TEST REPORT

No. I19Z70303-EMC02

for

Samsung Electronics. Co., Ltd.

Mobile phone

Model Name: SM-A015V

FCC ID: ZCASMA115V

with

Hardware Version: REV3.0

Software Version: A015V.001(A015VVRE0ASJ3)

Issued Date: 2020-02-11

Note:

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Test Laboratory:

CTTL-Telecommunication Technology Labs, CAICT

No. 52, Huayuan North Road, Haidian District, Beijing, P. R. China 100191.

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Email: cttl_terminals@caict.ac.cn, website: www.caict.ac.cn

REPORT HISTORY

Report Number	Revision	Description	Issue Date
I19Z70303-EMC02	Rev.0	1st edition	2020-02-11

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

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.

2. Test Laboratory

2.1. Testing Location

CTTL(huayuan North Road)

Address: No. 52, Huayuan North Road, Haidian District, Beijing, P. R. China100191

2.2. Testing Environment

Normal Temperature: 15-35° C

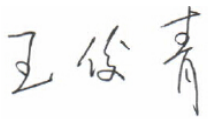
Relative Humidity: 20-75%

2.3. Project data

Testing Start Date: 2019-11-11

Testing End Date: 2019-12-16

2.4. Signature

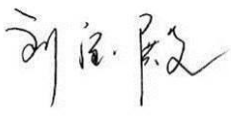


Wang Junqing

(Prepared this test report)

Zhang Ying

(Reviewed this test report)



Liu Baodian

Deputy Director of the laboratory

(Approved this test report)

3. Client Information

3.1. Applicant 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
Contact Person	JP KIM
Contact Email	jp426.kim@samsung.com
Telephone:	+82-10-4376-0326
Fax:	/

3.2. 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
Contact Person	JP KIM
Contact Email	jp426.kim@samsung.com
Telephone:	+82-10-4376-0326
Fax:	/

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

4.1. About EUT

Description	Mobile phone
Model Name	SM-A015V
FCC ID	ZCASMA115V
Extreme vol. Limits	3.6VDC to 4.2VDC (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.

4.2. Internal Identification of EUT used during the test

EUT ID*	SN or IMEI	HW Version	SW Version
EUT1	351765110000166	REV3.0	A015V.001(A015VVRE0ASJ3)

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

4.3. Internal Identification of AE used during the test

AE ID*	Description	SN	Remarks
AE1	Battery	/	/
AE2	Battery	/	/
AE3	Charger	/	315
AE4	Charger	/	929
AE5	Charger	/	941
AE6	USB Cable	/	/

AE1

Model	QL1695
Manufacturer	Ningde Amperex Technology Limited
Capacitance	/
Nominal voltage	3.85 V

AE2

Model	QL1695
Manufacturer	SCUD(Fujian) Electronics Co., Ltd.
Capacitance	/
Nominal voltage	3.85 V

AE3

Model	EP-TA50JWE
Manufacturer	DongYang E&P Inc.
Length of cable	/

AE4

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

AE5

Model	EP-TA50JWE

Manufacturer	RF Tech	
Length of cable	/	

AE6

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

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

Note: The USB cables are shielded.

4.4. EUT set-ups

EUT set-up No.	Combination of EUT and AE	Remarks
Set.8	EUT1+ AE1/AE2+ AE4+ AE6	Charger

5. Reference Documents

5.1. 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	2016
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.

6. LABORATORY ENVIRONMENT

Semi-anechoic chamber SAC-1 (23 meters×17meters×10meters) 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, 10 m distance
Site voltage standing-wave ratio (S_{VSWR})	Between 0 and 6 dB, from 1GHz to 6GHz
Uniformity of field strength	Between 0 and 6 dB, from 80 to 3000 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

7. SUMMARY OF TEST RESULTS

Abbreviations used in this clause:		
Verdict Column	P	Pass
	NA	Not applicable
	F	Fail

Items	Test Name	Clause in FCC rules	Section in this report	Verdict	Test Location
1	Radiated Emission	15.109(a)	B.1	P	**CTTL(huayuan North Road)**

8. Test Equipments Utilized

NO.	Description	TYPE	SERIES NUMBER	MANUFACTURE	CAL DUE DATE	CALIBRATION INTERVAL
1	Test Receiver	ESU26	100235	R&S	2020-03-01	1 Year
2	Universal Radio Communication Tester	CMW500	150344	R&S	2020-11-17	1 year
3	Universal Radio Communication Tester	CMW500	116588	R&S	2020-12-26	1 year
4	EMI Antenna	VULB 9163	9163-1222	Schwarzbeck	2020-03-14	1 year

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 10 meters(for 30MHz-1GHz). Tested in accordance with the procedures of ANSI C63.4 – 2014, section 8.3.

The EUT was placed on a non-conductive table. The measurement antenna was placed at a distance of 3/10 meters from the EUT. During the tests, the antenna height and the EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. This maximization process was repeated with the EUT positioned in each of its three orthogonal orientations.

A.1.2 EUT Operating Mode

The MS is operating in the charging mode and transmitter receiver mode.

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

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): U = 5.44 dB, k=2.

Charging Mode, GSM850MHz, idle, channel 128

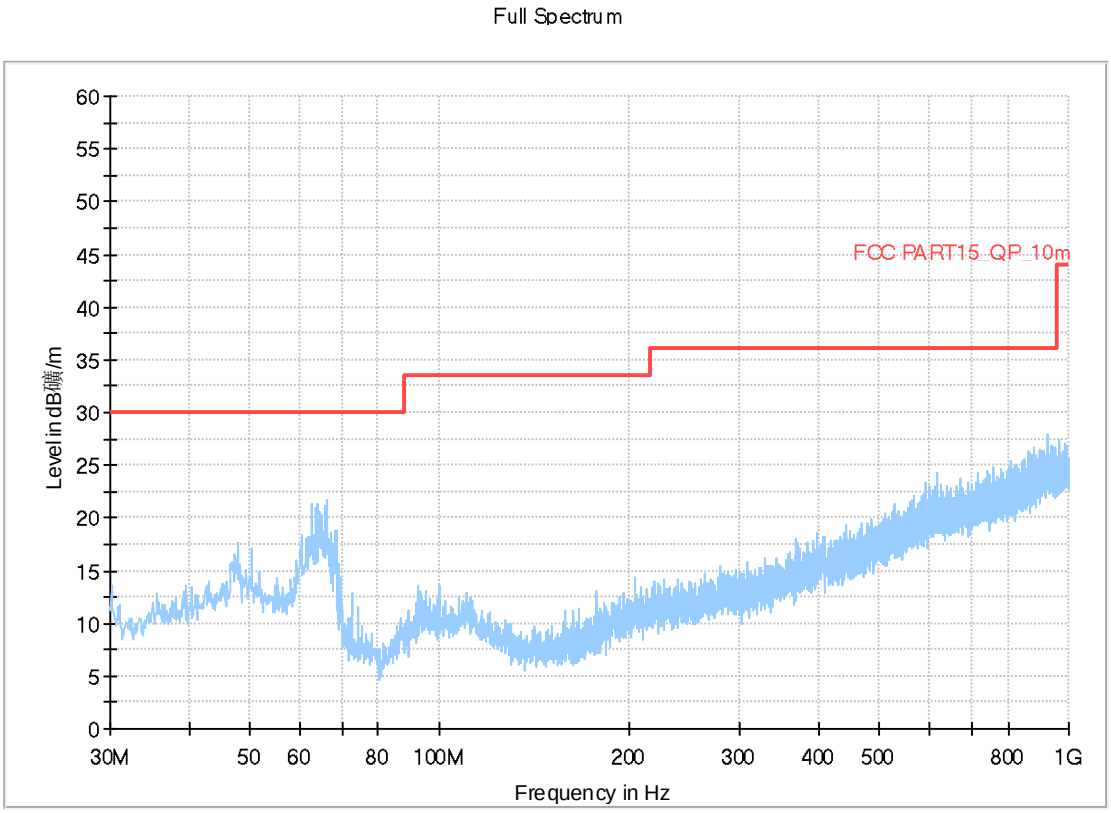


Fig A.1 Radiated Emission from 30MHz to 1GHz, GSM850MHz, idle, channel 128

Charging Mode, GSM850MHz, idle, channel 190

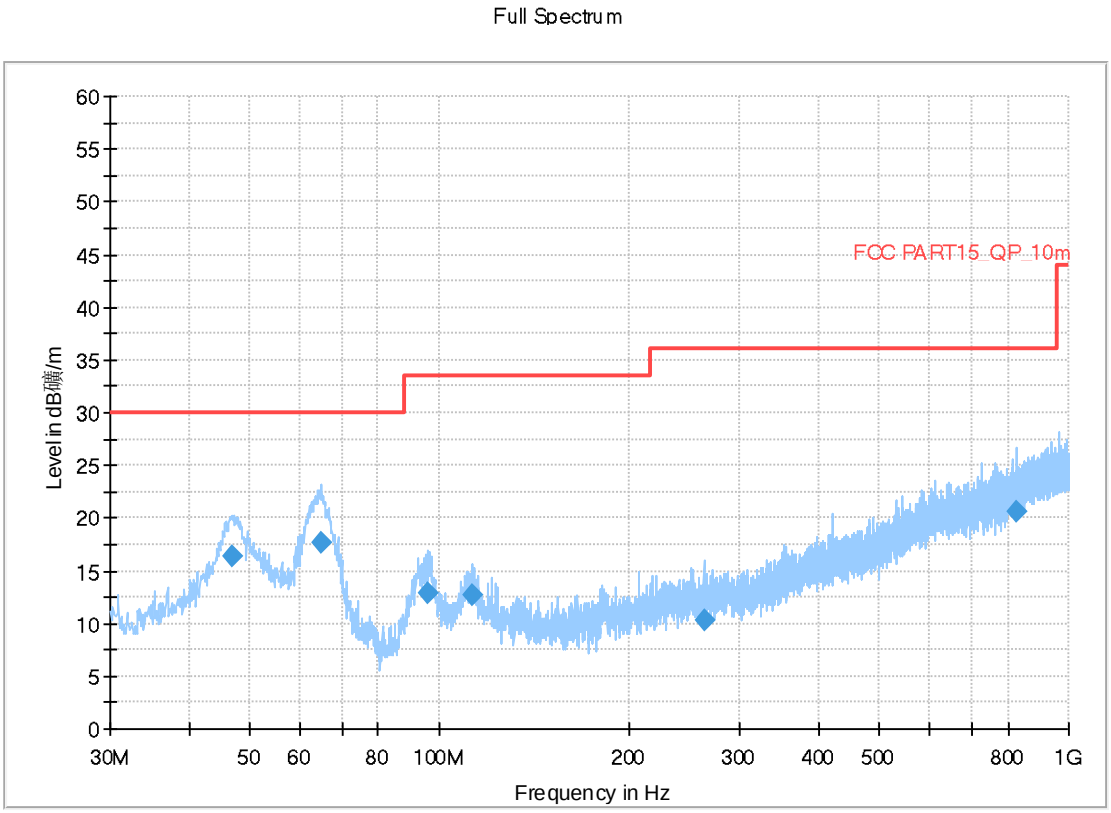


Fig A.2 Radiated Emission from 30MHz to 1GHz, GSM850MHz, idle, channel 190

Final_Result

Frequency (MHz)	QuasiPeak (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)
46.846000	16.37	30.00	13.63	1000.0	120.000	125.0	V	263.0
65.077000	17.71	30.00	12.29	1000.0	120.000	104.0	V	183.0
95.905000	12.80	33.50	20.72	1000.0	120.000	179.0	V	261.0
112.662000	12.62	33.50	20.90	1000.0	120.000	125.0	V	255.0
263.271000	10.28	36.00	25.74	1000.0	120.000	125.0	V	90.0
824.675000	20.69	36.00	15.33	1000.0	120.000	125.0	V	-30.0

Charging Mode, GSM850MHz, idle, channel 251

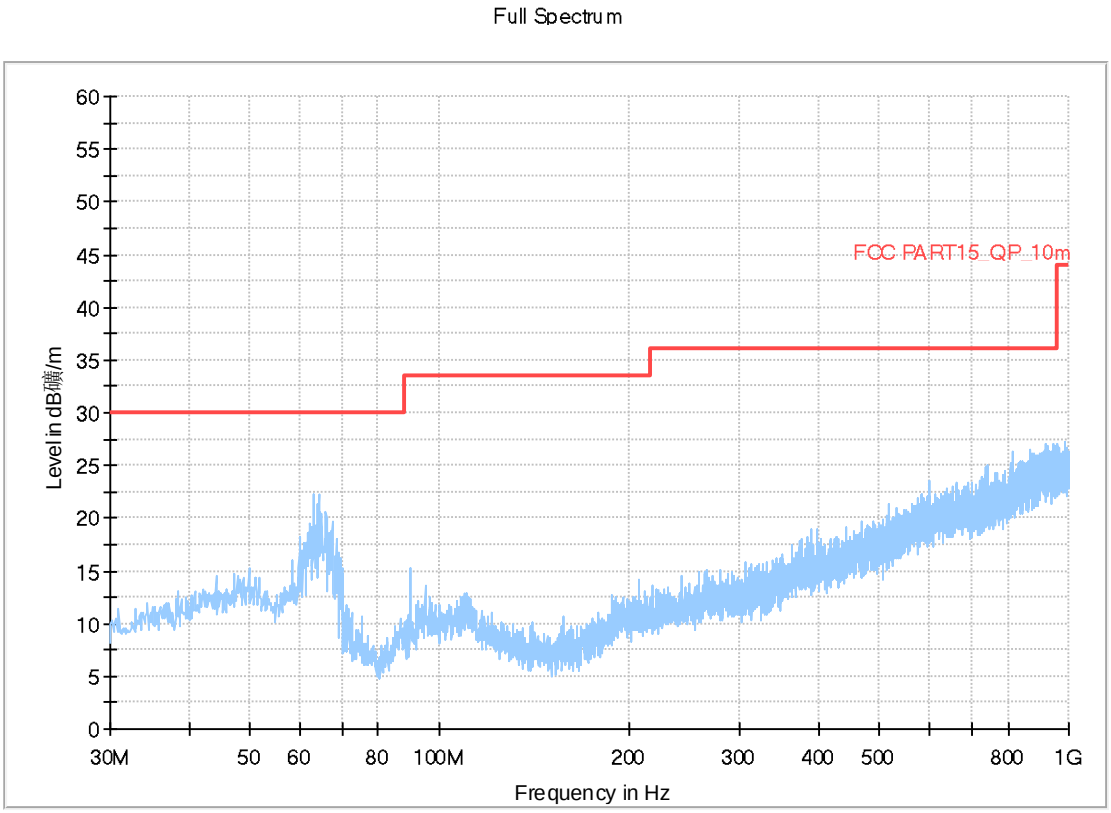


Fig A.3 Radiated Emission from 30MHz to 1GHz, GSM850MHz, idle, channel 251

Charging Mode, WCDMA850MHz, idle, channel 4132

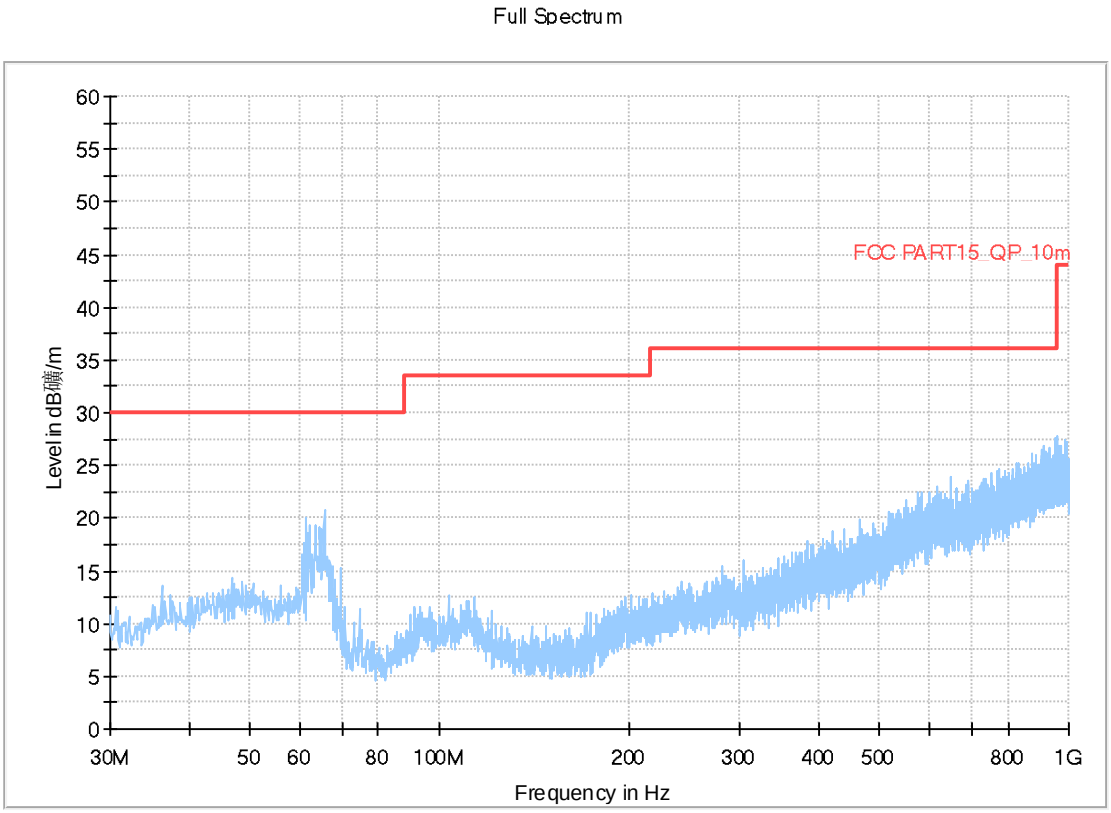


Fig A.4 Radiated Emission from 30MHz to 1GHz, WCDMA850MHz, idle, channel 4132

Charging Mode, WCDMA850MHz, idle, channel 4183

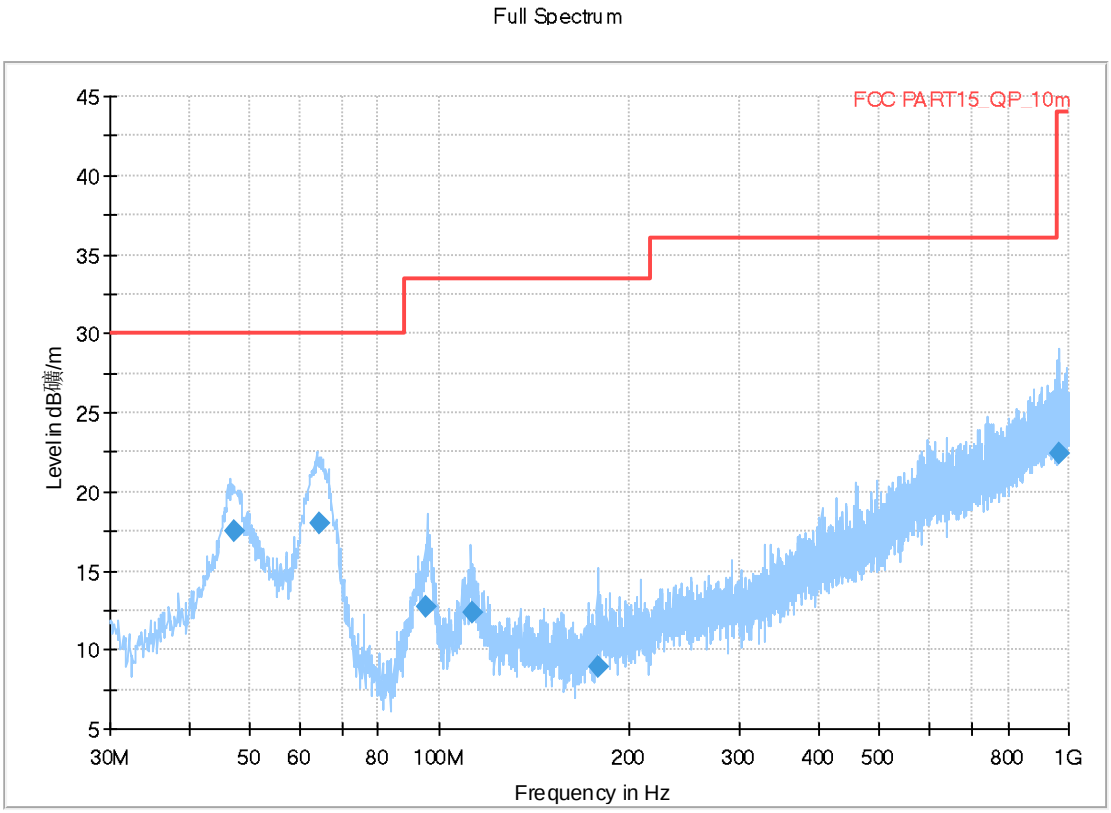


Fig A.5 Radiated Emission from 30MHz to 1GHz, WCDMA850MHz, idle, channel 4183

Final_Result

Frequency (MHz)	QuasiPeak (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)
47.261000	17.47	30.00	12.53	1000.0	120.000	111.0	V	-5.0
64.333000	18.04	30.00	11.96	1000.0	120.000	225.0	V	-12.0
95.152000	12.68	33.50	20.84	1000.0	120.000	102.0	V	287.0
112.893000	12.38	33.50	21.14	1000.0	120.000	125.0	V	265.0
178.267000	8.87	33.50	24.65	1000.0	120.000	119.0	V	8.0
962.794000	22.43	44.00	21.55	1000.0	120.000	325.0	V	168.0

Charging Mode, WCDMA850MHz, idle, channel 4233

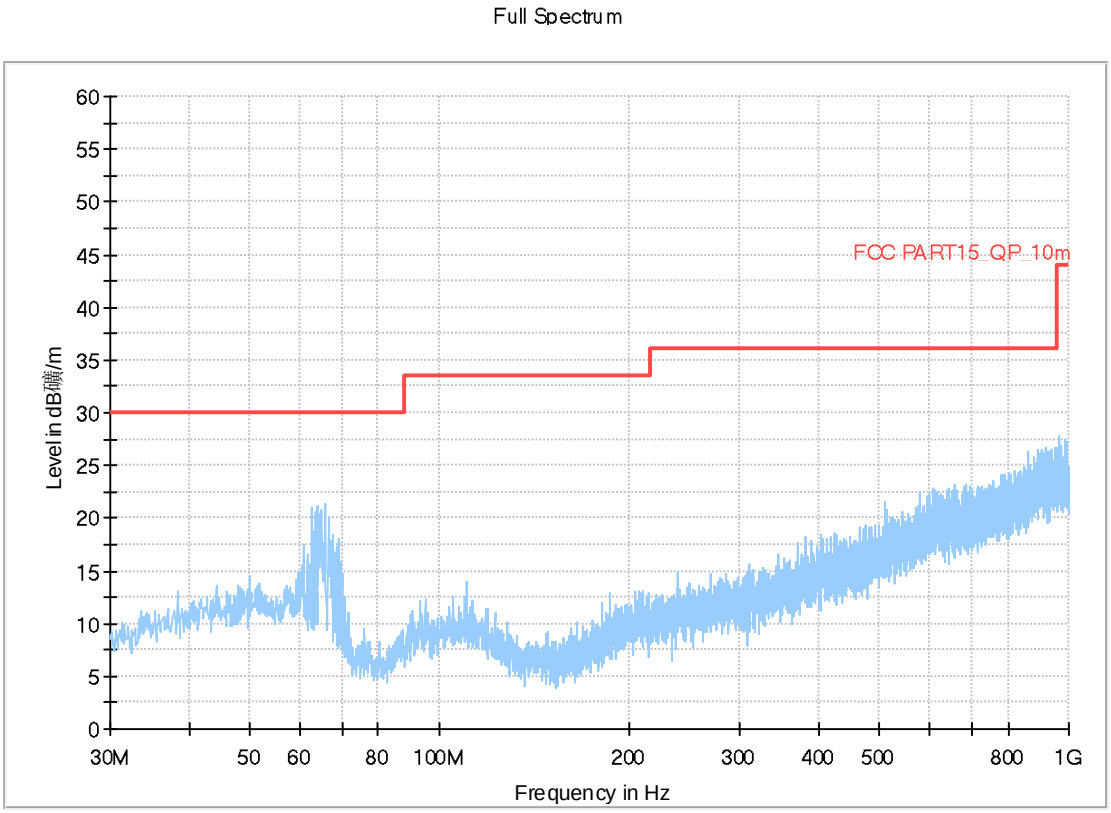


Fig A.6 Radiated Emission from 30MHz to 1GHz, WCDMA850MHz, idle, channel 4233

Charging Mode, LTE band 5, idle, channel 20407

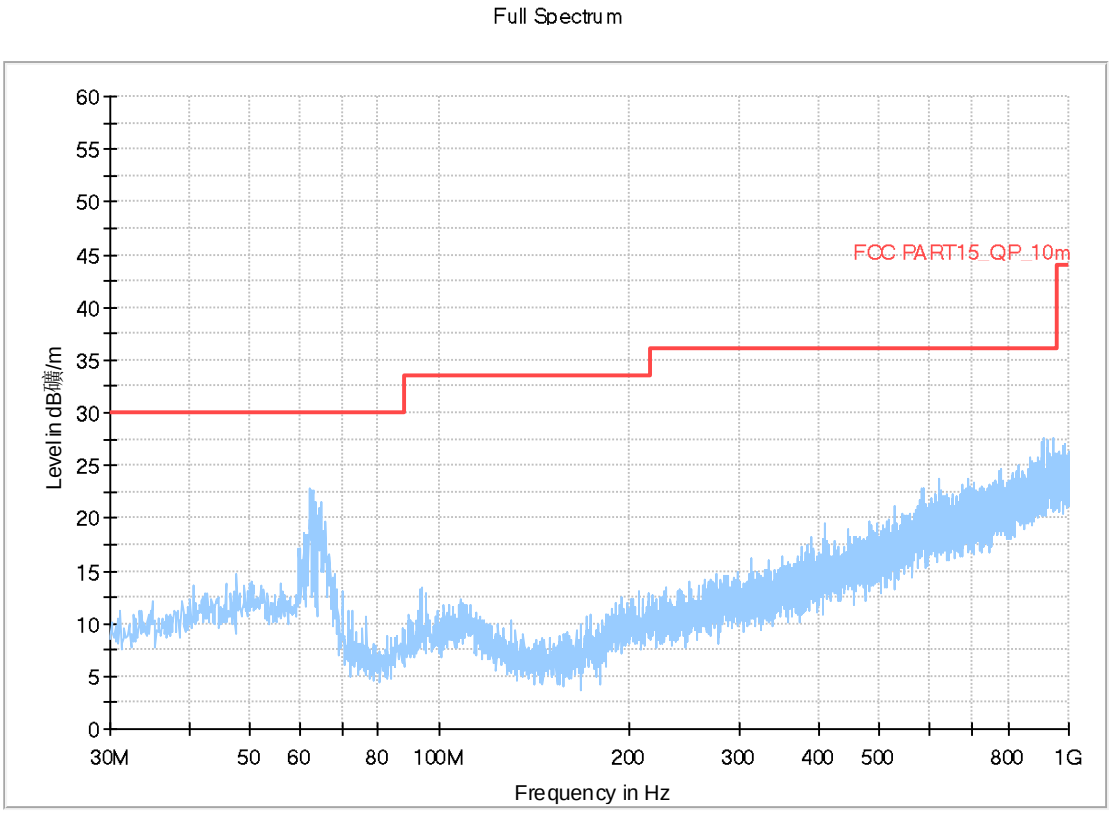


Fig A.7 Radiated Emission from 30MHz to 1GHz, LTE band 5, idle, channel 20407

Charging Mode, LTE band 5, idle, channel 20525

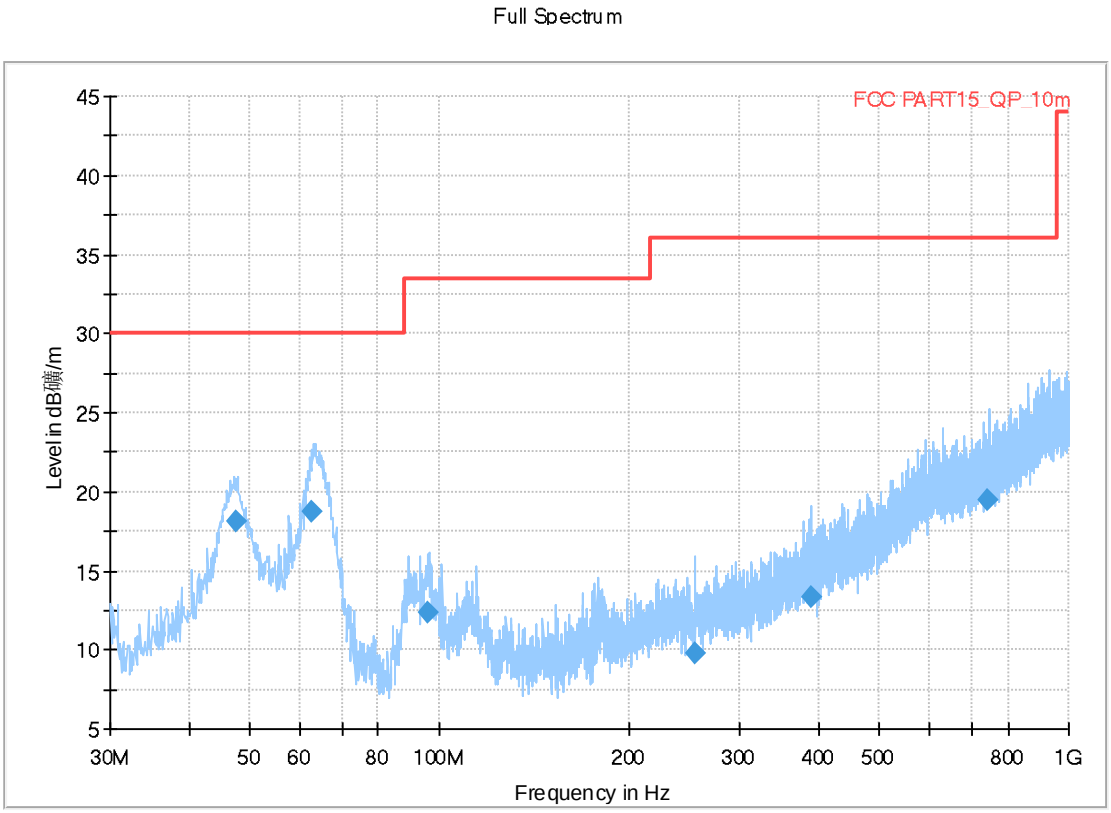


Fig A.8 Radiated Emission from 30MHz to 1GHz, LTE band 5, idle, channel 20525

Final_Result

Frequency (MHz)	QuasiPeak (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)
47.428000	18.13	30.00	11.87	1000.0	120.000	102.0	V	151.0
62.814000	18.72	30.00	11.28	1000.0	120.000	102.0	V	151.0
95.734000	12.35	33.50	21.17	1000.0	120.000	125.0	V	-30.0
255.534000	9.81	36.00	26.21	1000.0	120.000	288.0	V	30.0
390.240000	13.35	36.00	22.67	1000.0	120.000	282.0	V	107.0
745.029000	19.44	36.00	16.58	1000.0	120.000	125.0	V	30.0

Charging Mode, LTE band 5, idle, channel 20643

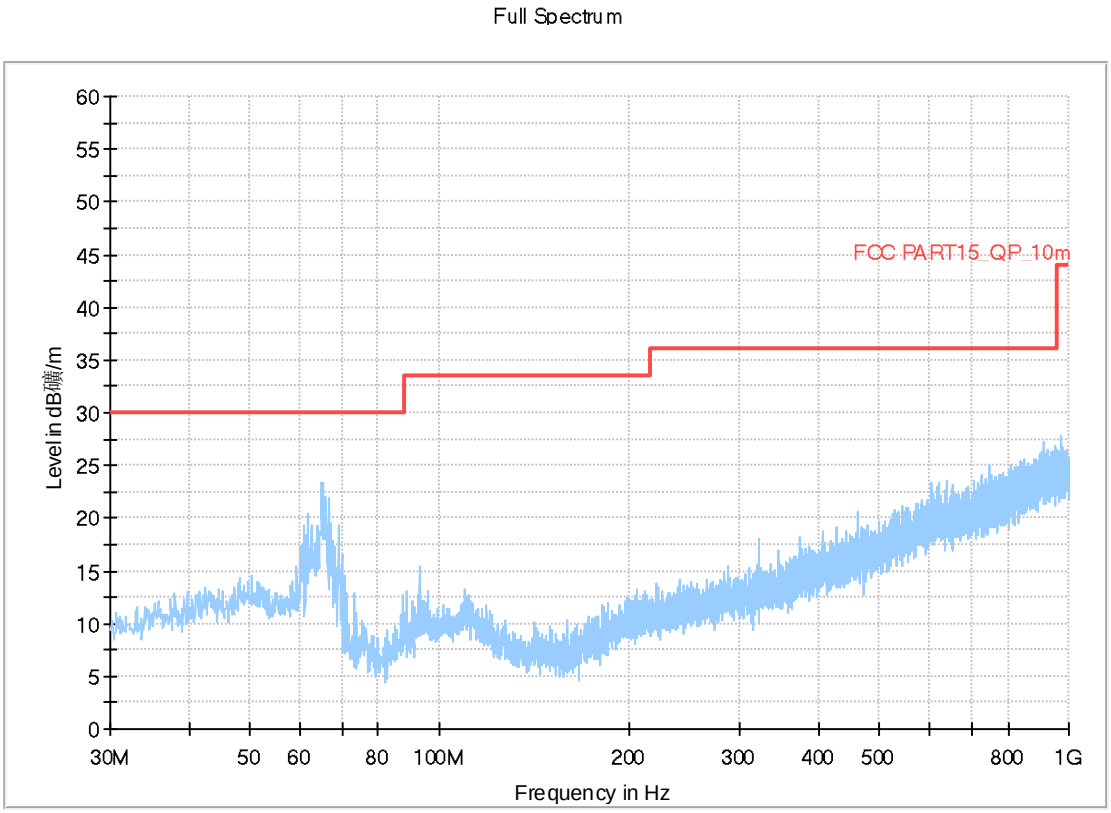


Fig A.9 Radiated Emission from 30MHz to 1GHz, LTE band 5, idle, channel 20643

Charging Mode, LTE band 13, idle, channel 23205

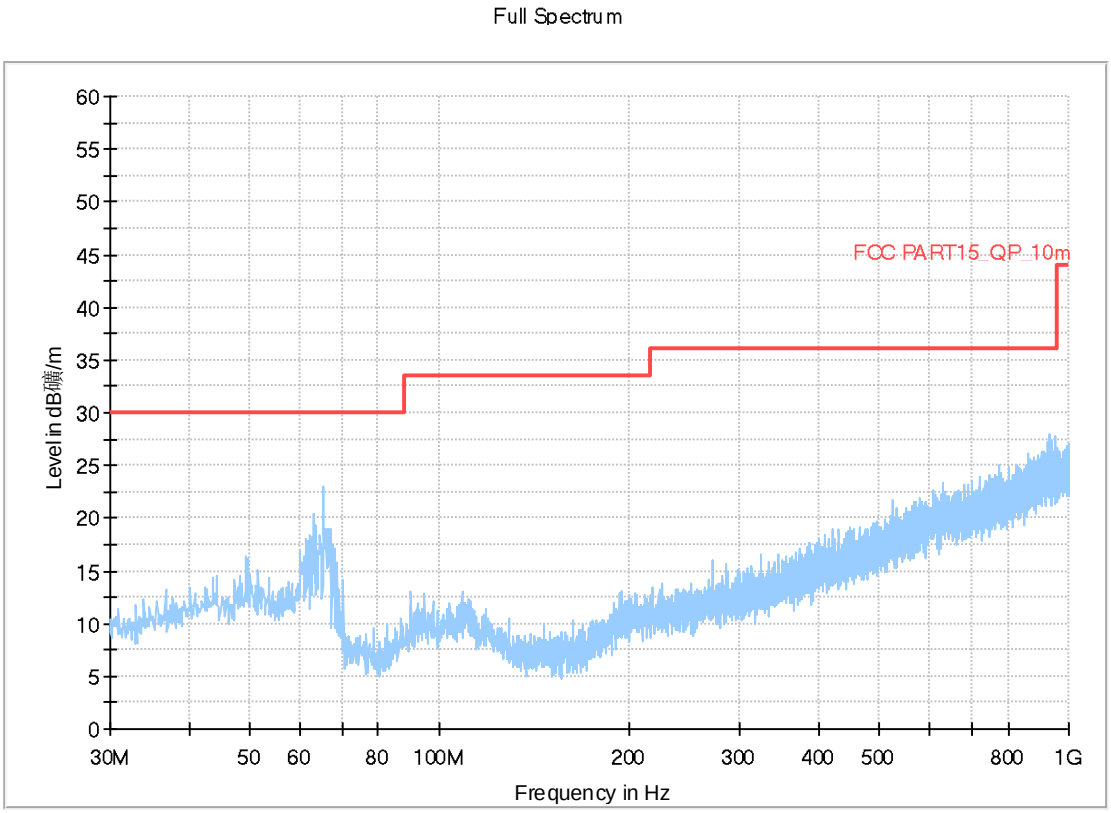


Fig A.10 Radiated Emission from 30MHz to 1GHz, LTE band 13, idle, channel 23205

Charging Mode, LTE band 13, idle, channel 23230

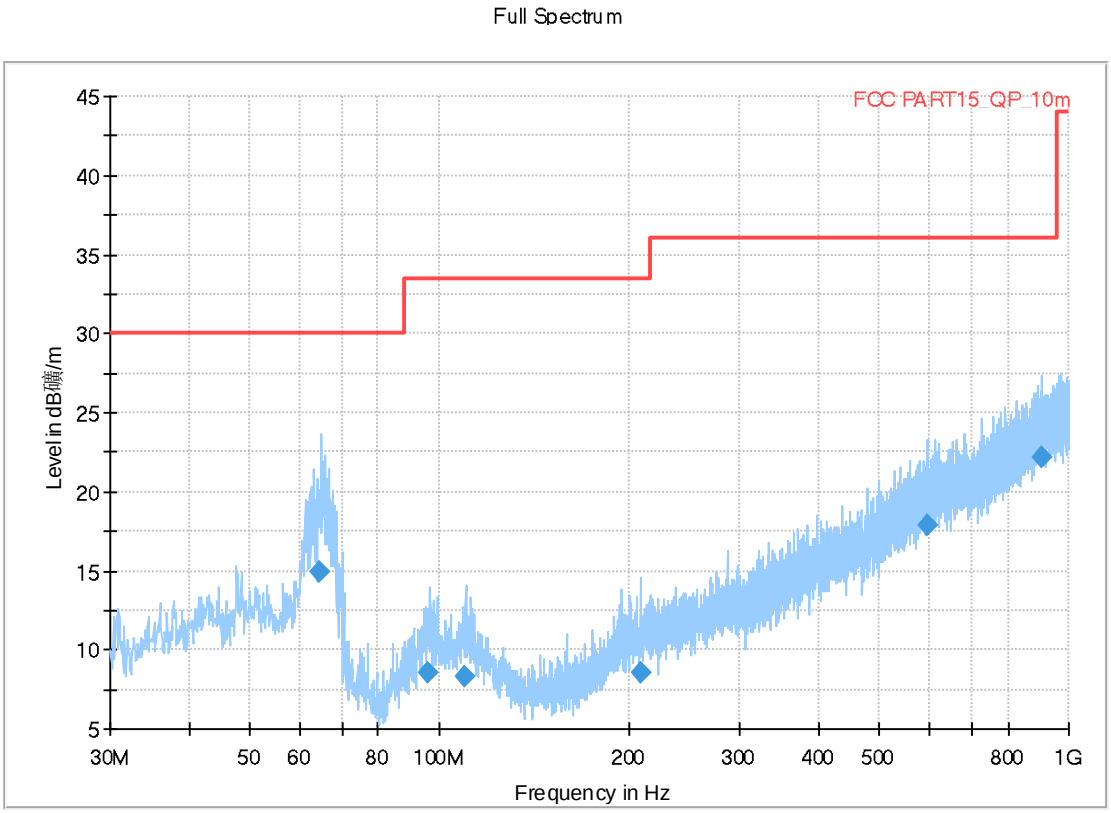


Fig A.11 Radiated Emission from 30MHz to 1GHz, LTE band 13, idle, channel 23230

Final_Result

Frequency (MHz)	QuasiPeak (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)
64.523000	14.93	30.00	15.07	1000.0	120.000	125.0	V	91.0
95.748000	8.57	33.50	24.95	1000.0	120.000	100.0	V	-29.0
109.642000	8.36	33.50	25.16	1000.0	120.000	102.0	V	26.0
208.974000	8.57	33.50	24.95	1000.0	120.000	125.0	V	169.0
597.159000	17.89	36.00	18.13	1000.0	120.000	312.0	V	-21.0
908.136000	22.19	36.00	13.83	1000.0	120.000	225.0	V	2.0

Charging Mode, LTE band 13, idle, channel 23255

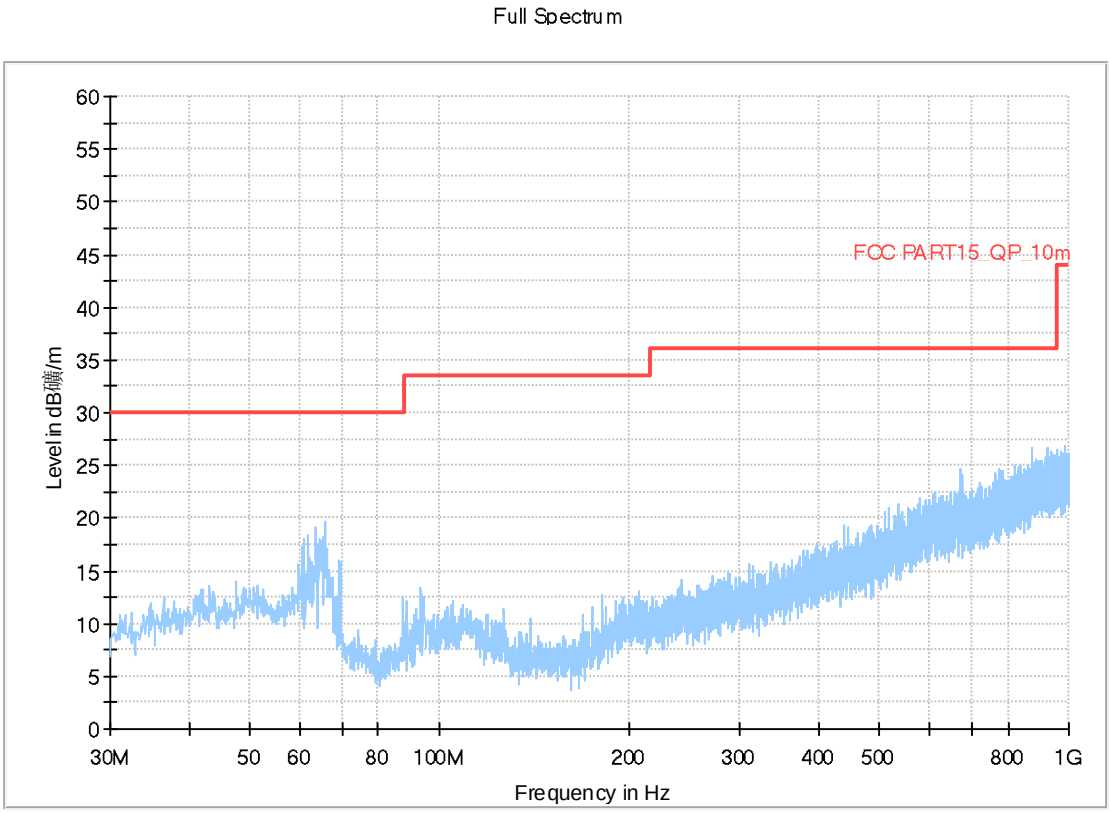


Fig A.12 Radiated Emission from 30MHz to 1GHz, LTE band 13, idle, channel 23255

ANNEX B: PERSONS INVOLVED IN THIS TESTING

Test Item	Test Software and Version	Software Vendor	Test operator
Radiated Emission	EMC32 V9.01.00	R&S	Yan Hanchen

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