FCC Part 15, Subpart B, Class B(sDoC)

TEST REPORT

iSocket Systems Ltd

iSocket

Test Model: ISPROEMUS

Additional Model No.: Please Refer to Page 7

Prepared for	:	iSocket Systems Ltd
Address	:	Kurolantie 1, 78500 Varkaus, Finland

Prepared by	:	Shenzhen LCS Compliance Testing Laboratory Ltd.
Address	:	Room 101, 201, Building A and Room 301, Building C, Juji Industrial Park, Yabianxueziwei, Shajing Street, Bao’an District, Shenzhen, Guangdong, China
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Mail	:	webmaster@LCS-cert.com

Date of receipt of test sample	:	December 28, 2020
Number of tested samples	:	1
Sample number	:	201225075A
Date of Test	:	December 28, 2020 ~ January 18, 2021
Date of Report	:	January 21, 2021

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FCC TEST REPORT
FCC Part 15, Subpart B, Class B(sDoC)

Report Reference No. ..... :	**LCS201225075AE**
Date Of Issue..... :	January 21, 2021
Testing Laboratory Name ... :	**Shenzhen LCS Compliance Testing Laboratory Ltd.**
Address ..... :	Room 101, 201, Building A and Room 301, Building C, Juji Industrial Park, Yabianxueziwei, Shajing Street, Bao' an District, Shenzhen, Guangdong, China
Testing Location/ Procedure.. :	Full application of Harmonised standards ■ Partial application of Harmonised standards □ Other standard testing method □
Applicant's Name..... :	**iSocket Systems Ltd**
Address ..... :	Kurolantie 1, 78500 Varkaus, Finland
Test Specification	
Standard..... :	FCC Part 15, Subpart B, Class B(sDoC), ANSI C63.4 -2014
Test Report Form No..... :	LCSEMC-1.0
TRF Originator..... :	Shenzhen LCS Compliance Testing Laboratory Ltd.
Master TRF..... :	Dated 2011-03

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Test Item Description. ..... :	**iSocket**
Test Model ..... :	ISPROEMUS
Trade Mark ..... :	iSocket
Ratings ..... :	Input: AC 100-240V, 50-60Hz Output: AC 110-250V, 15A
Result ..... :	**Positive**

Compiled by:	**Supervised by:**	**Approved by:**
Scent Hu	Jin Wang	Gavin Liang
Scent Hu/ Administrator	Jin Wang/ Technique principal	Gavin Liang/ Manager

FCC -- TEST REPORT

Test Report No. : LCS201225075AE	January 21, 2021 Date of issue

Test Model	: ISPROEMUS
EUT.....	: iSocket
Applicant.....	**: iSocket Systems Ltd**
Address.....	: Kurolantie 1, 78500 Varkaus, Finland
Telephone.....	: /
Fax.....	: /
Manufacturer.....	**: iSocket Systems Ltd**
Address.....	: Kurolantie 1, 78500 Varkaus, Finland
Telephone.....	: /
Fax.....	: /
Factory.....	**: /**
Address.....	: /
Telephone.....	: /
Fax.....	: /

Test Result according to the standards on page 6: **Positive**

The test report merely corresponds to the test sample.
It is not permitted to copy extracts of these test result without the written permission of the test laboratory.

Revision History

Revision	Issue Date	Revisions	Revised By
000	January 21, 2021	Initial Issue	Gavin Liang

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1. SUMMARY OF STANDARDS AND RESULTS

1.1. Description of Standards and Results

The EUT have been tested according to the applicable standards as referenced below.

EMISSION			
Description of Test Item	Standard	Limits	Results
Conducted disturbance at mains terminals	FCC Part 15, Subpart B, Class B(sDoC), ANSI C63.4 -2014	Class B	PASS
Radiated disturbance	FCC Part 15, Subpart B, Class B(sDoC), ANSI C63.4 -2014	Class B	PASS
N/A is an abbreviation for Not Applicable.			

Test mode:		
Mode 1	Normal Operation	Record

2. GENERAL INFORMATION

2.1. Description of Device (EUT)

EUT	:	iSocket
Trade Mark	:	iSocket
Test Model	:	ISPROEMUS
Additional Model No	:	ISPROUS
Model Declaration	:	PCB board, structure and internal of these model(s) are the same, So no additional models were tested
Power Supply	:	Input: AC 100-240V, 50-60Hz Output: AC 110-250V, 15A

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2.2. Support equipment List

Manufacturer	Description	Model	Serial Number	Certificate
--	--	--	--	--

2.3. Description of Test Facility

Site Description

EMC Lab. : NVLAP Accreditation Code is 600167-0.

FCC Designation Number is CN5024.

CAB identifier is CN0071.

CNAS Registration Number is L4595.

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2.4. Statement of the Measurement Uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. To CISPR 16 – 4 “Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC Measurements” and is documented in the LCS quality system acc. To DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

2.5. Measurement Uncertainty

Test	Parameters	Expanded Uncertainty (Ulab)	Expanded Uncertainty (Ucispr)
Conducted Emission	Level accuracy (9kHz to 150kHz) (150kHz to 30MHz)	± 2.63 dB ± 2.35 dB	± 3.8 dB ± 3.4 dB
Radiated Emission	Level accuracy (9kHz to 30MHz)	± 3.68 dB	N/A
Radiated Emission	Level accuracy (30MHz to 1000MHz)	± 3.48 dB	± 5.3 dB
Radiated Emission	Level accuracy (above 1000MHz)	± 3.90 dB	± 5.2 dB

（1）Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus.

（2）The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor of k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.

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3. TEST RESULTS

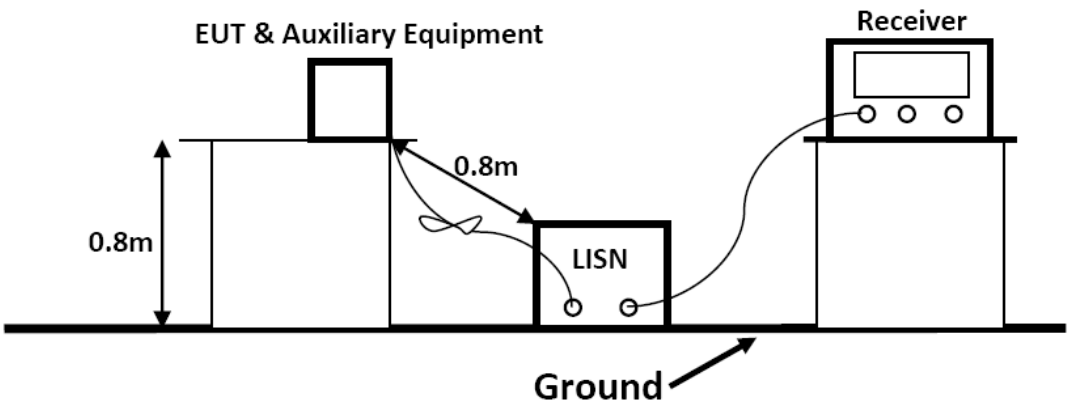
3.1. POWER LINE CONDUCTED EMISSION MEASUREMENT

3.1.1. Test Equipment

The following test equipments are used during the power line conducted measurement:

Item	Equipment	Manufacturer	Model No.	Serial No.	Cal Date	Due Date
1	EMI Test Software	EMC-EZ	EZ	/	N/A	N/A
2	EMI Test Receiver	R&S	ESPI	101840	2020-06-22	2021-06-21
3	Artificial Mains	R&S	ENV216	101288	2020-06-22	2021-06-21
4	10dB Attenuator	SCHWARZBECK	MTS-IMP-136	261115-001-0032	2020-06-22	2021-06-21
5	Impedance Stabilization Network	TESEQ	ISN T800	45130	2020-10-20	2021-10-19

3.1.2.Block Diagram of Test Setup



3.1.3.Test Standard

Power Line Conducted Emission Limits (Class B)

Frequency (MHz)			Limit (dBμV)	
			Quasi-peak Level	Average Level
0.15	~	0.50	66.0 ~ 56.0 *	56.0 ~ 46.0 *
0.50	~	5.00	56.0	46.0
5.00	~	30.00	60.0	50.0
NOTE1-The lower limit shall apply at the transition frequencies. NOTE2-The limit decreases linearly with the logarithm of the frequency in the range 0.15MHz to 0.50MHz.				

3.1.4.EUT Configuration on Test

The following equipments are installed on Power Line Conducted Emission Measurement to meet the commission requirement and operating regulations in a manner, which tends to maximize its emission characteristics in a normal application.

3.1.5.Operating Condition of EUT

3.1.5.1.Setup the EUT as shown on Section 3.1.2

3.1.5.2.Turn on the power of all equipments.

3.1.5.3.Let the EUT work in measuring Mode 1 and measure it.

3.1.6.Test Procedure

The EUT system is connected to the power mains through a line impedance stabilization network (L.I.S.N.). This provides 50ohm coupling impedance for the EUT system. Please refer the block diagram of the test setup and photographs. Both sides of AC line are checked to find out the maximum conducted emission. In order to find the maximum emission levels, the relative positions of equipment and all of the interface cables shall be changed according to FCC/ANSI C63.4-2014 on Conducted Emission Measurement.

The bandwidth of the test receiver is set at 9kHz.

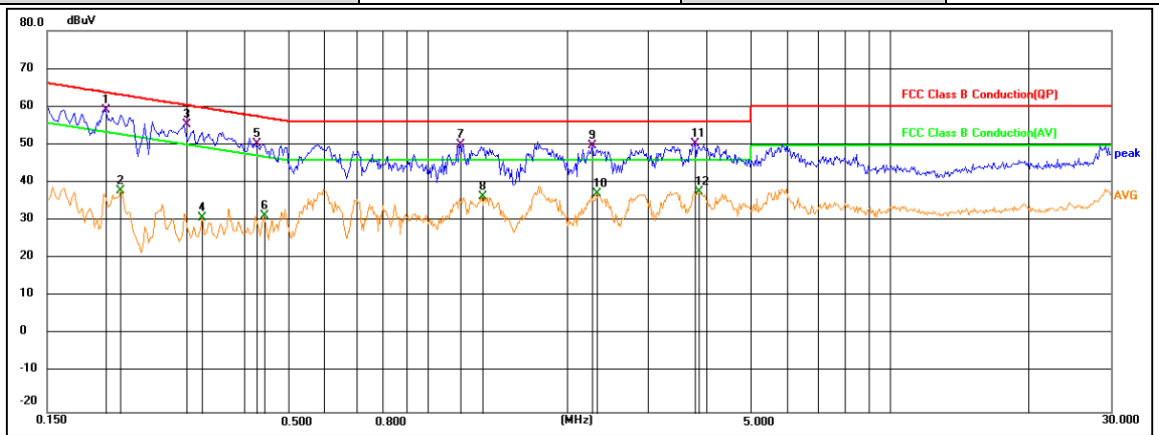
The frequency range from 150kHz to 30MHz is investigated

3.1.7.Test Results

PASS.

The test result please refer to the next page.

Test Model	ISPROEMUS	Test Mode	Mode 1
Environmental Conditions	23.3℃, 53.7% RH	Test Engineer	Carl Fu
Pol	Line	Test Voltage	AC 120V/60Hz



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
1	0.2007	40.00	19.18	59.18	63.58	-4.40	QP
2	0.2162	18.91	19.20	38.11	52.96	-14.85	AVG
3	0.2986	36.24	19.27	55.51	60.28	-4.77	QP
4	0.3256	11.61	19.29	30.90	49.56	-18.66	AVG
5	0.4246	31.18	19.32	50.50	57.36	-6.86	QP
6	0.4426	12.08	19.32	31.40	47.01	-15.61	AVG
7	1.1760	30.93	19.27	50.20	56.00	-5.80	QP
8	1.3110	17.20	19.29	36.49	46.00	-9.51	AVG
9	2.2740	30.47	19.42	49.89	56.00	-6.11	QP
10	2.3145	17.91	19.42	37.33	46.00	-8.67	AVG
11	3.7816	31.01	19.46	50.47	56.00	-5.53	QP
12	3.8581	18.25	19.46	37.71	46.00	-8.29	AVG

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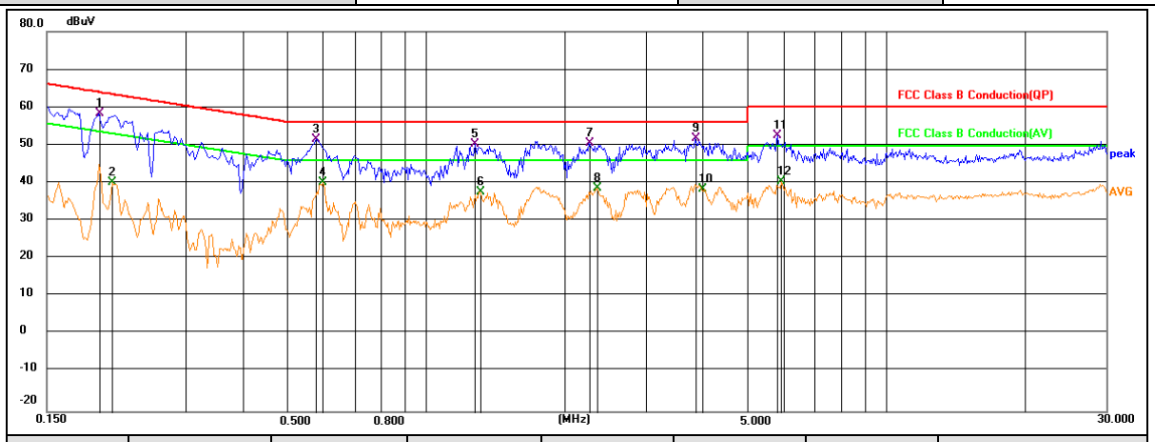
Test Model	ISPROEMUS	Test Mode	Mode 1
Environmental Conditions	23.3℃, 53.7% RH	Test Engineer	Carl Fu
Pol	Neutral	Test Voltage	AC 120V/60Hz



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB)	(dBuV)	(dBuV)	(dB)	
1	0.1951	39.25	19.18	58.43	63.82	-5.39	QP
2	0.2086	21.04	19.19	40.23	53.26	-13.03	AVG
3	0.5775	32.44	19.30	51.74	56.00	-4.26	QP
4	0.6000	21.08	19.28	40.36	46.00	-5.64	AVG
5	1.2795	31.12	19.30	50.42	56.00	-5.58	QP
6	1.3110	18.46	19.30	37.76	46.00	-8.24	AVG
7	2.2695	31.35	19.43	50.78	56.00	-5.22	QP
8	2.3685	19.37	19.43	38.80	46.00	-7.20	AVG
9	3.8581	32.33	19.47	51.80	56.00	-4.20	QP
10	3.9661	19.07	19.47	38.54	46.00	-7.46	AVG
11	5.8201	33.14	19.53	52.67	60.00	-7.33	QP
12	5.9236	21.11	19.54	40.65	50.00	-9.35	AVG

Note: Pre-Scan all mode, Thus record worse case mode result in this report.
Margin=Reading level + Correct - Limit

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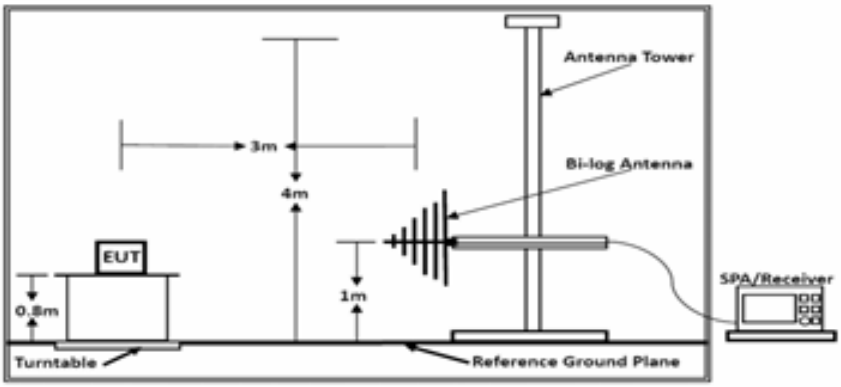
3.2. Radiated emission Measurement

3.2.1. Test Equipment

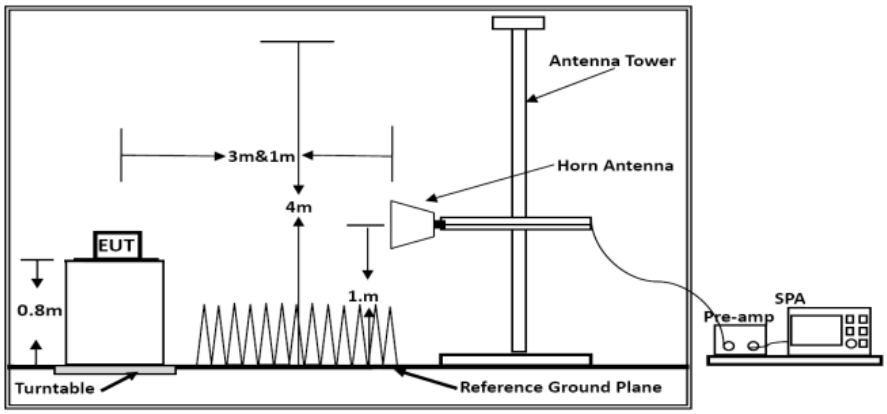
The following test equipments are used during the radiated emission measurement:

Item	Equipment	Manufacturer	Model No.	Serial No.	Cal Date	Due Date
1	EMI Test Software	AUDIX	E3	/	N/A	N/A
2	EMI Test Software	EMC-EZ	EZ	/	N/A	N/A
3	3m Semi Anechoic Chamber	SIDT FRANKONIA	SAC-3M	03CH03-HY	2020-06-22	2021-06-21
4	Positioning Controller	MF	MF7082	MF78020803	2020-06-22	2021-06-21
5	By-log Antenna	SCHWARZBECK	VULB9163	9163-470	2018-07-26	2021-07-25
6	Horn Antenna	SCHWARZBECK	BBHA 9120D	9120D-1925	2018-07-02	2021-07-01
7	EMI Test Receiver	R&S	ESR 7	101181	2020-06-22	2021-06-21
8	RS SPECTRUM ANALYZER	R&S	FSP40	100503	2020-11-21	2021-11-20
9	Broadband Preamplifier	/	BP-01M18G	P190501	2020-06-22	2021-06-21
10	RF Cable-R03m	Jye Bao	RG142	CB021	2020-06-22	2021-06-21
11	RF Cable-HIGH	SUHNER	SUCOFLEX 106	03CH03-HY	2020-06-22	2021-06-21

3.2.2. Block Diagram of Test Setup



Below 1GHz



Above 1GHz

3.2.3. Radiated Emission Limit (Class B)

Limits for Radiated Disturbance Below 1GHz

FREQUENCY MHz	DISTANCE Meters	FIELD STRENGTHS LIMIT	
		μV/m	dB(μV)/m
30 ~ 88	3	100	40
88 ~ 216	3	150	43.5
216 ~ 960	3	200	46
960 ~ 1000	3	500	54

Remark: (1) Emission level (dB)μV = 20 log Emission level μV/m
(2) The smaller limit shall apply at the cross point between two frequency bands.
(3) Distance is the distance in meters between the measuring instrument, antenna and the closest point of any part of the device or system.

Limits for Radiated Emission Above 1GHz

Frequency (MHz)	Distance (Meters)	Peak Limit (dBμV/m)	Average Limit (dBμV/m)
Above 1000	3	74	54

***Note: The lower limit applies at the transition frequency.

3.2.4. EUT Configuration on Measurement

The following equipment are installed on Radiated Emission Measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

3.2.5. Operating Condition of EUT

3.2.5.1.Setup the EUT as shown in Section 3.2.2.
3.2.5.2.Let the EUT work in test Mode 1 and measure it.

3.2.6. Test Procedure

EUT and its simulators are placed on a turntable, which is 0.8 meter high above ground. The turntable can rotate 360 degrees to determine the position of the maximum emission level. EUT is set 3.0 meters away from the receiving antenna, which is mounted on a antenna tower. The antenna can be moved up and down between 1.0 meter and 4 meters to find out the maximum emission level. Broadband antenna (calibrated by-log antenna) is used as receiving antenna. Both horizontal and vertical polarization of the antenna is set on measurement. In order to find the maximum emission levels, all of the interface cables must be manipulated according to ANSI C63.4-2014 on radiated emission measurement.

The bandwidth of the EMI test receiver is set at 120kHz, 300kHz.

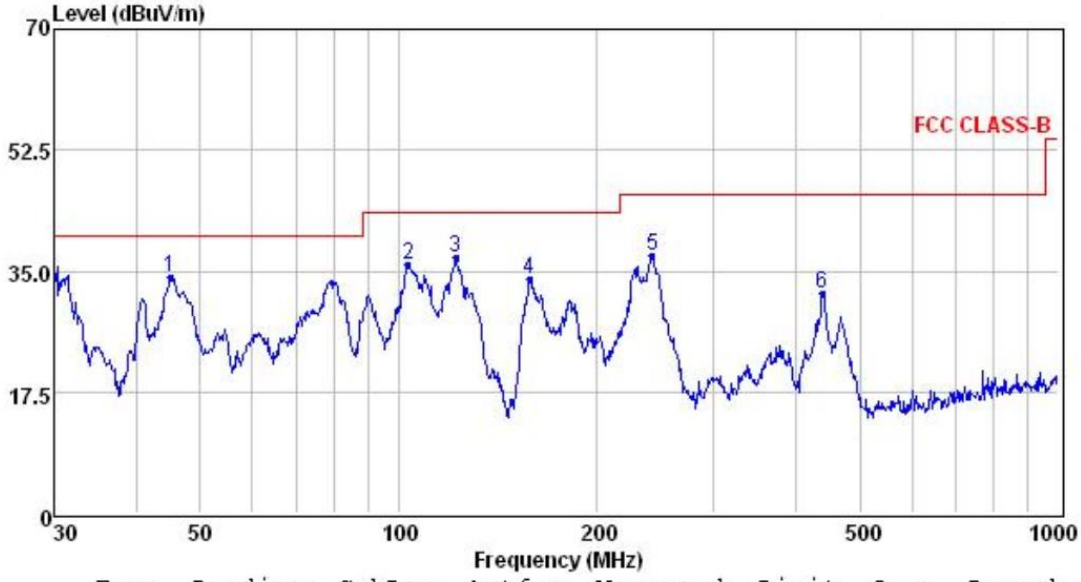
The frequency range from 30MHz to 1000MHz is checked.

3.2.7. Radiated Emission Noise Measurement Result

PASS.
The scanning waveforms please refer to the next page.

For Below 1GHz:

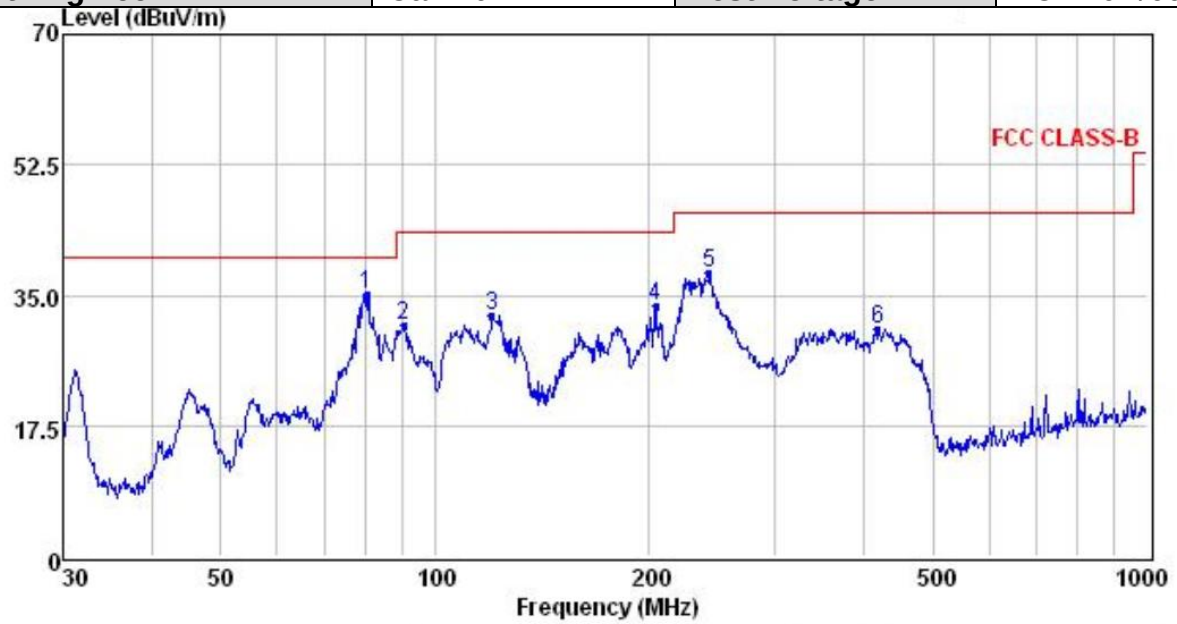
Test Model	ISPROEMUS	**Test Mode**	Mode 1
Environmental Conditions	22.1℃, 51.1% RH	**Detector Function**	Quasi-peak
Pol	Vertical	**Distance**	3m
Test Engineer	Carl Fu	**Test Voltage**	AC 120V/60Hz



	Freq	Reading	CabLos	Antfac	Measured	Limit	Over	Remark
	MHz	dBuV	dB	dB/m	dBuV/m	dBuV/m	dB	
1	45.06	50.22	0.41	13.55	34.19	40.00	-5.81	QP
2	103.44	52.54	0.61	12.85	35.89	43.50	-7.61	QP
3	121.98	56.12	0.70	10.17	36.82	43.50	-6.68	QP
4	158.11	54.65	0.83	8.59	33.80	43.50	-9.70	QP
5	242.53	54.71	0.90	12.08	37.27	46.00	-8.73	QP
6	438.66	45.93	1.27	15.55	31.80	46.00	-14.20	QP

Note: 1. All readings are Quasi-peak values.
2. Measured= Reading + Antenna Factor + Cable Loss
3. The emission that are 20db below the official limit are not reported

Test Model	ISPROEMUS	**Test Mode**	Mode 1
Environmental Conditions	22.7℃, 53.4% RH	**Detector Function**	Quasi-peak
Pol	Horizontal	**Distance**	3m
Test Engineer	Carl Fu	**Test Voltage**	AC 120V/60Hz



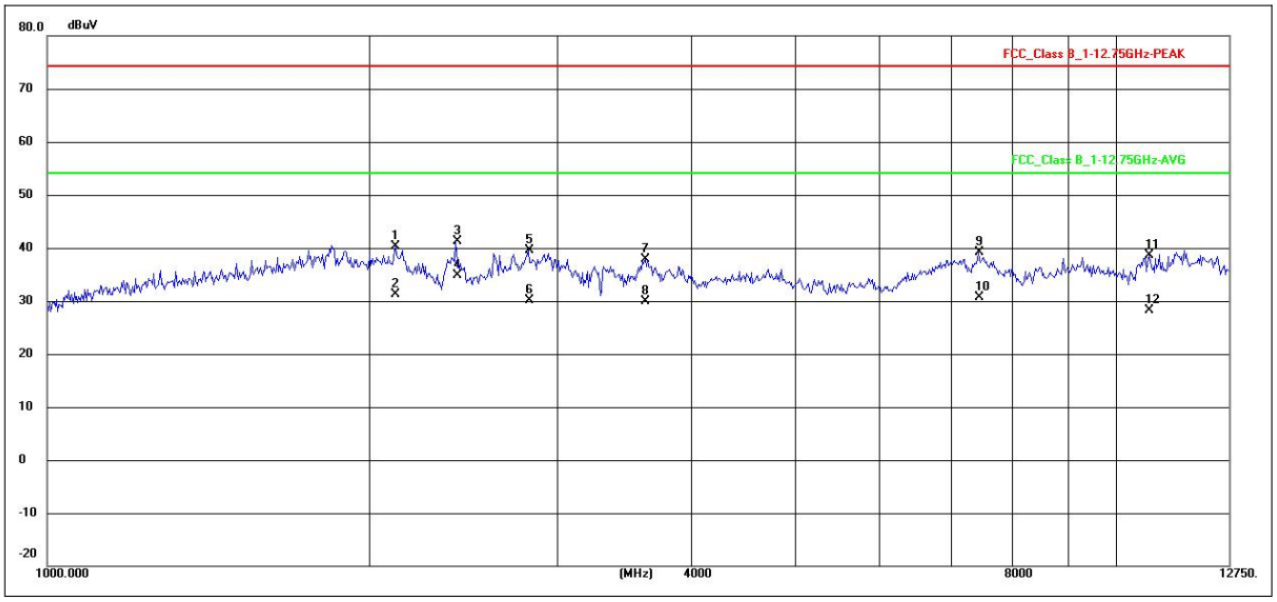
	Freq	Reading	CabLos	Antfac	Measured	Limit	Over	Remark
	MHz	dBuV	dB	dB/m	dBuV/m	dBuV/m	dB	
1	80.08	55.98	0.65	8.57	35.10	40.00	-4.90	QP
2	90.22	48.41	0.68	11.94	30.93	43.50	-12.57	QP
3	120.28	51.38	0.64	10.44	32.29	43.50	-11.21	QP
4	204.24	52.11	0.99	10.70	33.44	43.50	-10.06	QP
5	242.53	55.42	0.90	12.08	37.98	46.00	-8.02	QP
6	419.11	44.59	1.32	15.45	30.47	46.00	-15.53	QP

Note: 1. All readings are Quasi-peak values.
2. Measured= Reading + Antenna Factor + Cable Loss
3. The emission that are 20db below the official limit are not reported

Note: Pre-Scan all mode, Thus record worse case mode result in this report.

For Above 1GHz:

Test Model	ISPROEMUS	**Test Mode**	Mode 1
Environmental Conditions	22.1℃, 51.1% RH	**Detector Function**	Quasi-peak
Pol	Vertical	**Distance**	3m
Test Engineer	Carl Fu	**Test Voltage**	AC 120V/60Hz



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Det.
1	2118.973	49.54	-9.21	40.33	74.00	-33.67	peak
2	2118.973	40.41	-9.21	31.20	54.00	-22.80	AVG
3	2412.718	47.46	-6.31	41.15	74.00	-32.85	peak
4 *	2412.718	41.05	-6.31	34.74	54.00	-19.26	AVG
5	2818.011	43.87	-4.26	39.61	74.00	-34.39	peak
6	2818.011	34.34	-4.26	30.08	54.00	-23.92	AVG
7	3625.669	74.52	-36.68	37.84	74.00	-36.16	peak
8	3625.669	66.51	-36.68	29.83	54.00	-24.17	AVG
9	7432.622	71.02	-31.80	39.22	74.00	-34.78	peak
10	7432.622	62.39	-31.80	30.59	54.00	-23.41	AVG
11	10750.805	64.65	-26.02	38.63	74.00	-35.37	peak
12	10750.805	54.14	-26.02	28.12	54.00	-25.88	AVG

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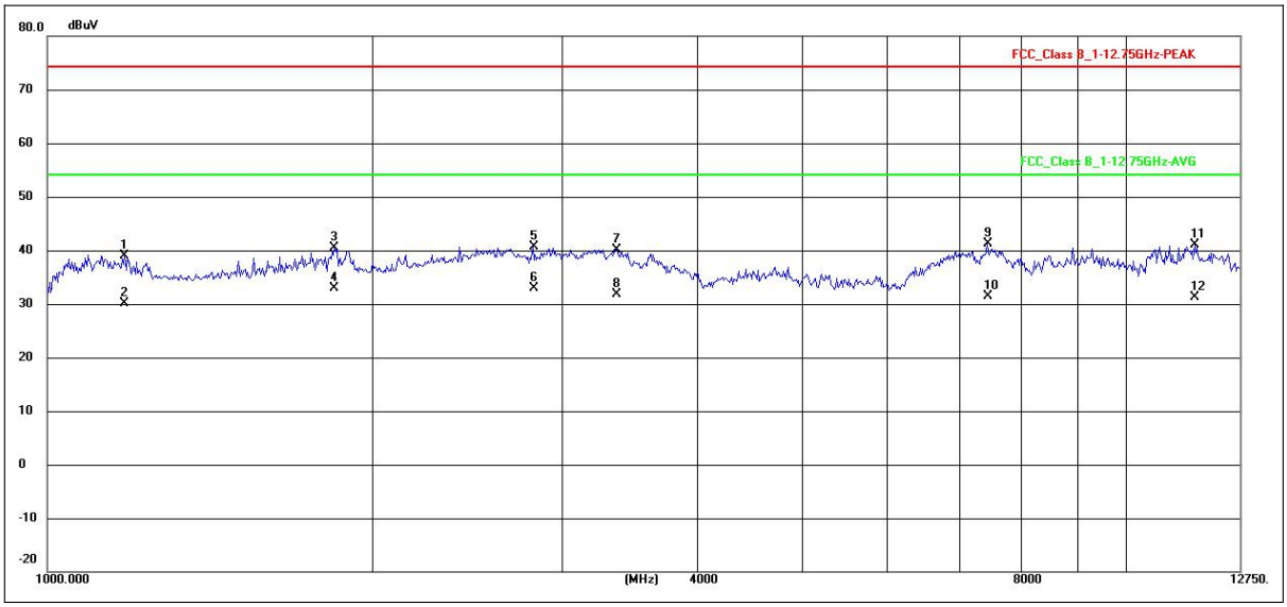
Test Model	ISPROEMUS	**Test Mode**	Mode 1
Environmental Conditions	22.7℃, 53.4% RH	**Detector Function**	Quasi-peak
Pol	Horizontal	**Distance**	3m
Test Engineer	Carl Fu	**Test Voltage**	AC 120V/60Hz



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Det.
1	1179.935	54.83	-15.96	38.87	74.00	-35.13	peak
2	1179.935	46.02	-15.96	30.06	54.00	-23.94	AVG
3	1846.834	51.25	-10.82	40.43	74.00	-33.57	peak
4 *	1846.834	43.78	-10.82	32.96	54.00	-21.04	AVG
5	2818.011	44.87	-4.26	40.61	74.00	-33.39	peak
6	2818.011	37.16	-4.26	32.90	54.00	-21.10	AVG
7	3376.244	77.04	-36.93	40.11	74.00	-33.89	peak
8	3376.244	68.69	-36.93	31.76	54.00	-22.24	AVG
9	7432.622	73.02	-31.80	41.22	74.00	-32.78	peak
10	7432.622	63.15	-31.80	31.35	54.00	-22.65	AVG
11	11574.461	65.18	-24.23	40.95	74.00	-33.05	peak
12	11574.461	55.41	-24.23	31.18	54.00	-22.82	AVG

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4. PHOTOGRAPH

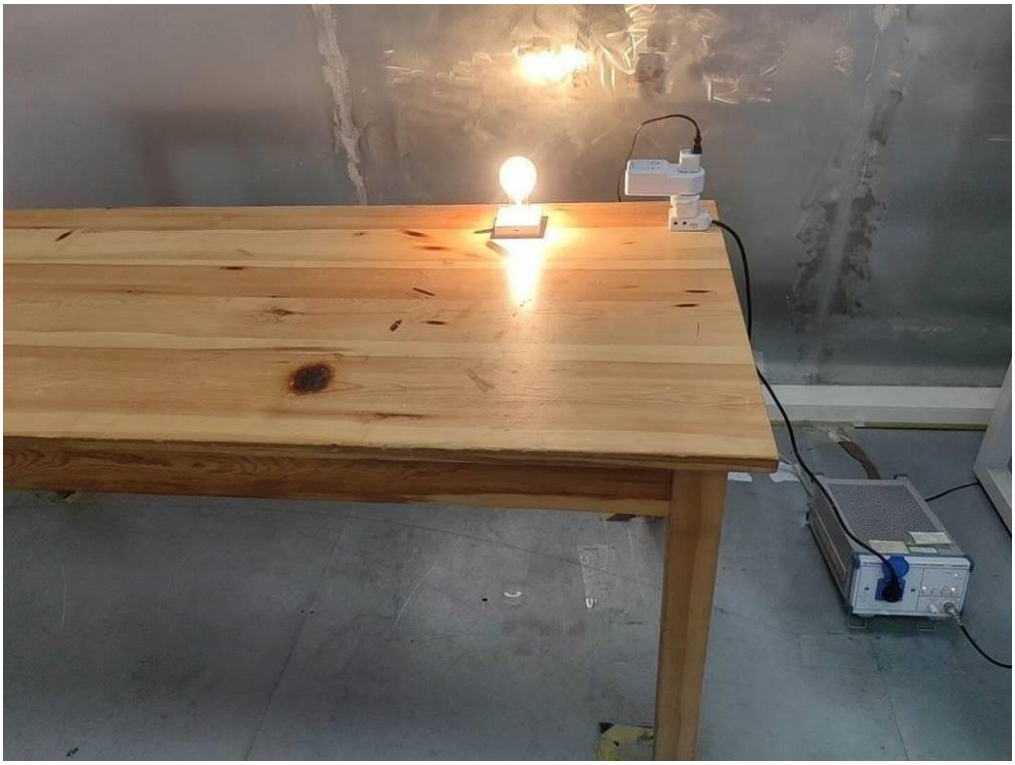

Photo of Power Line Conducted Measurement

Photo of Radiated Emission Measurement (Below 1G)

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Photo of Radiated Emission Measurement (Above 1G)

This report shall not be reproduced except in full, without the written approval of Shenzhen LCS Compliance Testing Laboratory Ltd.

5. EXTERNAL AND INTERNAL PHOTOS OF THE EUT

Fig. 1

Fig. 2

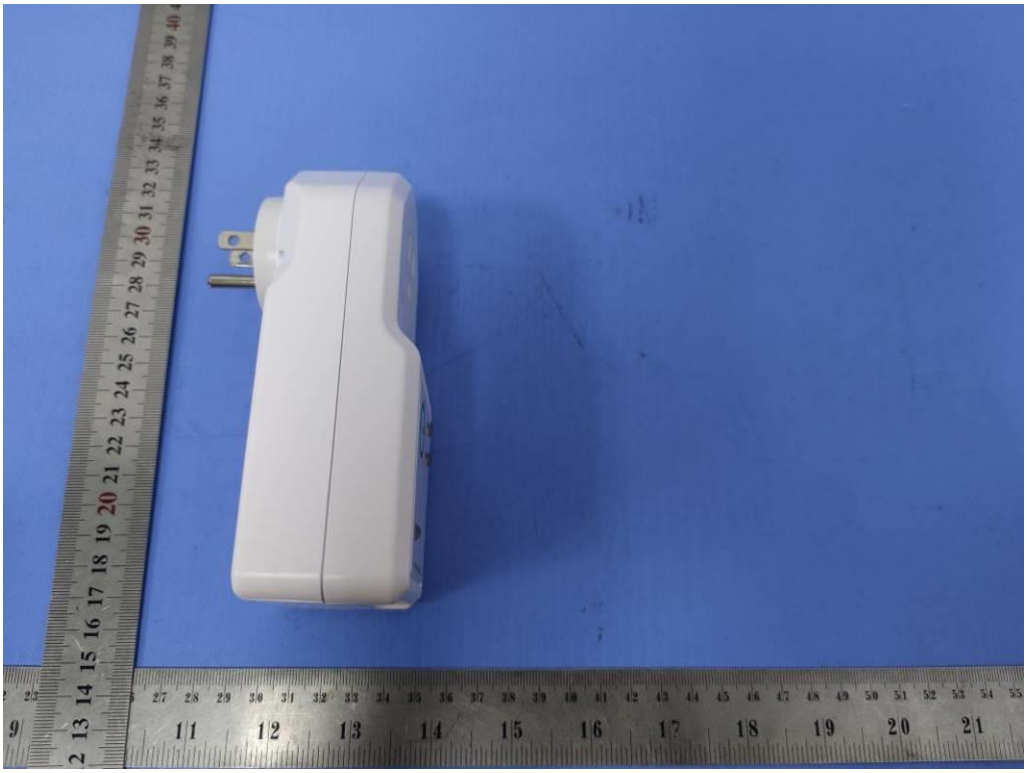

Fig. 3

Fig. 4

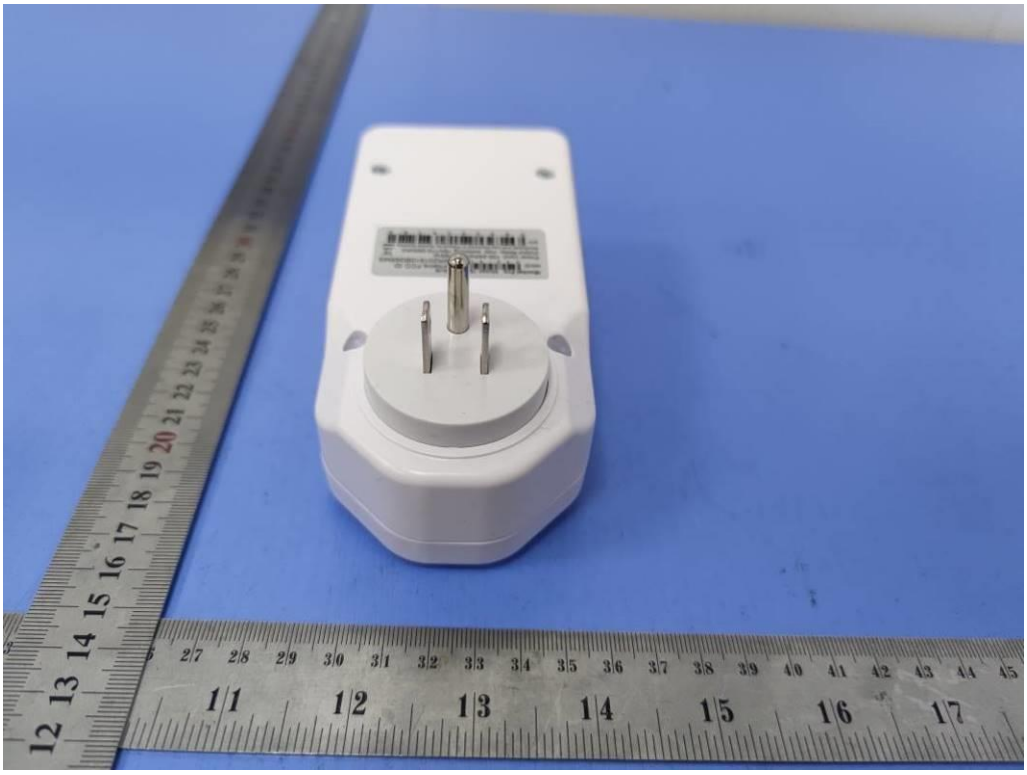

Fig. 5

Fig. 6

Fig. 7

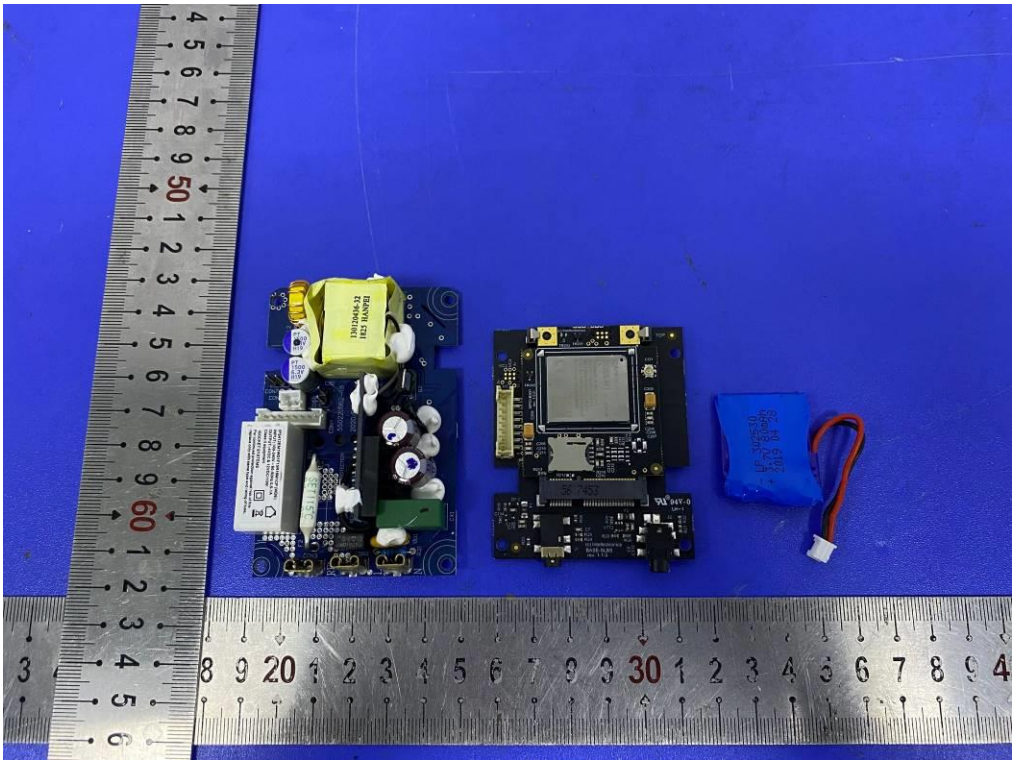

Fig. 8

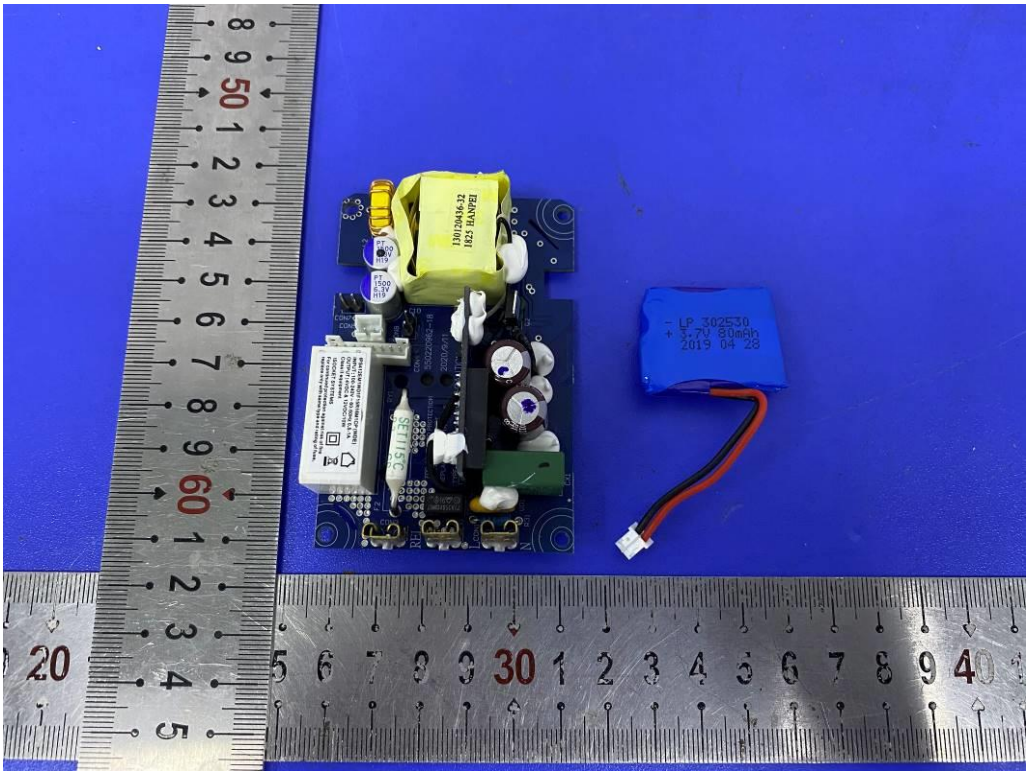
130120436-32
1825 HANFEI
- LP 302530
+ 3.7V 80mAh
2019 04 28

Fig. 9

QUECTEL
BG95-M3 Q1-A4448
LA
BG95M3LA-64-SGNS
IMEI:864475040105065
FCC ID: XMR2019108G95M3
IC:10224A-2019BG95M3
MPCI-BG91
REV 1.0.0

Fig. 10

Fig. 11

----------THE END OF TEST REPORT----------