



TEST REPORT

No. I19Z60823-EMC01

for

TCL Communication Ltd.

Tablet PC

Model Name: 9029W

FCC ID: 2ACCJBT16

with

Hardware Version: 02

Software Version: V5F5U

Issued Date: 2019-06-20



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
I19Z60823-EMC01	Rev.0	1 st edition	2019-06-20



CONTENTS

1. TEST LABORATORY	4
1.1. INTRODUCTION & ACCREDITATION	4
1.2. TESTING LOCATION	4
1.3. TESTING ENVIRONMENT	4
1.4. PROJECT DATA	4
1.5. SIGNATURE.....	4
2. CLIENT INFORMATION	5
2.1. CERTIFICATION INFORMATION.....	5
2.2. APPLICANT INFORMATION.....	5
2.3. MANUFACTURER INFORMATION.....	5
3. EQUIPMENT UNDER TEST (EUT) AND ANCILLARY EQUIPMENT (AE)	6
3.1. ABOUT EUT.....	6
3.2. INTERNAL IDENTIFICATION OF EUT USED DURING THE TEST	6
3.3. INTERNAL IDENTIFICATION OF AE USED DURING THE TEST.....	6
3.4. EUT SET-UPS	7
4. REFERENCE DOCUMENTS.....	8
4.1. REFERENCE DOCUMENTS FOR TESTING.....	8
5. LABORATORY ENVIRONMENT.....	9
6. SUMMARY OF TEST RESULTS.....	10
7. TEST EQUIPMENTS UTILIZED.....	11
ANNEX A: MEASUREMENT RESULTS	12
ANNEX B: PERSONS INVOLVED IN THIS TESTING	24

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 (huayuan North Road)

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

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

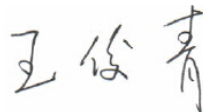
Relative Humidity: 20-75%

1.4. Project data

Testing Start Date: 2018-07-09


Testing End Date: 2019-06-20

1.5. Signature



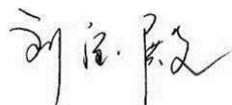
Wang Junqing

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Deputy Director of the laboratory

(Approved this test report)



2. Client Information

2.1. Certification Information

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2.2. Applicant Information

Company Name: TCL Communication Ltd.
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Shenzhen, Guangdong, P.R. China 518052
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2.3. Manufacturer Information

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Address /Post: International E City, Zhong Shan Yuan Road, Nanshan District,
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Telephone: 0086-755-36611722
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3. Equipment Under Test (EUT) and Ancillary Equipment (AE)

3.1. About EUT

Description	Tablet PC
Model Name	9029W
FCC ID	2ACCJBT16
Extreme vol. Limits	3.65VDC to 4.3VDC (nominal: 3.9VDC)

Note: Components list, please refer to documents of the manufacturer; it is also included in the original test record of CTTL, Telecommunication Technology Labs, Academy of Telecommunication Research, MIIT.

3.2. Internal Identification of EUT used during the test

EUT ID*	SN or IMEI	HW Version	SW Version
EUT1	/	02	V5F5U

*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	/	inbuilt
AE2	Charger	/	18TCT-CH-0515/0516
AE3	Charger	/	18TCT-CH-0531/0535
AE4	USB Cable	/	18TCT-DC-0209/0217
AE5	USB Cable	/	18TCT-DC-0223/0226

AE1

Model	TLp040J1
Manufacturer	BYD
Capacitance	4000mAh
Nominal voltage	3.85V

AE2

Model	CBA0059AGAC7
Manufacturer	Chenyang
Length of cable	/

AE3

Model	CBA0059AGAC5
Manufacturer	PUAN
Length of cable	/

AE4

Model	CDA0000024C8
Manufacturer	/
Length of cable	cm

AE5

Model	CDA0000024C2
Manufacturer	/
Length of cable	cm



*AE ID: is used to identify the test sample in the lab internally.
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+ AE4/AE5	Charger + FM
Set.2	EUT1+ AE1+ AE3+ AE4/AE5	Charger
Set.3	EUT1+ AE1+ AE4/AE5	USB mode

Note: Tablet PC 9029W manufactured by TCL Communication Ltd. is a variant model based on 9027W for conformance test. According to the declaration of changes, the following items are tested on Set.1:

Mode or Feature	EUT set-up No	Test Item
GSM 900 + FM mode	Set.1	all test cases

all results are cited from the initial model. The report number for initial model is I18Z61163-EMC01.



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	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.

5. 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, 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 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



6. 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)



7. 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
3	Test Receiver	ESC13	100344	R&S	2020-02-14	1 year
4	Universal Radio Communication Tester	CMW500	143008	R&S	2019-12-26	1 year
5	Universal Radio Communication Tester	CMW500	116588	R&S	2020-01-26	1 year
6	LISN	ENV216	101459	R&S	2020-04-10	1 year
7	EMI Antenna	VULB 9163	9163-302	Schwarzbeck	2020-02-27	3 years
8	EMI Antenna	3115	0067250	ETS-Lindgren	2020-05-21	3 years
9	PC	OPTIPLEX 380	2X1YV2X	DELL	N/A	N/A
10	Printer	P1606dn	VNC3L52122	HP	N/A	N/A
11	Keyboard	L100	CN0RH6596589 07ATOI40	DELL	N/A	N/A
12	Mouse	M-UAE119	LZ935220ZRC	Lenovo	N/A	N/A

Test Item	Test Software and Version	Software Vendor
Radiated Continuous Emission	EMC32 V9.01	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 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 DELL OPTIPLEX 380, and the serial number of the PC is 2X1YV2X. 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): $U = 4.3 \text{ dB}$, $k=2$.

Measurement results for Set.1:

Charging Mode/Average detector

Frequency (MHz)	Measurement Result (dBμV/m)	Cable loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBμV)	Antenna Pol. (H/V)
17780.700	34.9	-18.5	45.6	7.800	H
17615.800	34.9	-18.9	45.6	8.200	H
17815.833	34.9	-18.5	45.6	7.800	V
17694.567	34.9	-18.9	45.6	8.200	H
17591.433	34.9	-18.9	45.6	8.200	H
17904.233	34.9	-18.5	45.6	7.800	H

Charging Mode/Peak detector

Frequency (MHz)	Measurement Result (dBμV/m)	Cable loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBμV)	Antenna Pol. (H/V)
17989.800	46.5	-17.7	45.6	18.600	H
17592.567	46.3	-18.9	45.6	19.600	H
17593.133	46.1	-18.9	45.6	19.400	V
17792.033	46.0	-18.5	45.6	18.900	H
17829.433	46.0	-18.5	45.6	18.900	H
17768.800	45.9	-18.5	45.6	18.800	H

Measurement results for Set.2:

Charging Mode/Average detector

Frequency (MHz)	Measurement Result (dBμV/m)	Cable loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBμV)	Antenna Pol. (H/V)
17979.033	40.6	-25.5	43.4	22.702	H
17969.967	40.4	-25.5	43.4	22.502	H
17986.967	40.3	-25.5	43.4	22.402	V
17972.800	40.3	-25.5	43.4	22.402	H
17992.633	40.2	-25.5	43.4	22.302	H
17992.067	40.1	-25.5	43.4	22.202	H

Charging Mode/Peak detector

Frequency (MHz)	Measurement Result (dBμV/m)	Cable loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBμV)	Antenna Pol. (H/V)
17992.067	52.0	-25.5	43.4	34.102	H
17985.267	51.6	-25.5	43.4	33.702	H
17759.167	51.6	-25.7	43.4	33.942	V
17858.333	51.5	-25.7	43.4	33.842	H
17973.933	51.2	-25.5	43.4	33.302	H
17936.533	51.2	-25.5	43.4	33.302	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)
17979.600	40.5	-25.5	43.4	22.602	H
17974.500	40.4	-25.5	43.4	22.502	H
17985.267	40.4	-25.5	43.4	22.502	V
17983.567	40.4	-25.5	43.4	22.502	H
17990.933	40.4	-25.5	43.4	22.502	H
17987.533	40.3	-25.5	43.4	22.402	H

Charging Mode/Peak detector

Frequency (MHz)	Measurement Result (dBμV/m)	Cable loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBμV)	Antenna Pol. (H/V)
1493.000	54.0	-39.8	23.3	70.482	H
1492.433	53.2	-39.8	23.3	69.682	H
1494.133	53.2	-39.8	23.3	69.682	V
1493.567	53.0	-39.8	23.3	69.482	H
17980.167	53.0	-25.5	43.4	35.102	H
1495.267	53.0	-39.8	23.3	69.482	H

Note: The measurement results of Set.1, Set.2 and Set.3 showed here are worst cases of the combinations of different USB cables.

Charging Mode, Set.1

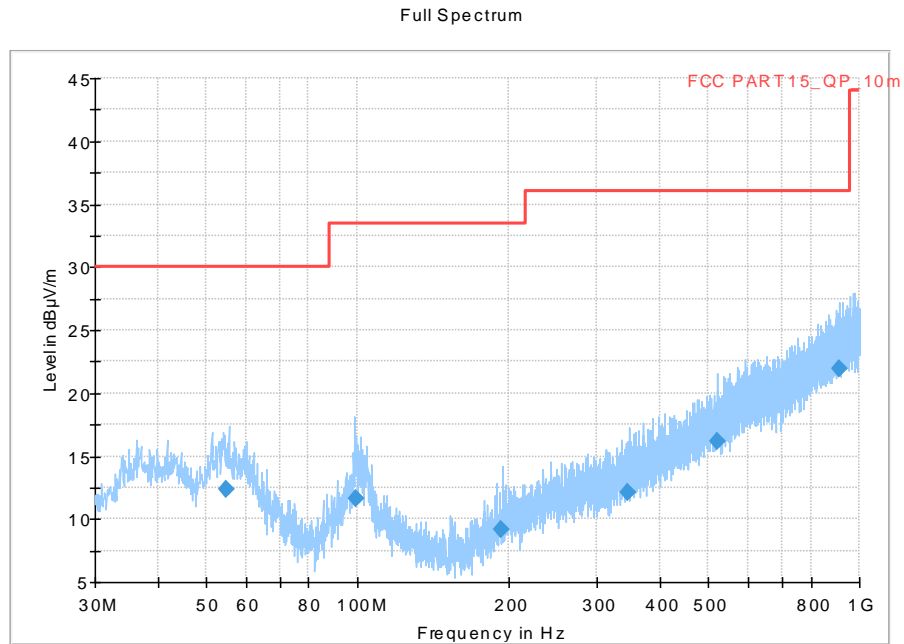


Fig A.1 Radiated Emission from 30MHz to 1GHz

Final Result

Frequency (MHz)	QuasiPeak (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)
54.934000	12.35	30.00	17.65	1000.0	120.000	225.0	V	76.0
99.230000	11.61	33.50	21.91	1000.0	120.000	102.0	V	153.0
193.921000	9.14	33.50	24.38	1000.0	120.000	319.0	V	120.0
346.613000	12.12	36.00	23.90	1000.0	120.000	313.0	V	200.0
521.670000	16.19	36.00	19.83	1000.0	120.000	325.0	V	-29.0
914.986000	21.95	36.00	14.07	1000.0	120.000	125.0	V	113.0

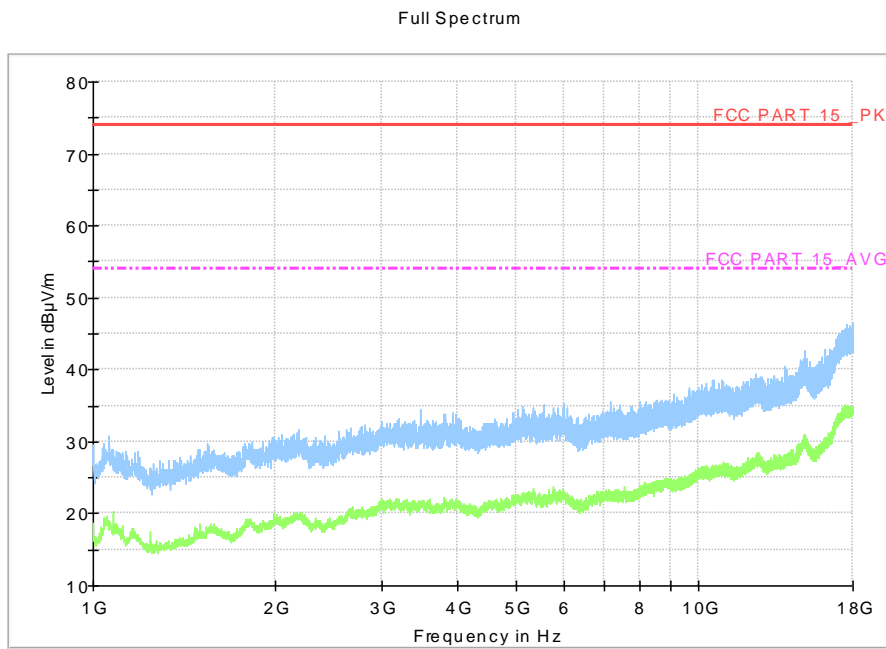


Fig A.2 Radiated Emission from 1GHz to 18GHz

Charging Mode, Set.2

Full Spectrum

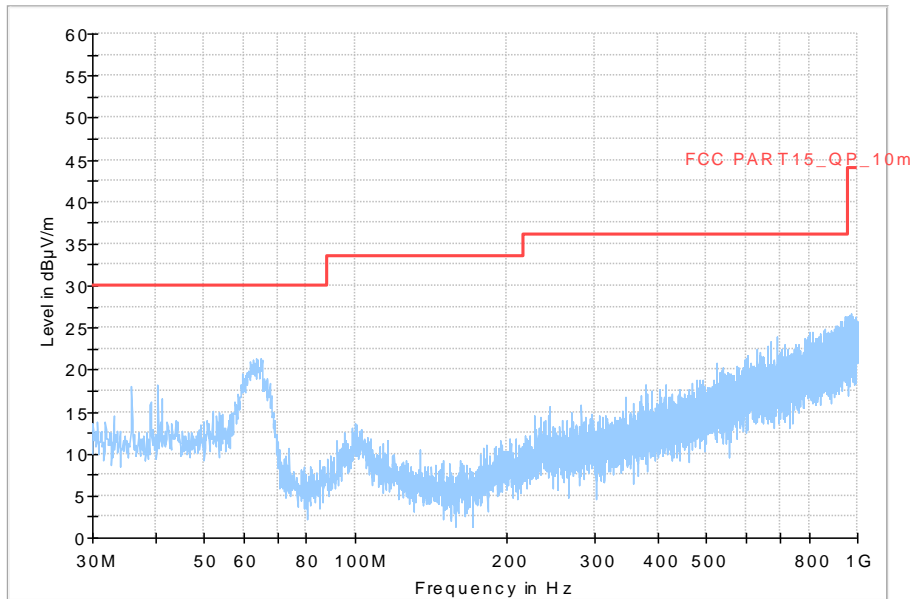


Fig A.3 Radiated Emission from 30MHz to 1GHz

Full Spectrum

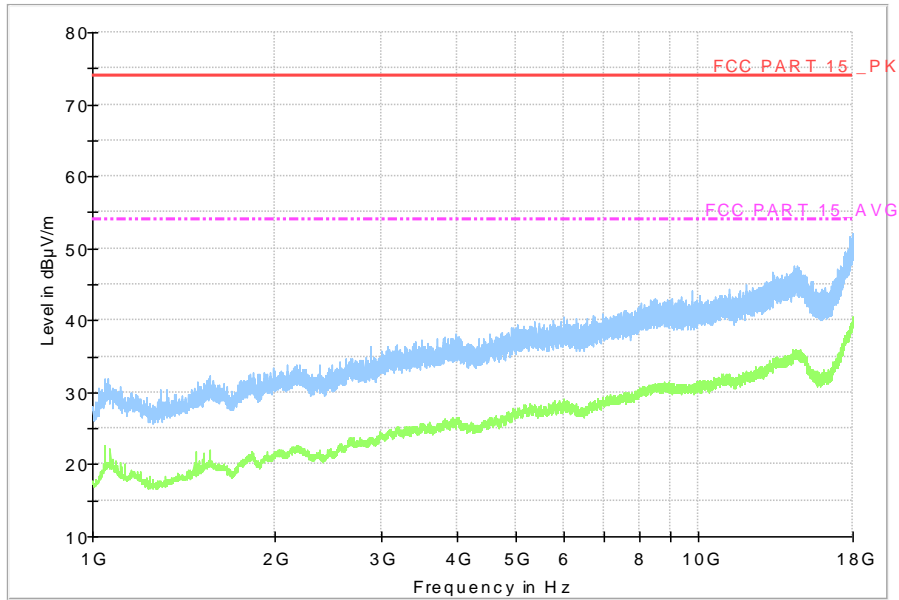


Fig A.4 Radiated Emission from 1GHz to 18GHz

USB Mode, Set.3

Full Spectrum

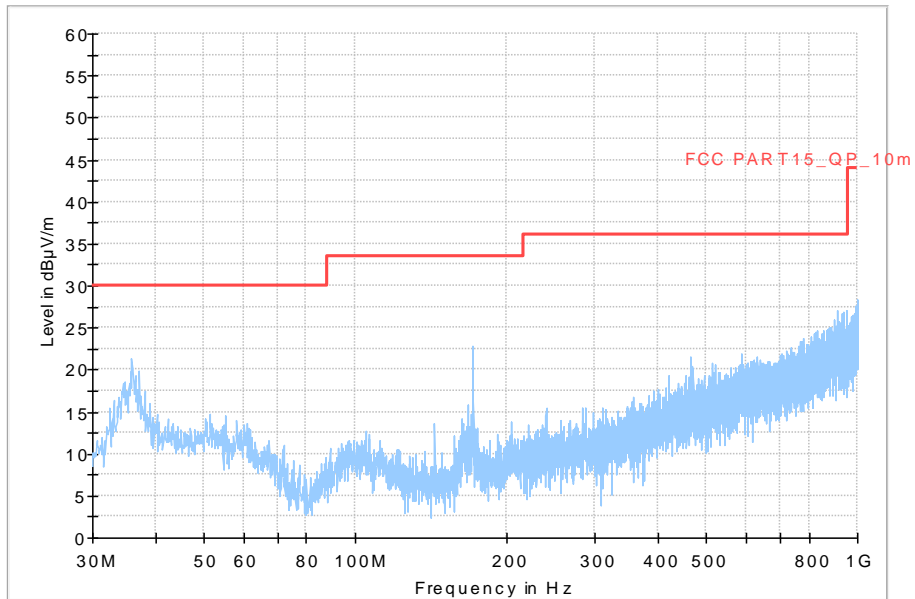


Fig A.5 Radiated Emission from 30MHz to 1GHz

Full Spectrum

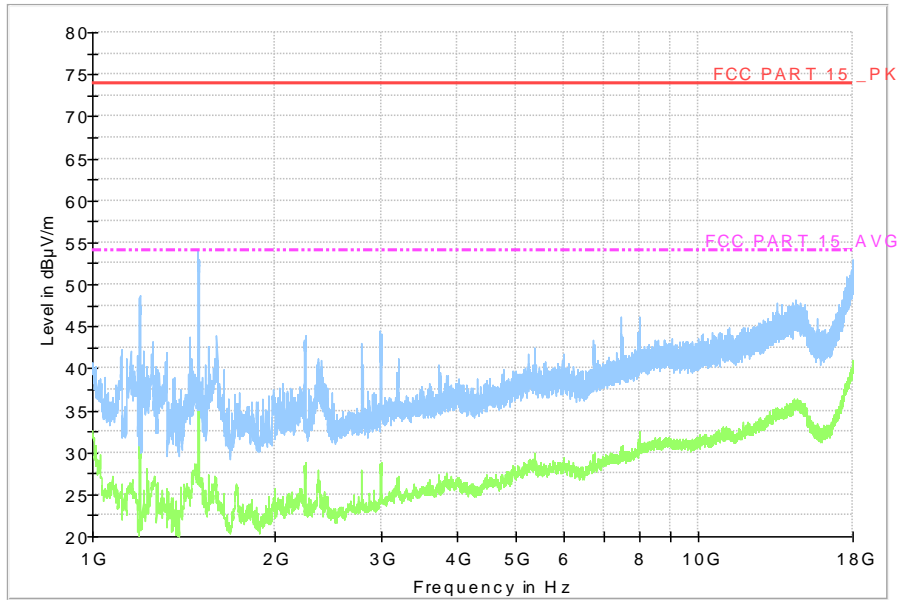


Fig A.6 Radiated Emission from 1GHz to 18GHz

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 OPTIPLEX 380, and the serial number of the PC is 2X1YV2X. 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: $U= 2.9 \text{ dB}$, $k=2$.

Charging Mode, Set.1

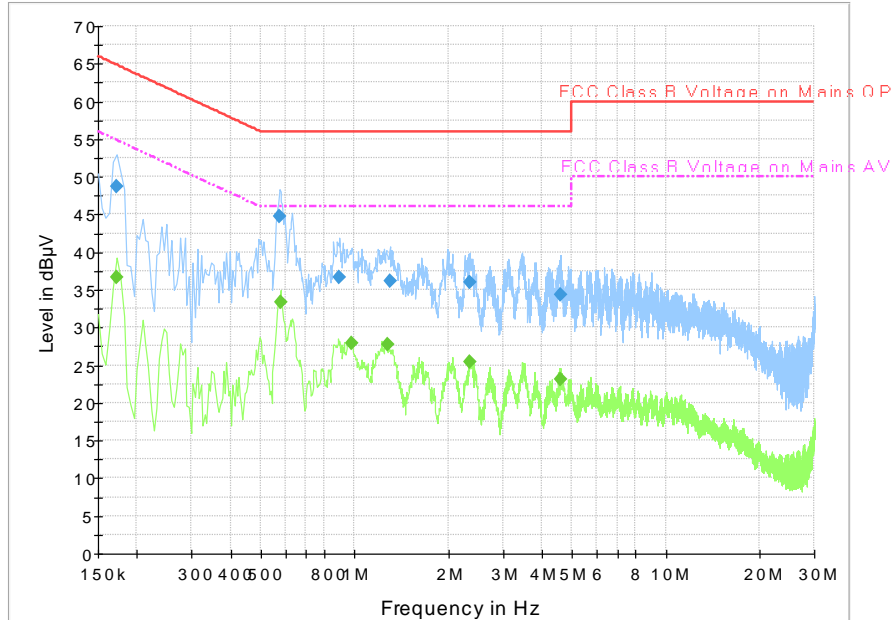


Fig A.7 Conducted Emission

Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.172500	48.8	2000.0	9.000	On	N	25.7	16.1	64.8	
0.573000	44.8	2000.0	9.000	On	L1	19.8	11.2	56.0	
0.897000	36.7	2000.0	9.000	On	L1	19.7	19.3	56.0	
1.297500	36.1	2000.0	9.000	On	L1	19.6	19.9	56.0	
2.337000	36.0	2000.0	9.000	On	L1	19.6	20.0	56.0	
4.596000	34.4	2000.0	9.000	On	L1	19.6	21.6	56.0	

Final Result 2

Frequency (MHz)	Average (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.172500	36.6	2000.0	9.000	On	L1	25.8	18.3	54.8	
0.577500	33.4	2000.0	9.000	On	L1	19.8	12.6	46.0	
0.978000	28.0	2000.0	9.000	On	L1	19.7	18.0	46.0	
1.275000	27.7	2000.0	9.000	On	L1	19.6	18.3	46.0	
2.346000	25.5	2000.0	9.000	On	L1	19.6	20.5	46.0	
4.582500	23.1	2000.0	9.000	On	L1	19.6	22.9	46.0	

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

Charging Mode, Set.2

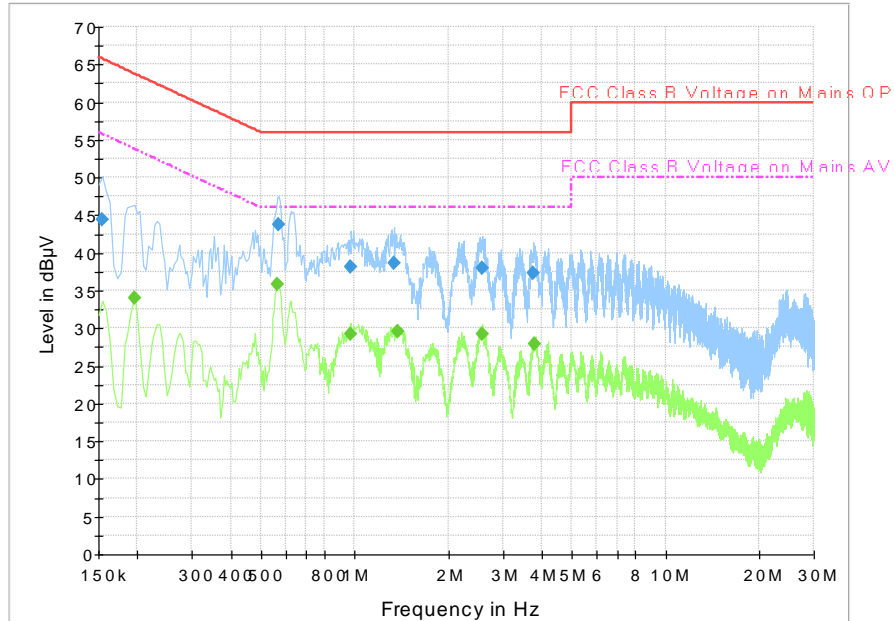


Fig A.8 Conducted Emission

Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.154500	44.3	2000.0	9.000	On	L1	20.0	21.4	65.8	
0.568500	43.8	2000.0	9.000	On	L1	19.9	12.2	56.0	
0.973500	38.2	2000.0	9.000	On	L1	19.6	17.8	56.0	
1.338000	38.6	2000.0	9.000	On	L1	19.6	17.4	56.0	
2.575500	38.0	2000.0	9.000	On	L1	19.7	18.0	56.0	
3.768000	37.4	2000.0	9.000	On	L1	19.6	18.6	56.0	

Final Result 2

Frequency (MHz)	Average (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.195000	34.0	2000.0	9.000	On	N	19.8	19.8	53.8	
0.564000	35.8	2000.0	9.000	On	N	19.9	10.2	46.0	
0.973500	29.3	2000.0	9.000	On	L1	19.6	16.7	46.0	
1.374000	29.6	2000.0	9.000	On	L1	19.6	16.4	46.0	
2.571000	29.3	2000.0	9.000	On	L1	19.7	16.7	46.0	
3.790500	27.9	2000.0	9.000	On	L1	19.6	18.1	46.0	

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

USB Mode, Set.3

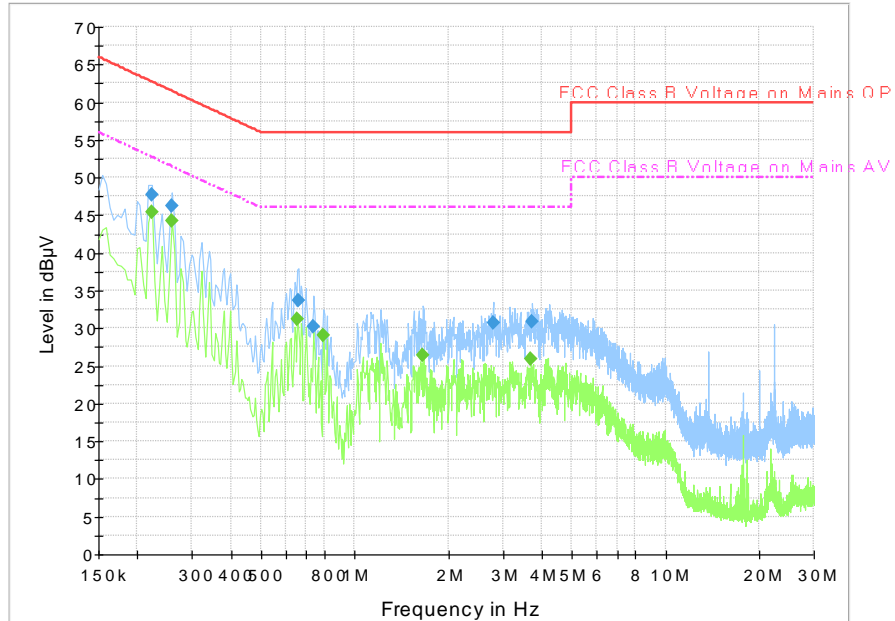


Fig A.9 Conducted Emission

Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.222000	47.7	2000.0	9.000	On	N	19.8	15.1	62.7	
0.258000	46.2	2000.0	9.000	On	N	19.8	15.3	61.5	
0.658500	33.6	2000.0	9.000	On	N	19.9	22.4	56.0	
0.739500	30.2	2000.0	9.000	On	N	19.9	25.8	56.0	
2.787000	30.7	2000.0	9.000	On	N	19.6	25.3	56.0	
3.732000	30.8	2000.0	9.000	On	N	19.7	25.2	56.0	

Final Result 2

Frequency (MHz)	Average (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.222000	45.5	2000.0	9.000	On	N	19.8	7.3	52.7	
0.258000	44.3	2000.0	9.000	On	N	19.8	7.2	51.5	
0.654000	31.3	2000.0	9.000	On	N	19.9	14.7	46.0	
0.793500	29.1	2000.0	9.000	On	N	19.8	16.9	46.0	
1.662000	26.4	2000.0	9.000	On	N	19.6	19.6	46.0	
3.691500	25.9	2000.0	9.000	On	N	19.7	20.1	46.0	

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



ANNEX B: Persons involved in this testing

Test Item	Tester
Conducted Continuous Emission	Shi Suolan
Radiated Continuous Emission	Shi Suolan

END OF REPORT