Certificate Number: 5055.02

TEST REPORT

Report No.:	SRTC2021-9003(F)-0028
Product Name:	RADIO，2ND DISPLAY
Mode Name:	HSCE-AN010
Applicant:	SHENZHEN HANGSHENG ELECTRONICS CO.,LTD
Manufacturer:	SHENZHEN HANGSHENG ELECTRONICS CO.,LTD
Specification:	FCC Part15B (Certification) (2020 edition) ANSI C63.4-2014
FCC ID:	Y9THSCE-AN010

The State Radio_monitoring_center Testing Center (SRTC)

15th Building, No.30 Shixing Street, Shijingshan District,

Beijing, China

Tel: 86-10-57996183 Fax: 86-10-57996388

CONTENTS

1. General information 3
1.1 Notes of the test report 3
1.2 Information about the testing laboratory 3
1.3 Applicant's details 3
1.4 Manufacturer's details 3
1.5 Application details 4
1.6 Reference specification 4
1.7 Information of EUT 4
1.7.1 General information 4
1.7.2 EUT details 5
1.7.3 Auxiliary equipment details 5
2. Test information 6
2.1 Summary of the test results 6
2.2 Test result 7
2.2.1 Conducted Emissions-FCC Part15.107 7
2.2.2 Radiated Emissions-FCC Part15.109 10
2.3. List of test equipments 14

1. General information

1.1 Notes of the test report

The test report may only be reproduced or published in full. Reproduction or publication of extracts from the report requires the prior written permission of The State Radio_monitoring_center Testing Center (SRTC).
The test results relate only to individual items of the samples which have been tested.

1.2 Information about the testing laboratory

Company:	The State Radio_monitoring_center Testing Center (SRTC)
Address:	15th Building, No.30 Shixing Street, Shijingshan District
Testing location：	No.80, Zhaojiachang, BeizangCun, Daxing District, Beijing, China.
City:	Beijing
Country or Region:	China
Contacted person:	Liu Jia
Tel:	+86 10 57996183
Fax:	+86 10 57996388
Email:	liujiaf@srtc.org.cn
Designtion Number:	CN1267
Registration number:	239125

1.3 Applicant’s details

Company:	SHENZHEN HANGSHENG ELECTRONICS CO.,LTD
Address:	Hangsheng Industrial Park , Fuyuan Yi road, Heping village, Fuyong town, Baoan District
City:	Shenzhen
Country or Region:	China
Contacted person:	Wang Xingji
Tel:	185 7556 2177
Email:	wansiyan@hangsheng.com.cn

1.4 Manufacturer’s details

Company:	SHENZHEN HANGSHENG ELECTRONICS CO.,LTD
Address:	Hangsheng Industrial Park , Fuyuan Yi road, Heping village, Fuyong town, Baoan District
City:	Shenzhen
Country or Region:	China
Contacted person:	Wang Xingji
Tel:	185 7556 2177
Email:	wansiyan@hangsheng.com.cn

1.5 Application details

Date of reception of test sample: 21th Jul. 2021
Date of test: 21th Jul. 2021 to 17th Aug. 2021

1.6 Reference specification

FCC Part 15B, 2020 (Certification)

1.7 Information of EUT

1.7.1 General information

Product Name of EUT	RADIO，2ND DISPLAY
Mode Name	HSCE-AN010
FCC ID	Y9THSCE-AN010
Frequency Range	Bluetooth: 2.4~2.4835GHz
Nominal Voltage	13.5V
Extreme Temperature	Lowest: -20°C Highest: +70°C
Extreme Voltage	Minimum:9V Maximum: 16V
HW Version	S02
SW Version	V6.07

1.7.2 EUT details

No.	Product Name	Mode Name	IMEI
EUT	RADIO，2ND DISPLAY	HSCE-AN010	---

1.7.3 Auxiliary equipment details

AE (Auxiliary Equipment) 1#: PC

Manufacturer	Lenovo
Model Number	Xiaoxinchao7000

2. Test information

2.1 Summary of the test results

No.	Test case	FCC reference	Verdict
1	Conducted emissions	15.107	Pass
2	Radiated emissions	15.109	Pass

Approved By: Liu Wei Director of the test department	Checked By:Guo Yu Vice director of the test department
Tested by: Mr. Lv Youyou Test engineer	Issued date: 2021.08.17

2.2 Test result

2.2.1 Conducted Emissions-FCC Part15.107

Ambient condition:

Temperature	Relative humidity	Pressure
23.5°C	40.2%	100.8kPa

Test Setup with charger:

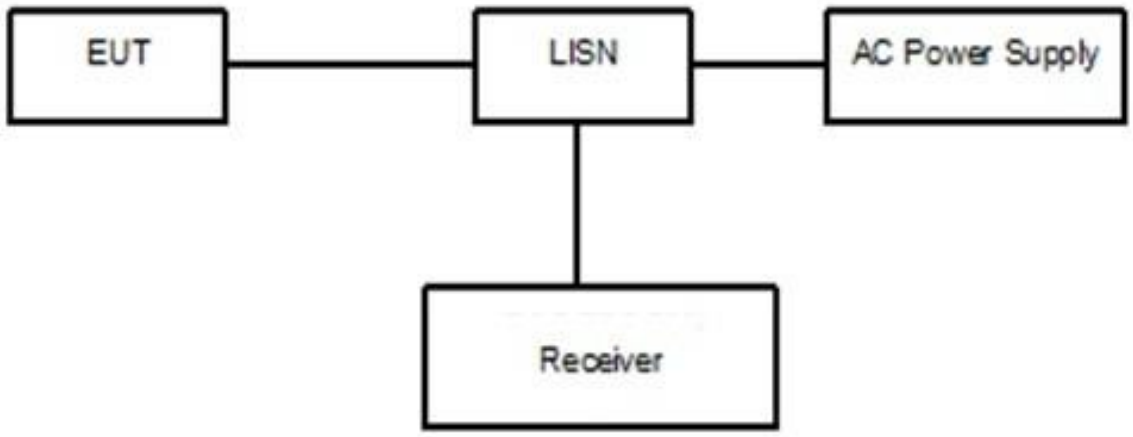


Figure 1

Test Procedure:

The EUT is placed on a non-matellic table 0.8m above the horizontal metal reference ground plane. The EUT is connected with LISN via the charger. The LISN is connected to the reference ground.
The test set-up and the test methods are performed according to ANSI C63.4:2014.
Then start the test software EMC32. Sweep the whole frequency band through the range from 150 KHz to 30 MHz with RBW 9kHz, VBW 30kHz.The measurement should be done for both L line and N line. During pre-test, the receiver uses both peak detector and average detector. And the final test, the receiver uses both average detector and Quasi-peak detector.
The data of cable loss has been calibrated in full testing frequency range before the testing.

A “reference path loss” Corr.(dB) is established and the L_{cable}+ATT+VDF is the attenuation of ”reference path loss”, and including the cable loss, the attenuation of the attenuator, the voltage division factor of AMN.
The measurement results are obtained as described below:
$P_{result}=P_{mea}$+Corr.(dB)
Sample calculation: (26.28dBμV) = (-4.22 dBμV) + (30.5 dB), the corresponding frequency is 0.184114MHz.

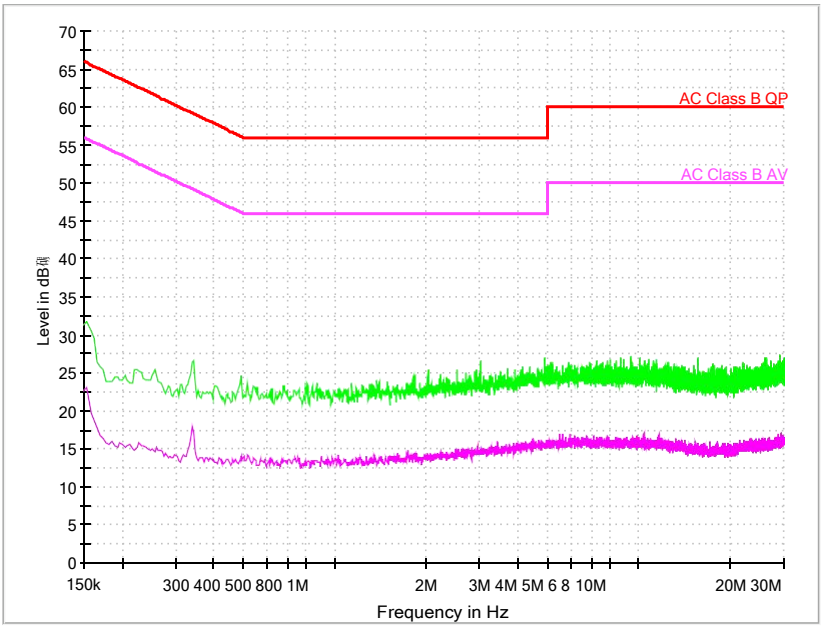
Limit:

Frequency of Emission(MHz)	Limits(dBμV)	
	Quasi-peak	Average
0.15～0.5	66 to 56*	56 to 46*
0.5～5	56	46
5～30	60	50

Note: * Decreases with the logarithm of the frequency

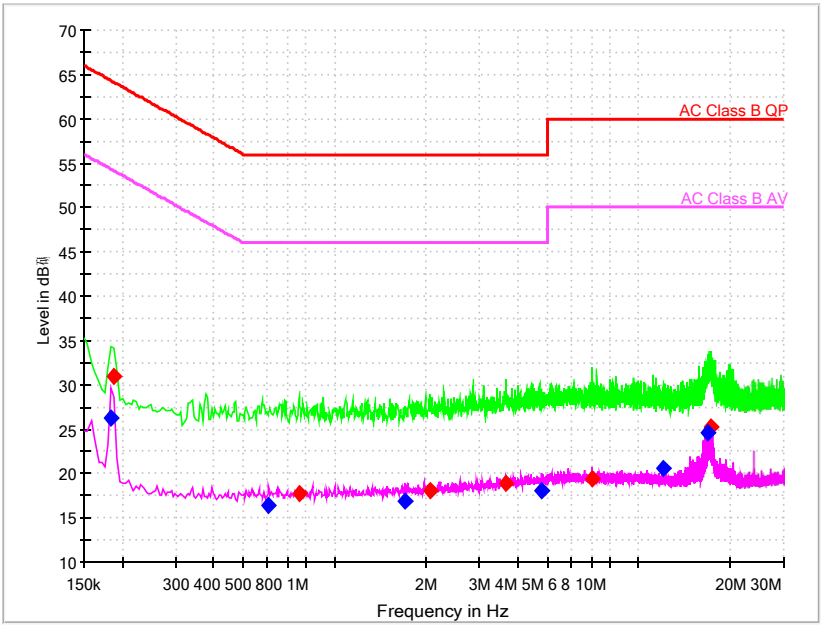
Test result:

Noise Level of the Measuring Instrument



Pic1.Conducted emission L and N Line

EUT+DC Power:



Pic2. Conducted emission L&N Line Voltage：120VAC

Frequency (MHz)	QuasiPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Corr. (dB)	P_{mea} QuasiPeak (dBµV)	P_{mea} Average (dBµV)
0.184114	---	26.28	54.30	28.02	L3	30.5	---	-4.22
0.188379	30.89	---	64.11	33.22	L3	30.5	0.39	---
0.606279	---	16.35	46.00	29.65	N	30.4	---	-14.05
0.764057	17.65	---	56.00	38.35	N	30.4	-12.75	---
1.702200	---	16.90	46.00	29.10	N	30.4	---	-13.5
2.068929	18.07	---	56.00	37.93	N	30.4	-12.33	---
3.655243	18.80	---	56.00	37.20	L3	30.4	-11.6	---
4.802336	---	18.05	46.00	27.95	N	30.4	---	-12.35
7.053879	19.38	---	60.00	40.62	L3	30.4	-11.02	---
12.000450	---	20.61	50.00	29.39	L3	30.4	---	-9.79
16.921436	---	24.57	50.00	25.43	L3	30.4	---	-5.83
17.232729	25.19	---	60.00	34.81	L3	30.4	-5.21	---

2.2.2 Radiated Emissions-FCC Part15.109

Ambient condition:

Temperature	Relative humidity	Pressure
23.6°C	41.5%	100.8kPa

Test Setup:

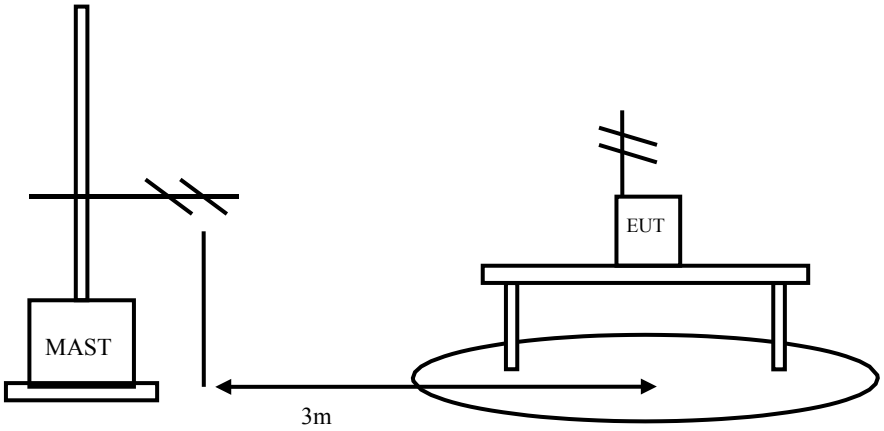


Figure 2

Test Procedure:

EUT+Charger:

The EUT should be placed on a non-metallic table 80cm above the ground plane. The receive antennas shall be moved from 1 to 4 meters. The distance between EUT and receive antenna should be 3 meters.

The EUT should work in idle mode. The accessories of the EUT are connected with the EUT such as headset etc. Open the following functions of EUT: Camera, flash lamp, GPS and video. The test set-up and the test methods are performed according to ANSI C63.4:2014. Then start the test software EMC32. Sweep the whole frequency band through the range from 30MHz to 1GHz, using receive log period antenna VULB 9163.

During the test, the height of receive antenna shall be moved from 1 to4 meters, and the antenna shall be performed under horizontal and vertical polarization. The turn table shall be rotated from 0 to 360 degrees for detecting the maximum of radiated spurious signal level. The measurements shall be repeated with orthogonal polarization of the test antenna. The EUT is laid in two modes as follow: 1. put the EUT in horizontal direction; 2. put the EUT in vertical direction.

The data of cable loss and antenna factor have been calibrated in full testing frequency range before the testing. All test results are performed with max hold at the horizontal and vertical polarity.

RBW=120kHz, VBW=300kHz, when the test frequency: 30MHz<f<1GHz
RBW=1MHz, VBW=3MHz, when the test frequency: f>1GHz

A “reference path loss” is established and the A_{Rpl} is the attenuation of “reference path loss”, and including the gain of receive antenna, the gain of the preamplifier, the cable loss.
The measurement results are obtained as described below:
Result= P_{mea} + A_{Rpl}
Sample calculation: (7.05 dBμV/m) = (24.65 dBμV) + (-17.6dB/m), the corresponding frequency is 50.467000MHz.

Limit:

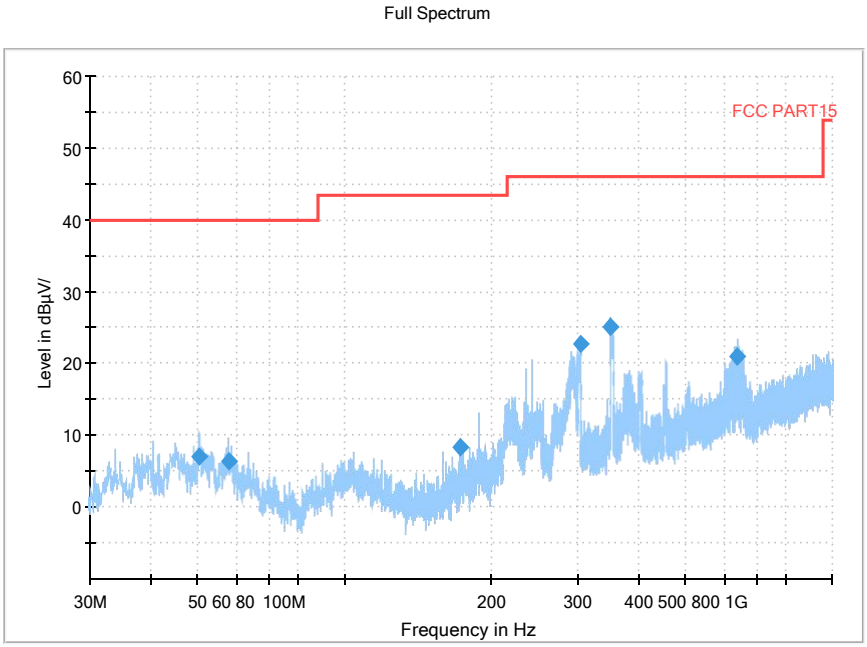
Frequency of Emission(MHz)	Limits	
	Detector	Unit (dBμV/m)
30～88	Quasi-peak	40
88～216	Quasi-peak	43.5
216～960	Quasi-peak	46
960～1000	Quasi-peak	54
1000～5th harmonic of the highest frequency or 40GHz, whichever is lower	Average Peak	54 74

Test result:

EUT+DC Power:

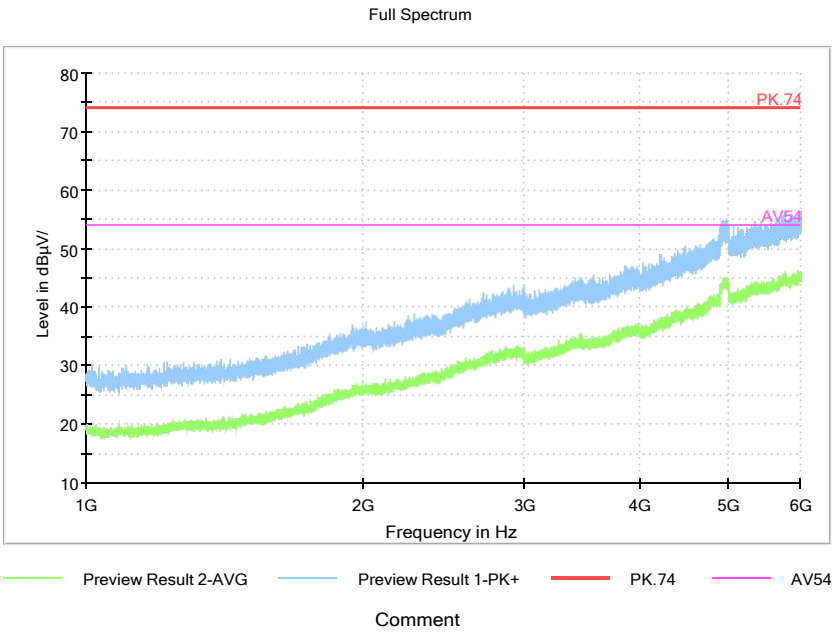
Frequency(MHz)	Result(dBuV/m)	A_{Rpl} (dB/m)	P_{mea} (dBuV)	Polarity
50.467000	7.05	-17.6	24.65	V
57.839000	6.44	-18.5	24.94	V
172.153500	8.26	-21.5	29.76	V
303.685500	22.61	-16.0	38.61	V
350.585000	25.14	-14.3	39.44	V
639.499500	20.96	-7.8	28.76	V

EUT+ Laptop: refer to Pic3 to Pic6



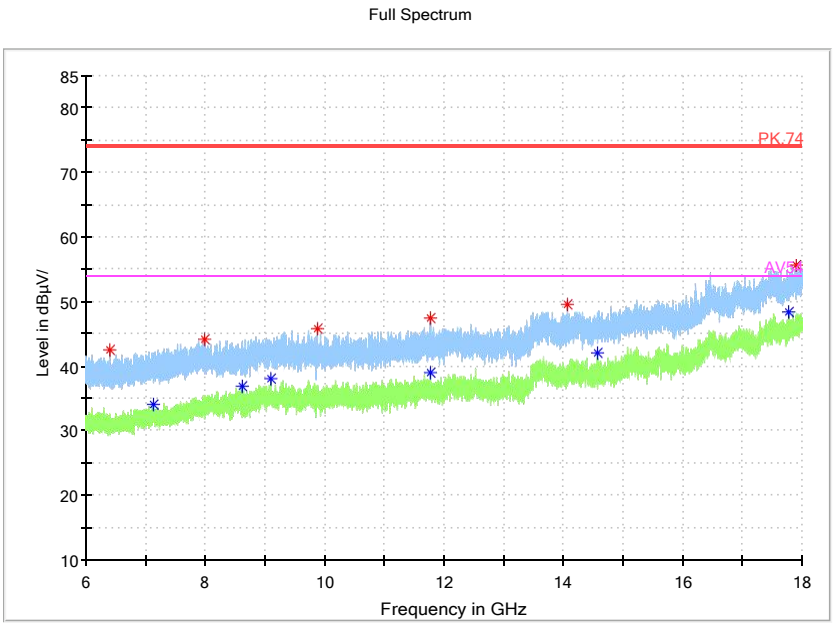
Pic3. Radiated emission (30MHz – 1GHz)

Note：The test data in the graph includes two polarizations: horizontal and vertical



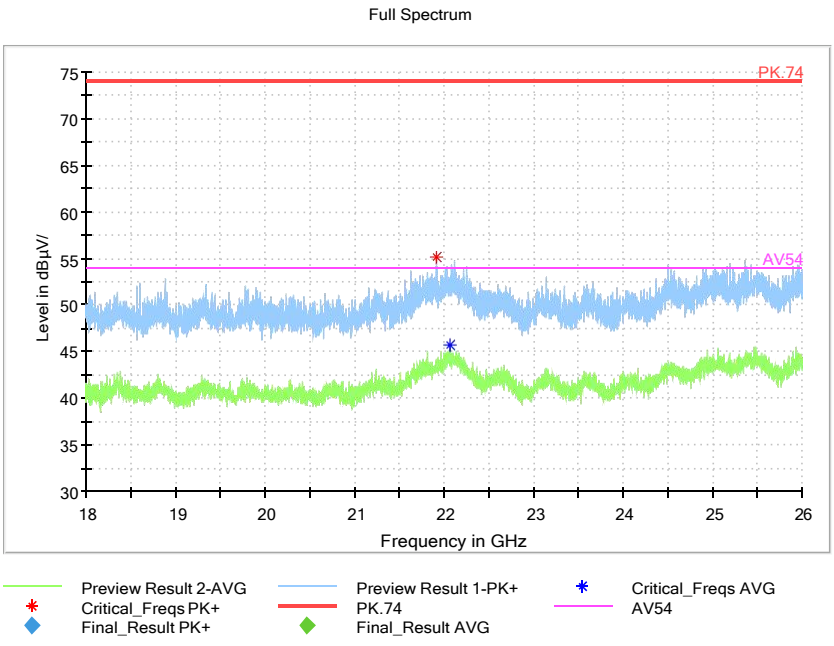
Pic4. Radiated emission (1GHz –6GHz)

Note：The test data in the graph includes two polarizations: horizontal and vertical



Pic5. Radiated emission (6GHz –18GHz)

Note：The test data in the graph includes two polarizations: horizontal and vertical



Pic6. Radiated emission (18GHz –26GHz)

Note：The test data in the graph includes two polarizations: horizontal and vertical

2.3. List of test equipments

No.	Name/Model	Manufacturer	S/N	Calibration Due Date	Calibration Date
1	23.18m×16.88m×9.60mSemi-AnechoicChamber	FRANKONIA	-----	2023.09.05	2018.09.06
2	ESW EMI test receiver	R&S	101574	2022.06.21	2021.06.20
3	ESR3 EMI test receiver	R&S	102361	2022.04.11	2021.04.12
4	9.080m×5.255m×3.525m Shielding room	FRANKONIA	-----	2021.09.05	2016.09.06
5	VULB 9163 Ultra log test antenna	schwarzbeck	867	2022.03.24	2021.03.25
6	HF 907 Double-Ridged Waveguide Horn Antenna	R&S	100512	2022.03.24	2021.03.25
7	SAS-574 Horn Antenna	schwarzbeck	535	2022.06.21	2021.06.20
8	ENV4200 AMN	R&S	100091	2022.06.21	2021.06.20
9	EMC32EMI test software	R&S	-----	-----	-----

----------The end----------