



Shenzhen CTL Electromagnetic Technology Co., Ltd.
Tel: +86-755-89486194 Fax: +86-755-26636041

FCC Part 15 Subpart B Test Report

FCC PART 15 Subpart B Class B: 2014

Report Reference No.: CTL1501300293-F

Compiled by

(position+printed name+signature)...: File administrators Jennifer NI

Name of the organization performing the tests

Test Engineer Jacky Chen

(position+printed name+signature)...

Approved by

(position+printed name+signature)...: Manager Tracy Qi

Date of issue.....: Feb. 29, 2016

Representative Laboratory Name : Shenzhen CTL Electromagnetic Technology Co., Ltd.

Address.....: Floor 1-A, Baisha Technology Park, No.3011, Shahexi Road, Nanshan District, Shenzhen, China 518055

Test Firm.....: Shenzhen CTL Electromagnetic Technology Co., Ltd.

Address.....: Floor 1-A, Baisha Technology Park, No.3011, Shahexi Road, Nanshan District, Shenzhen, China 518055

Applicant's name.....:

Address.....:

Test specification:

Standard: FCC PART 15 Subpart B Class B: 2014

TRF Originator.....: Shenzhen CTL Electromagnetic Technology Co., Ltd.

Master TRF.....: Dated 2011-01

Shenzhen CTL Electromagnetic Technology Co., Ltd.

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Test item description: Power Bank

Trade Mark: N/A

Model/Type reference.....: P324.011

Listed Models: /

Power Supply.....: DC 5V

Result.....: Positive

FCC Test Report

Test Report No. :	CTL1501300293-F	Feb. 29, 2016
		Date of issue

Equipment under Test : Power Bank

Type / Model : P324.011

Listed Models : /

Applicant :

Address :

Manufacturer :

Address :

Test Result according to the standards on page 4:	Positive
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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.

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1. TEST STANDARDS

The tests were performed according to following standards:

[FCC Rules Part 15 Subpart B - Unintentional Radiators](#)

[ANSI C63.4-2003](#)



2. SUMMARY

2.1. General Remarks

Date of receipt of test sample : Feb. 25, 2016

Testing commenced on : Feb. 26, 2016

Testing concluded on : Feb. 29, 2016

2.2. Equipment Under Test

Power supply system utilised

Power supply voltage : ☐ 120V / 60 Hz ☐ 115V / 60Hz
☐ 12 V DC ☐ 24 V DC
☒ Other (specified in blank below)

DC 5V

2.3. Short description of the Equipment under Test (EUT)

Power Bank.

For more details, refer to the user's manual of the EUT.

Serial number: P324.011

2.4. EUT operation mode

The EUT has been tested under typical operating condition.

2.5. EUT configuration

The following peripheral devices and interface cables were connected during the measurement:

- - supplied by the manufacturer
- - supplied by the lab

2.6. Related Submittal(s) / Grant (s)

This test report is intended for P324.011 filing to comply with the FCC Part 15, Subpart B Rules.

2.7. Modifications

No modifications were implemented to meet testing criteria.

2.8. Test Result Summary

Test Item	Test Requirement	Standard Paragraph	Result
Radiated Emission	FCC PART 15 Subpart B Class B: 2014	Section 15.109	PASS
Conducted Emission	FCC PART 15 Subpart B Class B: 2014	Section 15.107	N/A



3. TEST ENVIRONMENT

3.1. Address of the test laboratory

Shenzhen CTL Electromagnetic Technology Co., Ltd.
Floor 1-A, Baisha Technology Park, No. 3011, Shahexi Road, Nanshan, Shenzhen 518055 China

There is one 3m semi-anechoic chamber and two line conducted labs for final test. The Test Sites meet the requirements in documents ANSI C63.4 and CISPR 22/EN 55022 requirements.

3.2. Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

IC Registration No.: 9618A

The 3m alternate test site of Shenzhen CTL Electromagnetic Technology Co., Ltd. EMC Laboratory has been registered by Certification and Engineer Bureau of Industry Canada for the performance of with Registration NO.: 9618A on May, 2011.

FCC-Registration No.: 807767

Shenzhen CTL Electromagnetic Technology Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration 807767, June 27, 2011.

3.3. Environmental conditions

During the measurement the environmental conditions were within the listed ranges:

Temperature:	15-35 ° C
Humidity:	30-60 %
Atmospheric pressure:	950-1050mbar

3.4. 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 Shenzhen CTL Electromagnetic Technology Co., Ltd 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.

Hereafter the best measurement capability for CTL laboratory is reported:

Test	Range	Measurement Uncertainty	Notes
Radiated Emission	30~1000MHz	±3.56dB	(1)
Radiated Emission	1~12.75GHz	±4.32dB	(1)
Conducted Emission	0.15~30MHz	±2.66dB	(1)

(1) This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

3.5. Equipments Used during the Test

Radiated Emission					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	ULTRA-BROADBAND ANTENNA	Sunol Sciences Corp.	JB1 Antenna	A061713	2014/04
2	EMI TEST RECEIVER	ROHDE & SCHWARZ	ESPI	1164.6407.07	2014/04
3	RF TEST PANEL	ROHDE & SCHWARZ	TS / RSP	335015/ 0017	2014/04
4	Controller	EM Electronics	Controller EM 1000	N/A	2014/04
5	EMI TEST SOFTWARE	ROHDE & SCHWARZ	ESK1	N/A	2014/04

Conducted Emission					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	EMI Test Receiver	ROHDE & SCHWARZ	ESCI	1166.5950.03	2014/04
2	LISN	ROHDE & SCHWARZ	ENV216	101034	2014/04
4	EMI Test Software	ROHDE & SCHWARZ	ESK1	N/A	2014/04

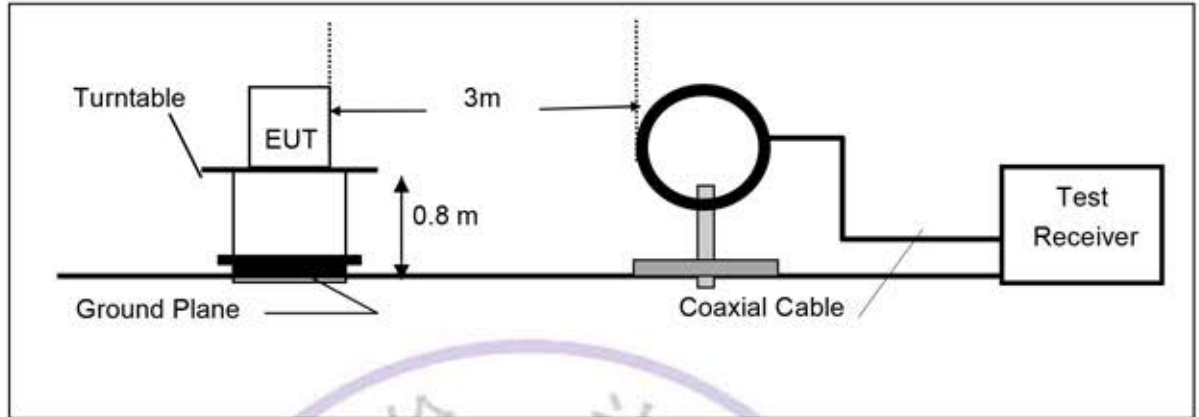


4. TEST CONDITIONS AND RESULTS

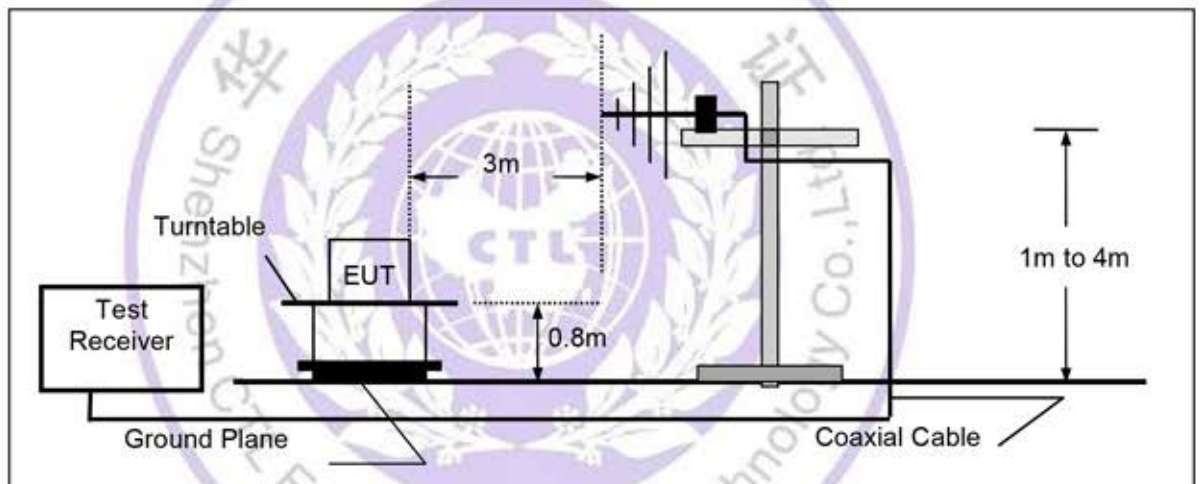
4.1. Radiated Emission Test

TEST CONFIGURATION

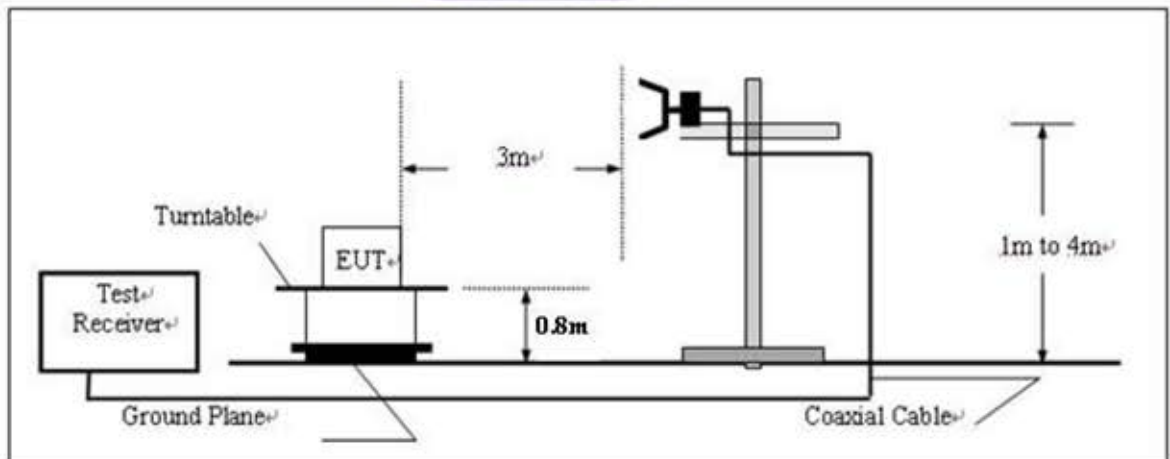
(A) Radiated Emission Test Set-Up, Frequency Below 30MHz



(B) Radiated Emission Test Set-Up, Frequency below 1000MHz



(C) Radiated Emission Test Set-Up, Frequency above 1000MHz



Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor and subtracting the Amplifier Gain and Duty Cycle Correction Factor(if any) from the measured reading. The basic equation with a sample calculation is as follows:

$$FS = RA + AF + CL - AG$$

Where FS = Field Strength	CL = Cable Attenuation Factor (Cable Loss)
RA = Reading Amplitude	AG = Amplifier Gain
AF = Antenna Factor	

RADIATION LIMIT

For unintentional device, according to § 15.109(a), except for Class A digital devices, the field strength of radiated emissions from unintentional radiators at a distance of 3 meters shall not exceed the following values:

Frequency (MHz)	Distance (Meters)	Radiated (dBμV/m)	Radiated (μV/m)
30-88	3	40.0	100
88-216	3	43.5	150
216-960	3	46.0	200
Above 960	3	54.0	500

For intentional device, according to § 15.209(a), the general requirement of field strength of radiated emissions from intentional radiators at a distance of 3 meters shall not exceed the above table.

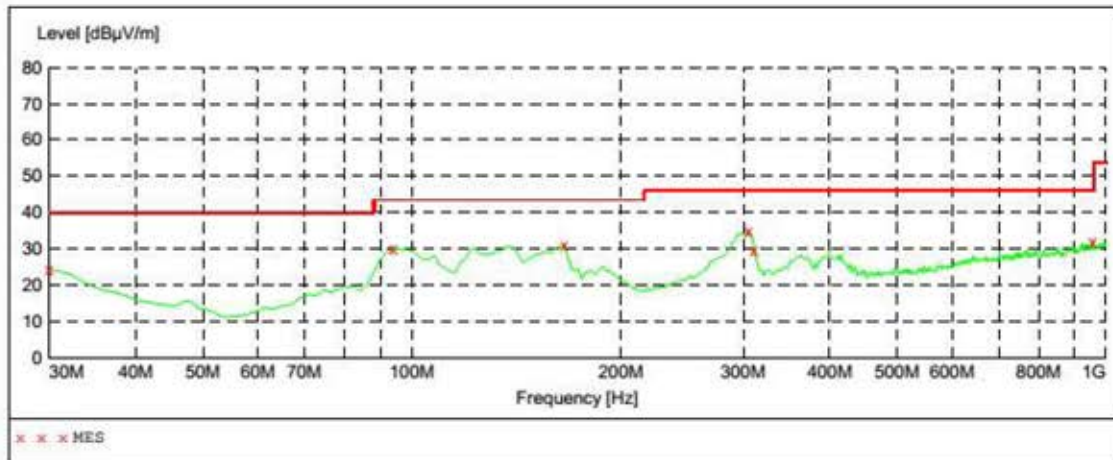
Test Procedure

1. The EUT is placed on a turntable, which is 0.8m above ground plane.
2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emissions.
4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
5. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
6. Repeat above procedures until the measurements for all frequencies are complete.

Radiation Test Results

SWEEP TABLE: "test (30M-1G)"

Short Description:		Field Strength			
Start	Stop	Detector	Meas.	IF	Transducer
Frequency	Frequency		Time	Bandw.	
30.0 MHz	1.0 GHz	MaxPeak	300.0 ms	120 kHz	JB1

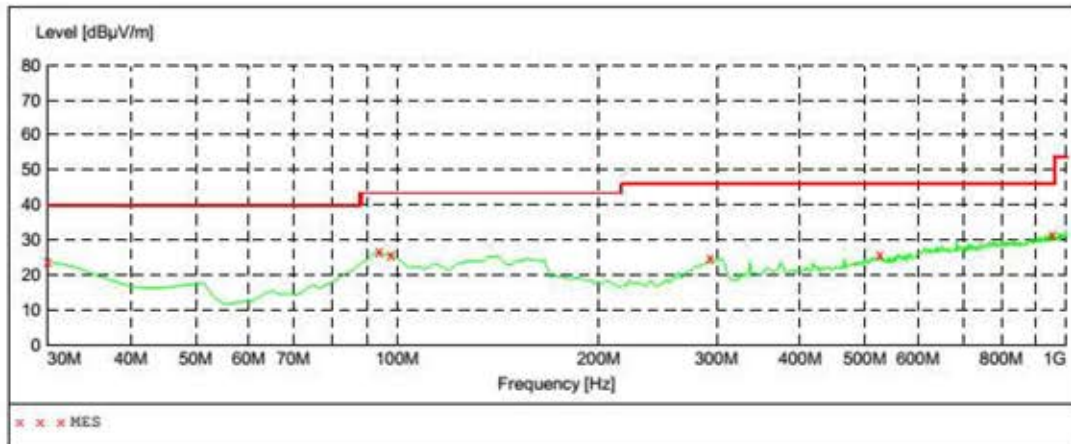
***MEASUREMENT RESULT:***

Frequency MHz	Level dBμV/m	Transd dB	Limit dBμV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
30.000000	24.30	21.1	40.0	15.7	---	0.0	0.00	HORIZONTAL
94.020000	30.20	10.2	43.5	13.3	---	0.0	0.00	HORIZONTAL
165.800000	31.00	13.8	43.5	12.5	---	0.0	0.00	HORIZONTAL
305.480000	35.00	15.5	46.0	11.0	---	0.0	0.00	HORIZONTAL
311.300000	29.50	15.7	46.0	16.5	---	0.0	0.00	HORIZONTAL
957.320000	31.80	26.7	46.0	14.2	---	0.0	0.00	HORIZONTAL



SWEEP TABLE: "test (30M-1G)"

Short Description:		Field Strength			Transducer
Start	Stop	Detector	Meas. Time	IF Bandw.	
30.0 MHz	1.0 GHz	MaxPeak	300.0 ms	120 kHz	JB1

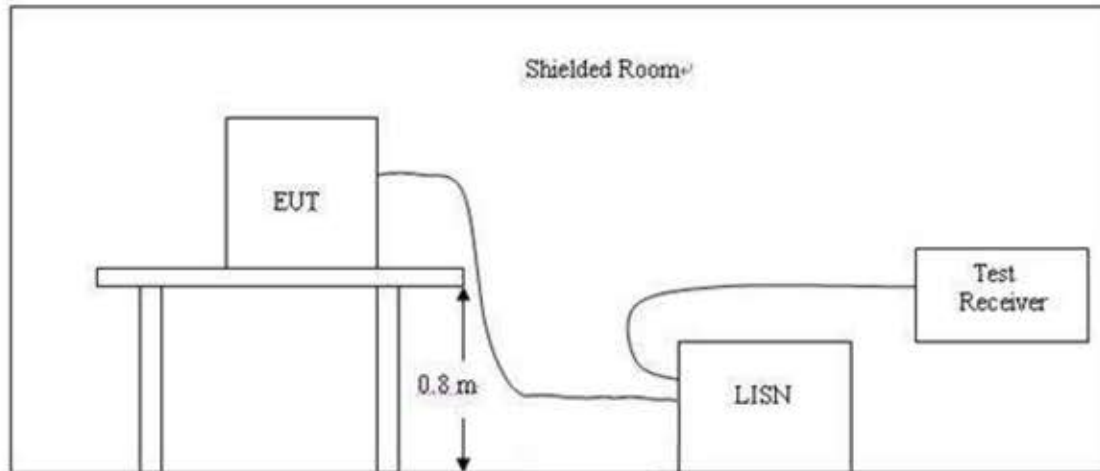
***MEASUREMENT RESULT:***

Frequency MHz	Level dBμV/m	Transd dB	Limit dBμV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
30.000000	23.80	21.1	40.0	16.2	---	0.0	0.00	VERTICAL
94.020000	26.60	10.2	43.5	16.9	---	0.0	0.00	VERTICAL
97.900000	25.70	11.1	43.5	17.8	---	0.0	0.00	VERTICAL
293.840000	24.70	15.4	46.0	21.3	---	0.0	0.00	VERTICAL
526.640000	25.80	20.5	46.0	20.2	---	0.0	0.00	VERTICAL
953.440000	31.60	26.7	46.0	14.4	---	0.0	0.00	VERTICAL



4.2. Conducted Emissions Test

TEST CONFIGURATION



TEST PROCEDURE

- 1 The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. The EUT is a tabletop system, a wooden table with a height of 0.8 meters is used and is placed on the ground plane as per ANSI C63.4.
- 2 Support equipment, if needed, was placed as per ANSI C63.4.
- 3 All I/O cables were positioned to simulate typical actual usage as per ANSI C63.4.
- 4 The EUT received power through a Line Impedance Stabilization Network (LISN) which supplied power source and was grounded to the ground plane.
- 5 All support equipments received AC power from a second LISN, if any.
- 6 The EUT test program was started. Emissions were measured on each current carrying line of the EUT using a spectrum Analyzer / Receiver connected to the LISN powering the EUT. The LISN has two monitoring points: Line 1 (Hot Side) and Line 2 (Neutral Side). Two scans were taken: one with Line 1 connected to Analyzer / Receiver and Line 2 connected to a 50 ohm load; the second scan had Line 1 connected to a 50 ohm load and Line 2 connected to the Analyzer / Receiver.
- 7 Analyzer / Receiver scanned from 150 KHz to 30MHz for emissions in each of the test modes.
- 8 During the above scans, the emissions were maximized by cable manipulation.

Conducted Power Line Emission Limit

For unintentional device, according to § 15.107(a) Line Conducted Emission Limits is as following :

Frequency (MHz)	Maximum RF Line Voltage (dBµV)			
	CLASS A		CLASS B	
	Q.P.	Ave.	Q.P.	Ave.
0.15 - 0.50	79	66	66-56*	56-46*
0.50 - 5.00	73	60	56	46
5.00 - 30.0	73	60	60	50

* Decreasing linearly with the logarithm of the frequency

For intentional device, according to §15.207(a) Line Conducted Emission Limit is same as above table.

TEST RESULTS

The test is not applicable.

5. Test Setup Photos of the EUT



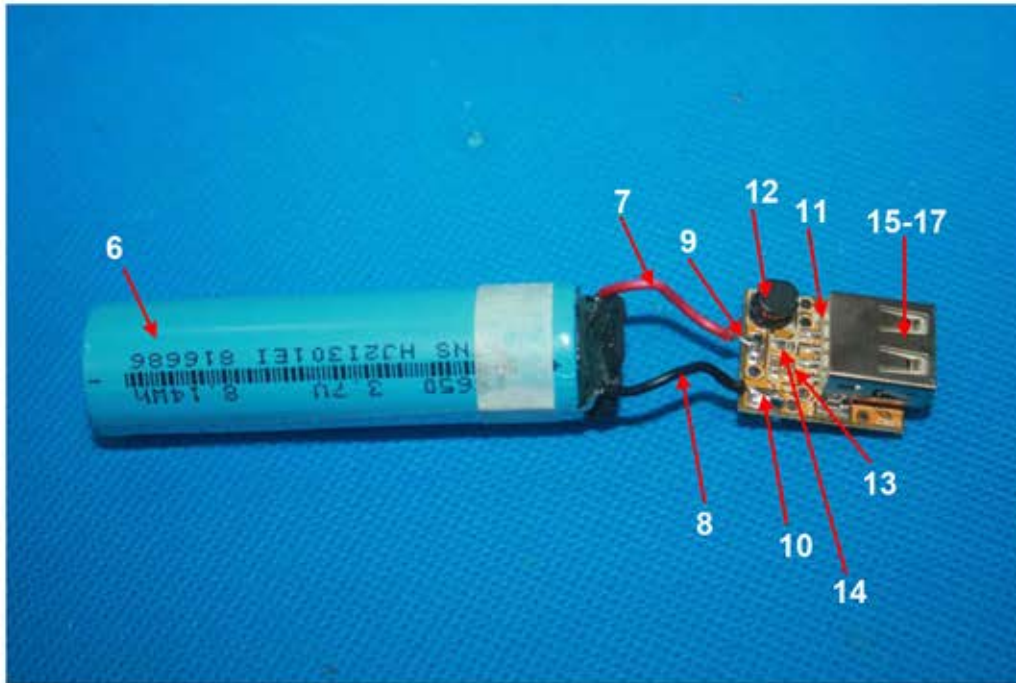
6. Photos of the EUT

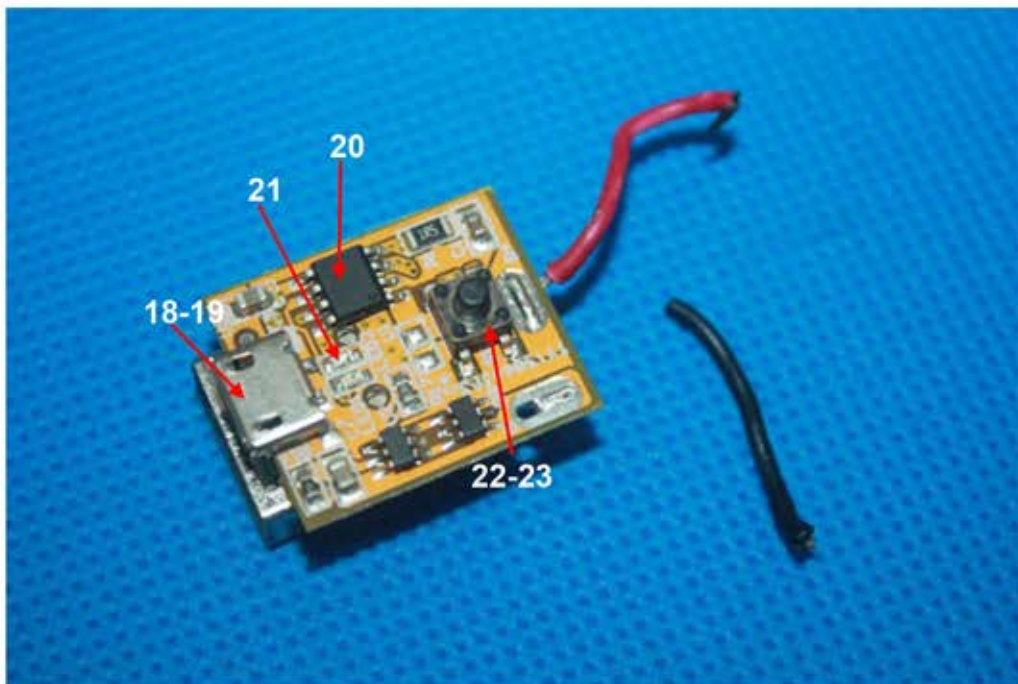
Photograph of Sample



Photo(s) of the tested component(s)







.....End of Report.....

