TEST REPORT

No. I18Z60848-EMC01

for

Shenzhen Tinno Mobile Technology Corp.

smart phone

Model Name: C210AE

FCC ID: 2AM86WC210

with

Hardware Version: V0.3

Software Version: C210AE-V02

Issued Date: 2018-06-22

TESTING
NVLAP LAB CODE 600118-0

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

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
I18Z60848-EMC01	Rev.0	1st edition	2018-06-22

CONTENTS

1. Test Laboratory

1.1. Testing Location

CTTL (huayuan North Road)

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

1.2. Testing Environment

Normal Temperature: 15-35°C

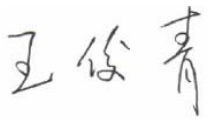
Relative Humidity: 20-75%

1.3. Project data

Testing Start Date: 2018-06-13

Testing End Date: 2018-06-22

1.4. Signature

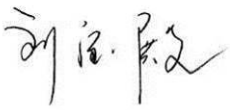


Wang Junqing

(Prepared this test report)

Zhang Ying

(Reviewed this test report)



Liu Baodian

Deputy Director of the laboratory

(Approved this test report)

2. Client Information

2.1. Certification Manager Information

Company Name:	Shenzhen Tinno Mobile Technology Corp.
Address /Post:	4/F, H-3 Building, OCT Eastern industrial Park, No.1 XiangShan East Road.,Nan Shan District, Shenzhen, P.R. China
Contact Person:	Robin.he
Contact Email	robin.he@tinno.com
Telephone:	0755 8609 5550 - 8804
Fax:	/

2.2. Applicant Information

Company Name:	Wiko SAS
Address /Post:	1, rue Capitaine Dessemond 13007 - Marseille - France.
Contact Person:	Laurent Dahan
Contact Email	ldahan@wikomobile.com
Telephone:	33488089515
Fax:	33488089520

2.3. Manufacturer Information

Company Name:	Shenzhen Tinno Mobile Technology Corp.
Address /Post:	4/F, H-3 Building, OCT Eastern industrial Park, No.1 XiangShan East Road.,Nan Shan District, Shenzhen, P.R. China
Contact Person:	Jingwen.Guo
Contact Email	jingwen.guo@tinno.com
Telephone:	0755-86095550
Fax:	0755-86095551

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

3.1. About EUT

Description	smart phone
Model Name	C210AE
FCC ID	2AM86WC210
Extreme vol. Limits	3.55VDC to 4.35VDC (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, 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	357960090021993	V0.3	C210AE-V02

*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	/	1860848CH002
AE3	USB Cable	/	1860848DC002

AE1

Model	C210AEBATT
Manufacturer	Ningbo Veken Battery Co., Ltd
Capacitance	2500mAh
Nominal voltage	3.8V

AE2

Model	TN-050100U4A
Manufacturer	Shenzhen BMT Electronics Co.,Ltd
Length of cable	/

AE3

Model	/
Manufacturer	/
Length of cable	1m

*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+ AE3	Charger
Set.2	EUT1+ AE1+ AE3	USB mode

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
Normalized site attenuation (NSA)	<±4dB, 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 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	2019-03-31	1 year
3	Test Receiver	ESCI 7	100344	R&S	2019-02-28	1 year
5	Universal Radio Communication Tester	CMW500	116588	R&S	2018-11-26	1 year
	Universal Radio Communication Tester	CMW500	143008	R&S	2018-12-26	1 year
6	LISN	ENV216	101200	R&S	2019-04-15	1 year
7	EMI Antenna	VULB 9163	9163-301	Schwarzbeck	2019-02-03	3 years
8	EMI Antenna	3115	00167250	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	CN0RH659658907ATOI40	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 (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/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:

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 = 4.3 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)
17995.467	40.1	-17.7	45.6	12.200	H
17991.500	39.9	-17.7	45.6	12.000	H
17985.833	39.9	-17.7	45.6	12.000	V
17987.533	39.9	-17.7	45.6	12.000	H
17992.067	39.9	-17.7	45.6	12.000	H
17983.567	39.8	-17.7	45.6	11.900	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)
17995.467	51.7	-17.7	45.6	23.800	H
17967.700	51.5	-17.7	45.6	23.600	H
17772.767	51.4	-18.5	45.6	24.300	V
17966.000	51.2	-17.7	45.6	23.300	H
17980.733	50.7	-17.7	45.6	22.800	H
17991.500	50.7	-17.7	45.6	22.800	H

Measurement results for Set.2:

USB Mode/Average detector

Frequency (MHz)	Measurement Result (dBμV/m)	Cable loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBμV)	Antenna Pol. (H/V)
17995.467	41.0	-17.7	45.6	13.100	H
17989.233	40.8	-17.7	45.6	12.900	H
17985.267	40.7	-17.7	45.6	12.800	V
17977.900	40.6	-17.7	45.6	12.700	H
17988.667	40.6	-17.7	45.6	12.700	H
17976.200	40.6	-17.7	45.6	12.700	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)
17867.400	52.2	-18.5	45.6	25.100	H
17986.400	51.9	-17.7	45.6	24.000	H
17974.500	51.7	-17.7	45.6	23.800	V
17988.100	51.6	-17.7	45.6	23.700	H
1988.833	51.5	-35.7	25.3	61.900	H
17980.733	51.5	-17.7	45.6	23.600	H

Charging Mode, Set.1

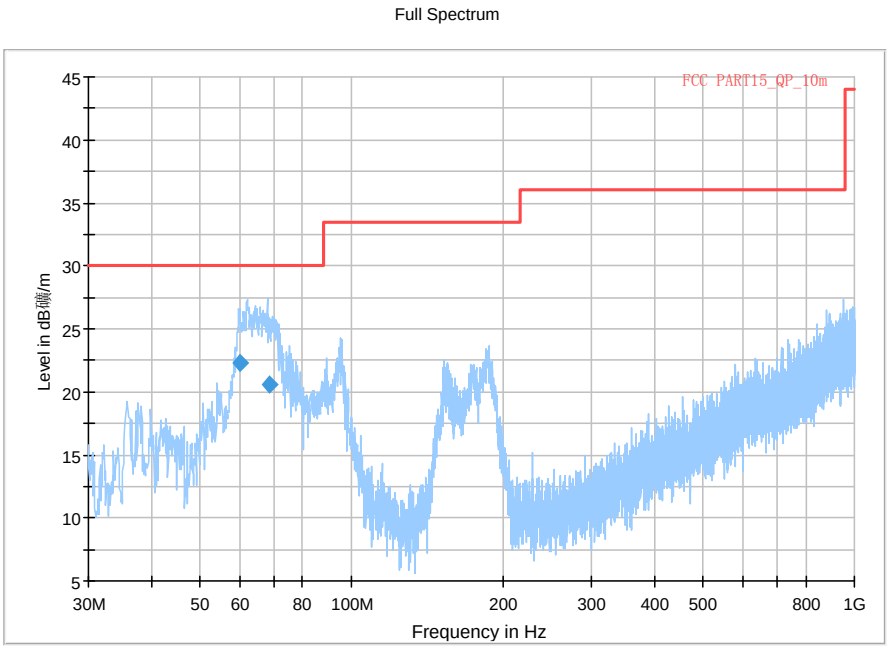


Fig A.1 Radiated Emission from 30MHz to 1GHz

Final_Result

Frequency (MHz)	QuasiPeak (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)
59.853000	22.36	30.00	7.64	1000.0	120.000	107.0	V	-26.0
68.624000	20.62	30.00	9.38	1000.0	120.000	125.0	V	-22.0

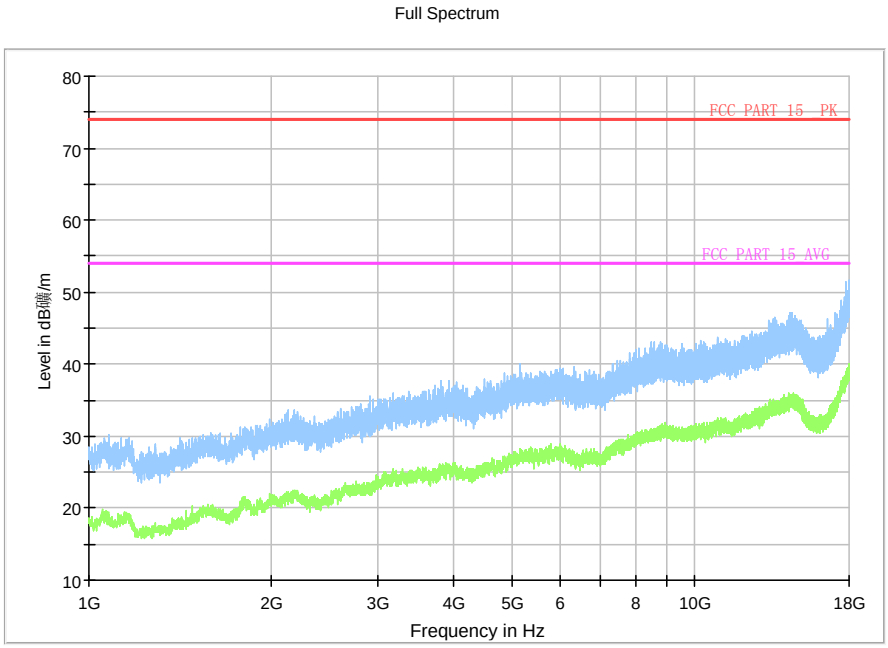


Fig A.2 Radiated Emission from 1GHz to 18GHz

USB Mode, Set.2

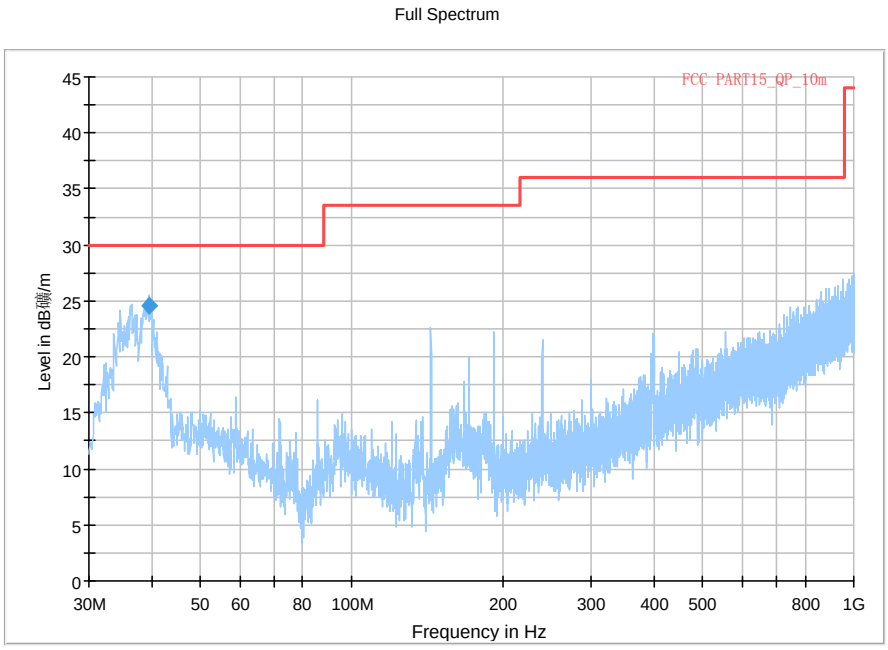


Fig A.3 Radiated Emission from 30MHz to 1GHz

Final_Result

Frequency (MHz)	QuasiPeak (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
39.423000	24.63	30.00	5.37	120.000	225.0	V	-30.0	-11.8

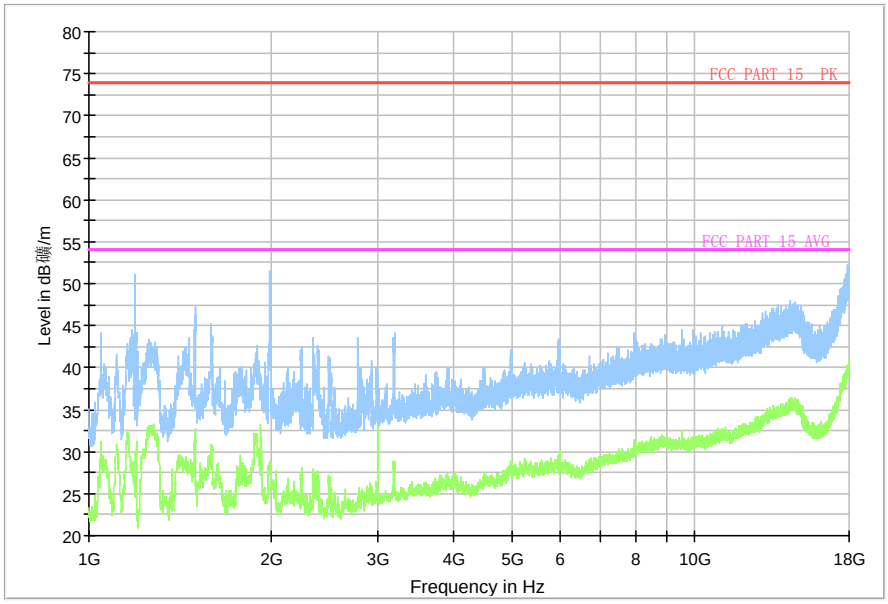


Fig A.4 Radiated Emission from 1GHz to 18GHz

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 dB, *k*=2.

Charging Mode, Set.1

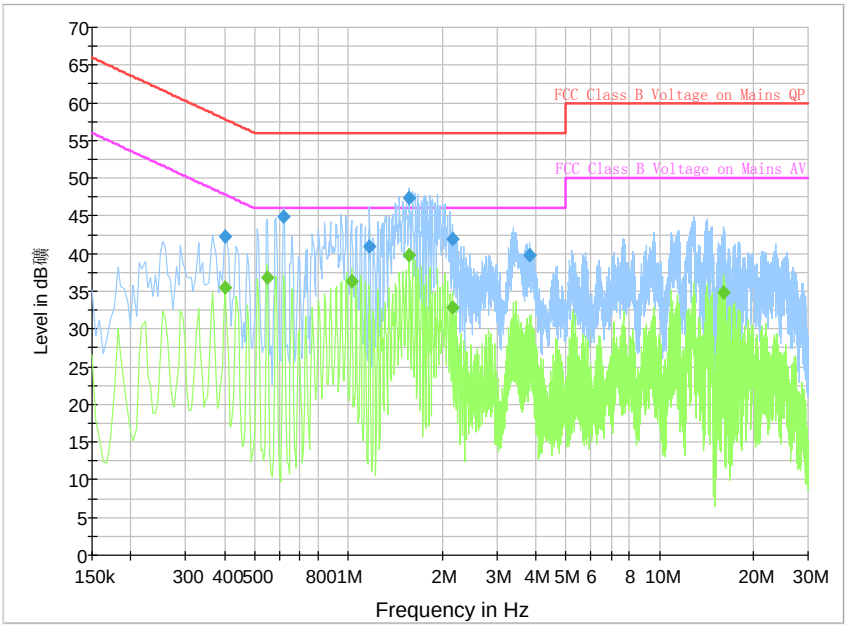


Fig A.5 Conducted Emission

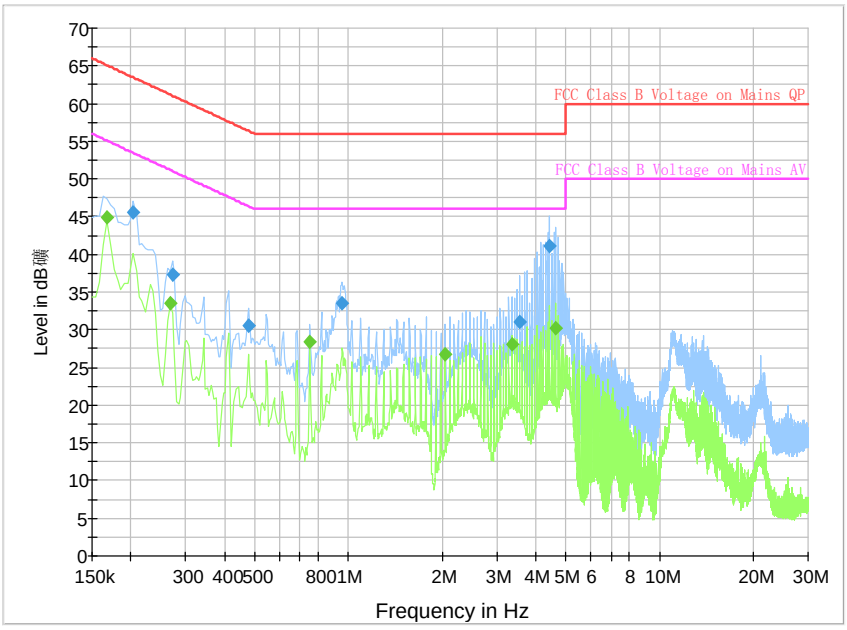
Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.402000	42.2	2000.0	9.000	On	L1	19.9	15.6	57.8	
0.618000	44.9	2000.0	9.000	On	L1	19.8	11.1	56.0	
1.171500	40.9	2000.0	9.000	On	L1	19.6	15.1	56.0	
1.567500	47.3	2000.0	9.000	On	L1	19.7	8.7	56.0	
2.152500	41.9	2000.0	9.000	On	L1	19.7	14.1	56.0	
3.826500	39.8	2000.0	9.000	On	L1	19.6	16.2	56.0	

Final Result 2

Frequency (MHz)	Average (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.402000	35.5	2000.0	9.000	On	L1	19.9	12.3	47.8	
0.550500	36.9	2000.0	9.000	On	L1	19.9	9.1	46.0	
1.023000	36.3	2000.0	9.000	On	L1	19.6	9.7	46.0	
1.567500	39.7	2000.0	9.000	On	L1	19.7	6.3	46.0	
2.152500	32.8	2000.0	9.000	On	L1	19.7	13.2	46.0	
16.039500	34.9	2000.0	9.000	On	L1	19.9	15.1	50.0	

USB Mode, Set.2



Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.204000	45.6	2000.0	9.000	On	L1	19.8	17.9	63.4	
0.271500	37.4	2000.0	9.000	On	L1	19.8	23.7	61.1	
0.478500	30.5	2000.0	9.000	On	N	19.9	25.9	56.4	
0.955500	33.5	2000.0	9.000	On	N	19.7	22.5	56.0	
3.556500	31.1	2000.0	9.000	On	N	19.7	24.9	56.0	
4.443000	41.1	2000.0	9.000	On	N	19.7	14.9	56.0	

Final Result 2

Frequency (MHz)	Average (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.168000	44.9	2000.0	9.000	On	N	19.8	10.2	55.1	
0.267000	33.4	2000.0	9.000	On	L1	19.8	17.8	51.2	
0.753000	28.4	2000.0	9.000	On	N	19.8	17.6	46.0	
2.049000	26.7	2000.0	9.000	On	N	19.6	19.3	46.0	
3.349500	28.1	2000.0	9.000	On	N	19.7	17.9	46.0	
4.645500	30.2	2000.0	9.000	On	N	19.7	15.8	46.0	

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