TEST REPORT

No. I23Z70153-EMC01

for

Samsung Electronics Co., Ltd.

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

Model Name: SM-A055F/DS, SM-A055F

with

FCC ID: ZCASMA055F

Hardware Version: REV1.0

Software Version: A055F.001

Issued Date: 2023-08-04

Note:

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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.

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REPORT HISTORY

Report Number	Revision	Description	Issue Date
I23Z70153-EMC01	Rev.0	1st edition	2023-08-04

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 17025:2017 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 ISED 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, 100176, P.R. China

1.3. Testing Environment

Normal Temperature: 15-35°C

Relative Humidity: 20-75%

1.4. Project data

Testing Start Date: 2023-07-24

Testing End Date: 2023-08-03

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 Person:	Jenni Chun
Contact Email	j1.chun@samsung.com
Telephone:	+1-201-937-4203
Fax	/

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 Person:	Sunghoon Cho
Contact Email	ggobi.cho@samsung.com
Telephone:	+82-10-2722-4159
Fax	/

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-A055F/DS, SM-A055F
FCC ID	ZCASMA055F

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/SN	HW Version	SW Version
UT04a	2370153UT04a	REV1.0	A055F.001
UT05a	2370153UT05a	REV1.0	A055F.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*	Name	Model	Manufacturer
AE1	Battery	WT-S-N28	SCUD (FUJIAN) Electronics Co., Ltd.
AE2	Adapter	EP-TA800	DONGGUAN SOLUM ELECTRONICS CO.,LTD.
AE3-1	Date Cable1 C-C	EP-DN980BWE	GUANGXI BROAD TELECOMMUNICATION CO.,LTD
AE3-2	Date Cable2 C-C	EP-DN980BWE	R.e.tech Electronics (Huizhou) Co., Ltd.
AE3-3	Date Cable3 C-C	EP-DN980BWE	Cresyn Electronics(Dongguan) Co., Ltd.
AE4	Date Cable4 A-C	EP-DR140AWE	/
AE5	Headset	ESH61ASFWE	/
AE6	PC	/	/
AE7	SD card	/	/
AE8	MHD	/	/

* The USB cables are shielded.

*AE2, AE4 and AE5 are not the AE for EUT, provided by the client for relevant tests.

*AE6, AE7 and AE8 are not the AE for EUT, provided by the Lab for relevant tests.

3.4. General Description

Equipment under Test (EUT) is a model of Multi-band GSM/WCDMA/LTE Phone with Bluetooth, WLAN with integrated antenna.

Description	Multi-band GSM/WCDMA/LTE Phone with Bluetooth, WLAN	
Model name	SM-A055F/DS, SM-A055F	
Marketing name	Galaxy A05	
Brand name	SAMSUNG	
Cellular Bands	☒GSM	Bands 850/900/1800MHz
	☐CDMA	/
	☒WCDMA	Bands 1/5/8
	☒LTE	Bands 1/3/5/7/8/20/28/38/40/41
	☐5G NR SA	/
	☐5G NR NSA	/
Unlicensed Radio	☒Wi-Fi 2.4GHz	802.11b/g/n(20MHz)
	☒Wi-Fi 5GHz	802.11a/n(20MHz,40MHz)/ac(20MHz,40MHz,80MHz)
	☒Wi-Fi 5.8GHz	802.11a/n(20MHz,40MHz)/ac(20MHz,40MHz,80MHz)
	☒Bluetooth	☒EDR ☐BLE4 ☒BLE5
Other	☒GNSS	☒GPS ☒BDS ☒Gallileo ☒Glonass
	☒FM ☒MP3 ☒MP4 ☒Camera ☒USB ☒External memory	
Temperature	-10-55℃	
Normal Voltage	3.85V	
Extreme Low Voltage	3.55V	
Extreme High Voltage	4.4V	

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

Samples undergoing test were selected by the client.

Manual and specifications of the EUT were provided to fulfil the test.

For more EUT information please refers to the manufacturer's specifications or user's manual.

3.5. EUT set-ups

Set-up

EUT set-up No.	Combination of EUT and AE	Remarks
Set.1	UT04a + AE2 + AE3-1 +AE5	Adapter + cable+ headset
Set.2	UT04a + AE2 + AE3-2	Adapter + cable
Set.3	UT04a + AE2 + AE3-3 +AE5	Adapter + cable+ headset
Set.4	UT04a + AE3-1/2/3 + UT05a +AE5	EUT+EUT+ headset
Set.5	UT04a + AE3-1/2/3 + HD	EUT+HD+ headset
Set.6	UT04a + AE3-1/2/3 + AE5 +PC	Type C communication with PC
Set.7	UT04a + AE4 + AE5 +PC+SD	USB communication with PC+SD

Test mode

Mode No.	Operating mode	Remarks
mode.1	MP4 Play	RE, CE
mode.2	Front Camera	RE, CE
mode.3	Rear Camera	RE, CE
mode.4	FM(Low/Mid/High channel)	RE, CE
mode.5	OTG Phone to Phone	RE only
mode.6	OTG + Mobile HD+MP4	RE only
mode.7	USB DATA (TYPE C)	RE, CE
mode.8	USB DATA (USB, SD TO PC)	RE, CE
mode.9	CXX RX mode	GSM850, WCDMA Band 5, LTE Band 5, (Low/Mid/High channel)

4. Reference Documents

4.1. Documents supplied by applicant

EUT parameters are supplied by the client or manufacturer, which is the basis of testing.

4.2. Reference Documents for testing

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

Reference	Title	Version
FCC 47 CFR Part 15, Subpart B	Radio frequency devices - Unintentional Radiators	2021
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 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.

6.1. Summary of Test Results

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)**

6.2. Statements

According to the product declaration provided by the applicant, the only difference between SM-A055F/DS, and SM-A055F was Dual SIM tray and Single SIM tray, the tests were mainly performed on SM-A055F/DS, and SM-A055F shared SM-A055F/DS results.

7. Test Equipments Utilized

Test Equipment

NO.	Description	TYPE	SERIES NUMBER	MANUFACTURER	CAL DUE DATE	CALIBRATION INTERVAL
1	Test Receiver	ESU26	100376	R&S	2023-09-22	1 year
2	Test Receiver	ESCI	100766	R&S	2024-02-29	1 year
3	LISN	ENV216	101459	R&S	2024-03-30	1 year
4	BiLog Antenna	VULB9163	01177	Schwarzbeck	2023-08-03	1 year
5	EMI Antenna	3115	00119021	ETS-Lindgren	2024-06-24	1 year
6	Universal Radio Communication Tester	CMW500	159408	R&S	2024-04-26	1 year
7	Printer	P1606dn	VNC3L52122	HP	N/A	N/A
8	Keyboard	KU-1601	2048361	Lenovo	N/A	N/A
9	Mouse	EMS-537A	8021S3MC	Lenovo	N/A	N/A
10	PC	M4000e-17	M706RMW2	Lenovo	N/A	N/A
11	PC	T14S	PC-1RP0TY	Lenovo	N/A	N/A

Test Software

Test Item	Test Software and Version	Software Vendor
Radiated Continuous Emission	EMC32 V8.53.0	R&S
Conducted Emission	EMC32 V8.53.0	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 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 and arranged in a typical configuration in accordance with ANSI C63.4-2014 and manipulated to obtain worst case emissions. 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.

For the test setup photographs please see the test setup photos document.

A.1.2 EUT Operating Mode

The MS is operating in the USB mode, charging mode, MP3, MP4, CAMERA, OTG, SD, FM and cellular RX 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 (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.

A.1.4 Test Condition

Voltage（V）	Frequency（Hz）
120	60

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：5.73dB, 1GHz-18GHz: 5.58dB, *k*=2.

Note: all the set-up and operating mode list in section 3.5 were tested, only the worst test data are showed in this section.

Set.1+Mode3, Adapter+ Rear Camera+ Headset,

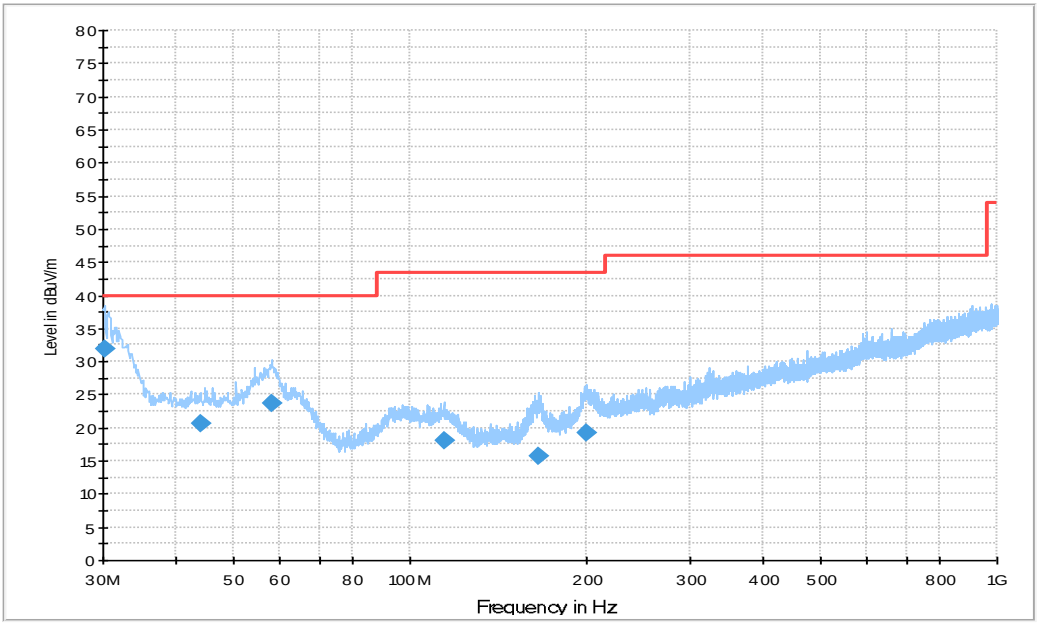


Figure A.1 Radiated Emission from 30MHz to 1GHz

Final Result 1

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)
30.194000	31.9	100.0	V	45.0	-3.6	8.1	40.0
43.871000	20.8	100.0	V	244.0	-0.4	19.2	40.0
58.130000	23.8	100.0	V	245.0	-0.7	16.2	40.0
114.09900	18.0	100.0	H	38.0	-2.5	25.5	43.5
165.21800	15.7	125.0	V	31.0	-4.0	27.8	43.5
199.75000	19.3	125.0	H	45.0	-1.1	24.2	43.5

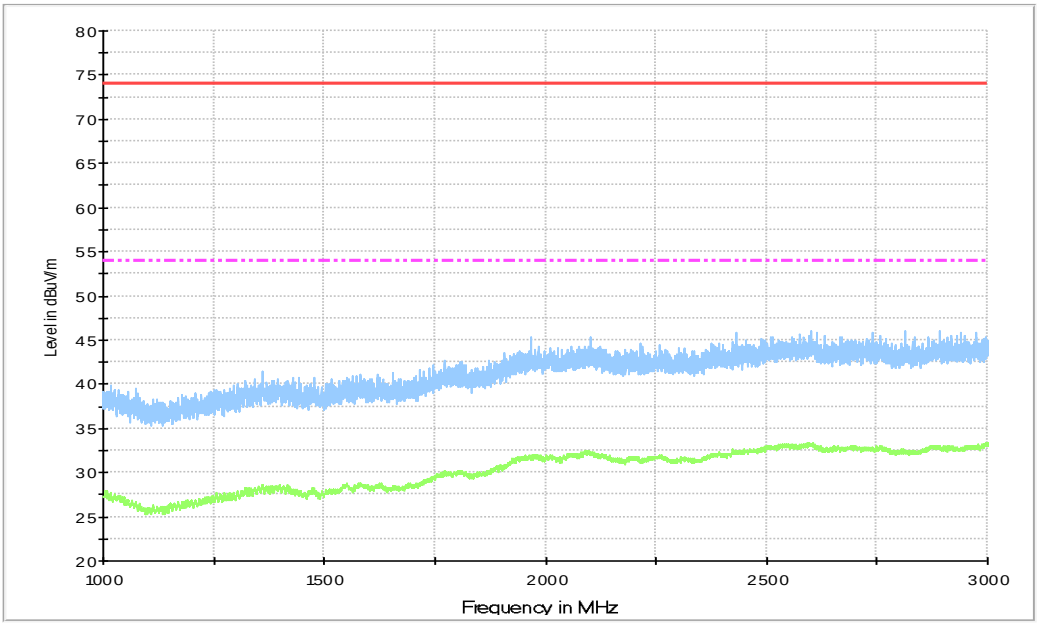


Figure A.2 Radiated Emission from 1GHz to 3GHz

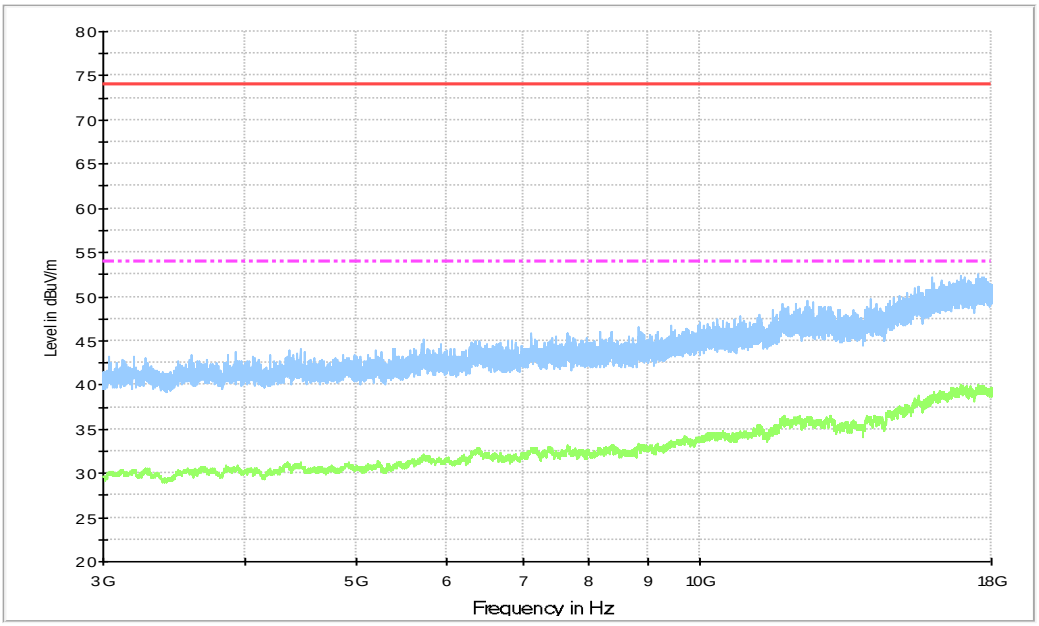


Figure A.3 Radiated Emission from 3GHz to 18GHz

Average detector result

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)
16925.500	40.07	-24.6	41.2	23.47	54.0	13.9	H
17523.500	39.98	-23.9	40.6	23.32	54.0	14.0	H
16930.000	39.98	-24.6	41.2	23.37	54.0	14.0	H
16900.000	39.98	-24.7	41.3	23.41	54.0	14.0	H
16911.000	39.97	-24.7	41.3	23.39	54.0	14.0	H
16919.500	39.97	-24.7	41.3	23.37	54.0	14.0	H

Peak detector result

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)
17540.500	52.5	-23.9	40.6	35.79	74.0	21.5	H
16921.500	52.4	-24.7	41.3	35.81	74.0	21.6	H
15989.500	52.2	-26.2	40.9	37.47	74.0	21.8	V
17685.500	52.2	-23.7	40.6	35.26	74.0	21.8	H
17692.500	52.2	-23.7	40.6	35.24	74.0	21.8	H
16899.000	52.1	-24.7	41.3	35.58	74.0	21.9	H

Set.2+Mode1+Mode9, Adapter+ MP4 +RX LTE B5

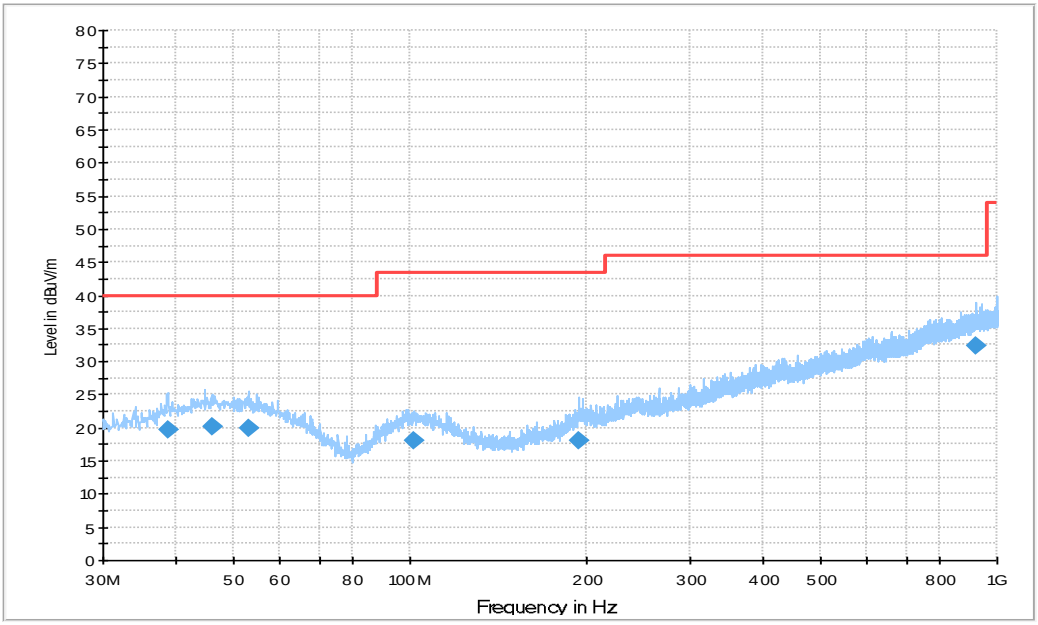


Figure A.4 Radiated Emission from 30MHz to 1GHz

Final Result 1

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)
38.633000	19.6	100.0	V	45.0	-1.6	20.4	40.0
46.199000	20.3	113.0	V	103.0	0.1	19.7	40.0
52.989000	20.0	125.0	V	-13.0	0.1	20.0	40.0
101.78000	18.0	125.0	H	218.0	-1.3	25.5	43.5
193.83300	18.0	100.0	V	51.0	-1.2	25.5	43.5
918.81100	32.4	100.0	H	302.0	13.1	13.6	46.0

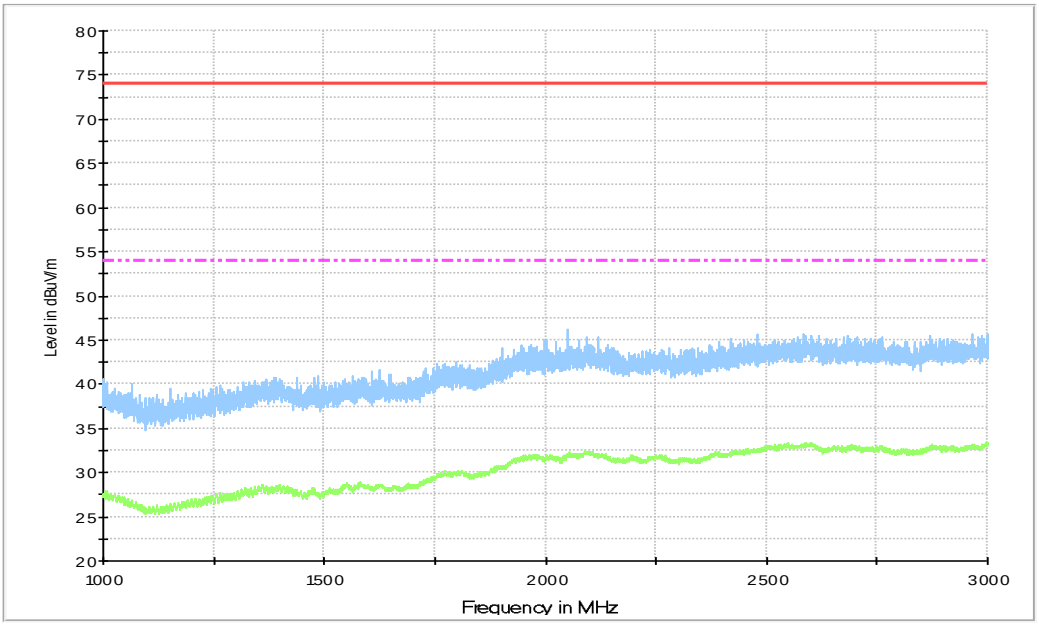


Figure A.5 Radiated Emission from 1GHz to 3GHz

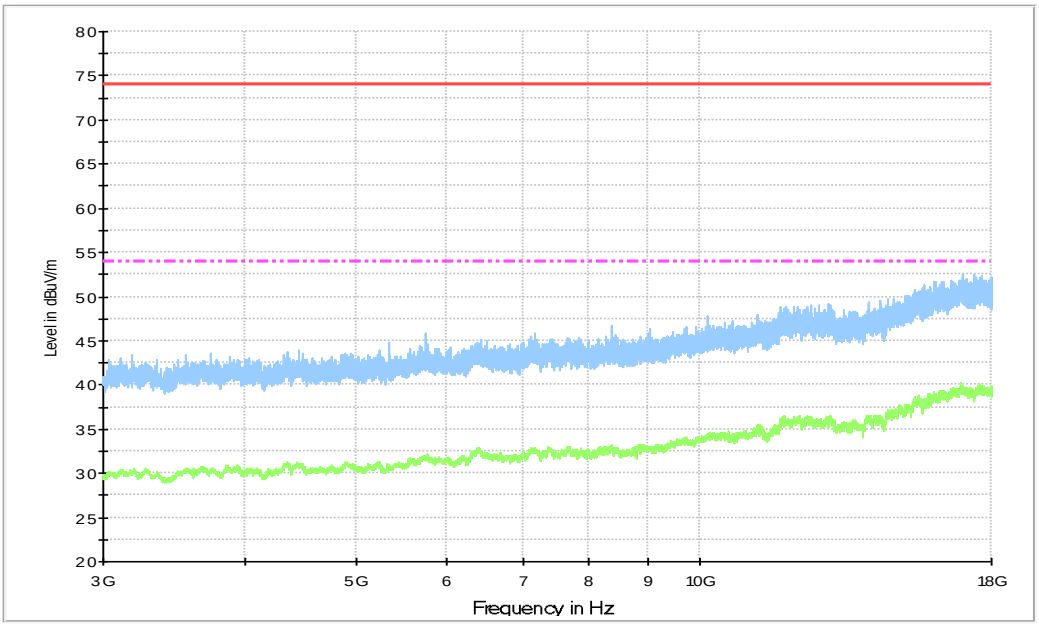


Figure A.6 Radiated Emission from 3GHz to 18GHz

Average detector result

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)
16926.500	40.15	-24.6	41.2	23.55	54.0	13.8	H
16931.500	40.11	-24.6	41.2	23.50	54.0	13.9	H
17604.500	40.10	-23.7	40.6	23.25	54.0	13.9	H
17603.000	40.09	-23.8	40.6	23.24	54.0	13.9	H
16930.500	40.01	-24.6	41.2	23.40	54.0	14.0	H
17610.000	39.99	-23.7	40.6	23.12	54.0	14.0	H

Peak detector result

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)
17013.000	52.6	-24.6	41.1	36.11	74.0	21.4	H
17367.000	52.5	-24.2	40.7	35.97	74.0	21.5	H
17621.000	52.3	-23.7	40.6	35.44	74.0	21.7	H
17484.000	52.3	-24.0	40.6	35.70	74.0	21.7	H
17004.000	52.3	-24.6	41.1	35.80	74.0	21.7	V
17987.500	52.2	-23.3	40.6	34.92	74.0	21.8	H

Set.3+Mode2, Adapter + Headset +Front C

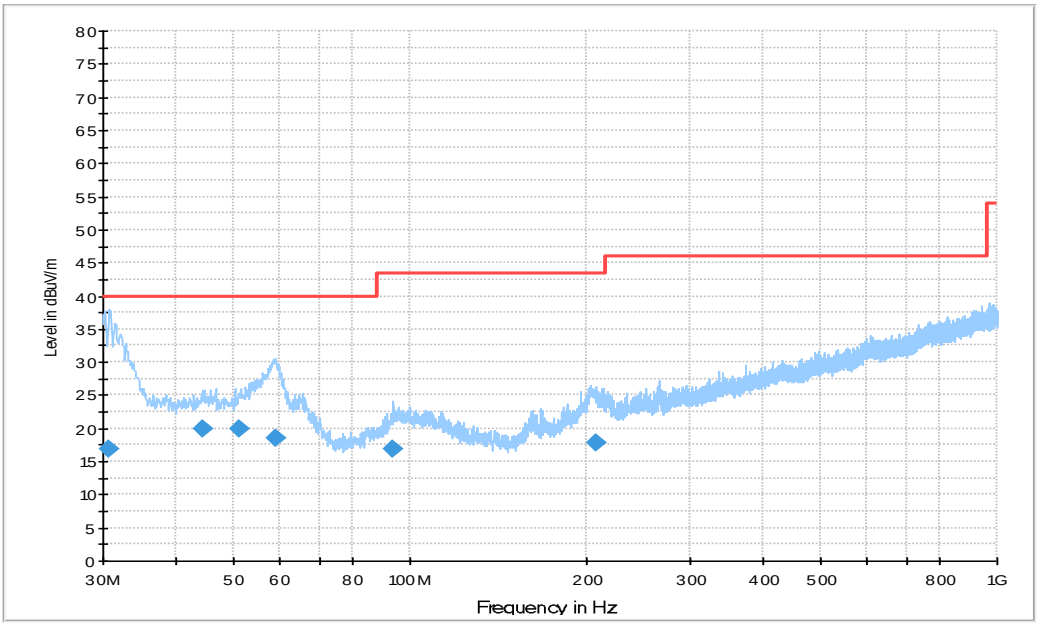


Figure A.7 Radiated Emission from 30MHz to 1GHz

Final Result 1

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)
30.776000	16.9	100.0	V	45.0	-3.7	23.1	40.0
44.259000	19.9	113.0	H	205.0	-0.3	20.1	40.0
51.049000	20.0	100.0	V	5.0	0.1	20.0	40.0
58.906000	18.6	125.0	V	250.0	-1.0	21.4	40.0
93.729000	16.8	125.0	V	25.0	-2.6	26.7	43.5
207.31600	17.9	113.0	H	263.0	-1.5	25.6	43.5

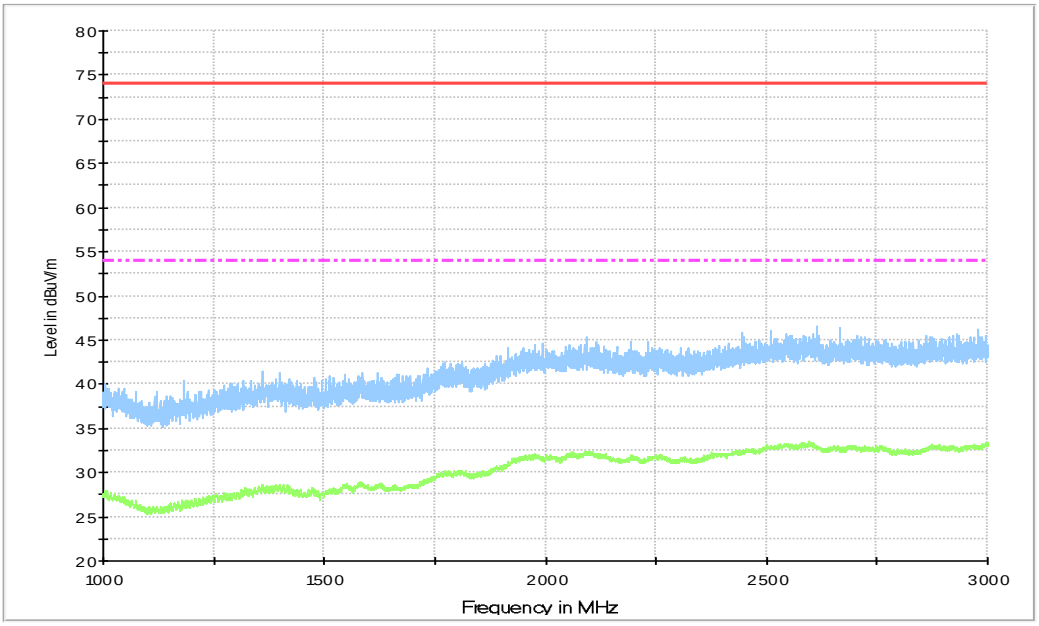


Figure A.8 Radiated Emission from 1GHz to 3GHz

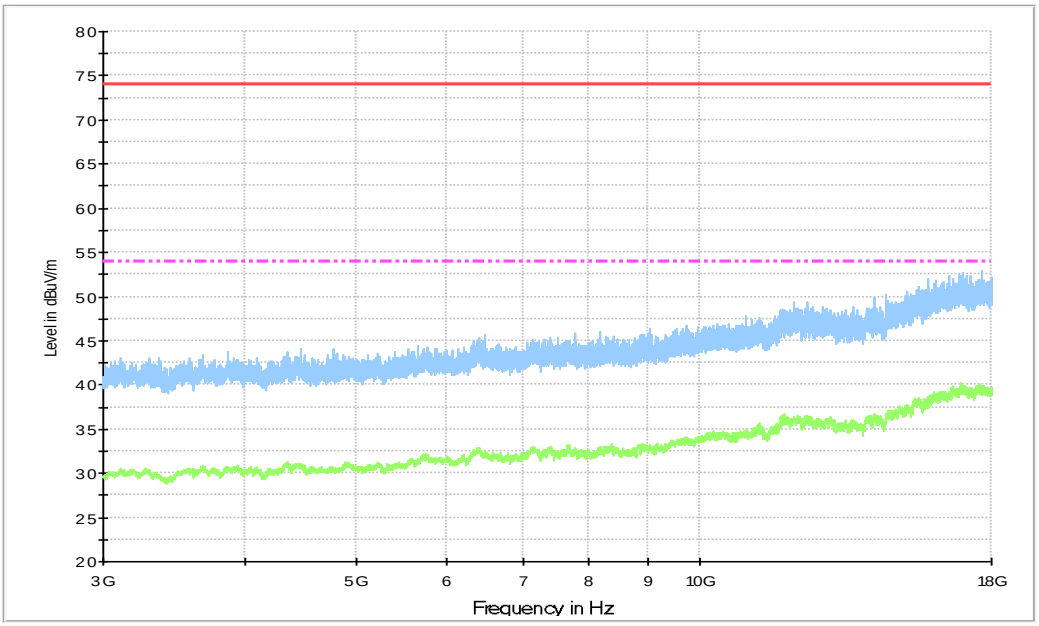


Figure A.9 Radiated Emission from 3GHz to 18GHz

Average detector result

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)
16926.500	40.18	-24.6	41.2	23.58	54.0	13.8	H
17608.000	40.14	-23.7	40.6	23.28	54.0	13.9	H
17610.500	40.12	-23.7	40.6	23.26	54.0	13.9	H
16930.500	40.11	-24.6	41.2	23.50	54.0	13.9	H
16925.500	40.06	-24.6	41.2	23.46	54.0	13.9	H
17603.500	40.02	-23.8	40.6	23.17	54.0	14.0	H

Peak detector result

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)
17671.500	53.0	-23.7	40.6	36.03	74.0	21.0	H
17011.000	52.7	-24.6	41.1	36.27	74.0	21.3	H
16863.000	52.5	-24.9	41.3	36.06	74.0	21.5	H
16939.500	52.4	-24.6	41.2	35.75	74.0	21.6	H
17227.000	52.4	-24.4	40.8	35.95	74.0	21.6	H
16878.500	52.3	-24.8	41.3	35.82	74.0	21.7	H

Set.4 +Mode4 +Mode5, OTG + +FM

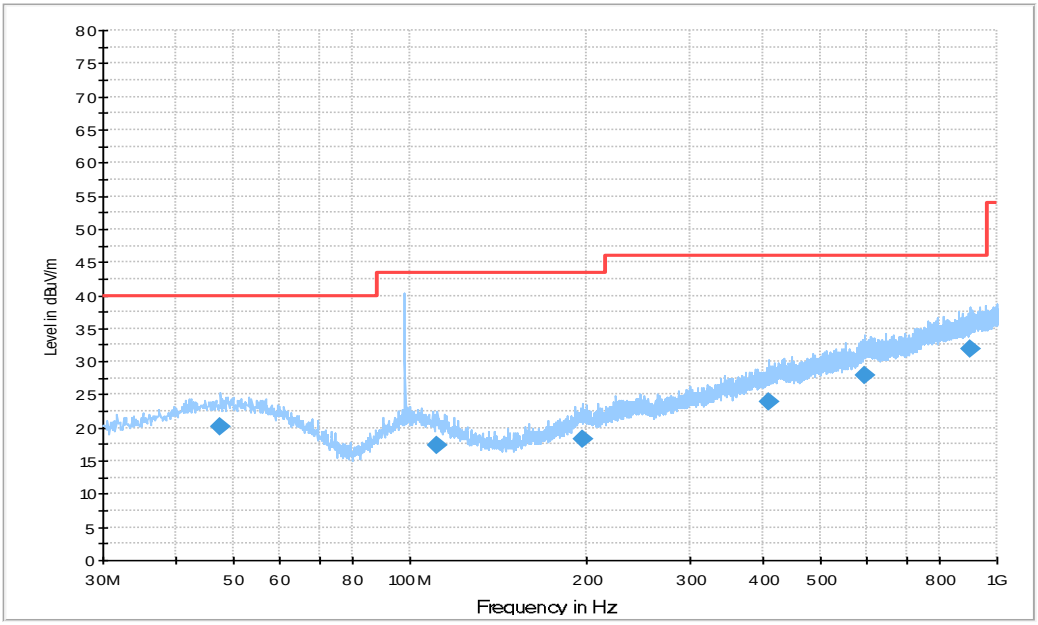


Figure A.10 Radiated Emission from 30MHz to 1GHz

Final Result 1

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)
47.654000	20.1	100.0	H	104.0	-0.1	19.9	40.0
111.48000	17.3	100.0	V	148.0	-2.1	26.2	43.5
197.32500	18.3	125.0	H	14.0	-0.9	25.2	43.5
407.91200	23.9	100.0	V	131.0	5.2	22.1	46.0
594.34600	27.8	100.0	H	-19.0	9.1	18.2	46.0
903.00000	31.8	100.0	H	208.0	12.8	14.2	46.0

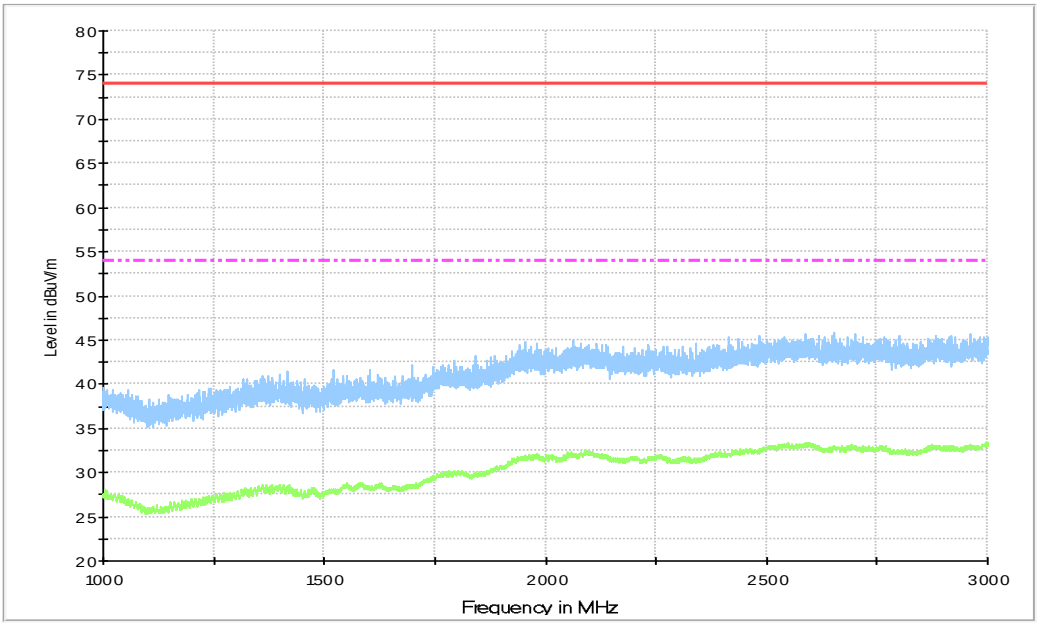


Figure A.11 Radiated Emission from 1GHz to 3GHz

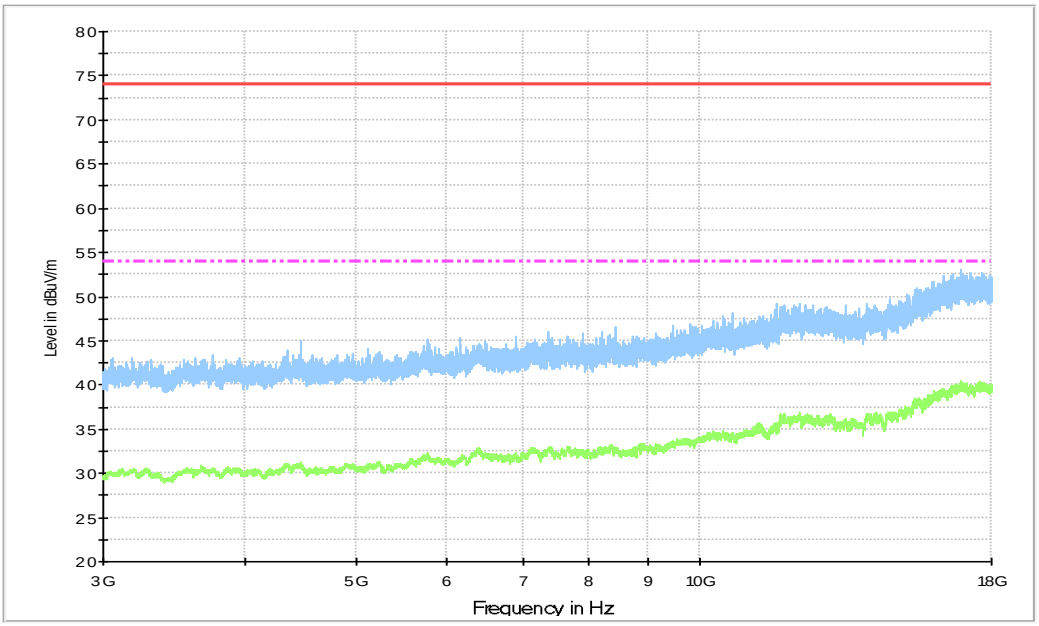


Figure A.12 Radiated Emission from 3GHz to 18GHz

Average detector result

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)
16922.000	40.43	-24.7	41.3	23.83	54.0	13.6	V
17600.000	40.43	-23.8	40.6	23.58	54.0	13.6	V
16925.500	40.37	-24.6	41.2	23.77	54.0	13.6	V
16940.500	40.33	-24.6	41.2	23.71	54.0	13.7	V
16924.500	40.33	-24.7	41.3	23.73	54.0	13.7	V
16922.500	40.32	-24.7	41.3	23.73	54.0	13.7	V

Peak detector result

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)
16932.000	53.2	-24.6	41.2	36.55	74.0	20.8	H
17640.500	52.7	-23.7	40.6	35.80	74.0	21.3	V
17245.000	52.7	-24.3	40.8	36.25	74.0	21.3	V
17688.500	52.7	-23.7	40.6	35.74	74.0	21.3	V
17743.500	52.6	-23.6	40.6	35.66	74.0	21.4	H
16999.000	52.5	-24.6	41.1	36.03	74.0	21.5	V

Set.5+Mode6+Mode9, OTG +MP4 +RX W850

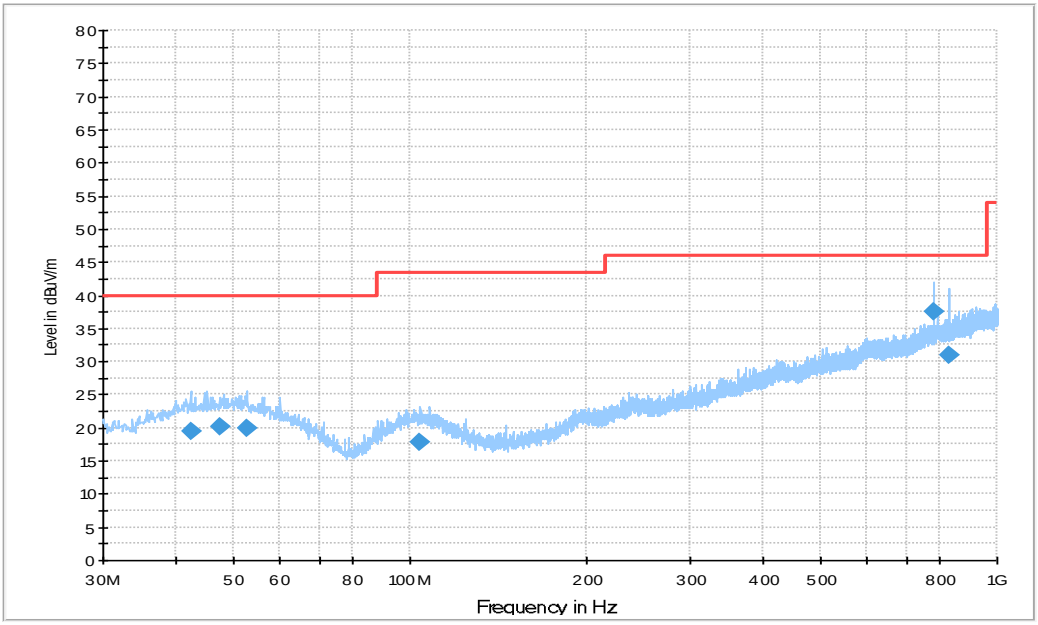


Figure A.13 Radiated Emission from 30MHz to 1GHz

Final Result 1

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)
42.319000	19.4	100.0	V	-20.0	-0.6	20.6	40.0
47.363000	20.1	100.0	V	270.0	0.0	19.9	40.0
52.795000	20.0	100.0	H	76.0	0.1	20.0	40.0
104.20500	17.7	100.0	V	210.0	-1.5	25.8	43.5
780.10100	37.4	100.0	H	90.0	11.2	8.6	46.0
827.82500	30.9	100.0	V	-8.0	11.9	15.1	46.0

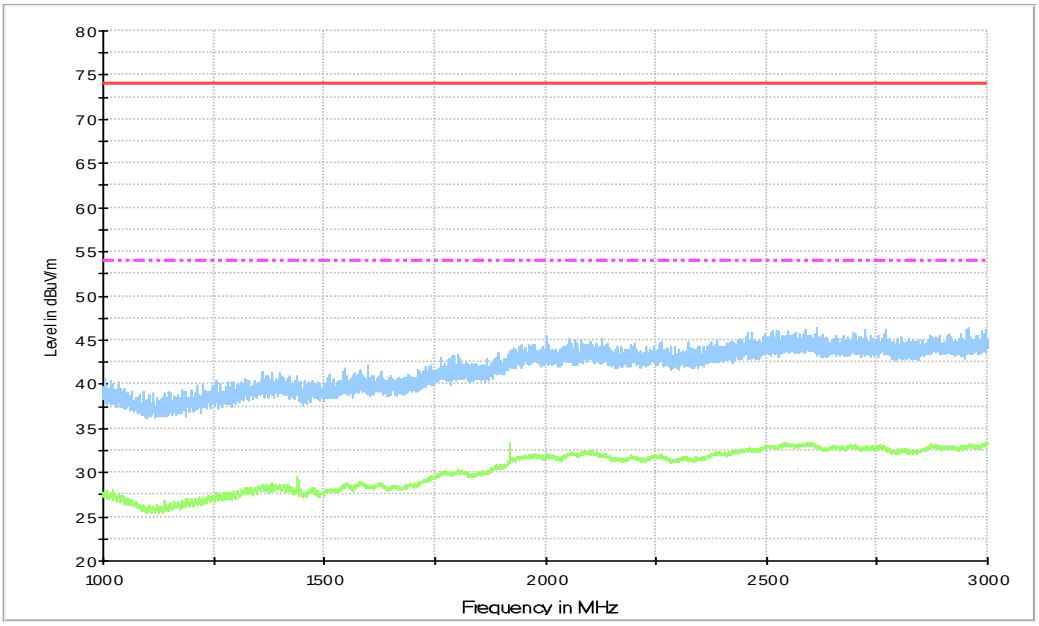


Figure A.14 Radiated Emission from 1GHz to 3GHz

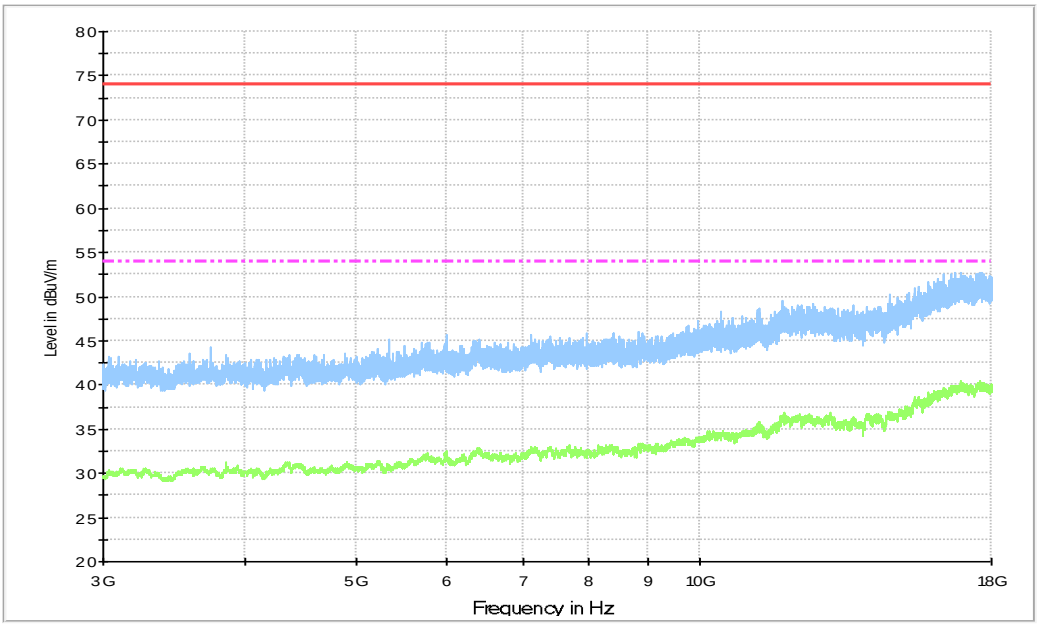


Figure A.15 Radiated Emission from 3GHz to 18GHz

Average detector result

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)
1440.000	27.5	-37.4	28.3	36.63	54.0	26.5	V
1920.000	32.58	-36.9	30.9	38.54	54.0	21.4	H
17611.000	40.22	-23.7	40.6	33.35	54.0	13.8	V
16925.500	40.74	-24.6	41.2	34.14	54.0	13.3	V
16943.500	39.51	-24.6	41.2	32.89	54.0	14.5	V
16939.500	39.37	-24.6	41.2	32.75	54.0	14.6	V

Peak detector result

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)
16944.000	52.8	-24.6	41.2	36.16	74.0	21.2	V
16745.000	52.8	-25.2	41.4	36.57	74.0	21.2	H
17582.500	52.7	-23.8	40.6	35.94	74.0	21.3	V
17621.500	52.7	-23.7	40.6	35.76	74.0	21.3	V
16316.500	52.6	-25.3	40.9	36.98	74.0	21.4	V
17467.500	52.6	-24.1	40.6	36.05	74.0	21.4	H

Set.7+Mode8+Mode9, USB mode (SD) + Headset + RX LTE Band5

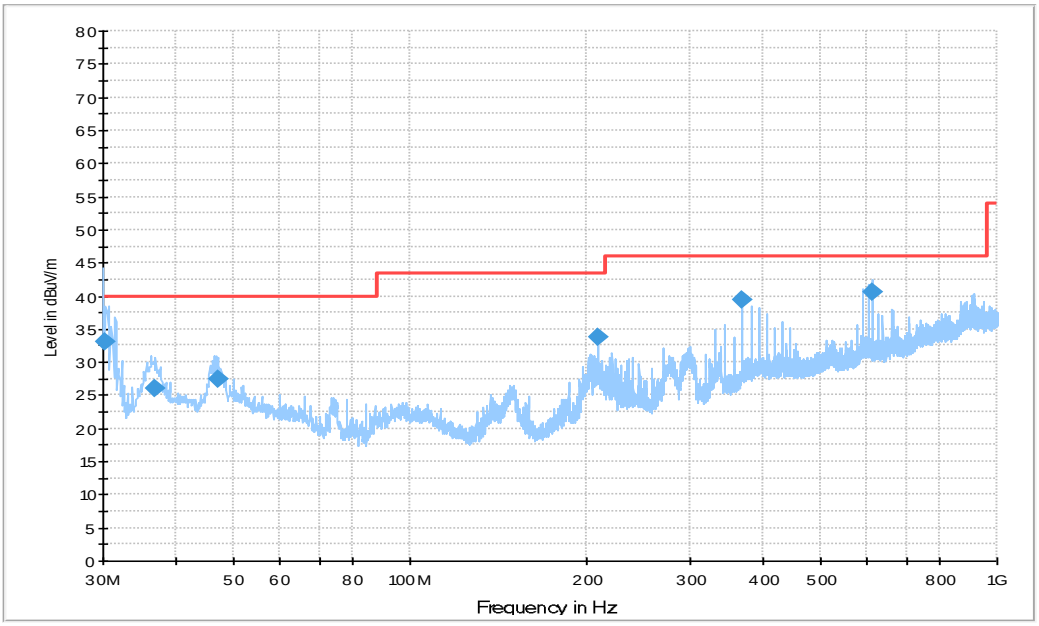


Figure A.16 Radiated Emission from 30MHz to 1GHz

Final Result 1

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)
30.291000	33.0	113.0	V	45.0	-3.6	7.0	40.0
36.887000	26.1	100.0	V	179.0	-2.2	13.9	40.0
46.975000	27.5	125.0	V	51.0	0.0	12.5	40.0
208.86800	33.9	100.0	H	135.0	-1.5	9.6	43.5
368.62700	39.4	100.0	H	263.0	4.0	6.6	46.0
614.42500	40.5	113.0	V	185.0	9.2	5.5	46.0

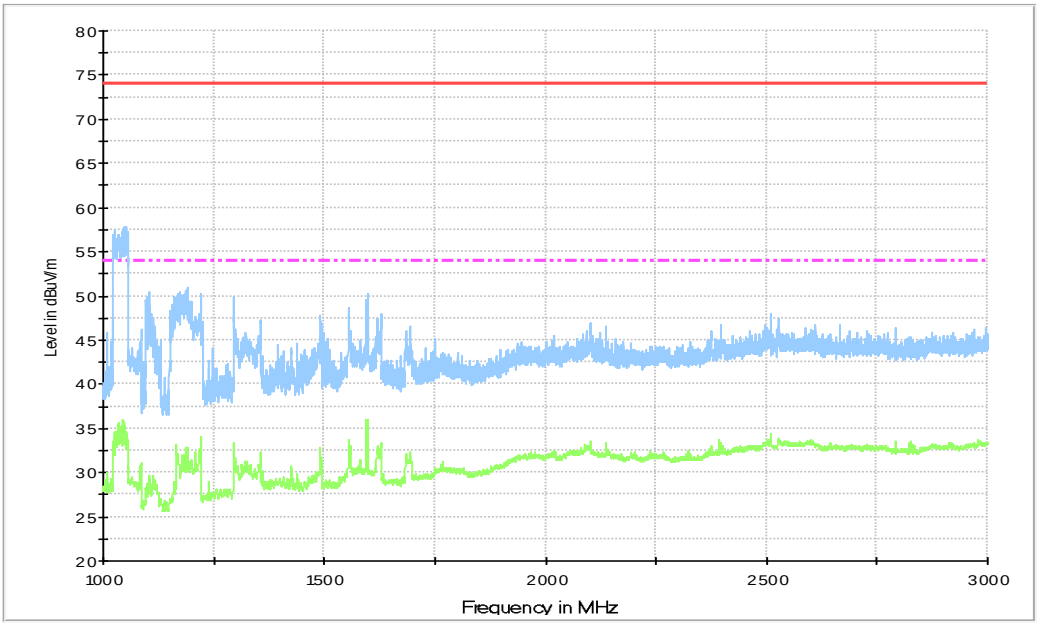


Figure A.17 Radiated Emission from 1GHz to 3GHz

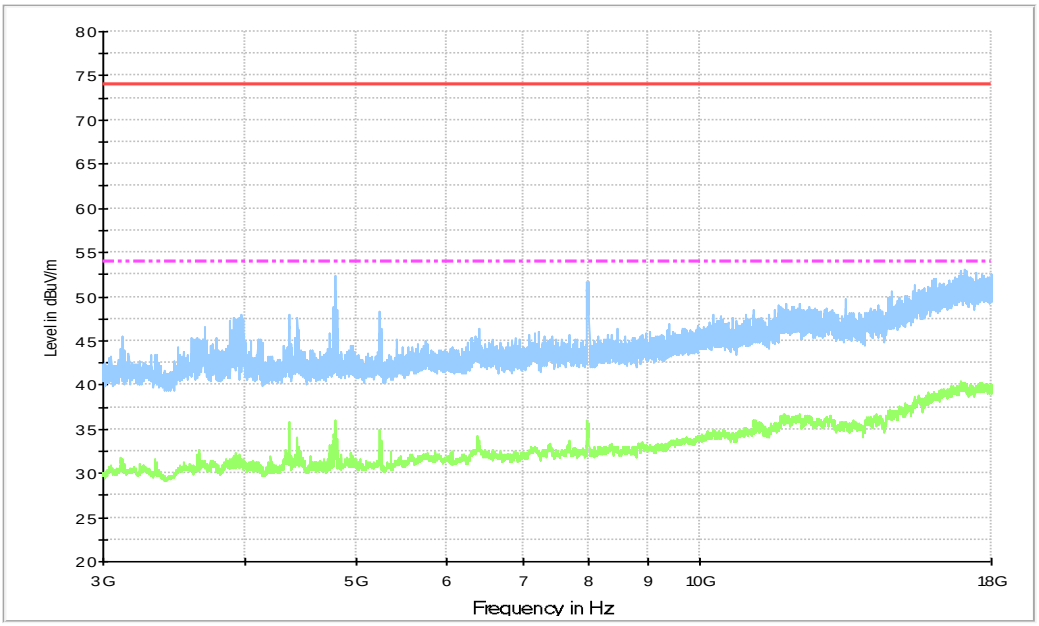


Figure A.18 Radiated Emission from 3GHz to 18GHz

Average detector result

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)
1045.400	35.93	-38.3	28.4	45.86	54.0	18.1	V
1220.600	34.05	-38.0	27.9	44.17	54.0	20.0	V
1599.200	36.01	-37.0	28.5	44.54	54.0	18.0	V
4793.000	35.98	-35.1	34.0	37.06	54.0	18.0	V
5244.000	34.99	-34.9	34.2	35.75	54.0	19.0	V
7970.500	36.05	-32.8	35.7	33.17	54.0	17.9	V

Peak detector result

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)
1054.000	57.9	-38.4	28.2	68.12	74.0	16.1	V
1190.400	50.7	-38.0	27.6	61.08	74.0	23.3	V
1295.400	49.9	-37.8	28.4	59.33	74.0	24.1	V
1596.000	49.6	-37.0	28.5	58.02	74.0	24.4	V
4793.000	52.3	-35.1	34.0	53.40	74.0	21.7	V
7970.500	51.7	-32.8	35.7	48.77	74.0	22.3	V

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.

For the test setup photographs please see the test setup photos document.

A.2.2 EUT Operating Mode

The MS is operating in the USB mode, charging mode, MP3, MP4, CAMERA, SD, FM and cellular RX 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

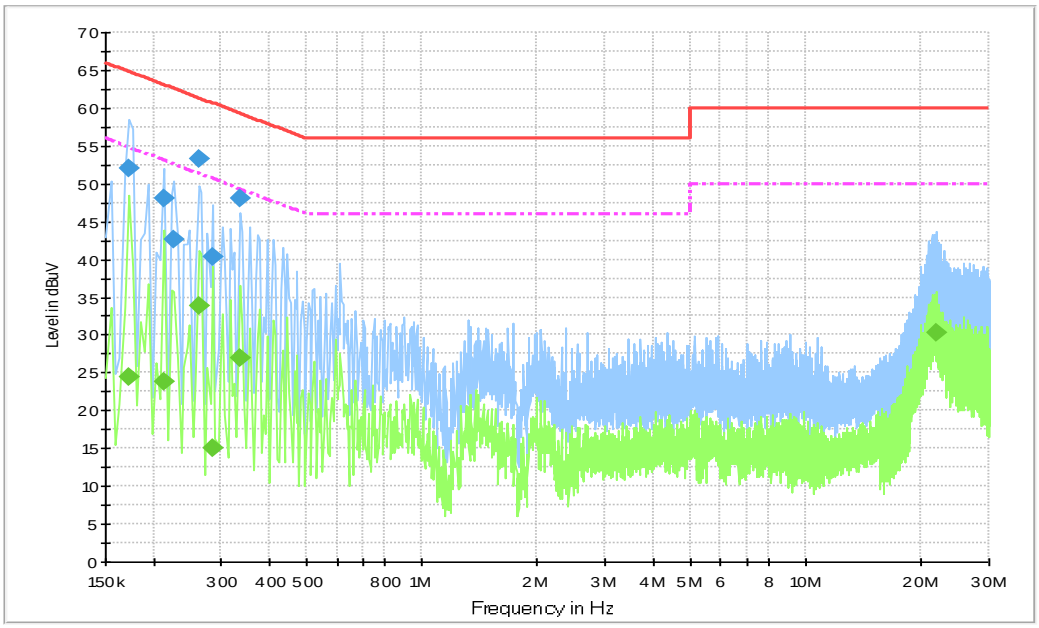
RBW/IF bandwidth	Sweep Time(s)
9kHz	1

A.2.5 Measurement Results

Measurement uncertainty: *U*= 3.10 dB, *k*=2.

Note: all the set-up and operating mode list in section 3.5 were tested, only the worst test data are showed in this section.

Set.1+Mode3



Note: The graphic result above is the maximum of the measurements for both phase line and neutral line.

Figure A.19 Conducted Emission

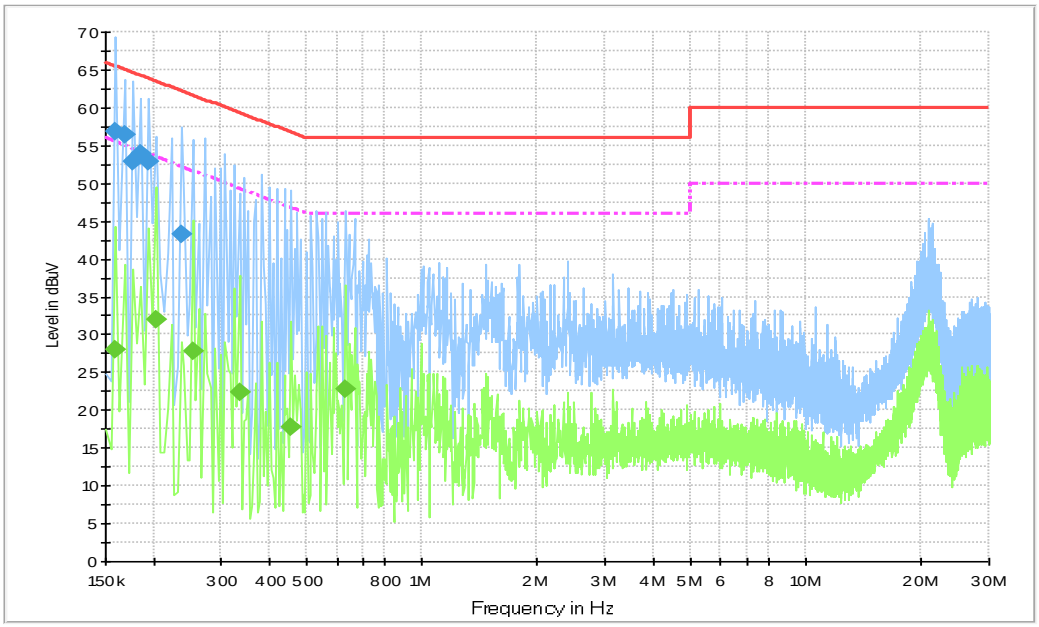
Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.172500	52.1	2000.0	9.000	On	N	24.3	12.7	64.8
0.213000	48.0	2000.0	9.000	On	L1	19.7	15.1	63.1
0.226500	42.7	2000.0	9.000	On	N	19.7	19.9	62.6
0.262500	53.4	2000.0	9.000	On	N	19.7	8.0	61.4
0.285000	40.3	2000.0	9.000	On	L1	19.7	20.4	60.7
0.334500	48.0	2000.0	9.000	On	N	19.7	11.3	59.3

Final Result 2

Frequency (MHz)	Average (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.172500	24.4	2000.0	9.000	On	L1	24.3	30.5	54.8
0.213000	23.7	2000.0	9.000	On	L1	19.7	29.3	53.1
0.262500	33.8	2000.0	9.000	On	L1	19.7	17.6	51.4
0.285000	15.0	2000.0	9.000	On	L1	19.7	35.7	50.7
0.334500	27.0	2000.0	9.000	On	L1	19.7	22.3	49.3
21.921000	30.3	2000.0	9.000	On	N	20.0	19.7	50.0

Set.2+Mode1



Note: The graphic result above is the maximum of the measurements for both phase line and neutral line.

Figure A.20 Conducted Emission

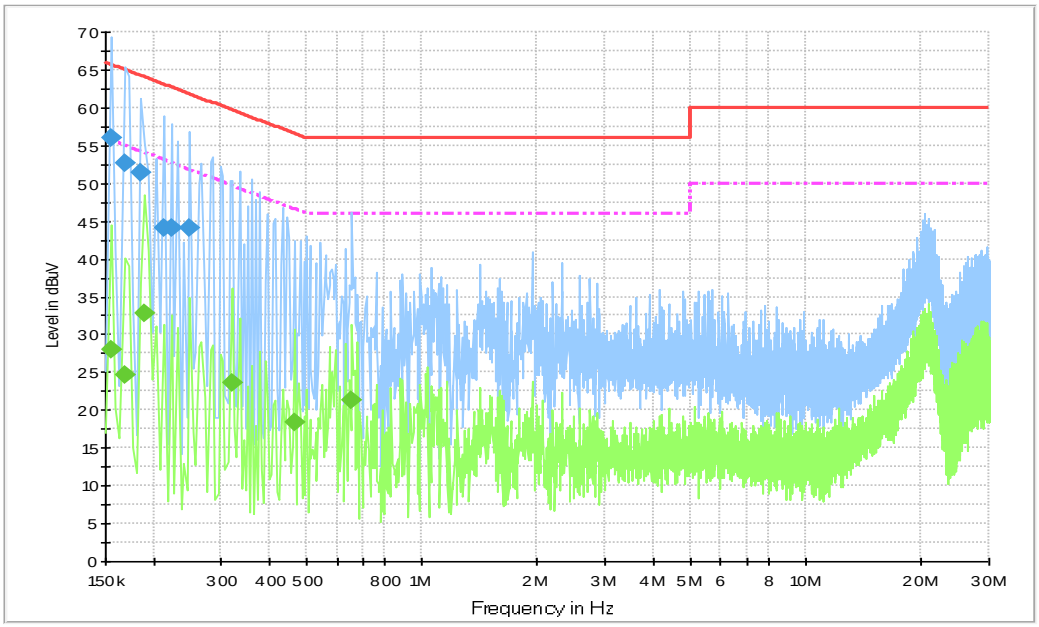
Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.159000	56.7	2000.0	9.000	On	N	26.8	8.8	65.5
0.168000	56.4	2000.0	9.000	On	L1	25.1	8.7	65.1
0.177000	52.8	2000.0	9.000	On	N	23.5	11.8	64.6
0.186000	53.9	2000.0	9.000	On	L1	22.0	10.3	64.2
0.195000	52.9	2000.0	9.000	On	L1	20.5	10.9	63.8
0.235500	43.2	2000.0	9.000	On	N	19.7	19.1	62.3

Final Result 2

Frequency (MHz)	Average (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.159000	28.0	2000.0	9.000	On	N	26.8	27.5	55.5
0.204000	32.0	2000.0	9.000	On	L1	19.7	21.5	53.4
0.253500	27.8	2000.0	9.000	On	N	19.7	23.8	51.6
0.334500	22.3	2000.0	9.000	On	L1	19.7	27.1	49.3
0.456000	17.7	2000.0	9.000	On	N	19.8	29.1	46.8
0.631500	22.7	2000.0	9.000	On	L1	19.7	23.3	46.0

Set.3+Mode2



Note: The graphic result above is the maximum of the measurements for both phase line and neutral line.

Figure A.21 Conducted Emission

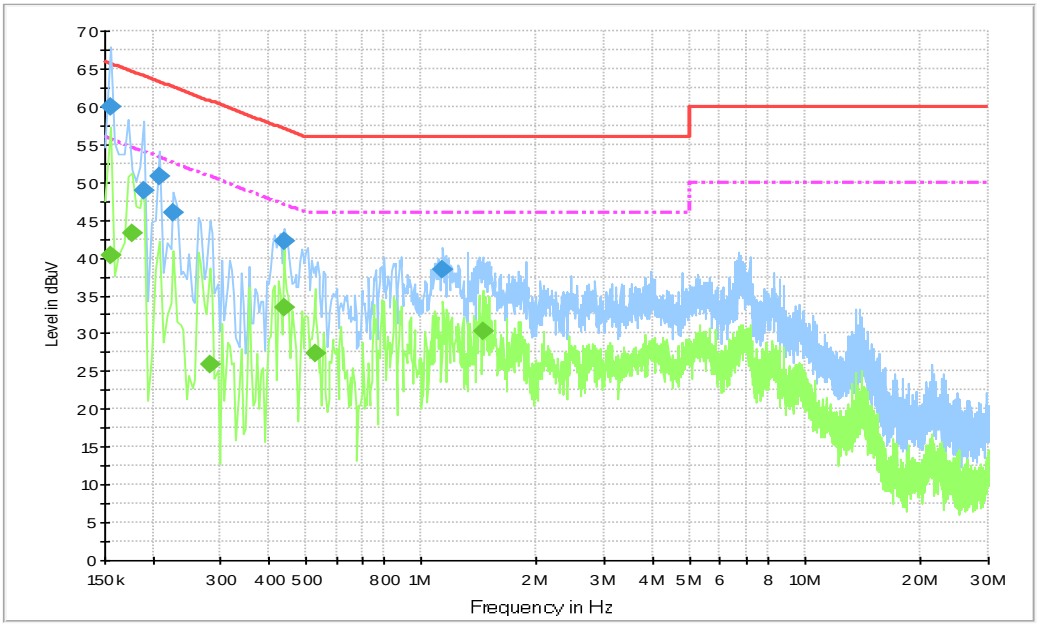
Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.154500	56.1	2000.0	9.000	On	L1	27.7	9.7	65.8
0.168000	52.6	2000.0	9.000	On	N	25.1	12.4	65.1
0.186000	51.4	2000.0	9.000	On	L1	22.0	12.8	64.2
0.213000	44.2	2000.0	9.000	On	N	19.7	18.9	63.1
0.222000	44.0	2000.0	9.000	On	N	19.7	18.7	62.7
0.249000	44.2	2000.0	9.000	On	L1	19.7	17.6	61.8

Final Result 2

Frequency (MHz)	Average (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.154500	27.9	2000.0	9.000	On	N	27.7	27.8	55.8
0.168000	24.6	2000.0	9.000	On	L1	25.1	30.5	55.1
0.190500	32.9	2000.0	9.000	On	L1	21.2	21.1	54.0
0.321000	23.6	2000.0	9.000	On	N	19.7	26.1	49.7
0.465000	18.5	2000.0	9.000	On	N	19.8	28.1	46.6
0.658500	21.2	2000.0	9.000	On	N	19.7	24.8	46.0

Set.6+Mode4+Mode7,



Note: The graphic result above is the maximum of the measurements for both phase line and neutral line.

Figure A.22 Conducted Emission

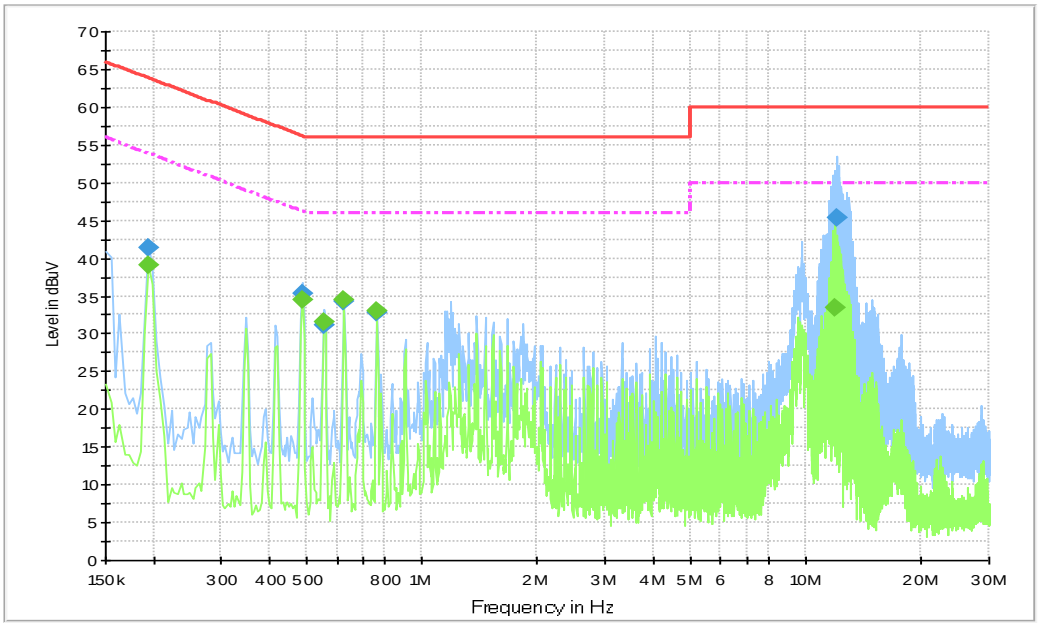
Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.154500	59.9	2000.0	9.000	On	N	27.7	5.9	65.8
0.190500	48.9	2000.0	9.000	On	N	21.2	15.1	64.0
0.208500	50.8	2000.0	9.000	On	L1	19.7	12.5	63.3
0.226500	46.0	2000.0	9.000	On	L1	19.7	16.6	62.6
0.438000	42.2	2000.0	9.000	On	N	19.8	14.9	57.1
1.140000	38.4	2000.0	9.000	On	N	19.6	17.6	56.0

Final Result 2

Frequency (MHz)	Average (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.154500	40.3	2000.0	9.000	On	L1	27.7	15.5	55.8
0.177000	43.3	2000.0	9.000	On	L1	23.5	11.4	54.6
0.280500	25.9	2000.0	9.000	On	N	19.7	24.9	50.8
0.438000	33.5	2000.0	9.000	On	L1	19.8	13.6	47.1
0.528000	27.5	2000.0	9.000	On	L1	19.8	18.5	46.0
1.446000	30.4	2000.0	9.000	On	N	19.6	15.6	46.0

Set.7+Mode8+Mode9



Note: The graphic result above is the maximum of the measurements for both phase line and neutral line.

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)
0.195000	41.4	2000.0	9.000	On	N	20.5	22.4	63.8
0.487500	35.2	2000.0	9.000	On	L1	19.8	21.0	56.2
0.555000	31.1	2000.0	9.000	On	N	19.8	24.9	56.0
0.627000	34.2	2000.0	9.000	On	L1	19.7	21.8	56.0
0.766500	32.9	2000.0	9.000	On	N	19.7	23.1	56.0
12.088500	45.3	2000.0	9.000	On	L1	19.8	14.7	60.0

Final Result 2

Frequency (MHz)	Average (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.195000	39.2	2000.0	9.000	On	L1	20.5	14.7	53.8
0.487500	34.5	2000.0	9.000	On	N	19.8	11.7	46.2
0.555000	31.6	2000.0	9.000	On	L1	19.8	14.4	46.0
0.627000	34.5	2000.0	9.000	On	N	19.7	11.5	46.0
0.766500	33.1	2000.0	9.000	On	N	19.7	12.9	46.0
11.890500	33.5	2000.0	9.000	On	L1	19.8	16.5	50.0

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ANNEX B: Persons involved in this testing

Test Item	Tester
Radiated Emission	Zhao Wenhui
Conducted Emission	Guo Qian

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