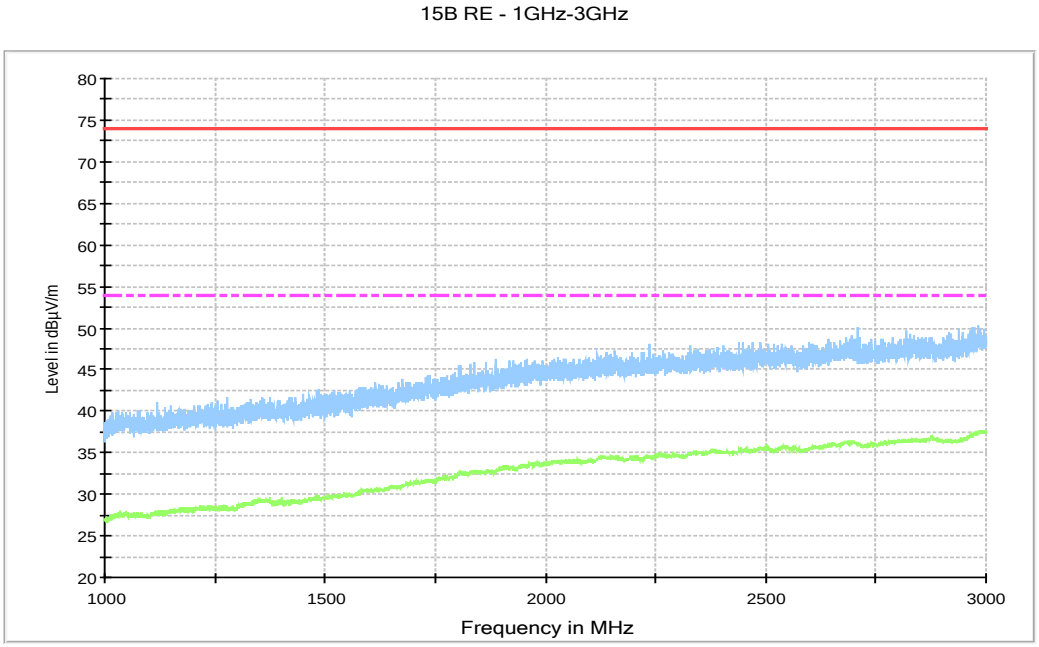


Figure A.5 Radiated Emission from 1GHz to 3GHz

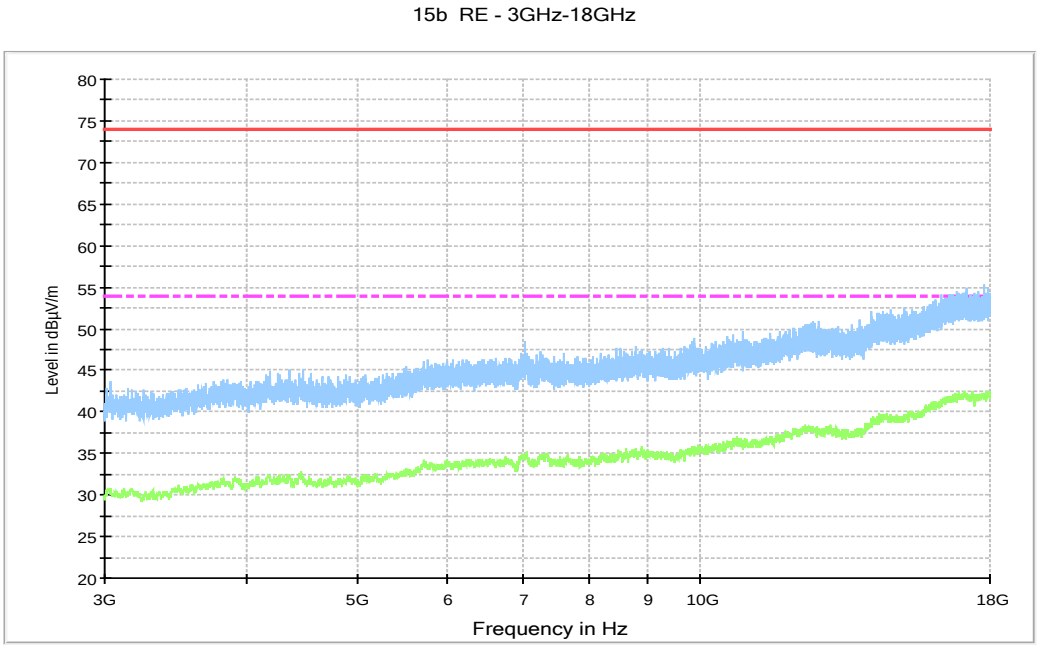


Figure A.6 Radiated Emission from 3GHz to 18GHz

USB mode +Mp4, Set.3

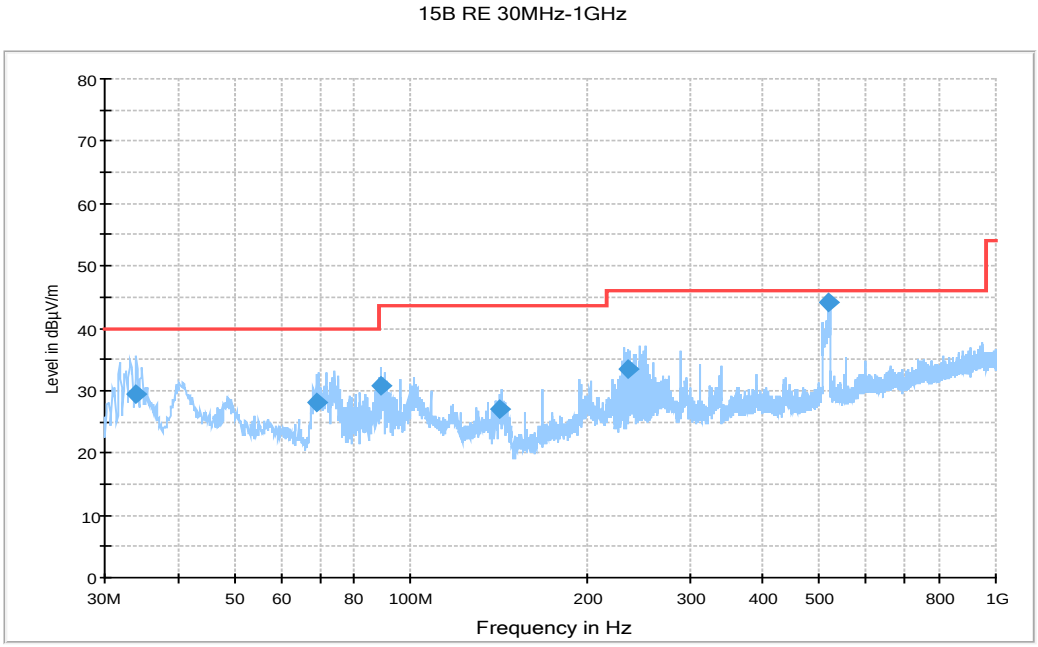


Figure A.7 Radiated Emission from 30MHz to 1GHz

Note: the spike（519MHz）is occurred by Printer

Final Result 1

Frequency (MHz)	QuasiPeak (dBµV/m)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
33.977000	29.5	100.0	V	97.0	-2.5	10.5	40.0
68.994000	28.2	119.0	V	40.0	-4.1	11.8	40.0
88.879000	30.8	100.0	V	55.0	-4.2	12.7	43.5
142.13200	27.2	110.0	V	194.0	-4.8	16.3	43.5
235.25200	33.4	100.0	H	14.0	-0.8	12.6	46.0
519.36500	44.1	100.0	H	-28.0	6.3	1.9	46.0

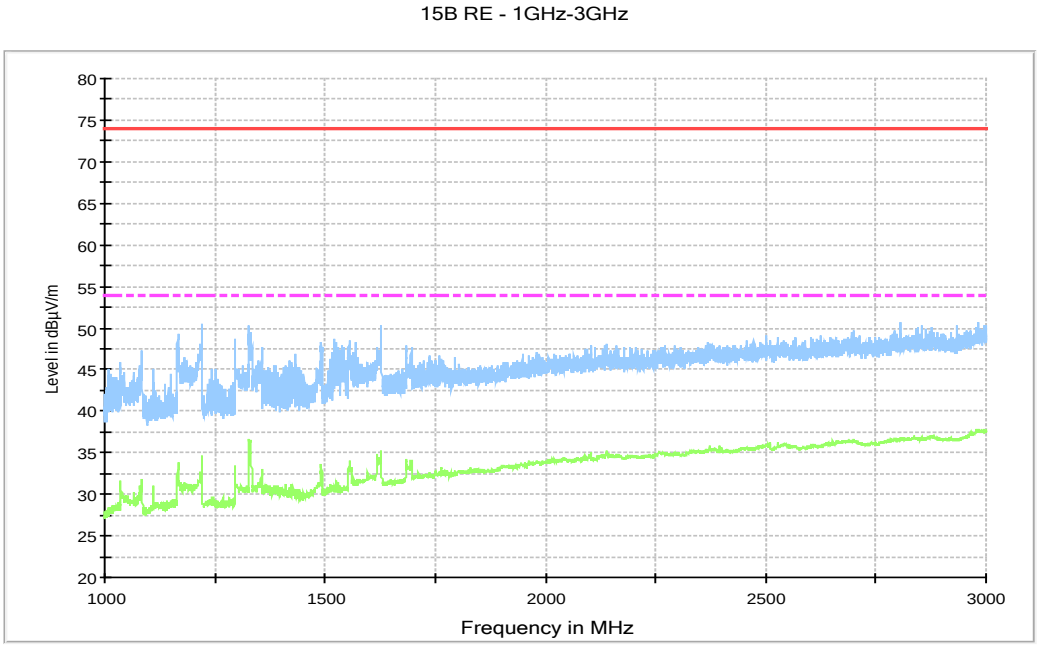


Figure A.8 Radiated Emission from 1GHz to 3GHz

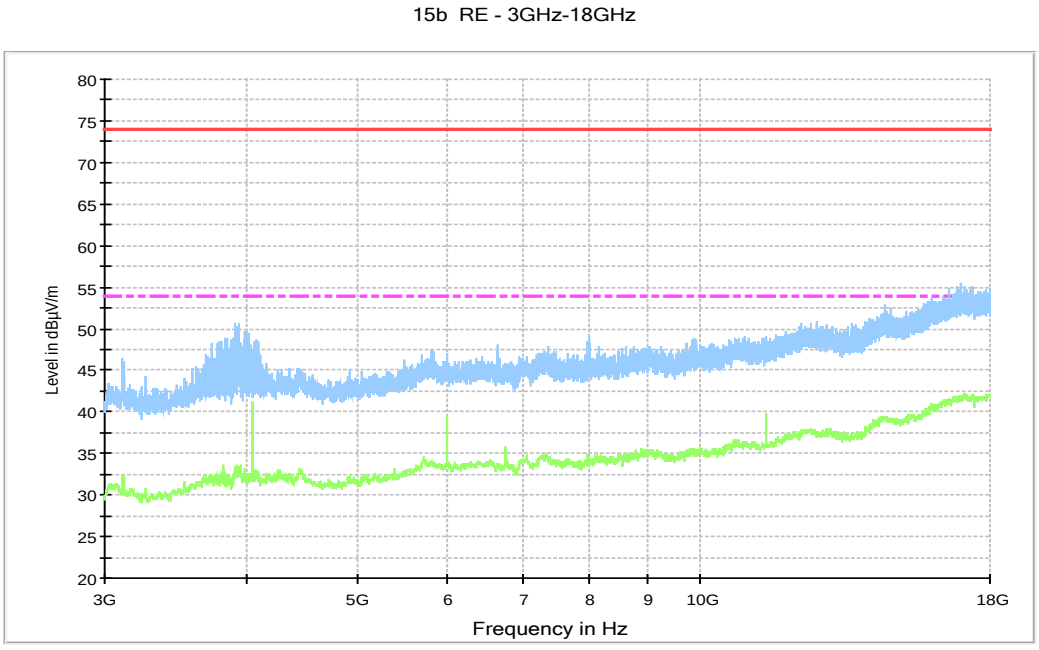


Figure A.9 Radiated Emission from 3GHz to 18GHz

USB (SD) Data mode, Set.4

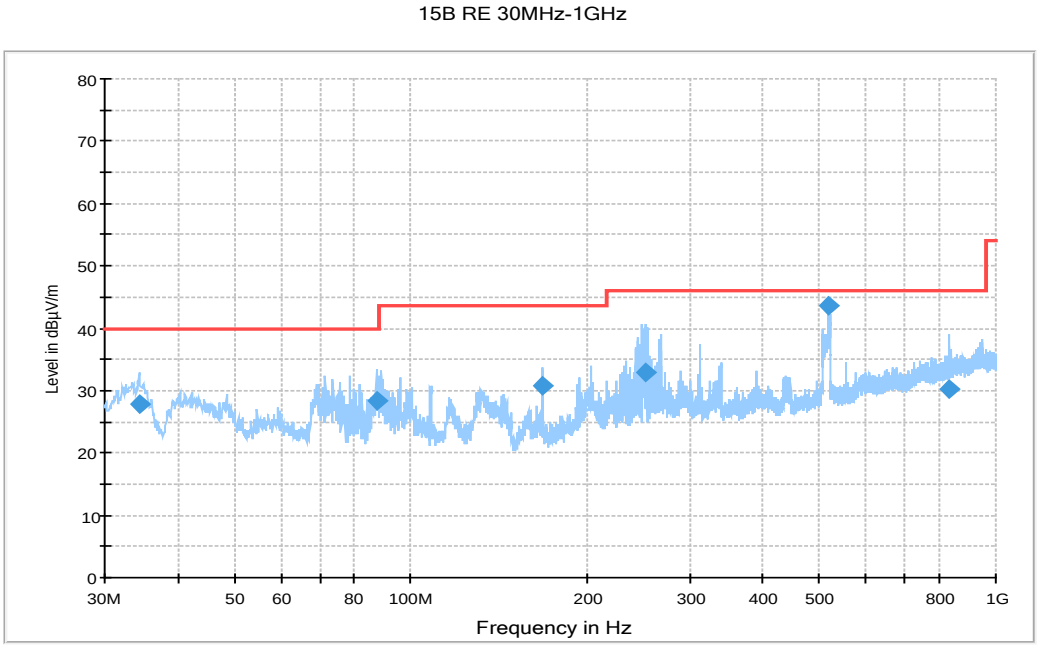


Figure A.10 Radiated Emission from 30MHz to 1GHz

Note: the spike（519MHz）is occurred by Printer

Final Result 1

Frequency (MHz)	QuasiPeak (dBµV/m)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
34.365000	27.9	100.0	V	135.0	-2.4	12.1	40.0
87.327000	28.3	100.0	V	45.0	-4.7	11.7	40.0
168.32200	30.9	125.0	V	-7.0	-4.4	12.6	43.5
252.32400	32.9	110.0	H	292.0	-0.4	13.1	46.0
519.26800	43.7	100.0	H	-32.0	6.3	2.3	46.0
833.93600	30.3	110.0	H	180.0	10.5	15.7	46.0

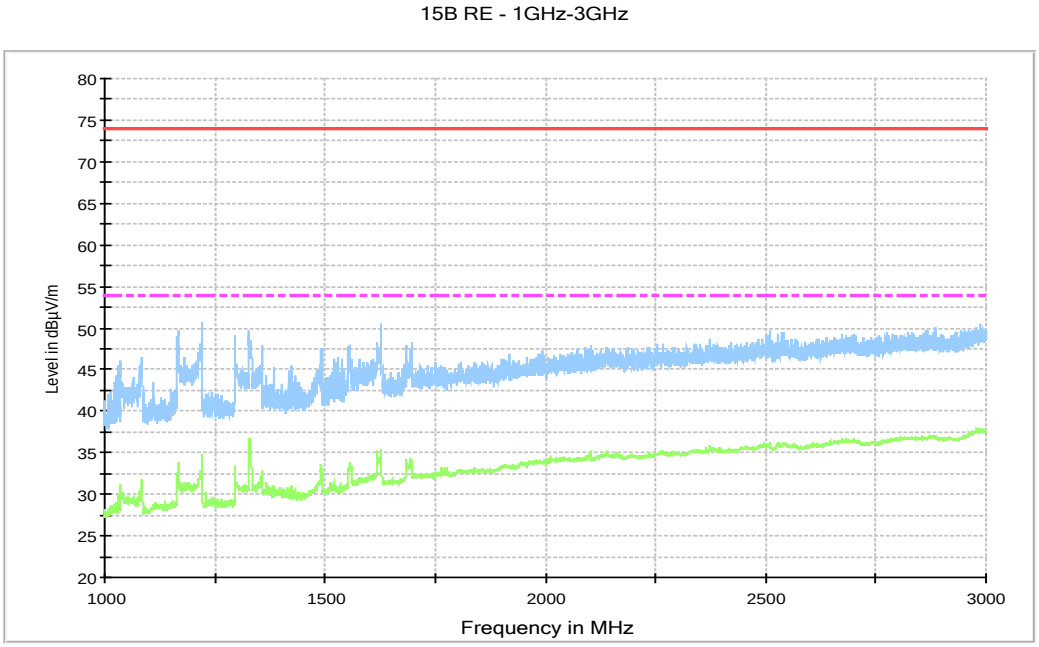


Figure A.11 Radiated Emission from 1GHz to 3GHz

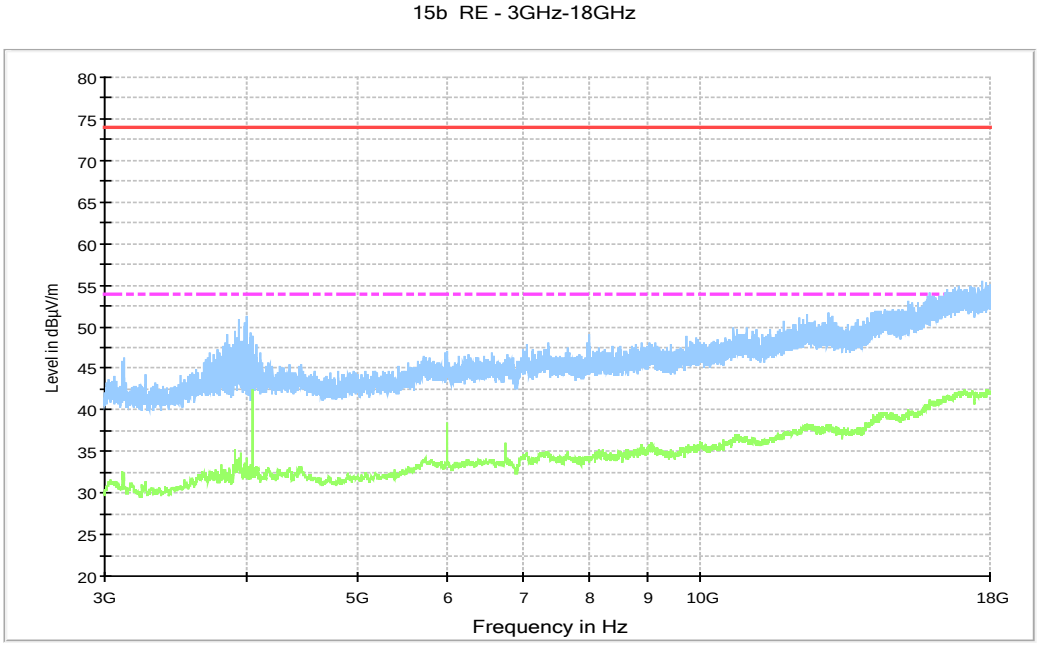


Figure A.12 Radiated Emission from 3GHz to 18GHz

License RX band mode, Set.5

GSM850MHz LOW CHANNEL (869.2MHz)

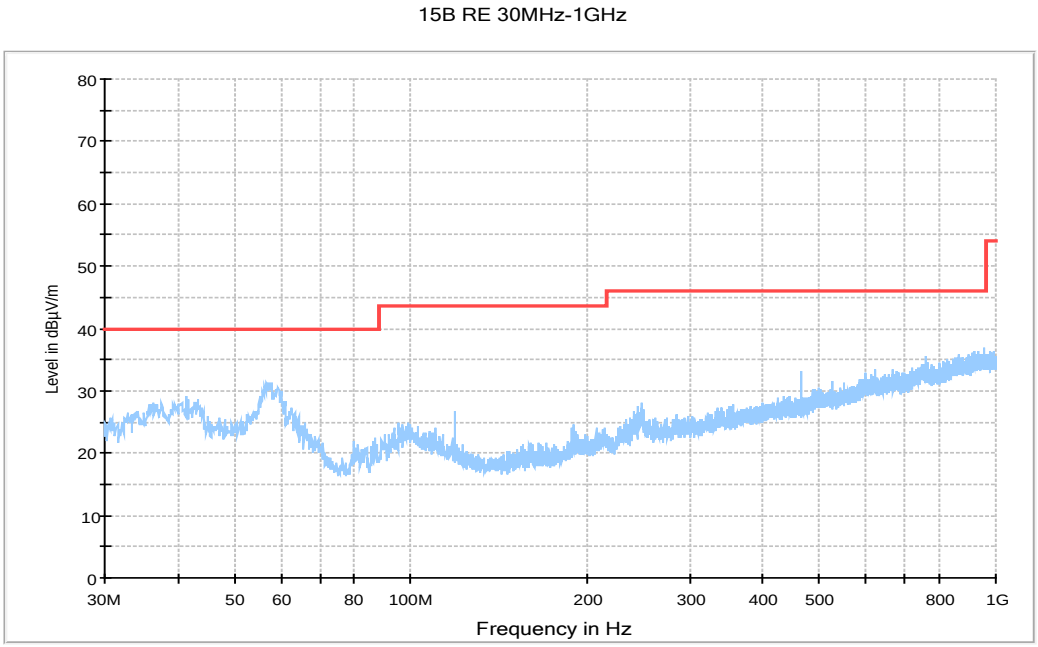


Figure A.13 Radiated Emission from 30MHz to 1GHz

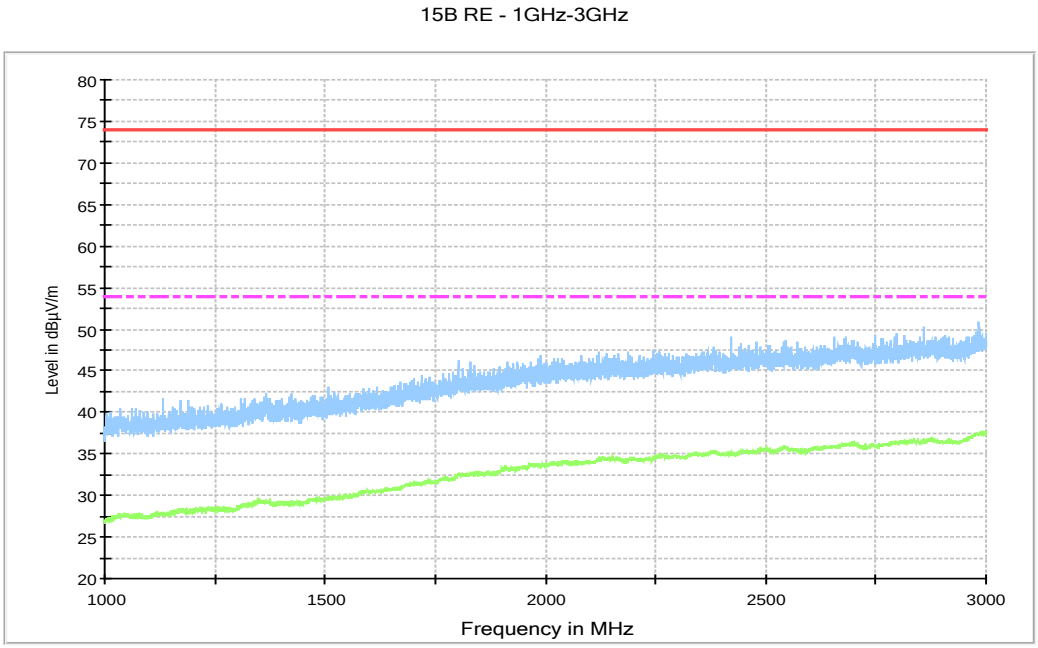


Figure A.14 Radiated Emission from 1GHz to 3GHz

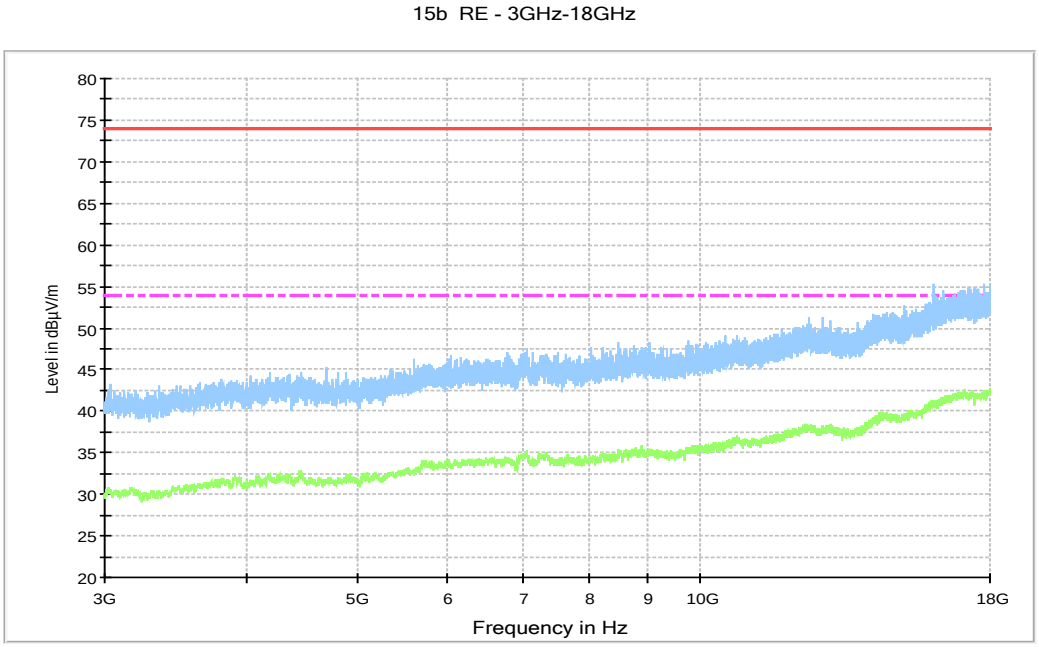


Figure A.15 Radiated Emission from 3GHz to 18GHz

GSM850MHz MID CHANNEL (881.6MHz)

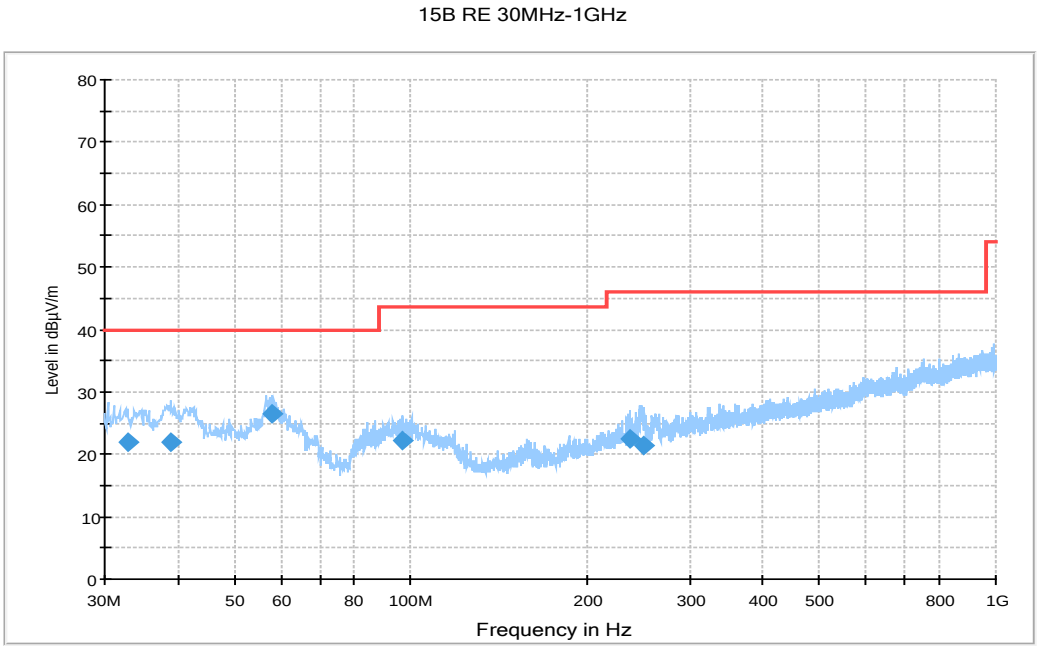


Figure A.16 Radiated Emission from 30MHz to 1GHz

Final Result 1

Frequency (MHz)	QuasiPeak (dBµV/m)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
32.813000	22.0	100.0	V	153.0	-3.0	18.0	40.0
38.924000	21.9	125.0	V	83.0	-0.9	18.1	40.0
57.936000	26.5	100.0	V	115.0	0.1	13.5	40.0
97.124000	22.1	100.0	V	188.0	-2.3	21.4	43.5
237.87100	22.5	100.0	V	-3.0	-0.7	23.5	46.0
249.70500	21.3	125.0	H	90.0	-0.3	24.7	46.0

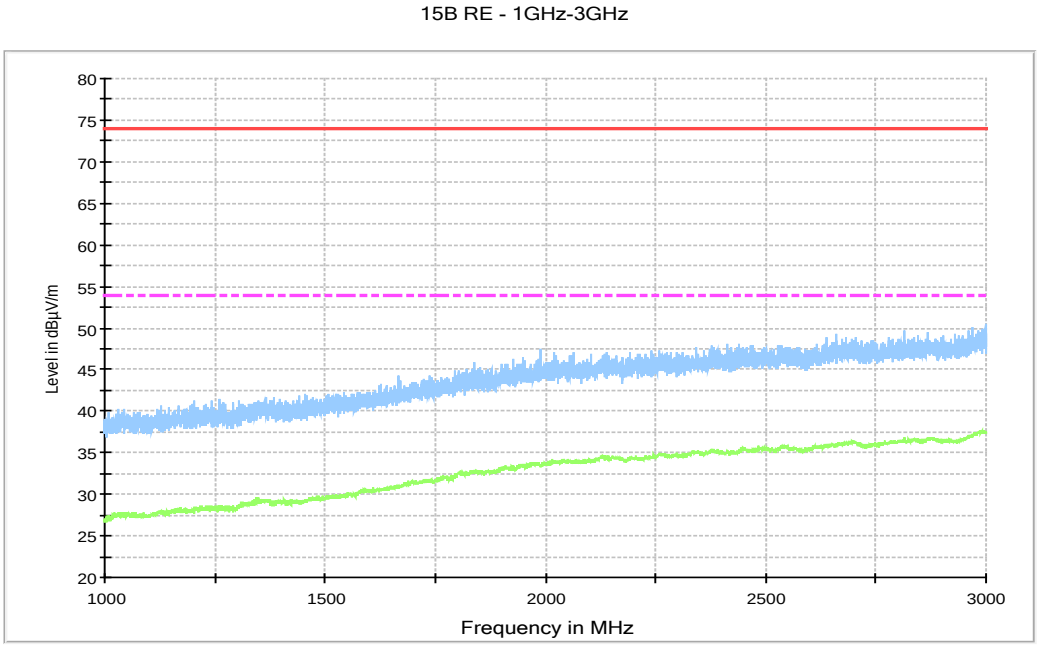


Figure A.17 Radiated Emission from 1GHz to 3GHz

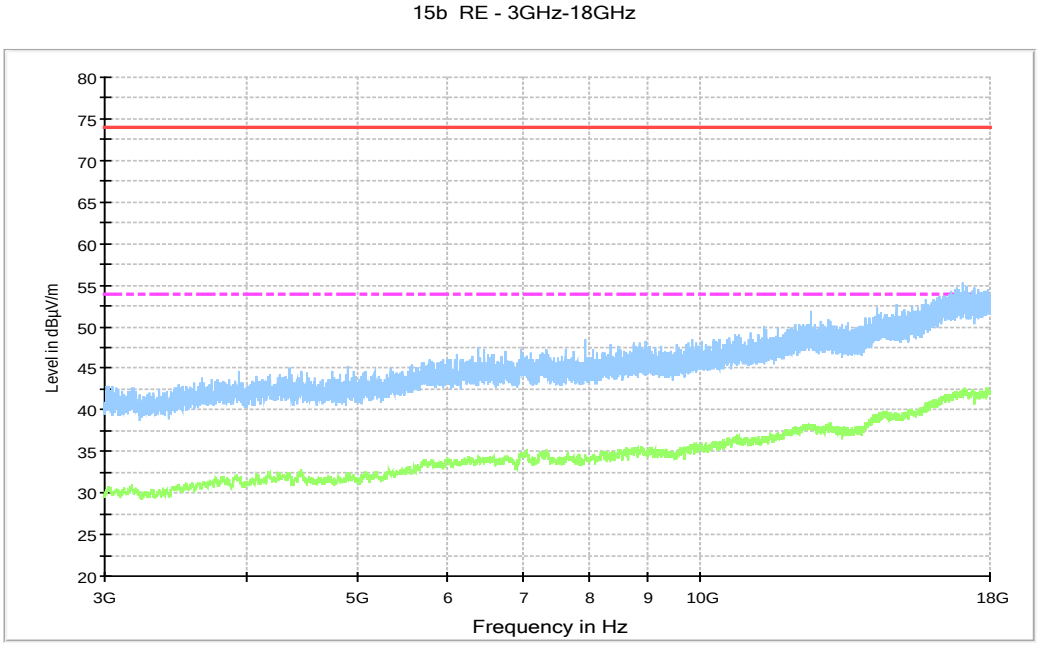


Figure A.18 Radiated Emission from 3GHz to 18GHz

GSM850MHz HIGH CHANNEL (893.8MHz)

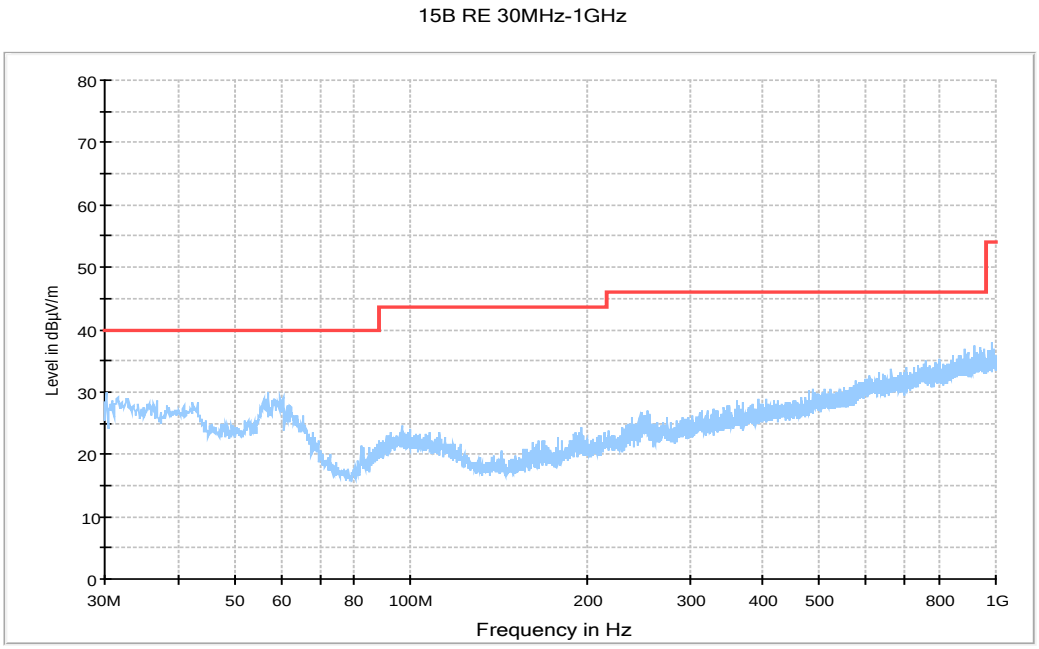


Figure A.19 Radiated Emission from 30MHz to 1GHz

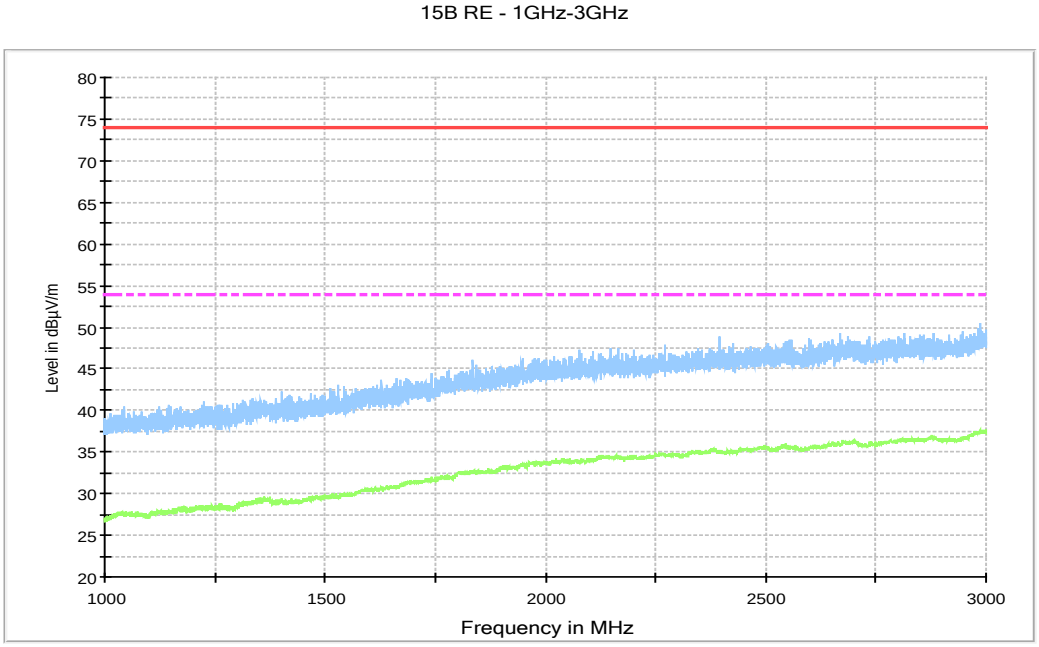


Figure A.20 Radiated Emission from 1GHz to 3GHz

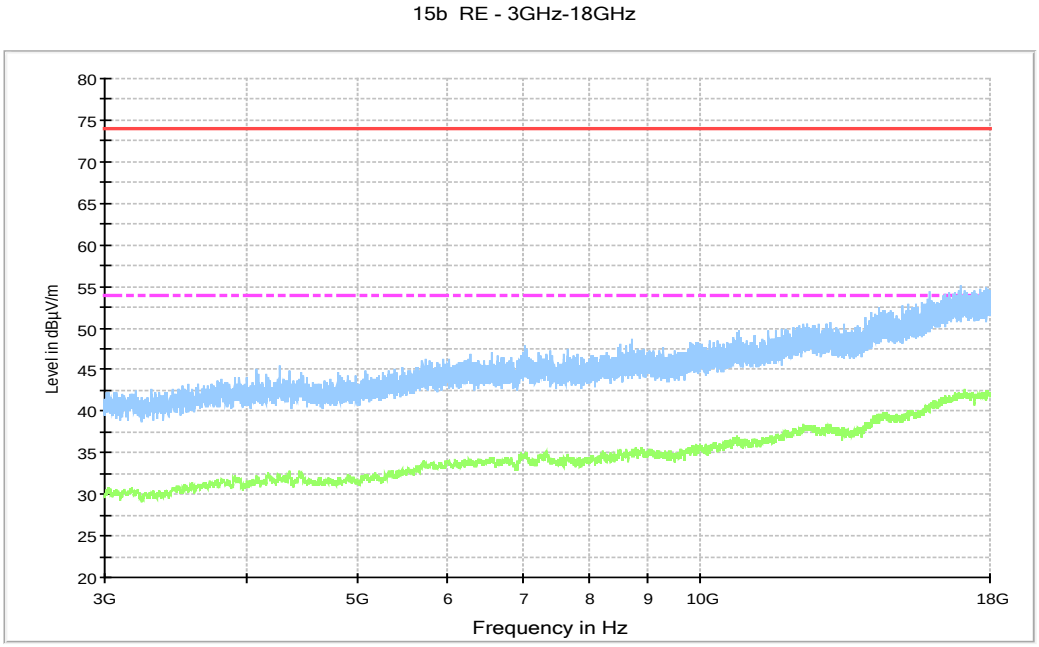


Figure A.21 Radiated Emission from 3GHz to 18GHz

WCDMA Band 5 LOW CHANNEL (871.4MHz)

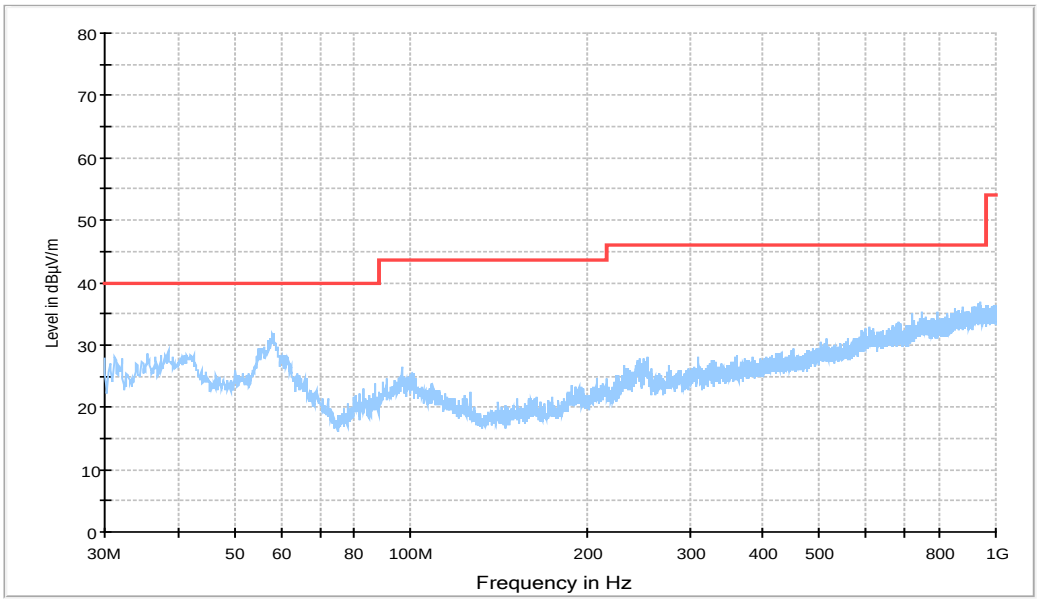


Figure A.22 Radiated Emission from 30MHz to 1GHz

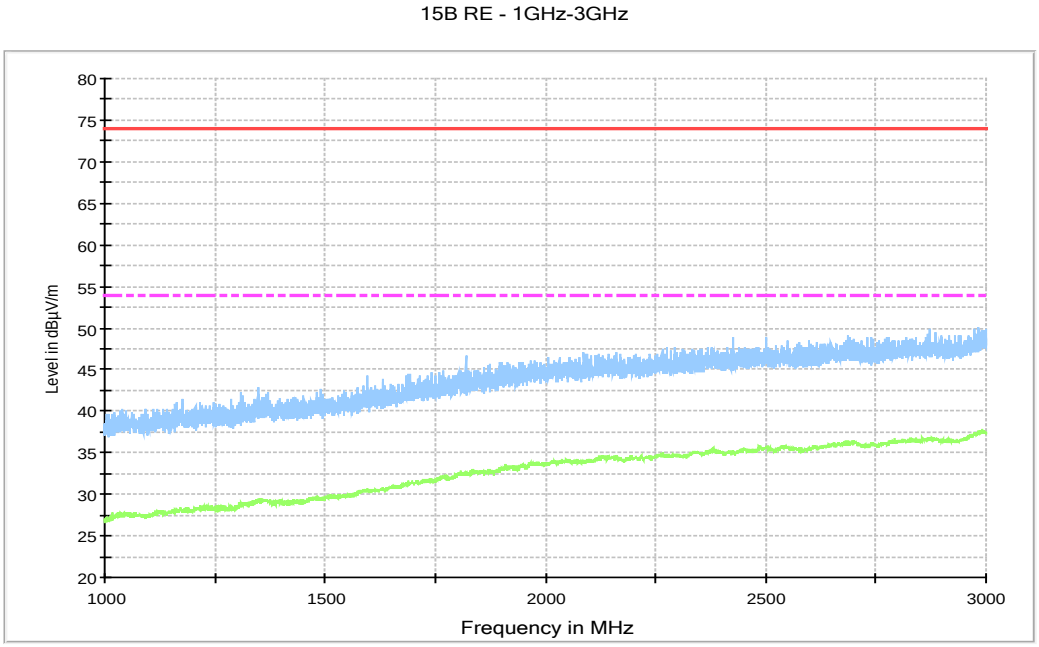


Figure A.23 Radiated Emission from 1GHz to 3GHz

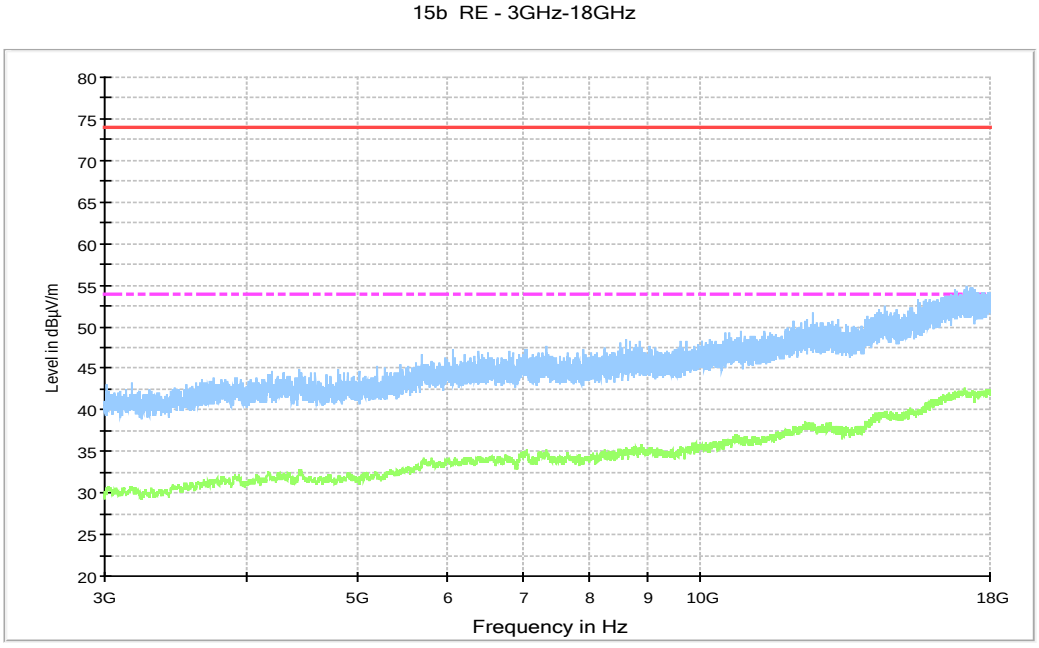


Figure A.24 Radiated Emission from 3GHz to 18GHz

WCDMA Band 5 MID CHANNEL (881.6MHz)

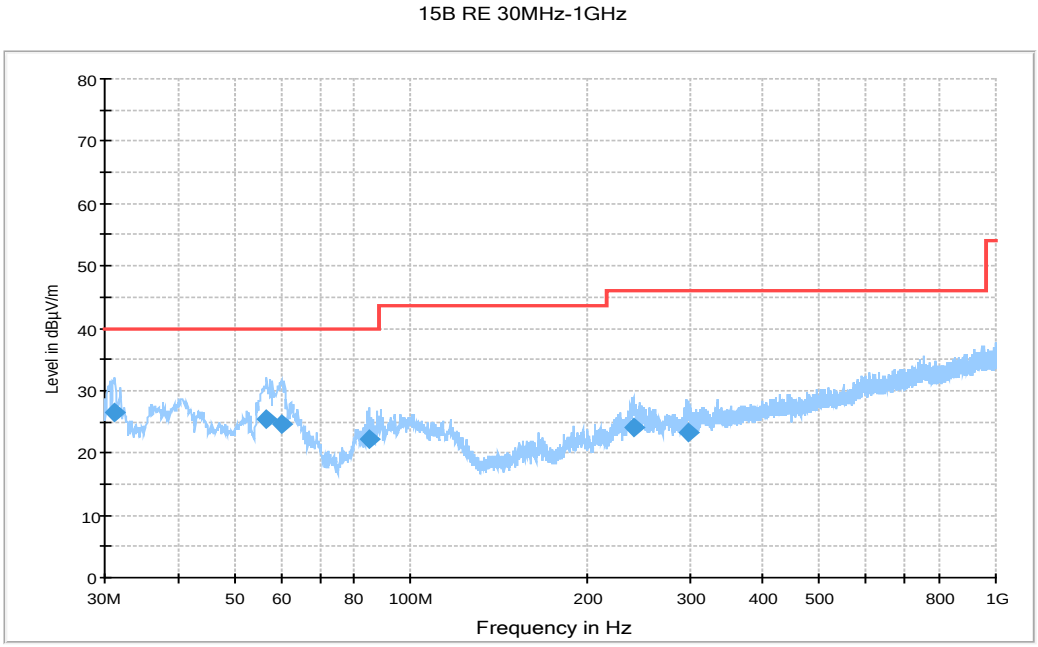


Figure A.25 Radiated Emission from 30MHz to 1GHz

Final Result 1

Frequency (MHz)	QuasiPeak (dBµV/m)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
31.261000	26.6	100.0	V	-35.0	-3.3	13.4	40.0
56.772000	25.3	125.0	V	225.0	0.0	14.7	40.0
60.264000	24.6	100.0	V	242.0	-1.1	15.4	40.0
84.999000	22.2	119.0	V	201.0	-5.5	17.8	40.0
240.87800	24.0	125.0	H	90.0	-0.5	22.0	46.0
299.27200	23.3	100.0	H	81.0	0.6	22.7	46.0

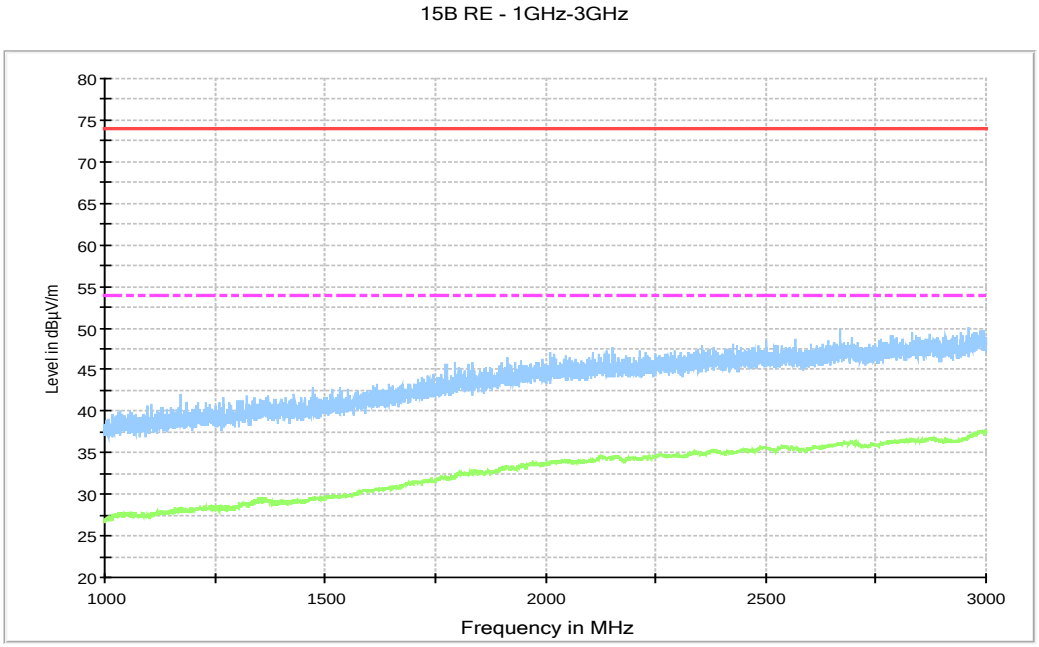


Figure A.26 Radiated Emission from 1GHz to 3GHz

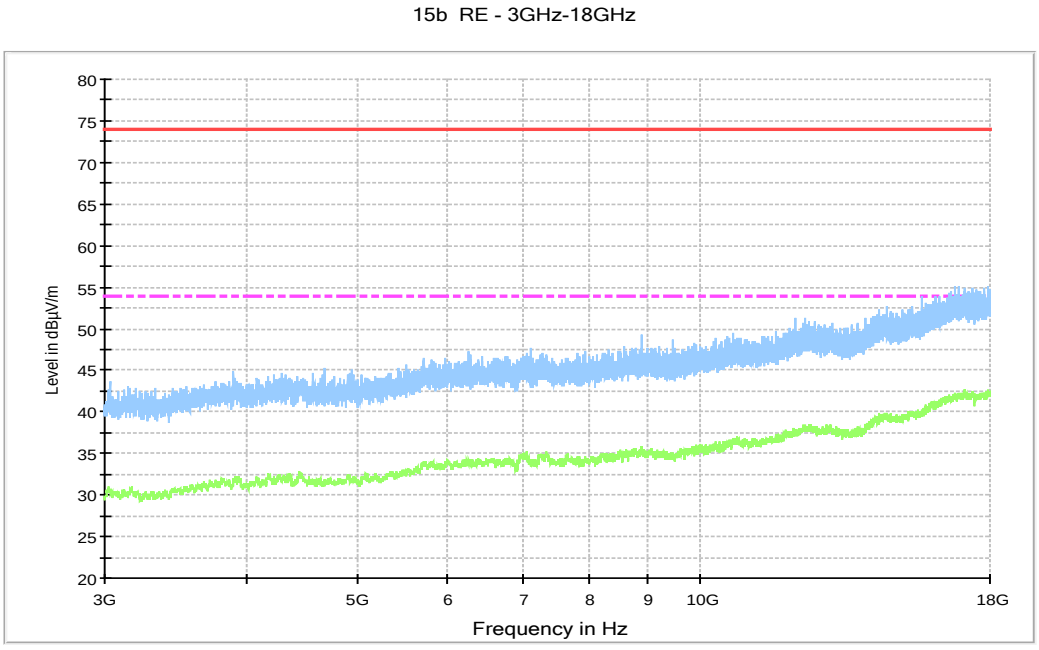


Figure A.27 Radiated Emission from 3GHz to 18GHz

WCDMA Band 5 HIGH CHANNEL (891.6MHz)

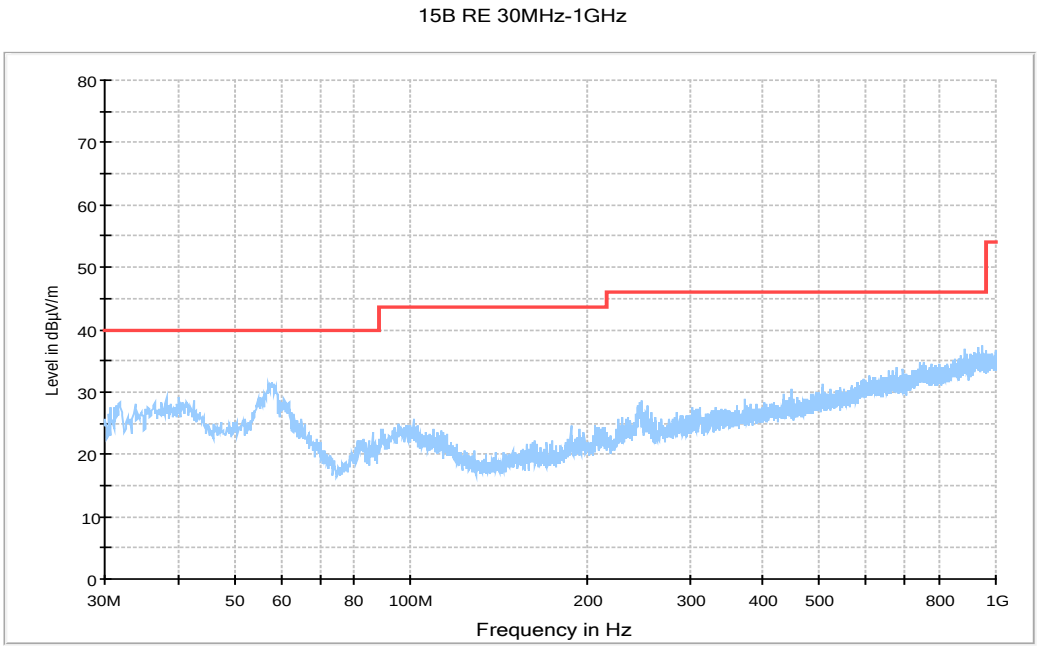


Figure A.28 Radiated Emission from 30MHz to 1GHz

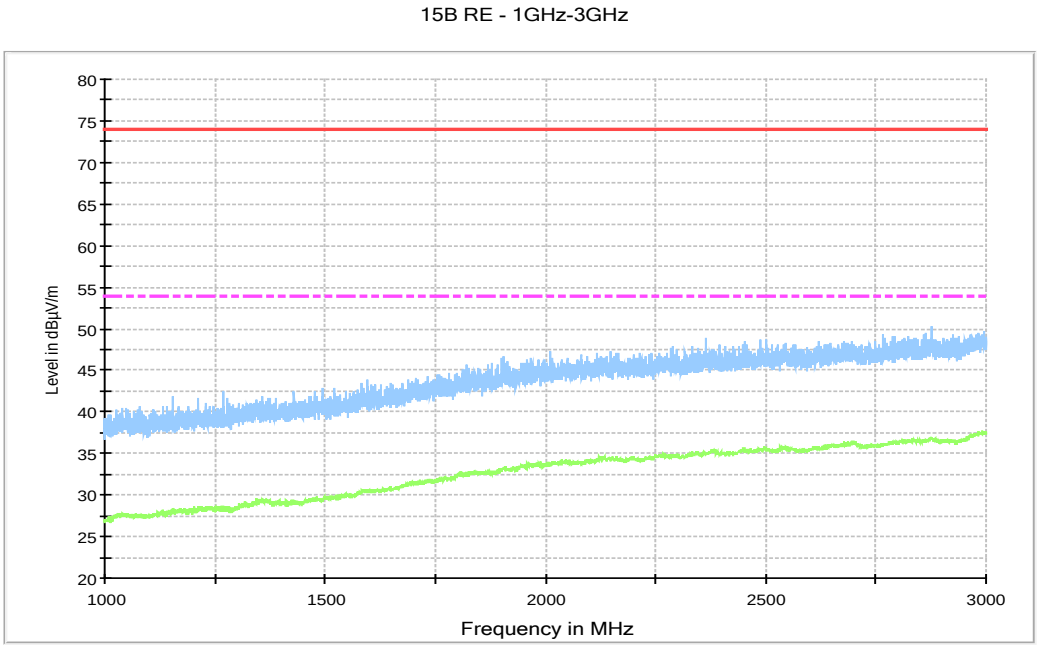


Figure A.29 Radiated Emission from 1GHz to 3GHz

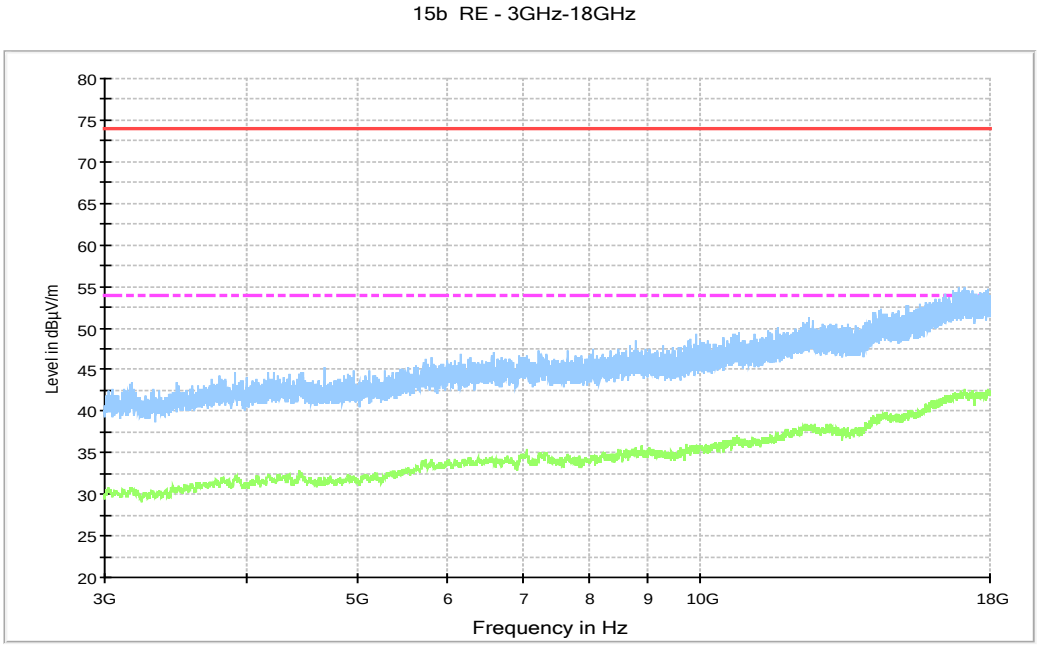


Figure A.30 Radiated Emission from 3GHz to 18GHz

LTE Band 12 LOW CHANNEL (729.7MHz)

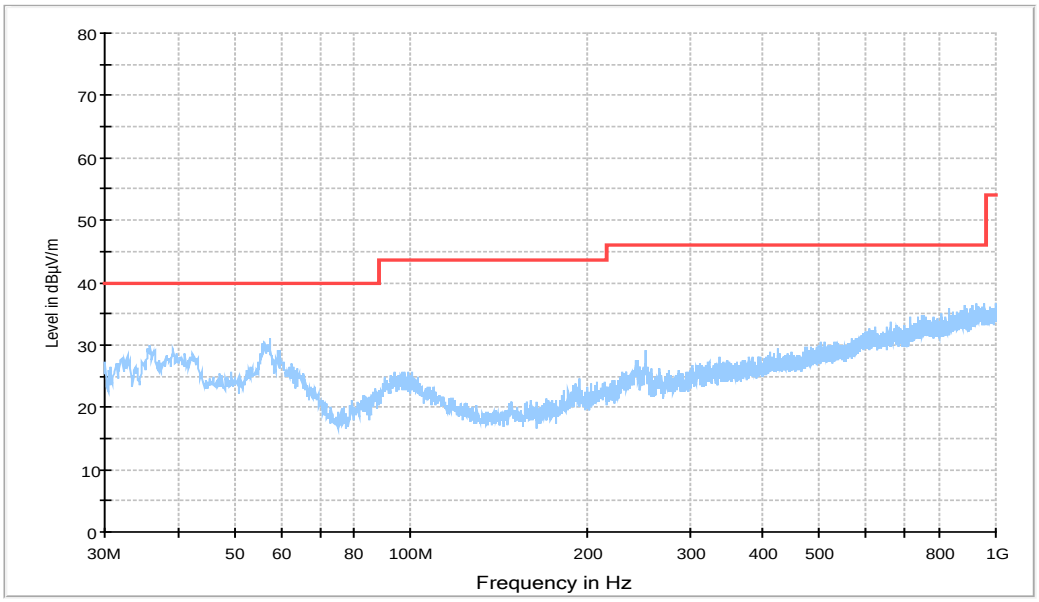


Figure A.31 Radiated Emission from 30MHz to 1GHz

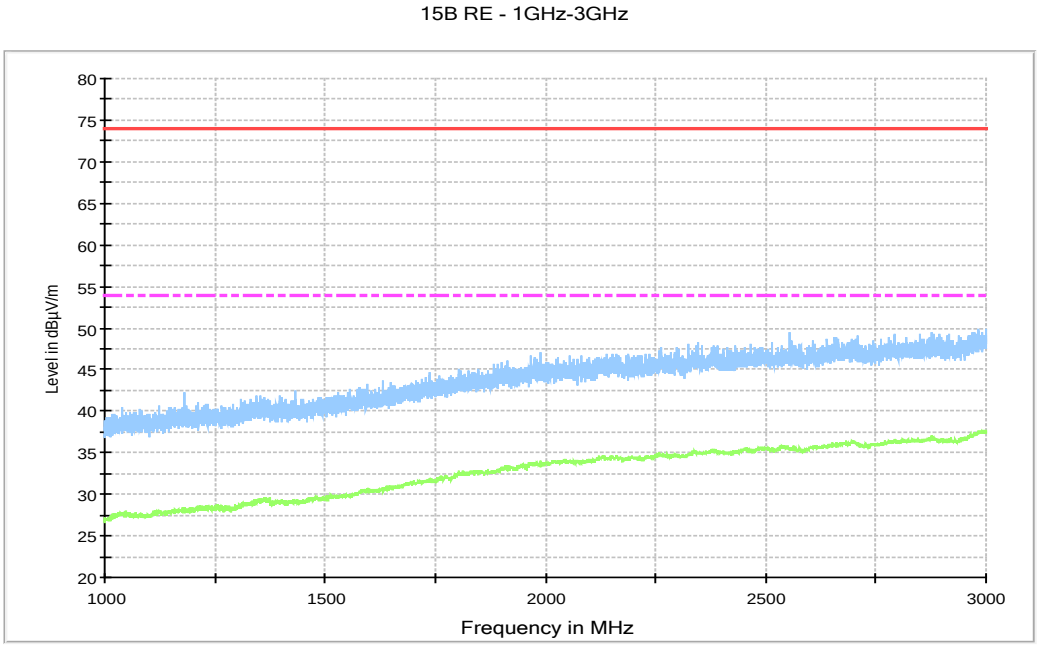


Figure A.32 Radiated Emission from 1GHz to 3GHz

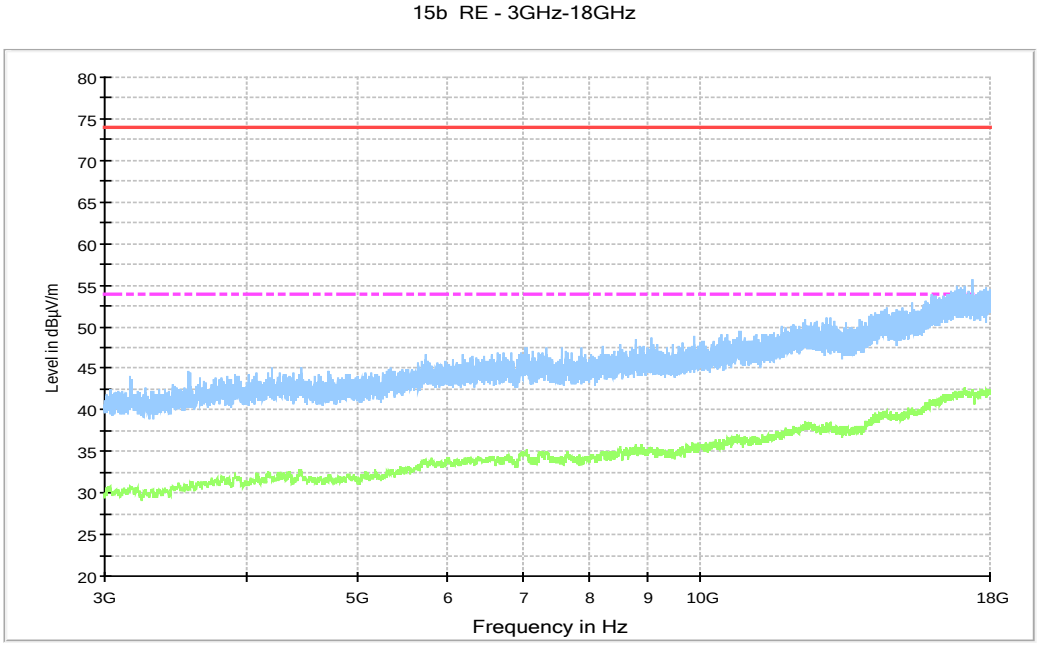


Figure A.33 Radiated Emission from 3GHz to 18GHz

LTE Band 12 MID CHANNEL (737.5MHz)

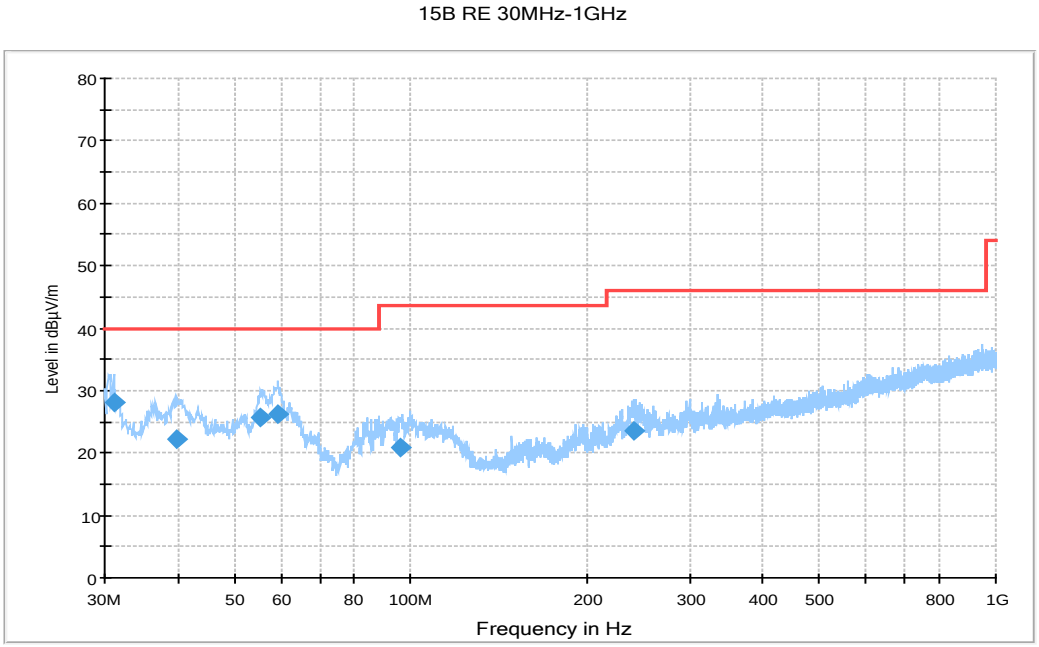


Figure A.34 Radiated Emission from 30MHz to 1GHz

Final Result 1

Frequency (MHz)	QuasiPeak (dBµV/m)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
31.067000	28.0	100.0	V	180.0	-3.3	12.0	40.0
39.894000	22.1	119.0	V	135.0	-0.8	17.9	40.0
55.511000	25.6	125.0	V	246.0	-0.3	14.4	40.0
59.197000	26.2	100.0	V	220.0	-0.6	13.8	40.0
96.154000	20.8	110.0	V	188.0	-2.3	22.7	43.5
240.97500	23.5	100.0	V	0.0	-0.5	22.5	46.0

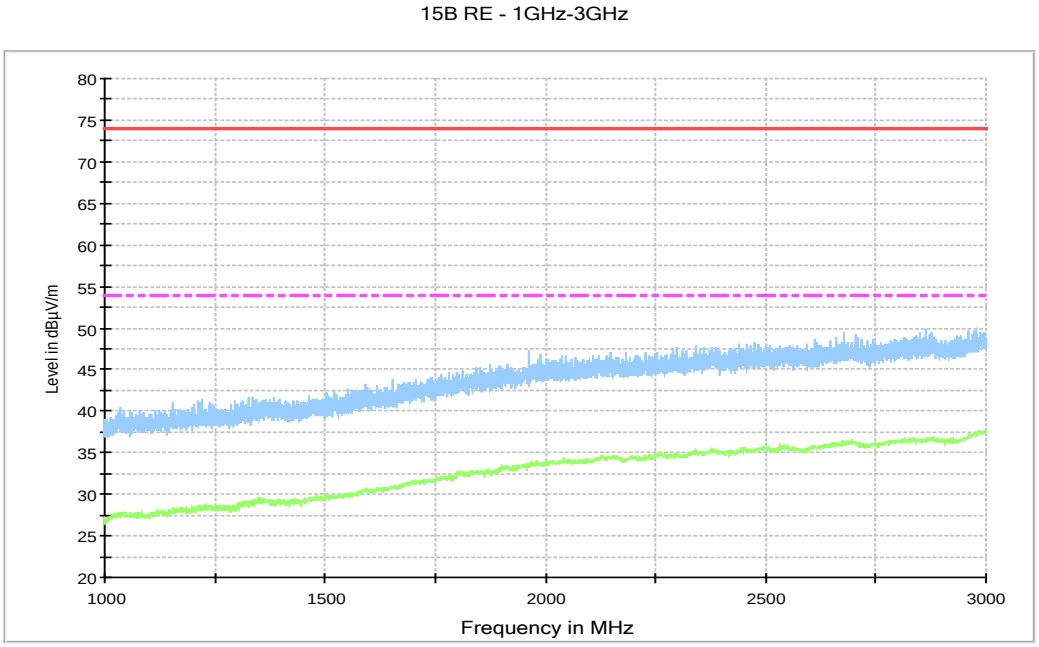


Figure A.35 Radiated Emission from 1GHz to 3GHz

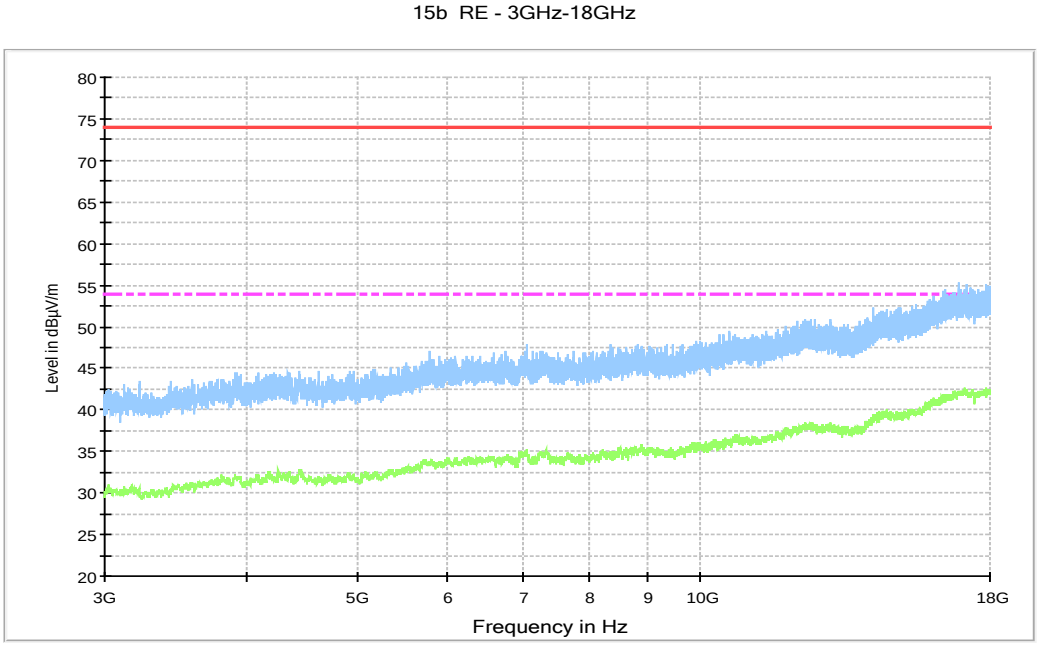


Figure A.36 Radiated Emission from 3GHz to 18GHz

LTE Band 12 HIGH CHANNEL (745.3MHz)

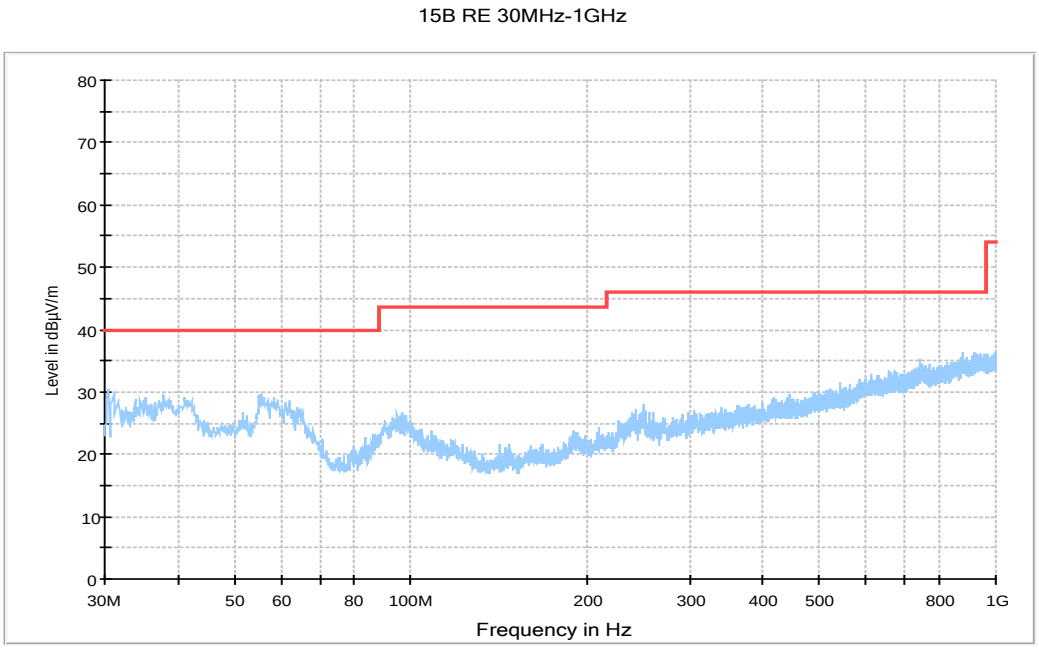


Figure A.37 Radiated Emission from 30MHz to 1GHz

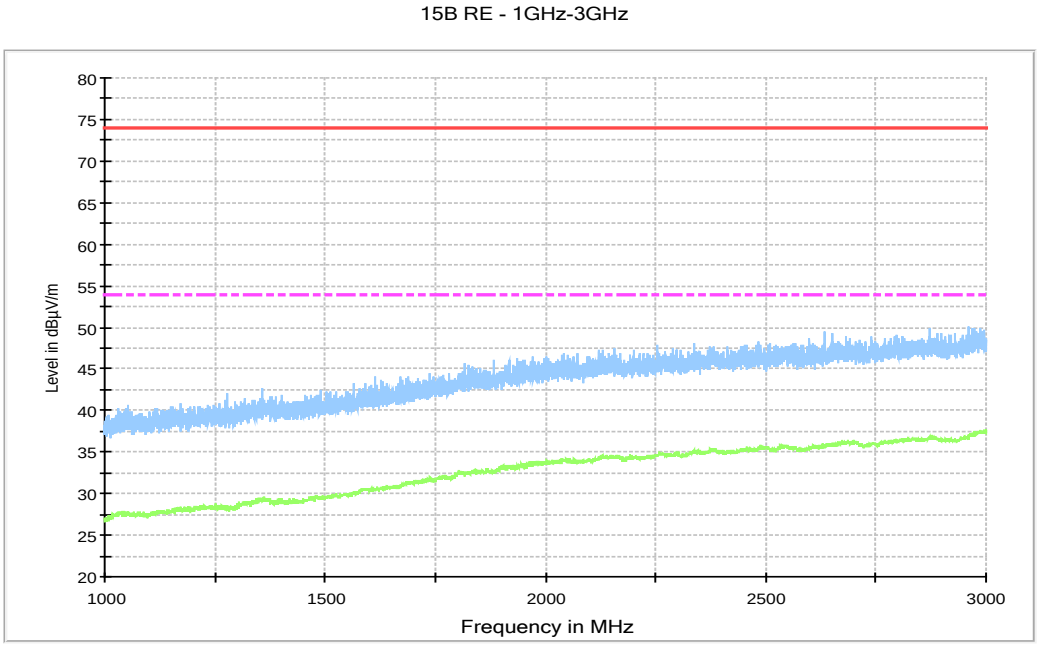


Figure A.38 Radiated Emission from 1GHz to 3GHz

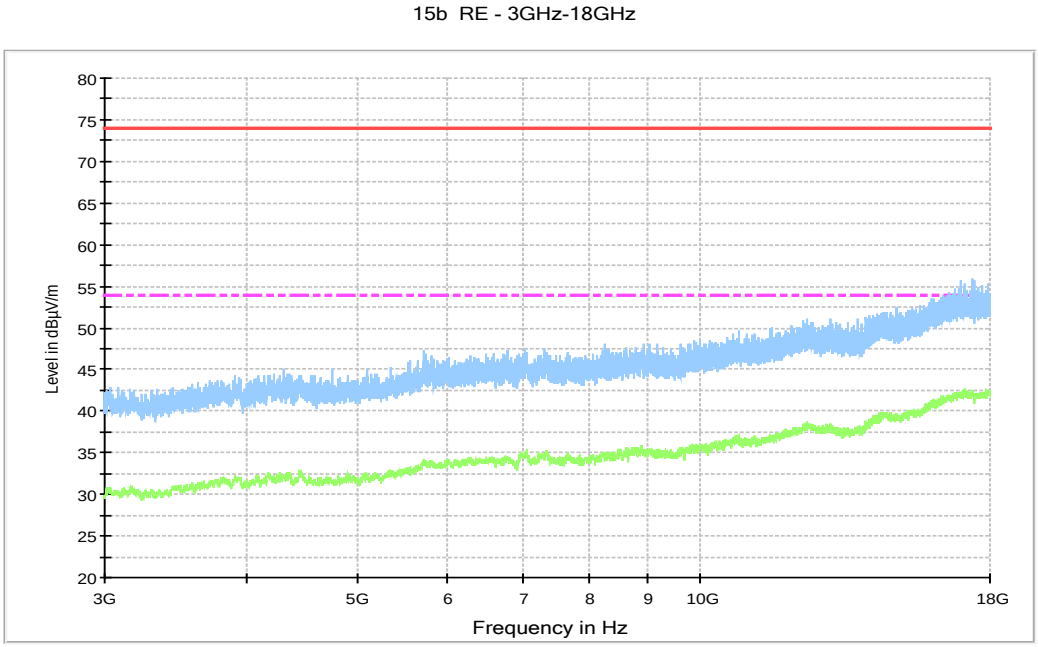


Figure A.39 Radiated Emission from 3GHz to 18GHz

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 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 dB, *k*=2.

Charger+MP3+Camera (front preview), Set.1

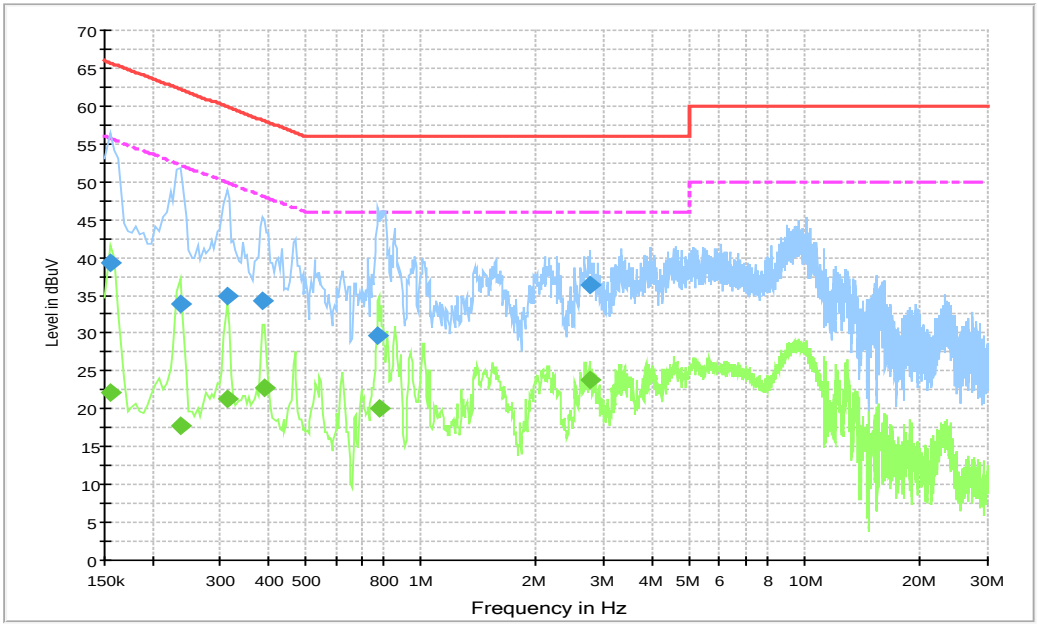


Figure A.40 Conducted Emission

Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.154500	39.3	10000.0	9.000	GND	N	10.2	26.5	65.8
0.235500	33.8	10000.0	9.000	GND	L1	10.1	28.5	62.3
0.312000	34.8	10000.0	9.000	GND	N	10.1	25.1	59.9
0.388500	34.3	10000.0	9.000	GND	L1	10.1	23.8	58.1
0.775500	29.6	10000.0	9.000	GND	L1	10.1	26.4	56.0
2.746500	36.3	10000.0	9.000	GND	L1	10.1	19.7	56.0

Final Result 2

Frequency (MHz)	Average (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.154500	22.2	10000.0	9.000	GND	L1	10.2	33.6	55.8
0.235500	17.7	10000.0	9.000	GND	N	10.1	34.6	52.3
0.312000	21.3	10000.0	9.000	GND	L1	10.1	28.6	49.9
0.393000	22.8	10000.0	9.000	GND	L1	10.1	25.2	48.0
0.780000	20.0	10000.0	9.000	GND	L1	10.1	26.0	46.0
2.746500	23.8	10000.0	9.000	GND	L1	10.1	22.2	46.0

Charger+Camera (rear recording), Set.2

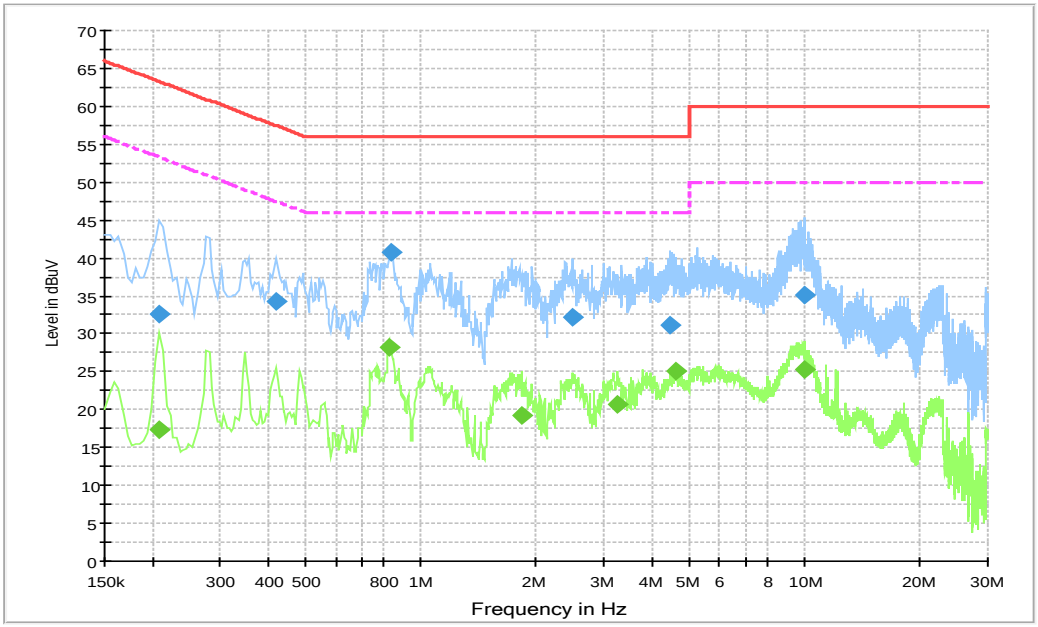


Figure A.41 Conducted Emission

Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.208500	32.6	10000.0	9.000	GND	N	10.2	30.7	63.3
0.420000	34.3	10000.0	9.000	GND	N	10.1	23.1	57.4
0.838500	40.8	10000.0	9.000	GND	L1	10.1	15.2	56.0
2.481000	32.1	10000.0	9.000	GND	L1	10.1	23.9	56.0
4.479000	31.1	10000.0	9.000	GND	N	10.2	24.9	56.0
10.000500	35.1	10000.0	9.000	GND	L1	10.5	24.9	60.0

Final Result 2

Frequency (MHz)	Average (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.208500	17.4	10000.0	9.000	GND	N	10.2	35.8	53.3
0.825000	28.2	10000.0	9.000	GND	L1	10.1	17.8	46.0
1.828500	19.2	10000.0	9.000	GND	L1	10.2	26.8	46.0
3.237000	20.8	10000.0	9.000	GND	L1	10.1	25.2	46.0
4.636500	25.0	10000.0	9.000	GND	L1	10.2	21.0	46.0
9.964500	25.3	10000.0	9.000	GND	L1	10.5	24.7	50.0

USB mode +Mp4, Set.3

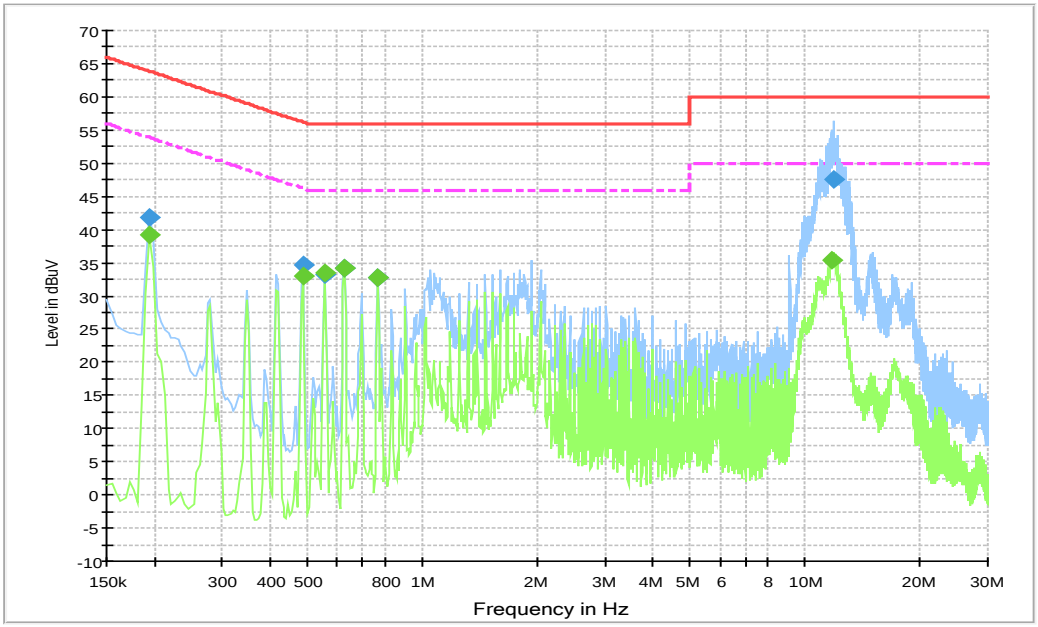


Figure A.42 Conducted Emission

Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.195000	41.7	10000.0	9.000	GND	N	10.2	22.1	63.8
0.487500	34.6	10000.0	9.000	GND	N	10.1	21.6	56.2
0.555000	33.3	10000.0	9.000	GND	N	10.1	22.7	56.0
0.627000	34.1	10000.0	9.000	GND	N	10.1	21.9	56.0
0.766500	32.8	10000.0	9.000	GND	N	10.1	23.2	56.0
11.827500	47.6	10000.0	9.000	GND	L1	10.6	12.4	60.0

Final Result 2

Frequency (MHz)	Average (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.195000	39.3	10000.0	9.000	GND	N	10.2	14.5	53.8
0.487500	33.0	10000.0	9.000	GND	N	10.1	13.2	46.2
0.555000	33.4	10000.0	9.000	GND	N	10.1	12.6	46.0
0.627000	34.2	10000.0	9.000	GND	N	10.1	11.8	46.0
0.766500	32.8	10000.0	9.000	GND	L1	10.1	13.2	46.0
11.764500	35.3	10000.0	9.000	GND	N	10.6	14.7	50.0

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*****