



TEST REPORT

No. I20Z60368-EMC01

for

TCL Communication Ltd.

LTE/UMTS/GSM Mobile Phone

Model Name: 3080G

FCC ID: 2ACCJB124

with

Hardware Version: PIO

Software Version: V1.0

Issued Date: 2020-05-06

Note:

The test results in this test report relate only to the devices specified in this report. This report shall not be reproduced except in full without the written approval of CTTL.

The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the U.S. Government.

Test Laboratory:

CTTL-Telecommunication Technology Labs, CAICT

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REPORT HISTORY

Report Number	Revision	Description	Issue Date
I20Z60368-EMC01	Rev.0	1 st edition	2020-05-06

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

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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.

2. Test Laboratory

2.1. Testing Location

CTTL(huayuan North Road)

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

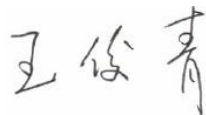
2.2. Testing Environment

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


2.3. Project data

Testing Start Date: 2020-03-26
Testing End Date: 2020-05-05

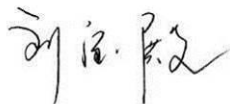
2.4. Signature



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

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3.2. Manufacturer Information

Company Name: TCL Communication Ltd.
Address: 5/F, Building 22E, 22 Science Park East Avenue, Hong Kong Science
Park, Shatin, NT, Hong Kong
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Fax: 0086-755-36612000-81722

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

4.1. About EUT

Description	LTE/UMTS/GSM Mobile Phone
Model Name	3080G
FCC ID	2ACCJB124
Extreme vol. Limits	3.5VDC to 4.35 VDC (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.

4.2. Internal Identification of EUT used during the test

EUT ID*	SN or IMEI	HW Version	SW Version
EUT1	354832110201181	PIO	V1.0

*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	/	inbuilt
AE2	Battery	/	inbuilt
AE3	Charger	/	CH023
AE4	Charger	/	CH012
AE5	Charger	/	/
AE6	Charger	/	/
AE9	USB Cable	/	/

AE1

Model	CAB1500071C7
Manufacturer	VEKEN
Capacitance	1500mAh
Nominal voltage	3.8V

AE2

Model	CAB1500079CA
Manufacturer	TIANMAO
Capacitance	1500mAh
Nominal voltage	3.8V

AE3

Model	CBA0066AAAC5
Manufacturer	PUAN
Length of cable	/

AE4

Model	CBA0066AAAC7
Manufacturer	chengyang
Length of cable	/

AE5

Model	CBA0066ABAC5
Manufacturer	PUAN
Length of cable	/

AE6

Model	CBA0066ABAC7
Manufacturer	PUAN
Length of cable	/

AE9

Model	/
Manufacturer	/
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.1	EUT1+ AE1/AE2+ AE3	Charger + Reciever mode
Set.2	EUT1+ AE1/AE2+ AE4	Charger + Reciever mode
Set.3	EUT1+ AE1/AE2+ AE9	USB Mode

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 M
Ground system resistance	< 4
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 M
Ground system resistance	< 4

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)
2	Conducted Emission	15.107(a)	B.2	P	CTTL(huayuan North Road)

8. Test Equipments Utilized

NO.	Description	TYPE	SERIES NUMBER	MANUFACTURE	CAL DUE DATE	CALIBRATI ON INTERVAL
1	Test Receiver	ESU26	100235	R&S	2021-03-05	1 Year
2	Test Receiver	ESCI 3	100766	R&S	2021-03-13	1 Year
4	Universal Radio Communication Tester	CMW500	116588	R&S	2020-12-05	1 year
5	LISN	ENV216	101200	R&S	2020-05-27	1 year
6	EMI Antenna	VULB 9163	9163-483	Schwarzbeck	2020-09-17	1 year
7	EMI Antenna	3115	00167250	ETS-Lindgren	2020-05-15	1 year
8	PC	M4000E-17	M706GWXD	LENOVO	N/A	N/A
9	Printer	P1606dn	VNC3L52122	HP	N/A	N/A

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 10 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 3/10 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 USB mode and charging mode. During the test MS is connected to a PC via a USB cable in the case of USB mode and is connected to a charger in the case of charging mode. The model of the PC is M4000E-17, and the serial number of the PC is M706GWXD. 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/1MHz	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): $U = 5.44 \text{ dB}$, $k=2$.

Measurement results for Set.1:

Charging Mode/Average detector

Frequency (MHz)	Measurement Result (dB μ V/m)	Cable loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dB μ V)	Antenna Pol. (H/V)
17997.733	43.4	-17.7	45.6	15.500	H
17967.700	43.3	-17.7	45.6	15.400	H
17985.833	43.3	-17.7	45.6	15.400	V
17975.633	43.1	-17.7	45.6	15.200	H
17869.100	43.0	-18.5	45.6	15.900	H
17990.367	42.9	-17.7	45.6	15.000	H

Charging Mode/Peak detector

Frequency (MHz)	Measurement Result (dB μ V/m)	Cable loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dB μ V)	Antenna Pol. (H/V)
17903.100	52.2	-18.5	45.6	25.100	H
17999.433	52.0	-17.7	45.6	24.100	H
17978.467	51.8	-17.7	45.6	23.900	V
17974.500	51.8	-17.7	45.6	23.900	H
17994.900	51.4	-17.7	45.6	23.500	H
17960.333	51.4	-17.7	45.6	23.500	H

Measurement results for Set.2:**Charging Mode/Average detector**

Frequency (MHz)	Measurement Result (dB μ V/m)	Cable loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dB μ V)	Antenna Pol. (H/V)
17992.633	42.9	-17.7	45.6	15.000	H
17986.400	42.9	-17.7	45.6	15.000	H
17992.067	42.8	-17.7	45.6	14.900	V
17955.233	42.7	-17.7	45.6	14.800	H
17982.433	42.7	-17.7	45.6	14.800	H
17944.467	42.7	-17.7	45.6	14.800	H

Charging Mode/Peak detector

Frequency (MHz)	Measurement Result (dB μ V/m)	Cable loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dB μ V)	Antenna Pol. (H/V)
17896.867	52.0	-18.5	45.6	24.900	H
17986.400	51.5	-17.7	45.6	23.600	H
17973.933	51.4	-17.7	45.6	23.500	V
17898.000	51.2	-18.5	45.6	24.100	H
17980.733	51.2	-17.7	45.6	23.300	H
17976.200	51.1	-17.7	45.6	23.200	H

Measurement results for Set.3:
USB Mode/Average detector

Frequency (MHz)	Measurement Result (dBμV/m)	Cable loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBμV)	Antenna Pol. (H/V)
6055.8	46.7	-32.900	35.2	44.4	H
6055.2	44.2	-33.600	35.2	42.6	H
17977.9	43.7	-17.700	45.6	15.8	V
4049.8	43.6	-36.300	33.2	46.7	H
17973.4	43.3	-17.700	45.6	15.4	H
17994.9	43.1	-17.700	45.6	15.2	H

USB Mode/ Peak detector

Frequency (MHz)	Measurement Result (dBμV/m)	Cable loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBμV)	Antenna Pol. (H/V)
1194.933	54.4	-41.2	24.1	71.500	H
3594.200	53.8	-37.4	32.1	59.100	H
3598.733	52.1	-37.4	32.1	57.400	V
17813.000	51.7	-18.5	45.6	24.600	H
17911.033	51.7	-18.5	45.6	24.600	H
17946.167	51.5	-17.7	45.6	23.600	H

Charging Mode, Set.1

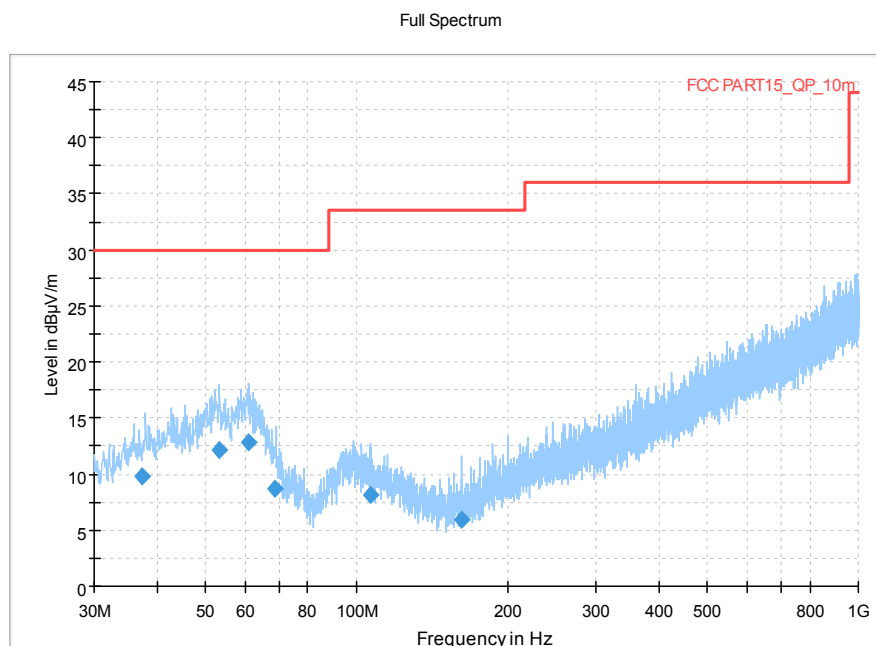


Fig A.1 Radiated Emission from 30MHz to 1GHz

Final_Result

Frequency (MHz)	QuasiPeak (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)
37.474000	9.75	30.00	20.25	1000.0	120.000	179.0	V	184.0
53.280000	12.17	30.00	17.83	1000.0	120.000	125.0	V	120.0
60.897000	12.87	30.00	17.13	1000.0	120.000	225.0	V	210.0
68.851000	8.71	30.00	21.29	1000.0	120.000	104.0	V	166.0
106.704000	8.14	33.50	25.38	1000.0	120.000	113.0	V	11.0
162.363000	5.93	33.50	27.59	1000.0	120.000	125.0	V	7.0

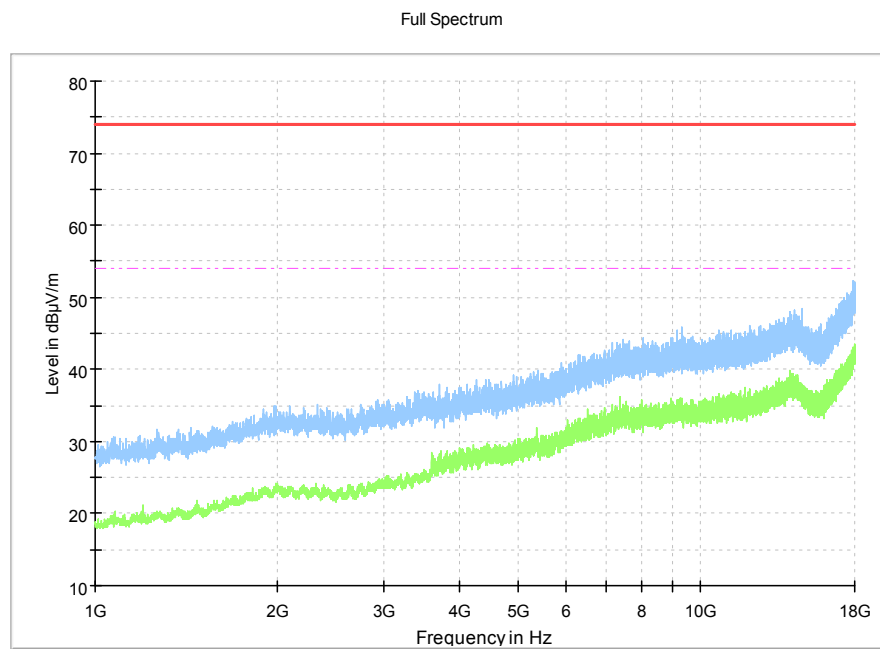


Fig A.2 Radiated Emission from 1GHz to 18GHz

Charging Mode, Set.2

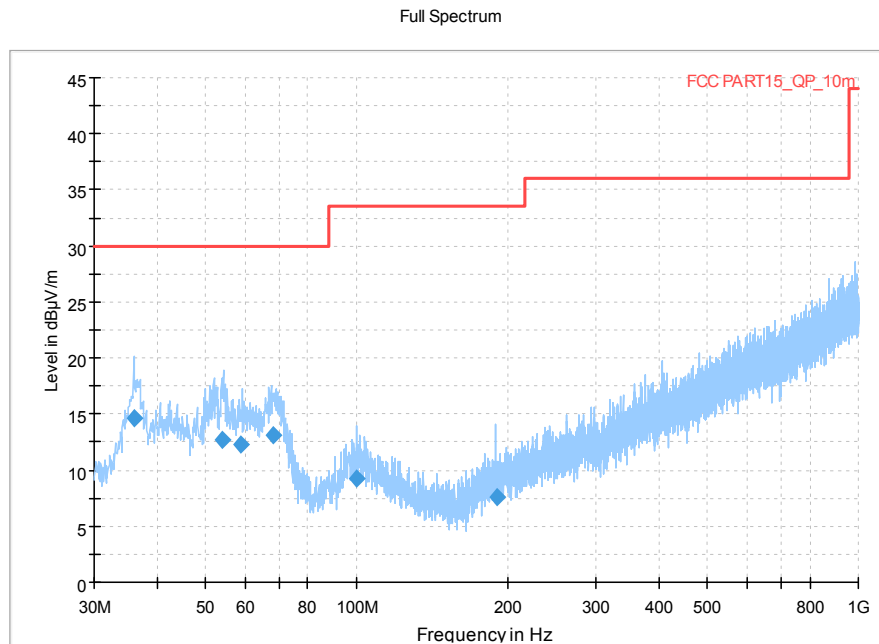


Fig A.3 Radiated Emission from 30MHz to 1GHz

Final_Result

Frequency (MHz)	QuasiPeak (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)
36.194000	14.60	30.00	15.40	1000.0	120.000	125.0	V	-22.0
53.950000	12.64	30.00	17.36	1000.0	120.000	176.0	V	25.0
58.777000	12.30	30.00	17.70	1000.0	120.000	117.0	V	185.0
68.019000	13.14	30.00	16.86	1000.0	120.000	209.0	V	150.0
99.974000	9.28	33.50	24.24	1000.0	120.000	125.0	V	204.0
190.119000	7.59	33.50	25.93	1000.0	120.000	105.0	V	30.0

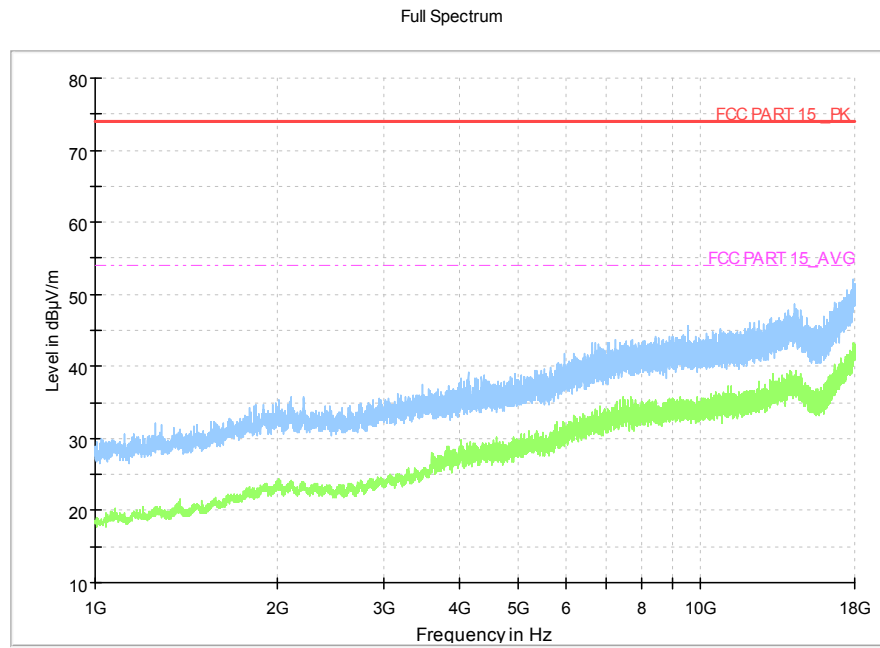


Fig A.4 Radiated Emission from 1GHz to 18GHz

USB Mode, Set.3

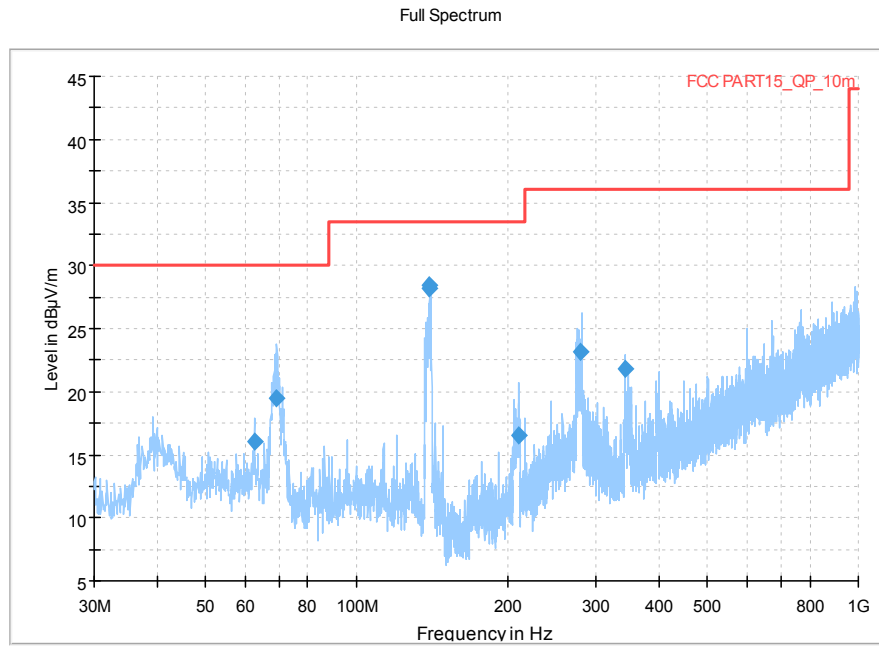


Fig A.5 Radiated Emission from 30MHz to 1GHz

Final_Result

Frequency (MHz)	QuasiPeak (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)
62.592000	16.09	30.00	13.91	1000.0	120.000	108.0	V	-4.0
69.022000	19.42	30.00	10.58	1000.0	120.000	178.0	V	101.0
140.035000	28.16	33.50	5.36	1000.0	120.000	125.0	V	154.0
140.040000	28.42	33.50	5.10	1000.0	120.000	125.0	V	150.0
210.614000	16.58	33.50	16.94	1000.0	120.000	125.0	V	196.0
280.265000	23.21	36.00	12.81	1000.0	120.000	113.0	V	202.0

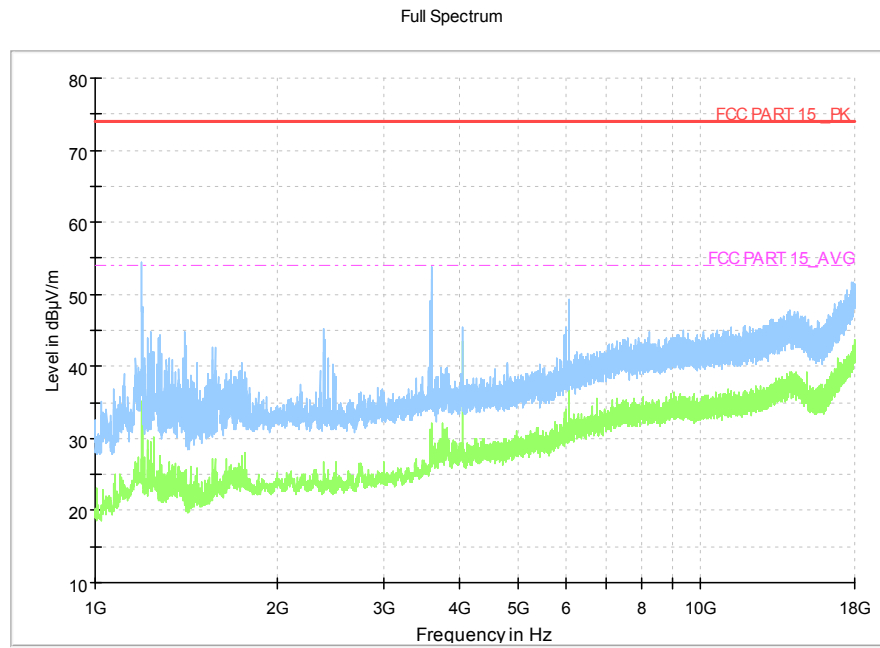


Fig A.6 Radiated Emission from 1GHz to 18GHz

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 and charging mode. During the test MS is connected to a PC via a USB cable in the case of USB mode and is connected to a charger in the case of charging mode. The model of the PC is DELL M4000E-17, and the serial number of the PC is M706GWXD. 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 (dB μ V)	
	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: $U = 3.38 \text{ dB}$, $k=2$.

Charging Mode, Set.1:

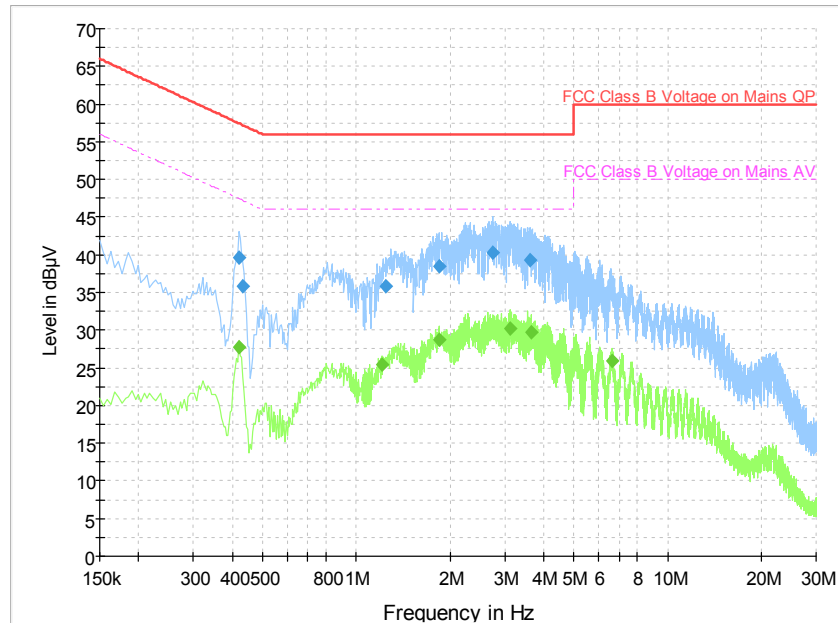


Fig A.7 Radiated Emission from 30MHz to 1GHz

Final Result 1

Frequency (MHz)	QuasiPeak (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.420000	39.6	1000.0	9.000	On	L1	19.8	17.9	57.4	
0.433500	35.8	1000.0	9.000	On	L1	19.8	21.4	57.2	
1.248000	35.8	1000.0	9.000	On	L1	19.8	20.2	56.0	
1.842000	38.4	1000.0	9.000	On	L1	19.8	17.6	56.0	
2.746500	40.3	1000.0	9.000	On	L1	19.8	15.7	56.0	
3.606000	39.3	1000.0	9.000	On	L1	19.8	16.7	56.0	

Final Result 2

Frequency (MHz)	Average (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.420000	27.7	1000.0	9.000	On	L1	19.8	19.8	47.4	
1.207500	25.5	1000.0	9.000	On	L1	19.8	20.5	46.0	
1.842000	28.7	1000.0	9.000	On	L1	19.8	17.3	46.0	
3.115500	30.2	1000.0	9.000	On	L1	19.8	15.8	46.0	
3.655500	29.8	1000.0	9.000	On	L1	19.8	16.2	46.0	
6.625500	26.0	1000.0	9.000	On	L1	19.8	24.0	50.0	

Charging Mode, Set.2:

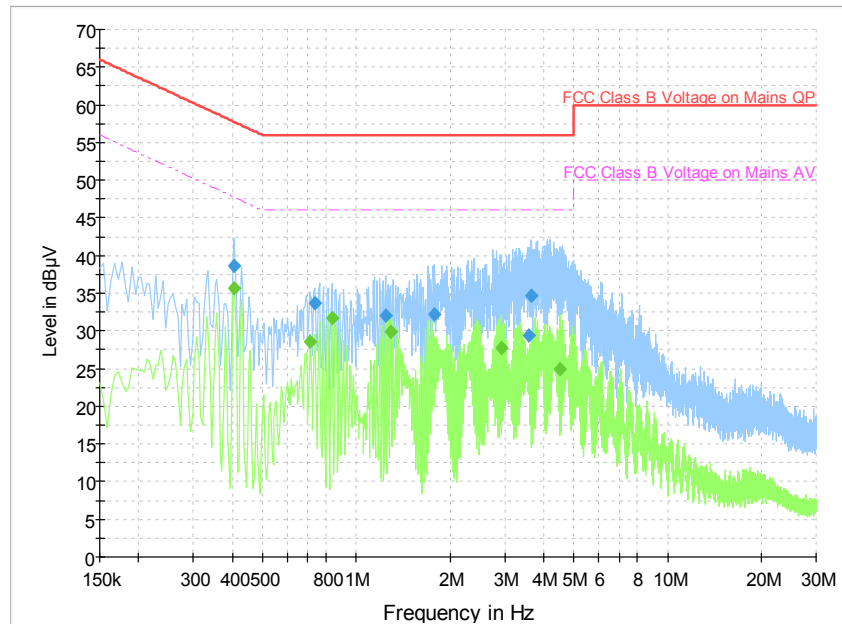


Fig A.8 Radiated Emission from 30MHz to 1GHz

Final Result 1

Frequency (MHz)	QuasiPeak (dBuV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)	Comment
0.406500	38.6	1000.0	9.000	On	L1	19.8	19.1	57.7	
0.735000	33.7	1000.0	9.000	On	L1	19.9	22.3	56.0	
1.239000	32.0	1000.0	9.000	On	N	19.9	24.0	56.0	
1.788000	32.2	1000.0	9.000	On	N	19.8	23.8	56.0	
3.597000	29.4	1000.0	9.000	On	N	19.8	26.6	56.0	
3.664500	34.6	1000.0	9.000	On	N	19.8	21.4	56.0	

Final Result 2

Frequency (MHz)	Average (dBuV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)	Comment
0.406500	35.6	1000.0	9.000	On	L1	19.8	12.1	47.7	
0.712500	28.6	1000.0	9.000	On	L1	19.9	17.4	46.0	
0.834000	31.7	1000.0	9.000	On	L1	19.8	14.3	46.0	
1.288500	29.9	1000.0	9.000	On	L1	19.8	16.1	46.0	
2.931000	27.8	1000.0	9.000	On	L1	19.8	18.2	46.0	
4.524000	24.9	1000.0	9.000	On	L1	19.8	21.1	46.0	

USB Mode, Set.3:

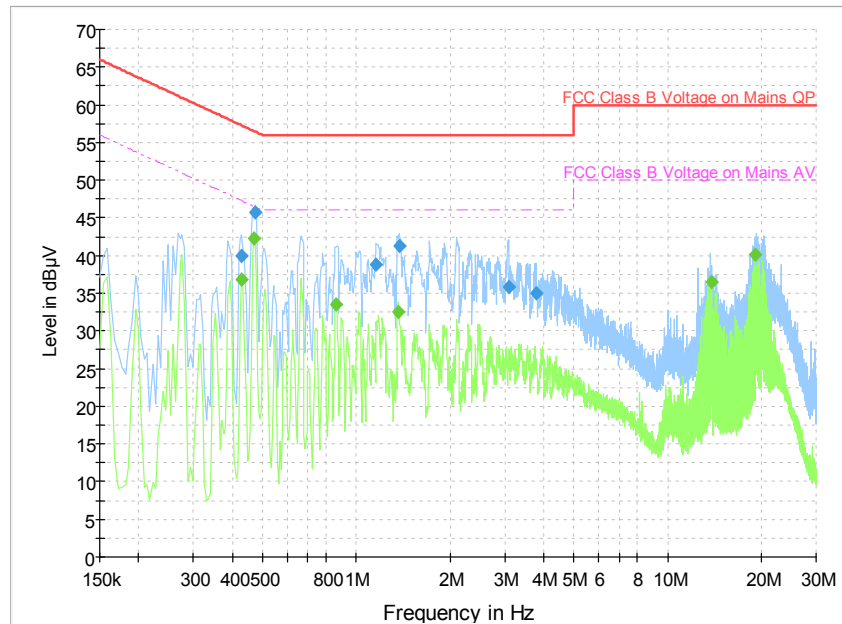


Fig A.9 Radiated Emission from 30MHz to 1GHz

Final Result 1

Frequency (MHz)	QuasiPeak (dBuV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)	Comment
0.429000	39.9	1000.0	9.000	On	L1	19.8	17.4	57.3	
0.474000	45.8	1000.0	9.000	On	L1	19.8	10.7	56.4	
1.158000	38.9	1000.0	9.000	On	L1	19.8	17.1	56.0	
1.374000	41.3	1000.0	9.000	On	L1	19.8	14.7	56.0	
3.079500	35.9	1000.0	9.000	On	N	19.8	20.1	56.0	
3.786000	34.9	1000.0	9.000	On	N	19.8	21.1	56.0	

Final Result 2

Frequency (MHz)	Average (dBuV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)	Comment
0.429000	36.7	1000.0	9.000	On	L1	19.8	10.5	47.3	
0.469500	42.2	1000.0	9.000	On	N	19.9	4.3	46.5	
0.861000	33.6	1000.0	9.000	On	N	19.9	12.4	46.0	
1.365000	32.5	1000.0	9.000	On	L1	19.8	13.5	46.0	
13.807500	36.5	1000.0	9.000	On	N	19.9	13.5	50.0	
19.072500	40.2	1000.0	9.000	On	N	20.0	9.8	50.0	

ANNEX B: PERSONS INVOLVED IN THIS TESTING

Test Item	Test Software and Version	Software Vendor	Test operator
Conducted Emission	EMC32 V8.5.2	R&S	Shi Suolan
Radiated Emission	EMC32 V9.01.00	R&S	Yan Hanchen Li Pengfei

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