



TEST REPORT

No. I23Z70001-EMC01

for

Wingtech Group (Hong Kong) Limited

Flex Mirror

Model name: ODP-R133

With

FCC ID: 2APXWODPR133

Hardware Version: REV1.0

Software Version: R133.001

Issued Date: 2023-03-08

Note:

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REPORT HISTORY

Report Number	Revision	Description	Issue Date
I23Z70001-EMC01	Rev.0	1 st edition	2023-03-08

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

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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: 2023-01-11
Testing End Date: 2023-03-03

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: Wingtech Group (Hong Kong) Limited
Address: Flat/RM 1902 19/F, Podium Plaza, 5 Hanoi Road, Tsim Sha Tsui, KL, HK
City: /
Postal Code: /
Country: /
Contact: sharui
Email: sharui@wingtech.com
Telephone: +86-21-53529900

2.2. Manufacturer Information

Company Name: Wingtech Group (Hong Kong) Limited
Address: Flat/RM 1802 18/F, Podium Plaza, 5 Hanoi Road, TSIM SHA
TSUI, KOWLOON, HONG KONG
City: /
Postal Code: /
Country: /
Contact: Li Zhonggang
Email: lizhonggang@wingtech.com
Telephone: +86-18321929116

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

3.1. About EUT

Description	Flex Mirror
Model name	ODP-R133
FCC ID	2APXWODPR133

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
EUT1	2370001UT50a	REV1.0	R133.001

*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*	Description	SN	Remarks
AE1	Adapter	/	Provided by client for relevant test.
AE2	Data Cable	/	21104/ BROAD TELECOMMUNICATION CO LTD
AE3	Battery	/	SCUD-WT-N19/ SCUD (Fujian) Electronics Co., Ltd.
AE4	Mobile phone	/	Provided by Lab for relevant test.
AE5	Notebook PC	/	Provided by Lab for relevant test.

Note: The USB cables are shielded.

3.4. General Description

Equipment under Test (EUT) is a model of Flex Mirror with integrated antenna.

It consists of normal options: lithium battery and charger.

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

EUT set-up No.	Combination of EUT and AE	Remarks
Set.1	EUT1 +AE1+AE2 +AE3+AE4	Projection by WIFI
Set.2	EUT1 +AE1+AE2 +AE3+AE5	Projection by Type C

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.

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)

7. Test Equipments Utilized

Test Equipment

NO.	Description	TYPE	SERIES NUMBER	MANUFACTURE	CAL DUE DATE	CALIBRATION INTERVAL
1	Test Receiver	ESU26	100376	R&S	2023-09-22	1 year
2	Test Receiver	ESCI	100766	R&S	2023-03-02	1 year
3	Test Receiver	ESW44	103015	R&S	2024-01-14	1 year
4	LISN	ENV216	101459	R&S	2023-03-16	1 year
5	BiLog Antenna	VULB9163	01177	Schwarzbeck	2023-08-03	1 year
6	EMI Antenna	3115	00119024	ETS-Lindgren	2023-06-07	1 year

Note: the Test Receiver which SERIES NUMBER is 100766 was before Cal Due Date when used.

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 battery and adapter are installed so that the EUT works well and is in charging state.

The mobile phone plays audio and video continuously and projects the screen to the EUT via WIFI.

The Notebook PC plays audio and video continuously and projects the screen to the EUT via Type C

EUT is keeping on screen display state.

A.1.3 Measurement Limit

Frequency range (MHz)	Field strength limit ($\mu\text{V}/\text{m}$)		
	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:

$$\text{Result} = P_{\text{Mea}} + A_{Rpl} = P_{\text{Mea}} + G_A + G_{PL}$$

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, $k=2$.

Set.1

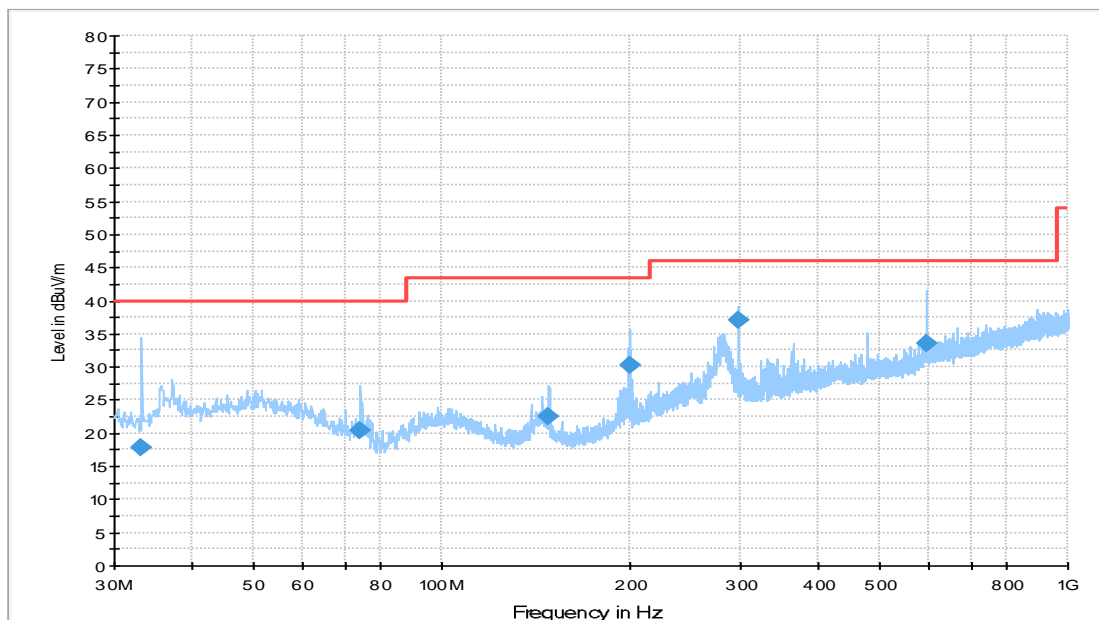
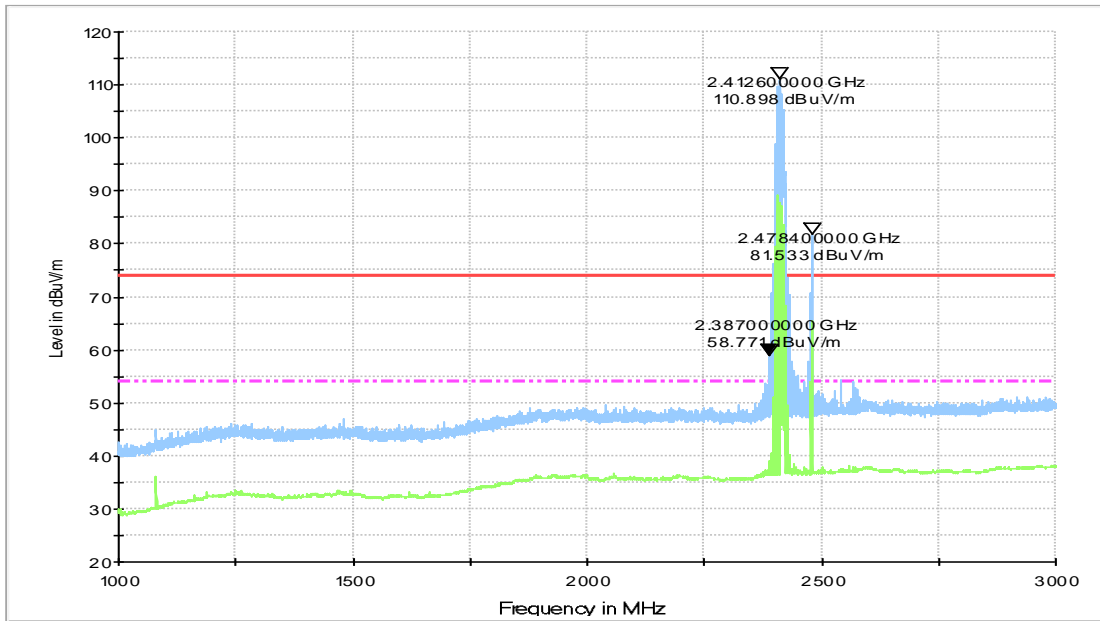


Figure A.1 Radiated Emission from 30MHz to 1GHz

Final Result 1

Frequency (MHz)	QuasiPeak (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBuV/m)
33.20100	17.9	125.0	V	179.0	-3.2	22.1	40.0
74.23200	20.4	100.0	V	-1.0	-5.3	19.6	40.0
148.4370	22.5	125.0	H	-27.0	-4.7	21.0	43.5
199.2650	30.2	125.0	H	307.0	-0.7	13.3	43.5
297.0410	37.1	100.0	H	63.0	1.4	8.9	46.0
594.0550	33.6	100.0	V	11.0	9.1	12.4	46.0



Note: 2402MHz-2480MHz is the Bluetooth and WIFI carrier frequency and coming from the radio equipment.

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

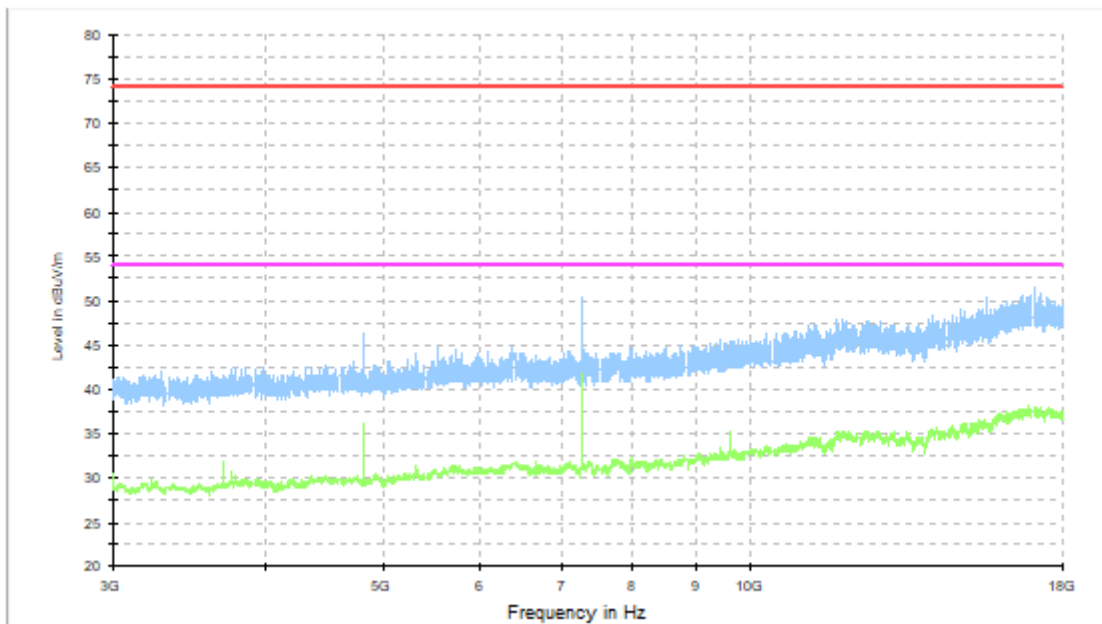


Figure A.3 Radiated Emission from 3GHz to 18GHz

Average detector result

Frequency (MHz)	Measurement Result (dB μ V/m)	Cable loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dB μ V)	Limit (dB μ V/m)	Margin (dB)	Antenna Pol. (H/V)
3692.500	31.42	-36.7	33.3	34.86	54.0	22.6	V
3750.000	30.75	-36.7	33.3	34.19	54.0	23.3	H
4804.500	35.99	-36.0	33.8	38.23	54.0	18.0	H
7278.000	41.80	-34.5	35.6	40.65	54.0	12.2	H
9607.000	35.27	-33.5	36.7	32.06	54.0	18.7	H
17124.000	37.88	-26.9	40.9	23.90	54.0	16.1	H

Peak detector result

Frequency (MHz)	Measurement Result (dB μ V/m)	Cable loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dB μ V)	Limit (dB μ V/m)	Margin (dB)	Antenna Pol. (H/V)
4804.000	46.3	-36.0	33.8	48.58	74.0	27.7	V
7278.000	50.4	-34.5	35.6	49.22	74.0	23.6	V
15627.500	50.3	-28.6	39.9	39.02	74.0	23.7	V
17042.500	51.4	-27.0	41.0	37.46	74.0	22.6	V
17245.000	50.8	-26.9	40.9	36.84	74.0	23.2	H
17012.500	50.6	-27.1	41.1	36.60	74.0	23.4	V

Set.2

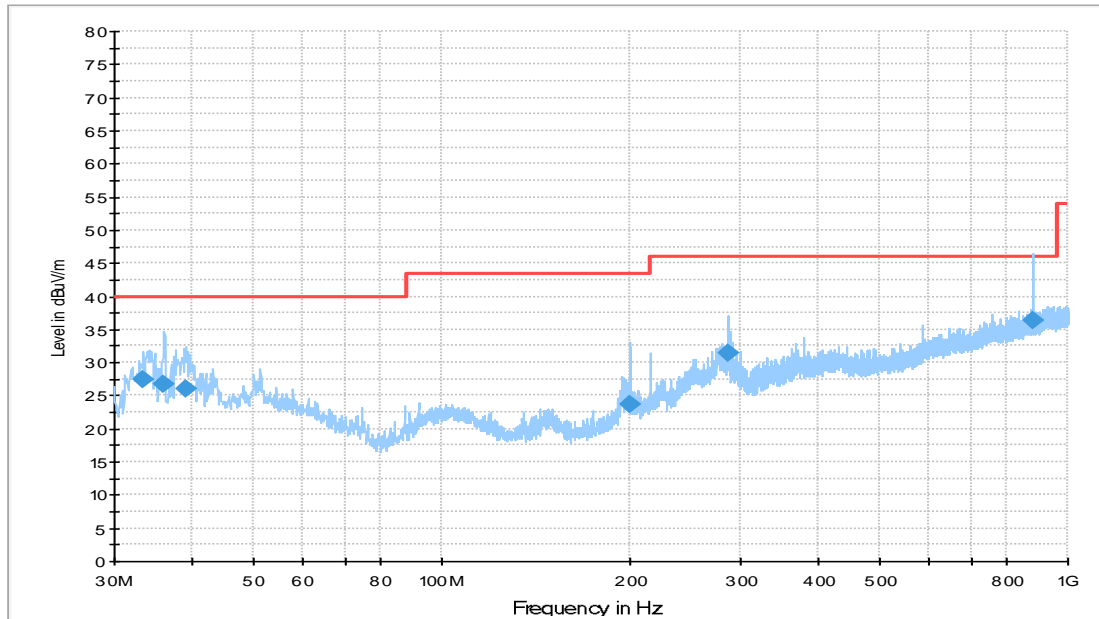
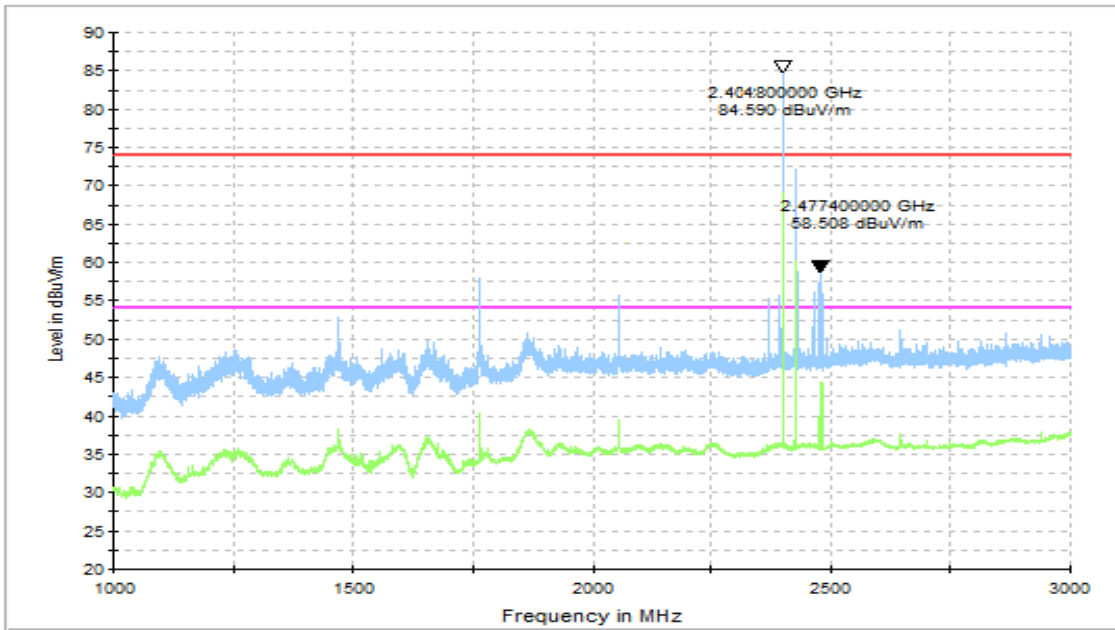


Figure A.4 Radiated Emission from 30MHz to 1GHz

Final Result 1

Frequency (MHz)	QuasiPeak (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBuV/m)
33.39500	27.5	100.0	V	120.0	-3.2	12.5	40.0
36.01400	26.7	113.0	V	179.0	-2.2	13.3	40.0
39.02100	26.1	100.0	V	30.0	-1.2	13.9	40.0
199.9440	23.6	113.0	H	300.0	-0.8	19.9	43.5
286.8560	31.4	113.0	H	192.0	1.1	14.6	46.0
882.0480	36.4	100.0	H	0.0	12.5	9.6	46.0



Note: 2402MHz-2480MHz is the Bluetooth carrier frequency and coming from the radio equipment.

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

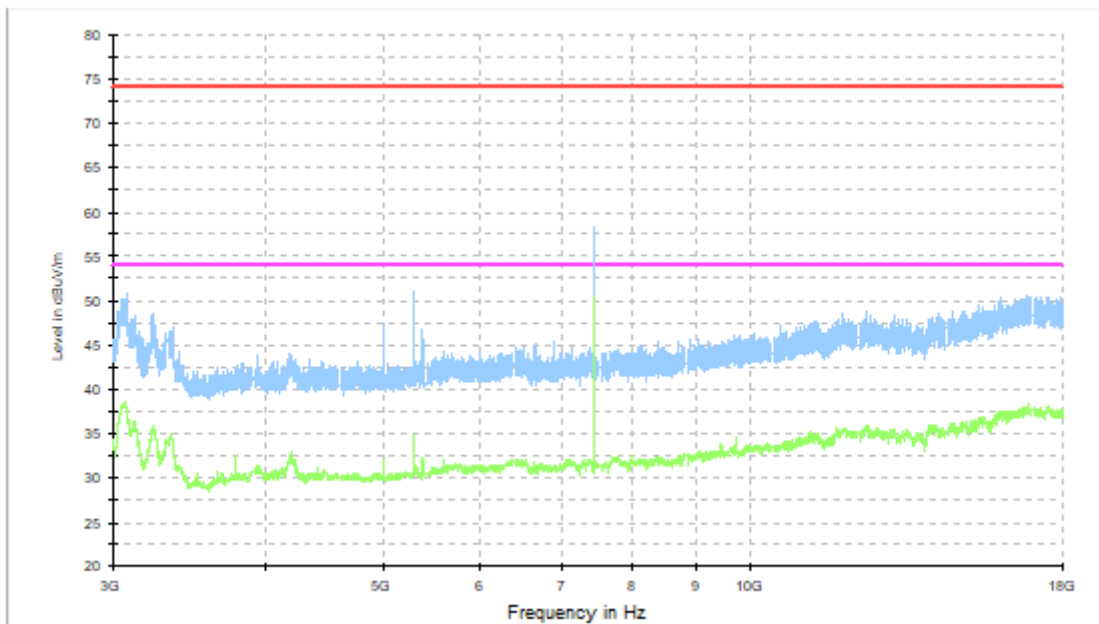


Figure A.6 Radiated Emission from 3GHz to 18GHz

Average detector result

Frequency (MHz)	Measurement Result (dB μ V/m)	Cable loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dB μ V)	Limit (dB μ V/m)	Margin (dB)	Antenna Pol. (H/V)
1470.000	38.27	-37.1	28.9	46.43	54.0	15.7	H
1764.000	40.02	-37.0	29.5	47.53	54.0	14.0	H
2058.400	38.75	-36.9	31.5	44.13	54.0	15.3	H
3060.500	38.55	-36.6	32.7	42.44	54.0	15.5	H
3065.000	38.66	-36.7	32.7	42.60	54.0	15.3	H
7440.500	50.30	-34.2	35.5	48.97	54.0	3.7	H

Peak detector result

Frequency (MHz)	Measurement Result (dB μ V/m)	Cable loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dB μ V)	Limit (dB μ V/m)	Margin (dB)	Antenna Pol. (H/V)
1763.800	58.0	-37.0	29.5	65.54	74.0	16.0	V
2058.000	55.6	-36.9	31.5	61.00	74.0	18.4	H
3082.000	50.8	-36.7	32.6	54.90	74.0	23.2	H
5291.500	51.0	-35.8	34.4	52.44	74.0	23.0	V
5292.000	50.8	-35.8	34.4	52.28	74.0	23.2	V
7440.500	58.2	-34.2	35.5	56.83	74.0	15.8	H

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 battery and adapter are installed so that the EUT works well and is in charging state.

The mobile phone plays audio and video continuously and projects the screen to the EUT via WIFI.

The Notebook PC plays audio and video continuously and projects the screen to the EUT via Type C

EUT is keeping on screen display state.

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

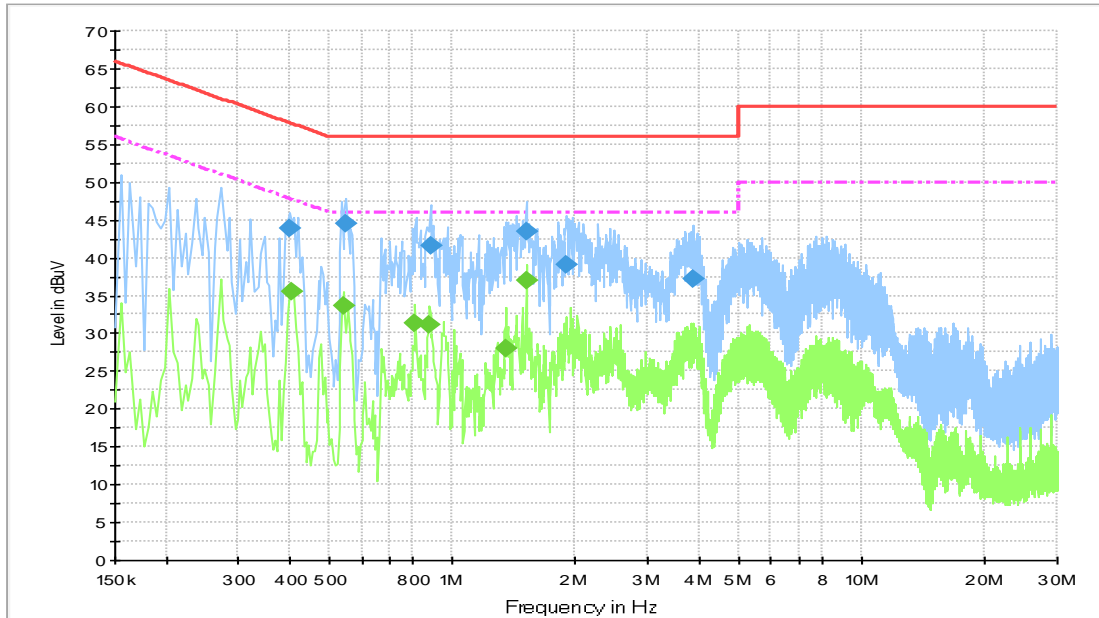
Voltage (V)	Frequency (Hz)
120	60

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

A.2.5 Measurement Results

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

Set.1



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

Figure A.7 Conducted Emission

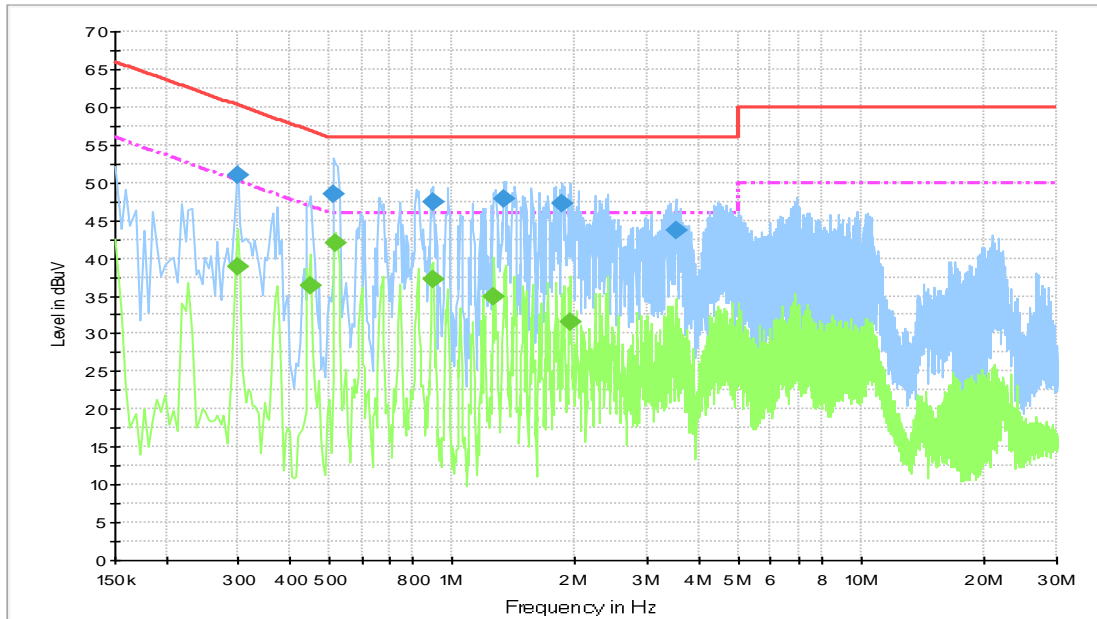
Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.402000	43.9	2000.0	9.000	On	L1	19.8	13.9	57.8
0.550500	44.4	2000.0	9.000	On	L1	19.8	11.6	56.0
0.883500	41.5	2000.0	9.000	On	N	19.7	14.5	56.0
1.513500	43.5	2000.0	9.000	On	N	19.6	12.5	56.0
1.900500	39.1	2000.0	9.000	On	L1	19.6	16.9	56.0
3.889500	37.1	2000.0	9.000	On	N	19.6	18.9	56.0

Final Result 2

Frequency (MHz)	Average (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.406500	35.6	2000.0	9.000	On	N	19.8	12.1	47.7
0.541500	33.7	2000.0	9.000	On	N	19.8	12.3	46.0
0.811500	31.4	2000.0	9.000	On	N	19.7	14.6	46.0
0.879000	31.1	2000.0	9.000	On	N	19.7	14.9	46.0
1.351500	27.9	2000.0	9.000	On	N	19.6	18.1	46.0
1.518000	37.1	2000.0	9.000	On	L1	19.6	8.9	46.0

Set.2



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

Figure A.8 Conducted Emission

Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.298500	51.0	2000.0	9.000	On	L1	19.7	9.3	60.3
0.514500	48.6	2000.0	9.000	On	N	19.8	7.4	56.0
0.897000	47.5	2000.0	9.000	On	L1	19.7	8.5	56.0
1.342500	47.8	2000.0	9.000	On	L1	19.6	8.2	56.0
1.860000	47.3	2000.0	9.000	On	N	19.6	8.7	56.0
3.511500	43.7	2000.0	9.000	On	N	19.6	12.3	56.0

Final Result 2

Frequency (MHz)	Average (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.298500	38.8	2000.0	9.000	On	L1	19.7	11.5	50.3
0.451500	36.3	2000.0	9.000	On	N	19.8	10.6	46.8
0.519000	42.1	2000.0	9.000	On	N	19.8	3.9	46.0
0.897000	37.2	2000.0	9.000	On	N	19.7	8.8	46.0
1.266000	35.0	2000.0	9.000	On	N	19.6	11.0	46.0
1.945500	31.6	2000.0	9.000	On	N	19.6	14.4	46.0



ANNEX B: Persons involved in this testing

Test Item	Tester
Radiated Emission	Zhao Wenhui
Conducted Emission	Guo Qian

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