Registration
No.788871

TEST REPORT

Report No.:	SRTC2018-9003(F)-0002
Product Name:	Sino Wealth BLE Module
Model Name:	SH-BLEM01
Applicant:	SINO WEALTH ELECTRONIC LTD.
Manufacturer:	SINO WEALTH ELECTRONIC LTD.
Specification:	FCC Part15B (Certification) (October 1, 2017 edition)
FCC ID:	2AOT2SH-BLEM01

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

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1. General information

1.1 Notes of the test report

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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
City:	Beijing
Country or Region:	P.R.China
Contacted person:	Liu Jia
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Fax:	86-10-57996388
Email:	liujiaf@srtc.org.cn

1.3 Applicant's details

Company:	SINO WEALTH ELECTRONIC LTD.
Address:	No. 3, Lane 767, JinZhong Road, Shanghai (PC: 200335), China
City:	Shanghai
Country or Region:	P.R.China
Contacted person:	Lisa.Duan
Tel:	86-021-61219988-1321
Fax:	/
Email:	Lisa.duan@sinowealth.com

1.4Manufacturer's details

Company:	SINO WEALTH ELECTRONIC LTD.
Address:	No. 3, Lane 767, JinZhong Road, Shanghai (PC: 200335), China
City:	Shanghai
Country or Region:	P.R.China
Contacted person:	Lisa.Duan
Tel:	86-021-61219988-1321
Fax:	/
Email:	Lisa.duan@sinowealth.com

1.5 Application details

Date of reception of test sample: 15th Jan 2018
Date of test: 15th Jan 2018 to 18th Jan 2018

1.6 Reference specification

FCC Part 15B, 2017 (Certification)

1.7 Information of EUT

1.7.1 General information

Name of EUT	SH-BLEM01
FCC ID	2AOT2SH-BLEM01
Frequency Range	Bluetooth: 2.402~2.480GHz
Antenna Type	PIFA Antenna
Power Supply	DC power supply
Rated Power Supply Voltage	3.3V
HW Version	V2.1
SW Version	V1.0

1.7.2 EUT details

Product Name	Model Name	IMEI
Sino Wealth BLE Module	SH-BLEM01	/

1.7.3 Auxiliary equipment details

AE (Auxiliary Equipment) 1#: Computer

Equipment	Computer
Manufacturer	Lenovo
Model Number	E40
S/N	MP06WE9E

Input Voltage	100V-240V AC
Frequency	50/60Hz

2.Test information

2.1 Summary of the test results

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

Approved by Mr. LiuWei Director of the test department	Checked by Mr. He Jia Project manager of the test department
Tested by: Mr. Liu Jian Test engineer	Issued date: 2018.01.31

2.2 Test result

2.2.1RadiatedEmissions-FCC Part15.109

Ambient condition:

Temperature	Relative humidity	Pressure
23.6°C	43.1%	100.8kPa

Test Setup:

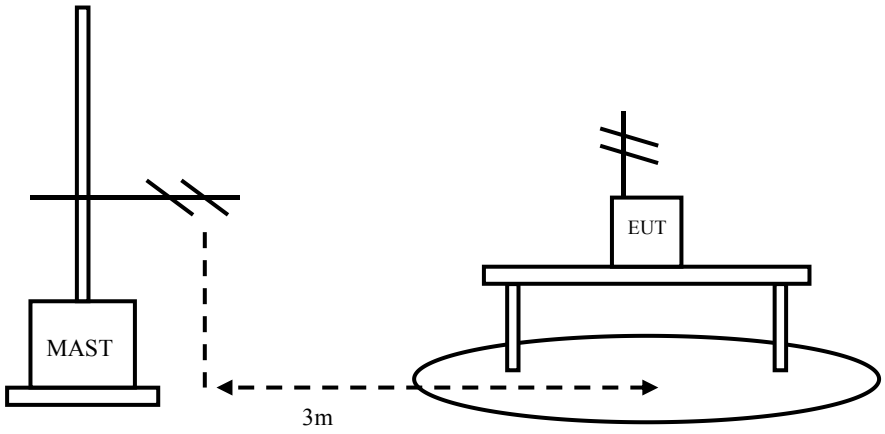


Figure 1

Test Procedure:

EUT+Laptop:
The EUT should be placed on a non-metallic table80cm 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 accessories of the EUT are connected with the EUT such as headset etc.The EUT was exercised during the testing by data read and write cycles repeated with internal storages connecting with a laptop via the USB cable. The laptop's LAN port is connected with another laptop via cable. And the data transferring between two laptops is maintained.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 HL562.
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.

A “reference path loss” is established and theA_{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}

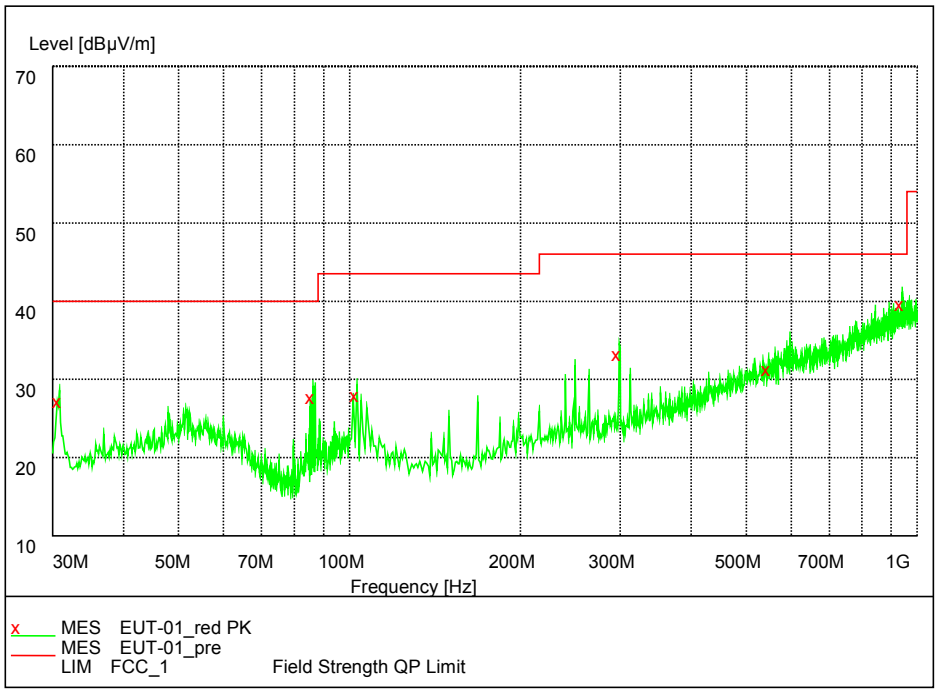
Limit:

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

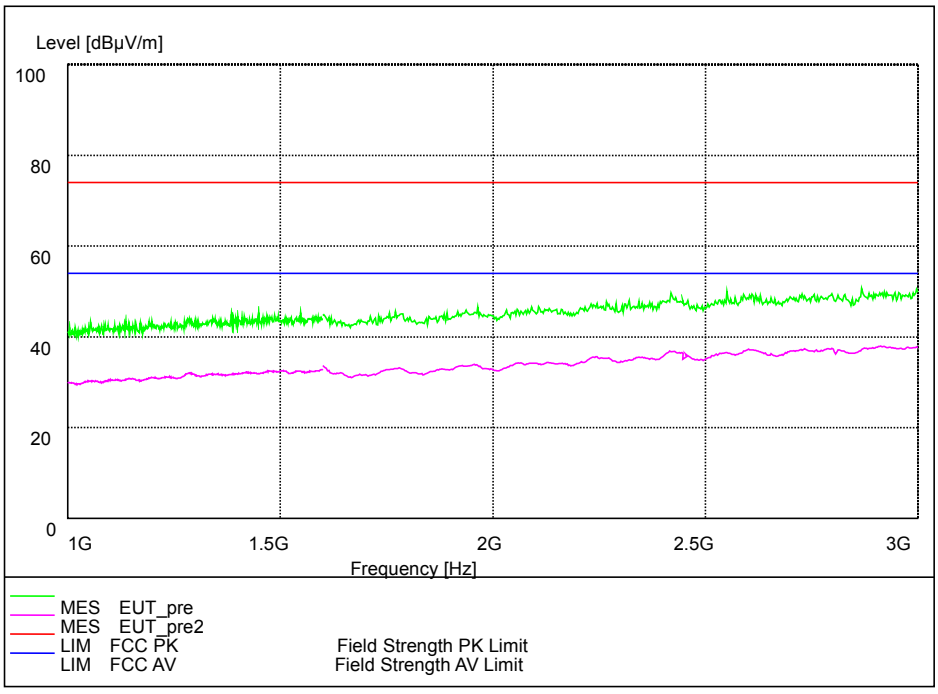
Test result:
EUT+Laptop

Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	Pmea (dBuV/m)	Polarity
30.841683	28.58	18.0	5.12	Vertical
86.252505	29.10	16.9	7.58	Vertical
103.206413	29.29	19.7	14.43	Vertical
298.797595	34.61	22.8	3.86	Vertical
547.094188	32.63	29.0	2.74	Vertical
941.883768	41.03	34.6	0.86	Vertical

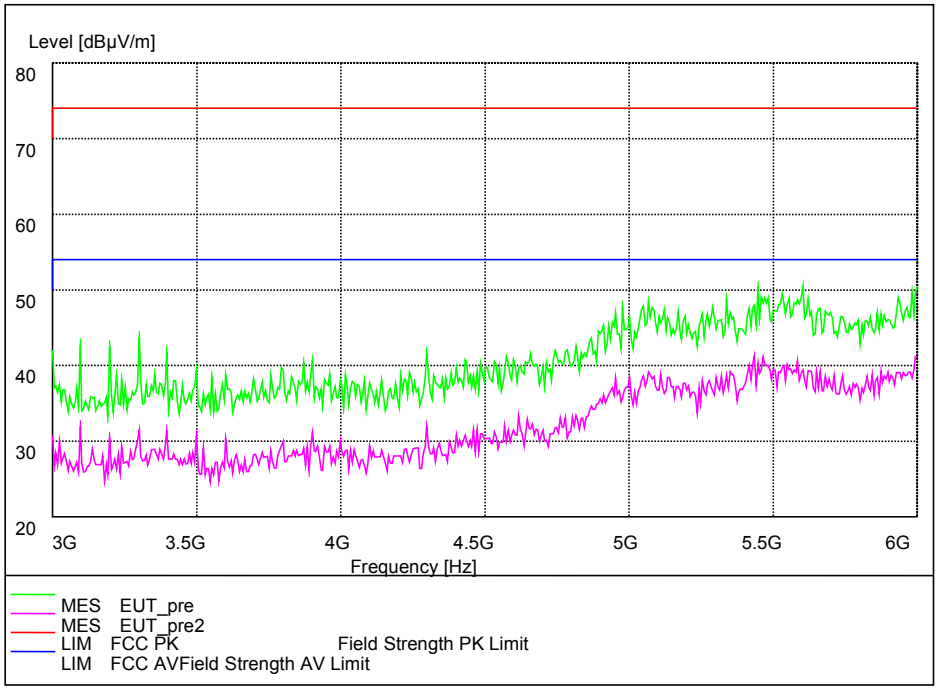
EUT+Laptop:



Pic1. Radiated emission(30MHz – 1GHz)



Pic2. Radiated emission (1GHz – 3GHz)



Pic3. Radiated emission (3GHz – 6GHz)

2.2.2Conducted Emissions-FCC Part15.107

Ambient condition:

Temperature	Relative humidity	Pressure
23.6°C	43.1%	100.8kPa

Test Setup with laptop:

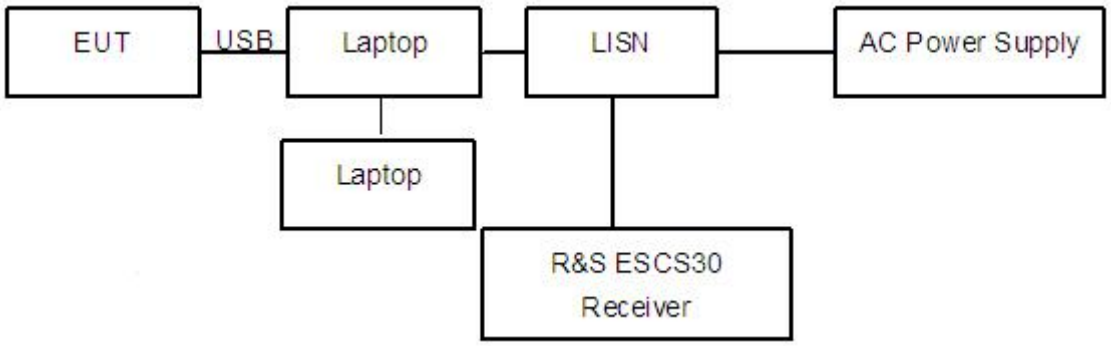


Figure 1

Test Procedure:

The EUT is placed on a non-metallic table 0.8m above the horizontal metal reference ground plane. The accessories of the EUT are connected with the EUT such as headset etc. The EUT was exercised during the testing by data read and write cycles repeated with internal storages connecting with a laptop via the USB cable. The laptop's LAN port is connected with another laptop via cable. And the data transferring between two laptops is maintained.

The AC main power supply of the laptop is connected to LISN and 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 ES-K1. Sweep the whole frequency band through the range from 150 KHz to 30 MHz. 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.

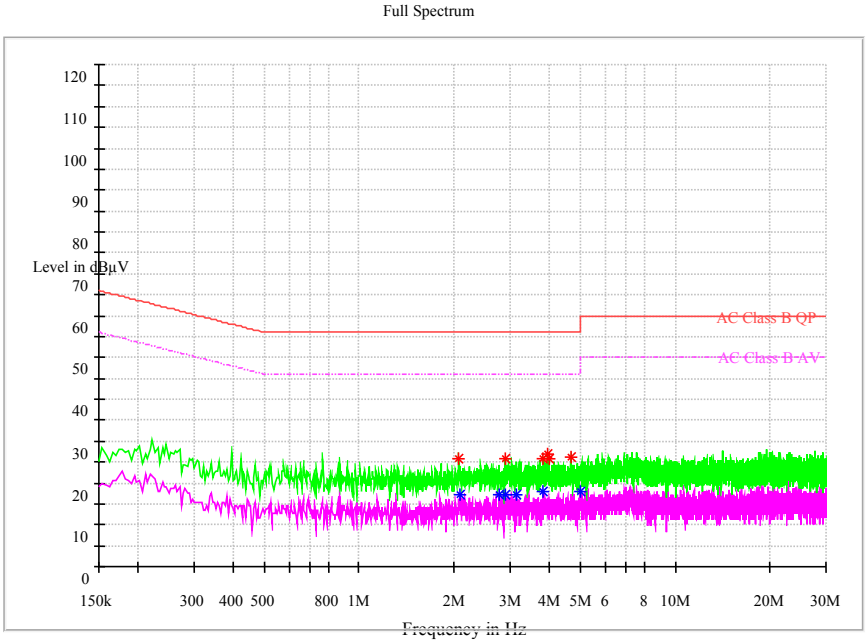
Limit:

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

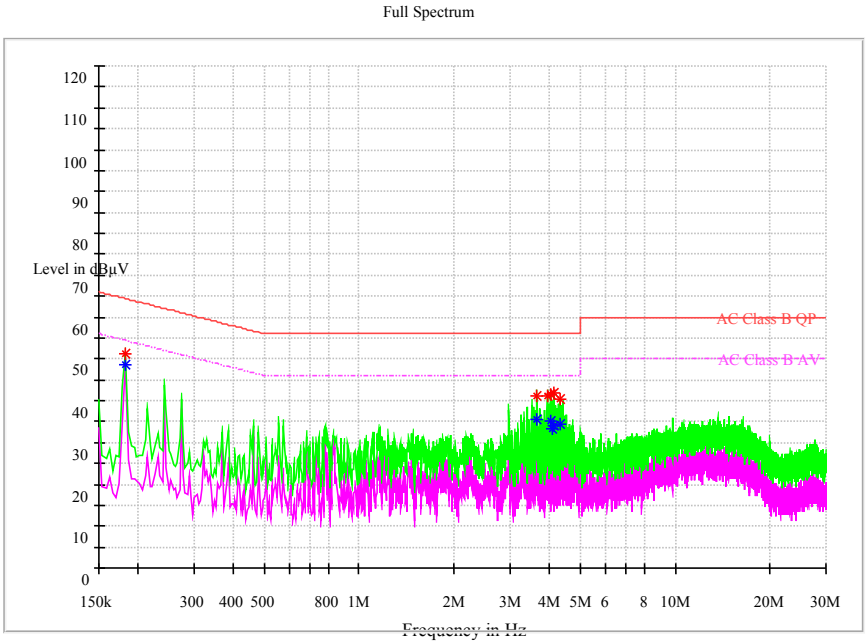
Test result:

Noise Level of the Measuring Instrument



Pic4.Conducted emission L and N Line

EUT+Laptop:



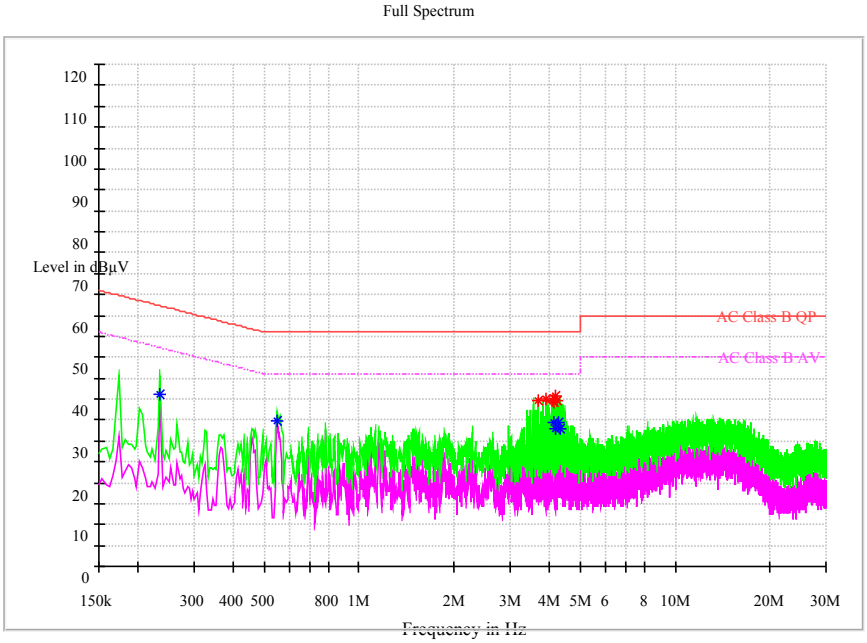
Pic5. Conducted emission L Line

MEASUREMENT RESULT: "EUT_fin QP"

Frequency (MHz)	QuasiPeak (dBµV)	Limit (dBµV)	Margin (dB)	Corr. (dB)
0.182000	51.09	64.39	13.30	30.1
3.662000	41.13	56.00	14.87	30.1
3.926000	41.01	56.00	14.99	29.9
4.030000	41.40	56.00	14.60	29.9
4.146000	41.81	56.00	14.19	29.9
4.342000	40.46	56.00	15.54	29.9

MEASUREMENT RESULT: "EUT_fin AV"

Frequency (MHz)	QuasiPeak (dBµV)	Limit (dBµV)	Margin (dB)	Corr. (dB)
0.182000	48.64	54.39	5.75	30.1
3.662000	35.38	46.00	10.62	29.9
4.030000	35.06	46.00	10.94	29.9
4.082000	33.40	46.00	12.60	29.9
4.146000	33.96	46.00	12.04	29.9
4.342000	34.31	46.00	11.69	29.9



Pic6. Conducted emission N Line

MEASUREMENT RESULT: "EUT_fin QP"

Frequency (MHz)	QuasiPeak (dBµV)	Limit (dBµV)	Margin (dB)	Corr. (dB)
3.702000	39.48	56.00	16.52	29.9
3.914000	40.07	56.00	15.93	29.9
4.078000	39.56	56.00	16.44	29.9
4.122000	39.32	56.00	16.68	29.9
4.186000	40.76	56.00	15.24	29.9
4.222000	39.46	56.00	16.54	29.9

MEASUREMENT RESULT: "EUT_fin AV"

Frequency (MHz)	QuasiPeak (dBµV)	Limit (dBµV)	Margin (dB)	Corr. (dB)
0.234000	40.94	52.31	11.37	30.1
0.550000	34.79	46.00	11.21	30.2
4.122000	34.48	46.00	11.52	29.9
4.186000	32.80	46.00	13.20	29.9
4.294000	34.40	46.00	11.60	29.9
4.346000	32.90	46.00	13.10	29.9

2.3. List of test equipments

No.	Name/Model	Manufacturer	S/N	Calibration Due Date
1	23.18m×16.88m×9.60mSemi-AnechoicChamber	FRANKONIA	-----	20th Aug. 2018
2	ESI 40EMI test receiver	R&S	100015	20th Aug. 2018
3	E5515C(8960) Mobile Station Tester	Agilent	GB44050904	20th Aug. 2018
4	9.080m×5.255m×3.525m Shielding room	FRANKONIA	-----	20th Aug. 2018
5	ESCS30EMI test receiver	R&S	100029	20th Aug. 2018
6	HL562Ultra log test antenna	R&S	100016	20th Aug. 2018
7	ENV216 AMN	R&S	3560.6550.12	20th Aug. 2018
8	HF 907 Double-Ridged Waveguide Horn Antenna	R&S	100512	25th May. 2018
9	HF 907 Double-Ridged Waveguide Horn Antenna	R&S	100513	20th Aug. 2018
10	PS2000 Turn Table	FRANKONIA	-----	20th Aug. 2018
11	MA260 Antenna Master	FRANKONIA	-----	20th Aug. 2018
12	EMC32EMI test software	R&S	-----	20th Aug. 2018
13	HL562 Receive antenna	R&S	100167	20th Aug. 2018

Appendix

Appendix1 Test Setup