



TEST REPORT

FCC PART 15 SUBPART C

Report Reference No.: CTL1911076011-WF

Compiled by: Happy Guo
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NICE NONG

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Ivan Xie

Product Name.....: Wireless Charging Power bank

Model/Type reference: XB-001

List Model(s).....: XB-002, XB-003, XB-004, XB-005

Trade Mark: N/A

FCC ID: 2ASN6-XB-001

Applicant's name: **Moxie corporation**

Address of applicant: 10F.-1, No.34, Sec.1, Fuxing S.Rd., Zhongshan Dist., Taipei City
104, Taiwan(R.O.C.)

Test Firm: **Shenzhen CTL Testing Technology Co., Ltd.**

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

Test specification.....:

Standard.....: **FCC Rules Part 15.207,15.209, 15.215(c)**
ANSI C63.10-2013

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

Master TRF: Dated 2011-01

Date of Receipt.....: Nov. 09, 2019

Date of sampling: Nov. 09, 2019

Date of Test Date.....: Nov. 09, 2019-Mar. 14, 2020

Data of Issue.....: Mar. 14, 2020

Result.....: Pass

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TEST REPORT

Test Report No. :	CTL1911076011-WF	Mar. 14, 2020 Date of issue
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Equipment under Test : Wireless Charging Power bank

Model /Type : XB-001

Listed Models : XB-002, XB-003, XB-004, XB-005

Applicant : **Moxie corporation**

Address : 10F.-1, No.34, Sec.1, Fuxing S.Rd., Zhongshan Dist.,
Taipei City 104, Taiwan(R.O.C.)

Manufacturer : **Shenzhen le chuang sheng technology CO.,Ltd**

Address : 6 Floor, Building B, Phase 3, Fuan Industrial Zone,
Fengtang Avenue, Fuyong Street, Baoan District,
Shenzhen City, China.

Test result	Pass *
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*In the configuration tested, the EUT complied with the standards specified page 5.

The test results presented in this report relate only to the object tested.

This report shall not be reproduced, except in full, without the written approval of the issuing testing laboratory.

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1. SUMMARY

1.1. TEST STANDARDS

The tests were performed according to following standards:

[FCC Rules Part 15.207, 15.209, 15.215\(c\)](#)

[ANSI C63.10: 2013](#): American National Standard for Testing Unlicensed Wireless Devices

1.2. Test Description

Test Item	Test Standards	Test Result
Electric Field Radiated Emissions	FCC Part 15 C (Section15.209)	PASS
20dB Bandwidth/99% Bandwidth	FCC Part 15 C (Section15.215(c))	PASS
Conducted Emissions	FCC Part 15 C (Section15.207)	PASS

1.3. Test Facility

1.3.1 Address of the test laboratory

Shenzhen CTL Testing 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 32/EN 55032 requirements.

1.3.2 Laboratory accreditation

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

CNAS-Lab Code: L7497

Shenzhen CTL Testing Technology Co., Ltd. has been assessed and proved to be in compliance with CNAS-CL01 Accreditation Criteria for Testing and Calibration Laboratories (identical to ISO/IEC 17025: 2005 General Requirements) for the Competence of Testing and Calibration Laboratories.

A2LA-Lab Cert. No. 4343.01

Shenzhen CTL Testing Technology Co., Ltd. EMC Laboratory has been accredited by A2LA for technical competence in the field of electrical testing, and proved to be in compliance with ISO/IEC 17025: 2005 General Requirements for the Competence of Testing and Calibration Laboratories and any additional program requirements in the identified field of testing.

IC Registration No.: 9618B

CAB identifier: CN0041

The 3m alternate test site of Shenzhen CTL Testing Technology Co., Ltd. EMC Laboratory has been registered by Innovation, Science and Economic Development Canada to test to Canadian radio equipment requirements with Registration No.: 9618B on Jan. 22, 2019.

FCC-Registration No.: 399832

Designation No.: CN1216

Shenzhen CTL Testing 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 399832, December 08, 2017.

1.4. 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 Testing 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	Measurement Uncertainty	Notes
Transmitter power conducted	±0.57 dB	(1)
Transmitter power Radiated	±2.20 dB	(1)
Conducted spurious emission 9KHz-40 GHz	±2.20 dB	(1)
Occupied Bandwidth	±0.01ppm	(1)
Radiated Emission 30~1000MHz	±4.10dB	(1)
Radiated Emission Above 1GHz	±4.32dB	(1)

Conducted Disturbance0.15~30MHz	$\pm 3.20\text{dB}$	(1)
---------------------------------	---------------------	-----

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

2. GENERAL INFORMATION

2.1. Environmental conditions

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

Normal Temperature:	25°C
Relative Humidity:	55 %
Air Pressure:	101 kPa

2.2. General Description of EUT

Product Name:	Wireless Charging Power bank
Model/Type reference:	XB-001
DC Input :	5V2A / 9V1.6A
Wireless Charging output:	10W
Operation frequency:	115KHz~205KHz
Antenna type:	Loop Antennas
Antenna gain:	0dBi

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

2.3. Special Accessories

Manufacturer	Description	Model	Serial Number	Provided by laboratories	Note
DELL	Notebook PC	Vostro 14	N/A	Yes	/
Samsung	Phone	Galaxy s7	35615607721414	Yes	/
HUAWEI	adapter	HW-200325CP0	C973Y1K2N01930	Yes	Input:100-240V~ 50/60Hz,1.8A Output:5V/2A,9V /2A,12V/2A,15V/ 3A,20V/3.25A

2.4. Test Mode

Test Mode	
Mode1	Battery powered
Mode2	USB power supply (Other voltages have been tested and 9V-1.6 A is the worst mode.)

2.5. Equipments Used during the Test

Test Equipment	Manufacturer	Model No.	Serial No.	Calibration Date	Calibration Due Date
LISN	R&S	ESH2-Z5	860014/010	2019/05/21	2020/05/20
Double cone logarithmic antenna	Schwarzbeck	VULB 9168	824	2019/05/23	2020/05/22
Horn Antenna	Ocean Microwave	OBH100400	26999002	2019/11/28	2020/11/27
EMI Test Receiver	R&S	ESCI	1166.5950.03	2019/05/21	2020/05/20
Spectrum Analyzer	Agilent	E4407B	MY41440676	2019/05/20	2020/05/19
Spectrum Analyzer	Agilent	N9020A	US46220290	2019/05/20	2020/05/19
Spectrum Analyzer	Keysight	N9020A	MY53420874	2019/05/20	2020/05/19
Controller	EM Electronics	EM 1000	060859	2019/05/21	2020/05/20
Horn Antenna	Sunol Sciences Corp.	DRH-118	A062013	2019/05/23	2020/05/22
Active Loop Antenna	Da Ze	ZN30900A	/	2019/05/23	2020/05/22
Amplifier	Agilent	8449B	3008A02306	2019/05/21	2020/05/20
Amplifier	Agilent	8447D	2944A10176	2019/05/21	2020/05/20
Amplifier	Brief&Smart	LNA-4018	2104197	2019/05/20	2020/05/19
Temperature/Humidity Meter	Gangxing	CTH-608	02	2019/05/22	2020/05/21
Power Sensor	Agilent	U2021XA	MY55130004	2019/05/20	2020/05/19
Power Sensor	Agilent	U2021XA	MY55130006	2019/05/20	2020/05/19
Power Sensor	Agilent	U2021XA	MY54510008	2019/05/20	2020/05/19
Power Sensor	Agilent	U2021XA	MY55060003	2019/05/20	2020/05/19
Spectrum Analyzer	RS	FSP	1164.4391.38	2019/05/20	2020/05/19
Test Software					
Name of Software			Version		
TST-PASS			1.0.2		
ES-K1(Below 1GHz)			V1.71		
e3(Above 1GHz)			6.111221a		

The calibration interval was one year

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

This submittal(s) (test report) is intended to comply with FCC Part 15, Subpart C Rules.

2.7. Modifications

No modifications were implemented to meet testing criteria.

3. TEST CONDITIONS AND RESULTS

3.1. Conducted Emissions Test

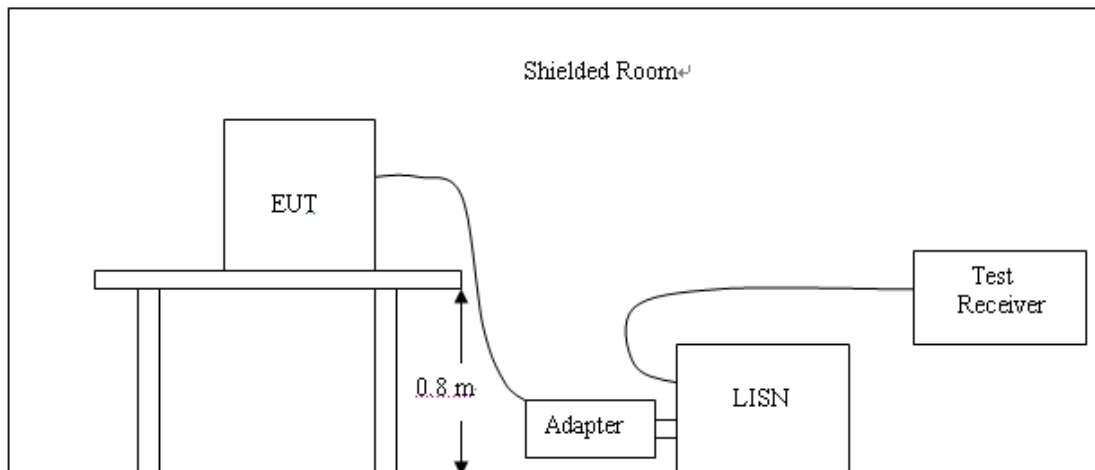
LIMIT

FCC CFR Title 47 Part 15 Subpart C Section 15.207

Frequency range (MHz)	Limit (dBuV)	
	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.

TEST CONFIGURATION



TEST PROCEDURE

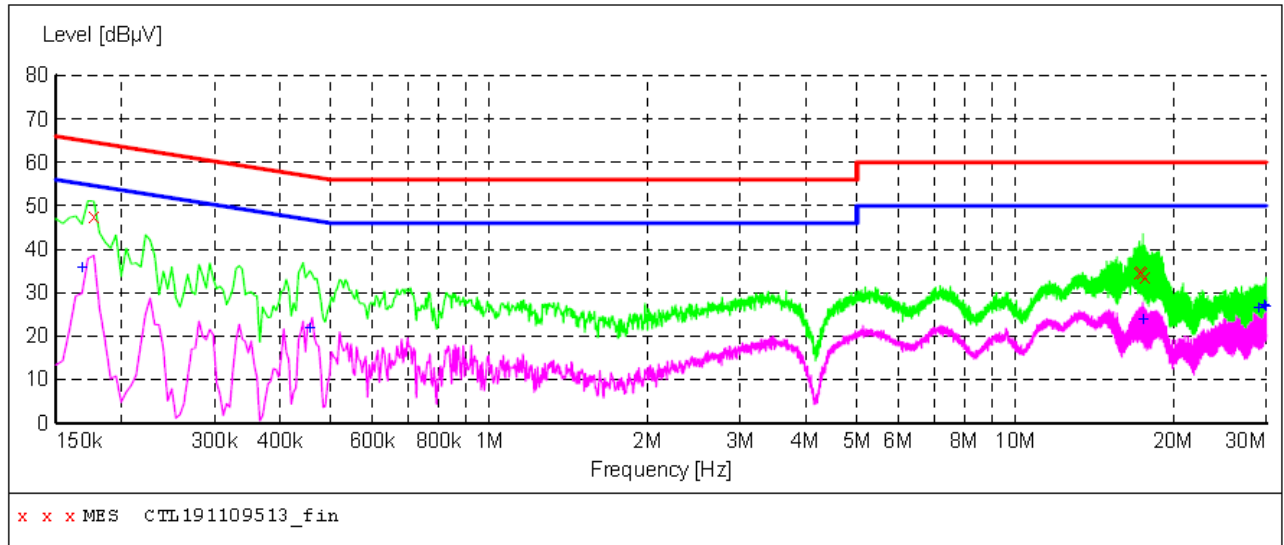
1. The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. The EUT is a tabletop system; a wooden table with a height of 0.8 meters is used and is placed on the ground plane as per ANSI C63.10:2013.
2. Support equipment, if needed, was placed as per ANSI C63.10:2013.
3. All I/O cables were positioned to simulate typical actual usage as per ANSI C63.10:2013.
4. The adapter received AC120V/60Hz 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.

TEST RESULTS

Note: Both power supply modes have been tested, and the following data are the worst

SCAN TABLE: "Voltage (9K-30M) FIN"

Short Description: 150K-30M Voltage



MEASUREMENT RESULT: "CTL191109513_fin"

11/9/2019 3:54PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.177000	47.50	10.1	65	17.1	QP	L1	GND
17.160000	34.60	11.0	60	25.4	QP	L1	GND
17.272500	35.10	11.0	60	24.9	QP	L1	GND
17.286000	35.00	11.0	60	25.0	QP	L1	GND
17.421000	34.70	11.0	60	25.3	QP	L1	GND
17.646000	33.60	11.0	60	26.4	QP	L1	GND

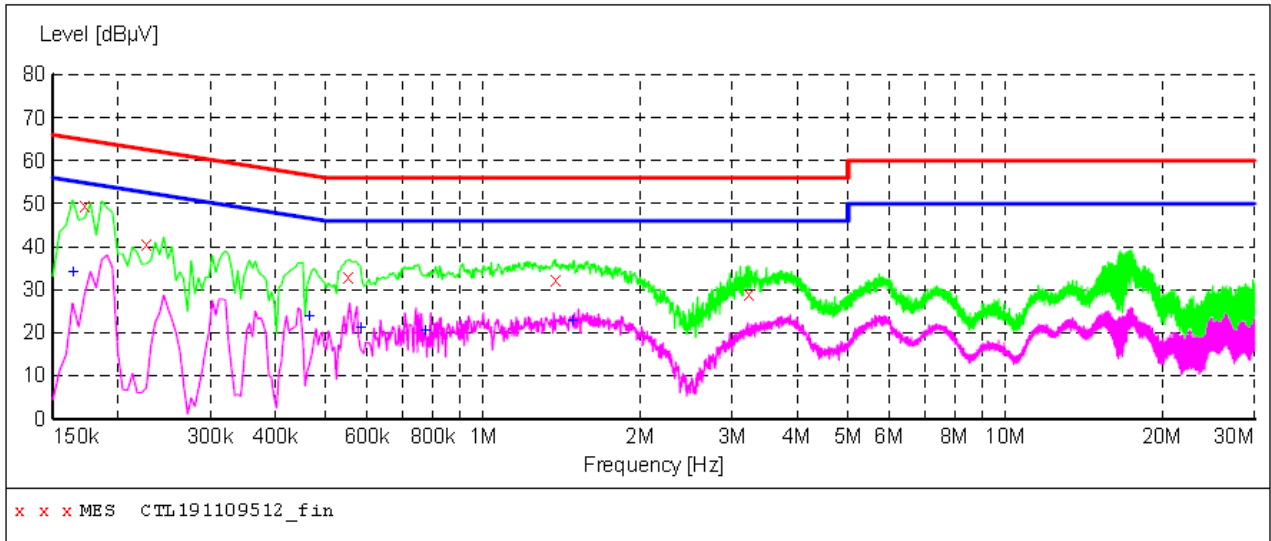
MEASUREMENT RESULT: "CTL191109513_fin2"

11/9/2019 3:54PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.168000	35.70	10.1	55	19.4	AV	L1	GND
0.456000	21.90	10.1	47	24.9	AV	L1	GND
17.470500	23.60	11.0	50	26.4	AV	L1	GND
28.995000	26.50	11.4	50	23.5	AV	L1	GND
29.823000	27.20	11.4	50	22.8	AV	L1	GND
29.962500	26.70	11.4	50	23.3	AV	L1	GND

SCAN TABLE: "Voltage (9K-30M) FIN"

Short Description: 150K-30M Voltage



MEASUREMENT RESULT: "CTL191109512_fin"

11/9/2019 3:51PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.172500	49.50	10.1	65	15.3	QP	N	GND
0.226500	40.70	10.1	63	21.9	QP	N	GND
0.550500	32.90	10.1	56	23.1	QP	N	GND
1.374000	32.30	10.2	56	23.7	QP	N	GND
3.219000	28.90	10.3	56	27.1	QP	N	GND

MEASUREMENT RESULT: "CTL191109512_fin2"

11/9/2019 3:51PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.163500	33.90	10.1	55	21.4	AV	N	GND
0.465000	23.70	10.1	47	22.9	AV	N	GND
0.582000	21.20	10.1	46	24.8	AV	N	GND
0.775500	20.30	10.1	46	25.7	AV	N	GND
1.486500	22.60	10.2	46	23.4	AV	N	GND

3.2. Radiated Emissions

Limit

For intentional device, according to § 15.209(a), the general requirement of field strength of radiated emission out of authorized band shall not exceed the following table at a 3 meters measurement distance.

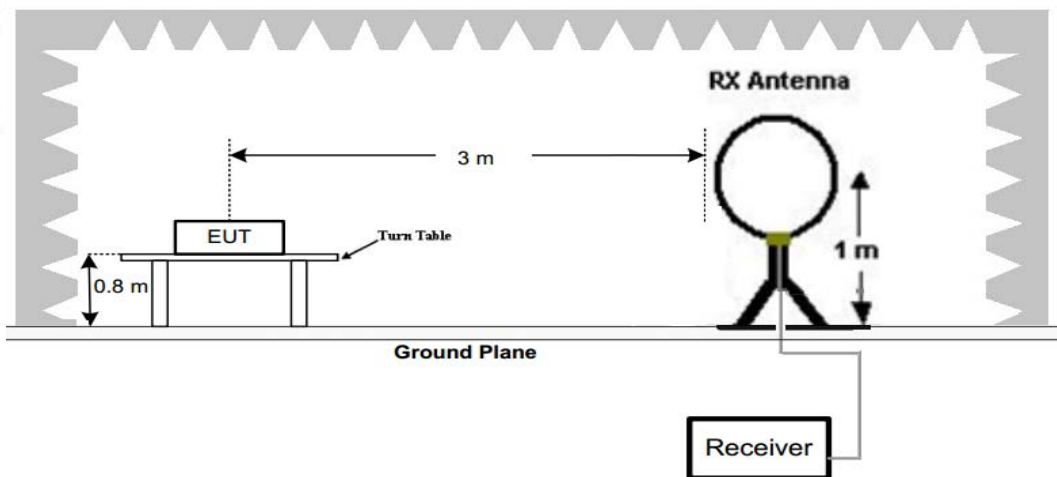
In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a)

Radiated emission limits

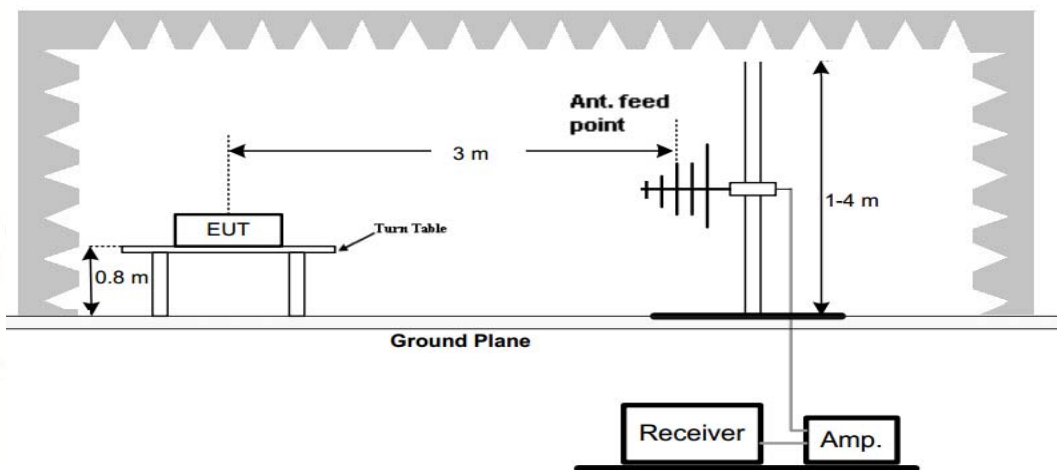
Frequency (MHz)	Distance (Meters)	Radiated (dBµV/m)	Radiated (µV/m)
0.009-0.49	3	$20\log(2400/F(\text{KHz})) + 40\log(300/3)$	$2400/F(\text{KHz})$
0.49-1.705	3	$20\log(24000/F(\text{KHz})) + 40\log(30/3)$	$24000/F(\text{KHz})$
1.705-30	3	$20\log(30) + 40\log(30/3)$	30
30-88	3	40.0	100
88-216	3	43.5	150
216-960	3	46.0	200
Above 960	3	54.0	500

TEST CONFIGURATION

1. Radiated Emission Test Set-Up, Frequency Below 30MHz



2. Radiated Emission Test Set-Up, Frequency below 1000MHz



Test Procedure

- Below 1GHz measurement the EUT is placed on a turntable which is 0.8m above ground plane, and above 1GHz measurement EUT was placed on a low permittivity and low loss tangent turn table which is 1.5m above ground plane.
- Maximum procedure was performed by raising the receiving antenna from 1m to 4m and rotating the turn table from 0°C to 360°C to acquire the highest emissions from EUT
- And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
- Repeat above procedures until all frequency measurements have been completed.
- Radiated emission test frequency band from 9KHz to 1000MHz.
- The distance between test antenna and EUT as following table states:

Test Frequency range	Test Antenna Type	Test Distance
9KHz-30MHz	Active Loop Antenna	3
30MHz-1GHz	Bilog Antenna	3

- Setting test receiver/spectrum as following table states:

Test Frequency range	Test Receiver/Spectrum Setting	Detector
9KHz-150KHz	RBW=200Hz/VBW=3KHz,Sweep time=Auto	QP
150KHz-30MHz	RBW=9KHz/VBW=100KHz,Sweep time=Auto	QP
30MHz-1GHz	RBW=120KHz/VBW=1000KHz,Sweep time=Auto	QP

Test Results

WORST-CASE RADIATED EMISSION BELOW 30 MHz

Mode1

Frequency	Reading	Polar	Antenna Factor	Cable Loss	Emission Levels	Limits at 3m	Margin	Detector Mode
(MHz)	(dB μ V/m)	Loop	(dB/m)	(dB)	(dB μ V/m)	(dB μ V/m)	(dB)	
0.117(F)	55.50	Loop	23.64	0.01	79.15	105.74	26.59	PK
0.117(F)	44.78	Loop	23.64	0.01	68.43	85.74	17.31	AV
0.110	36.99	Loop	23.55	0.01	60.55	106.78	46.23	PK
0.110	31.68	Loop	23.55	0.01	55.24	86.78	31.54	AV
0.495	25.37	Loop	25.07	-0.17	50.27	73.71	23.44	QP
1.654	16.85	Loop	27.12	-0.25	43.72	63.23	19.51	QP
2.418	16.91	Loop	23.91	-0.24	40.58	69.54	28.96	QP

Mode2

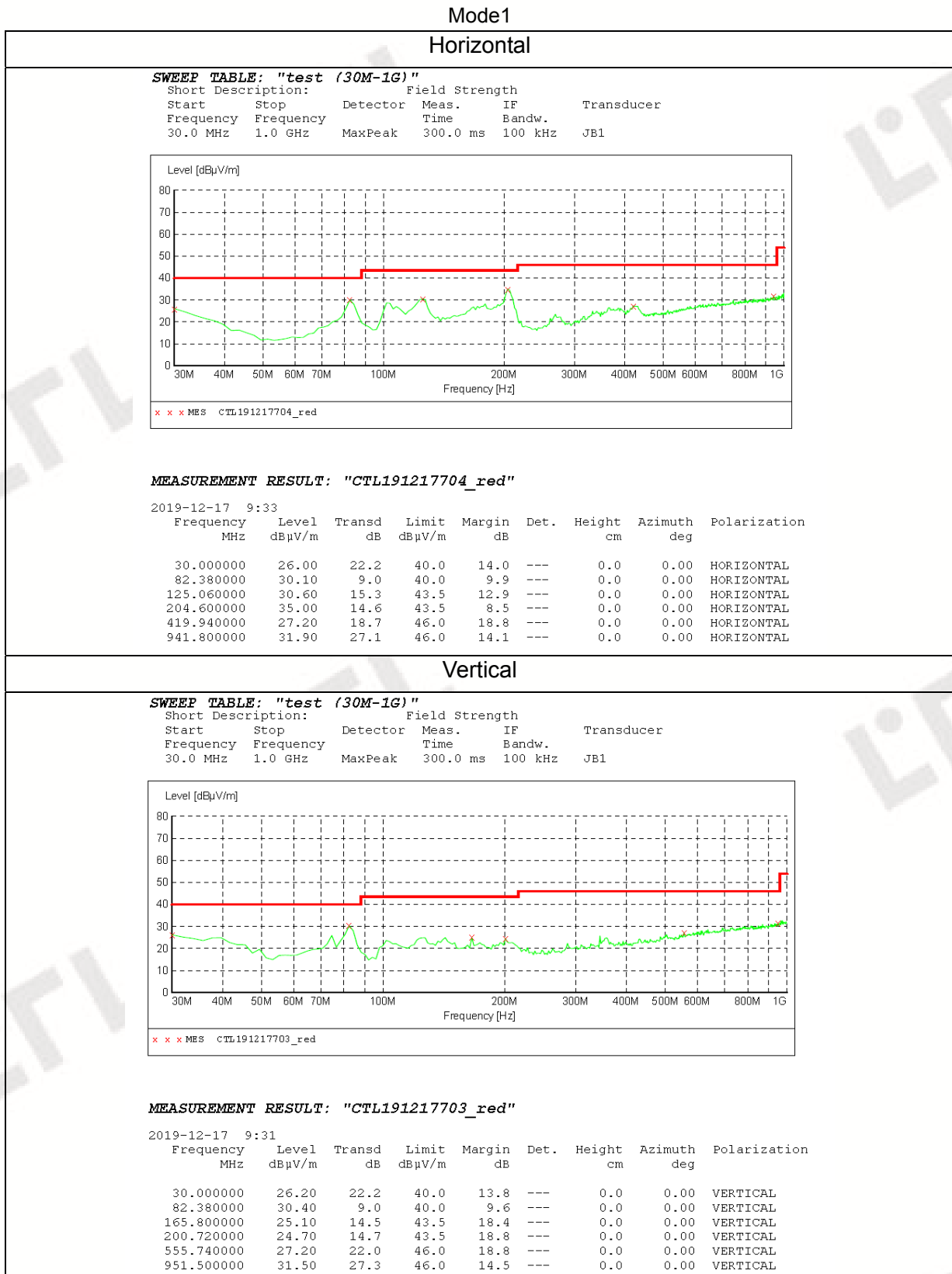
Frequency	Reading	Polar	Antenna Factor	Cable Loss	Emission Levels	Limits at 3m	Margin	Detector Mode
(MHz)	(dB μ V/m)	Loop	(dB/m)	(dB)	(dB μ V/m)	(dB μ V/m)	(dB)	
0.124(F)	58.12	Loop	23.64	0.01	78.31	105.74	27.43	PK
0.124(F)	48.36	Loop	23.64	0.01	68.65	85.74	17.09	AV
0.110	37.15	Loop	23.55	0.01	60.71	106.78	46.07	PK
0.110	31.76	Loop	23.55	0.01	55.32	86.78	31.46	AV
0.495	35.37	Loop	25.07	-0.17	60.27	73.71	13.44	QP
1.654	16.94	Loop	27.12	-0.25	43.81	63.23	19.42	QP
2.418	16.95	Loop	23.91	-0.24	40.62	69.54	28.92	QP

Remark:

1. Data of measurement within this frequency range shown "--" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits and not recorded.
2. The test limit distance is 3m limit.
3. PK means Peak Value, QP means Quasi Peak Value, AV means Average Value.
4. F means Fundamental Frequency.
5. Emission level (dBuV/m) = Reading + Antenna Factor + Cable Loss.
6. Margin value = Limit value- Emission level.

For 30MHz-1GHz

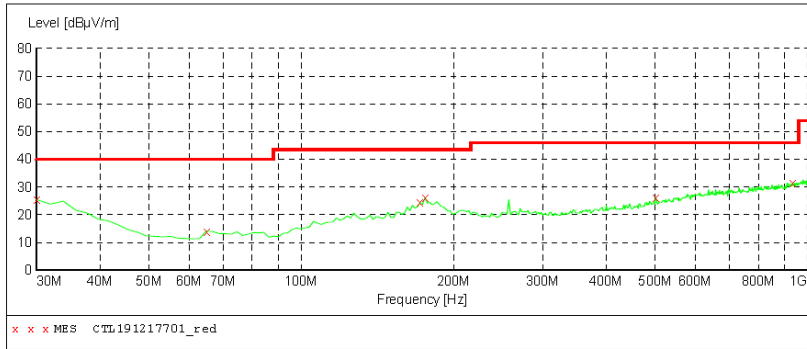
Note: Both power supply modes have been tested, and the following data are the worst



Mode2
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	100 kHz	JB1



MEASUREMENT RESULT: "CTL191217701_red"

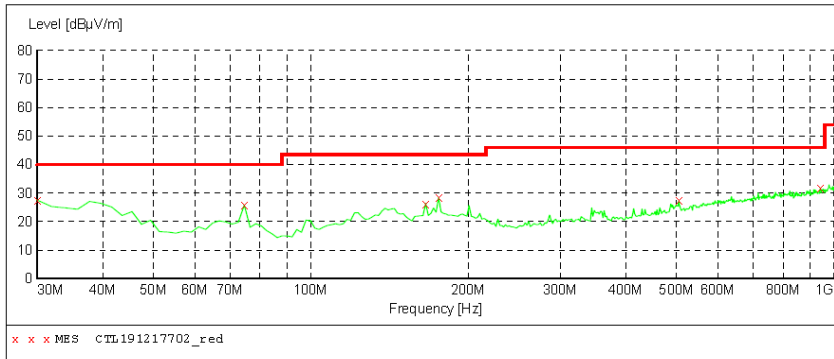
2019-12-17 9:23

Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
30.000000	25.50	22.2	40.0	14.5	---	0.0	0.00	HORIZONTAL
64.920000	14.10	8.4	40.0	25.9	---	0.0	0.00	HORIZONTAL
171.620000	24.40	14.5	43.5	19.1	---	0.0	0.00	HORIZONTAL
175.500000	26.30	14.6	43.5	17.2	---	0.0	0.00	HORIZONTAL
501.420000	26.30	20.6	46.0	19.7	---	0.0	0.00	HORIZONTAL
935.980000	31.50	27.0	46.0	14.5	---	0.0	0.00	HORIZONTAL

Vertical

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	100 kHz	JB1



MEASUREMENT RESULT: "CTL191217702_red"

2019-12-17 9:25

Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
30.000000	27.50	22.2	40.0	12.5	---	0.0	0.00	VERTICAL
74.620000	25.80	9.1	40.0	14.2	---	0.0	0.00	VERTICAL
165.800000	26.40	14.5	43.5	17.1	---	0.0	0.00	VERTICAL
175.500000	28.40	14.6	43.5	15.1	---	0.0	0.00	VERTICAL
505.300000	27.40	20.7	46.0	18.6	---	0.0	0.00	VERTICAL
941.800000	31.80	27.1	46.0	14.2	---	0.0	0.00	VERTICAL

3.3. 20dB Bandwidth

Limit

The 20dB bandwidth shall be less than 80% of the permitted frequency band.

Test Procedure

The transmitter output was connected to the spectrum analyzer through an attenuator. The bandwidth of the fundamental frequency was measured by spectrum analyzer with 30 KHz RBW and 100 KHz VBW.

The 20dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 20dB.

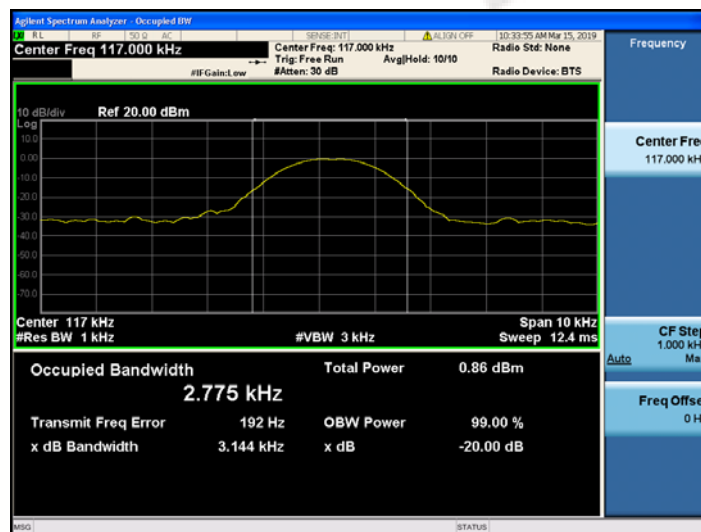
Test Configuration



Test Results

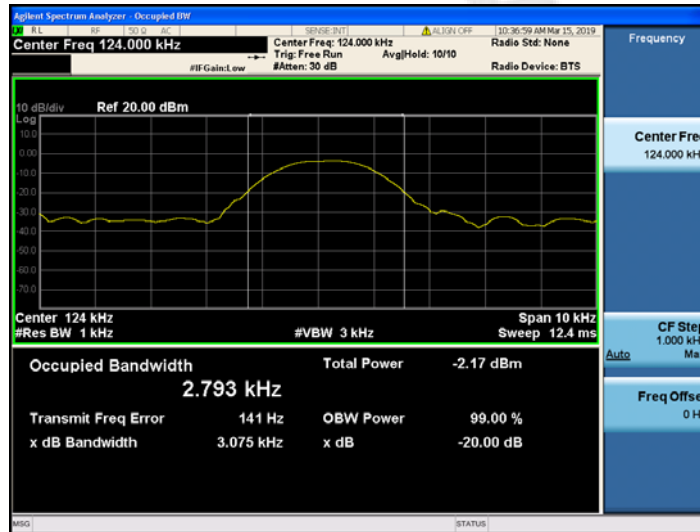
Mode1

Frequency (KHz)	20dB bandwidth (KHz)	99% OBW (KHz)	Result
117	3.144	2.775	Pass

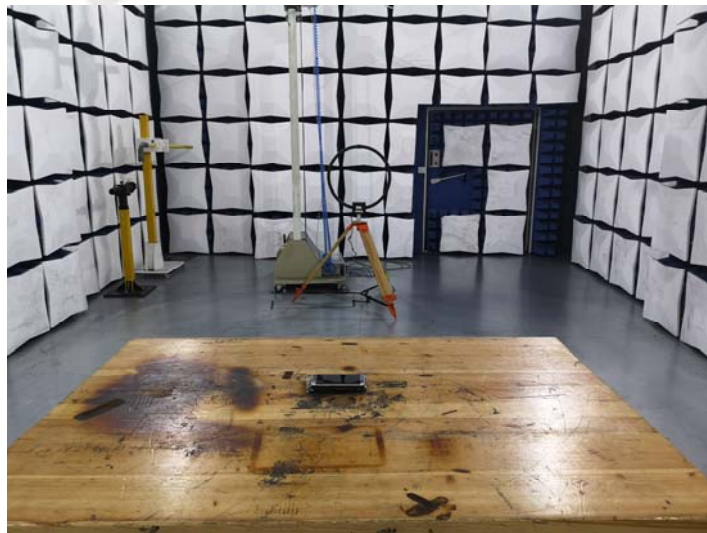


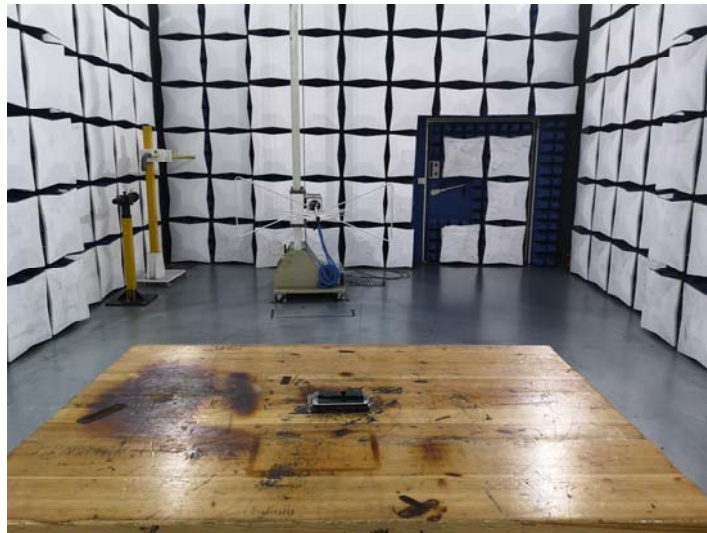
Mode2

Frequency (KHz)	20dB bandwidth (KHz)	99% OBW (KHz)	Result
124	3.075	2.793	Pass



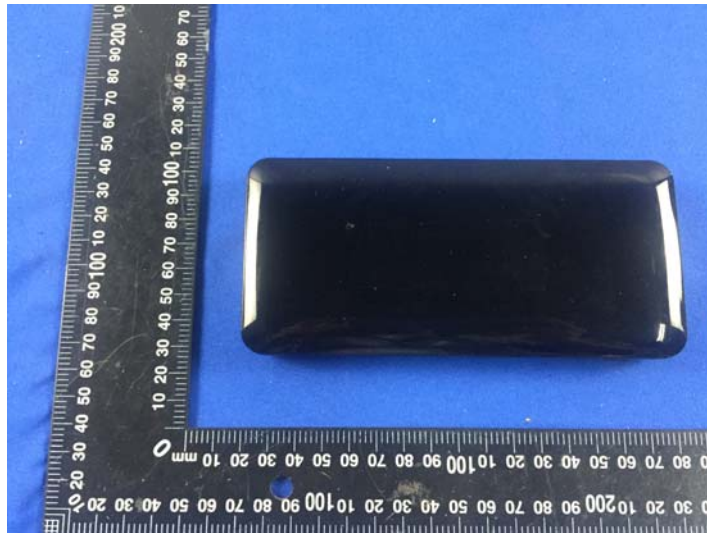
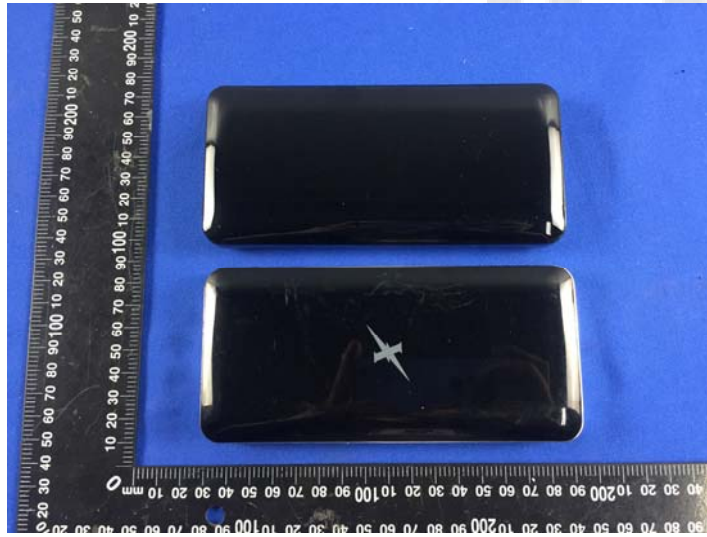
4. Test Setup Photos of the EUT

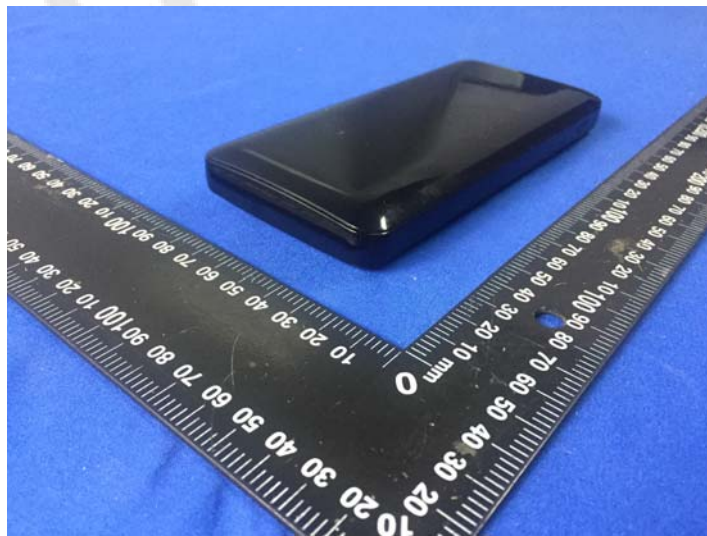
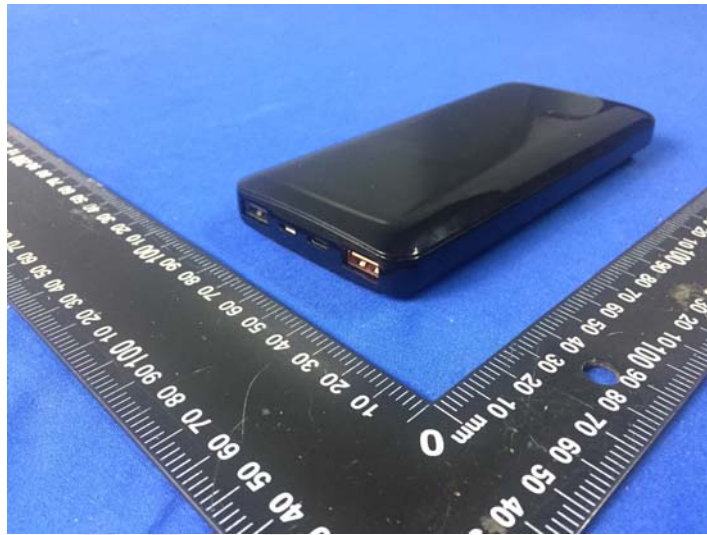




5. Photos of the EUT

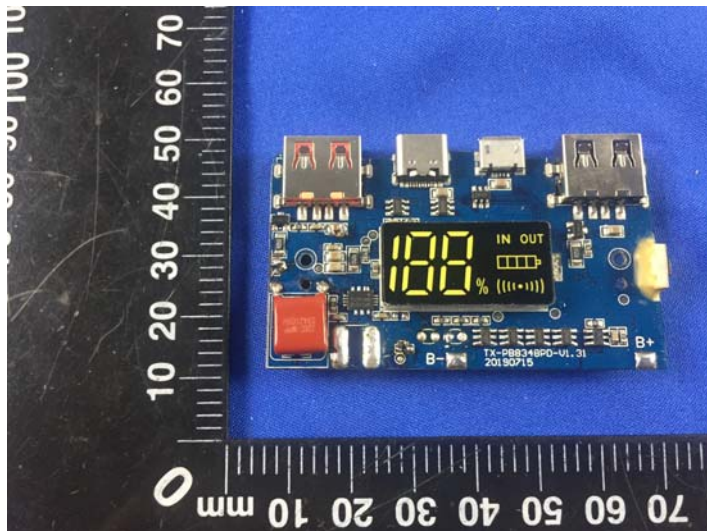
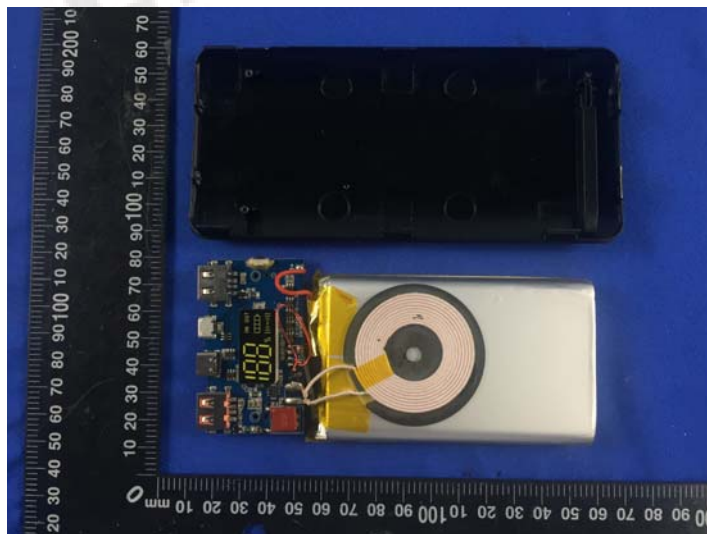
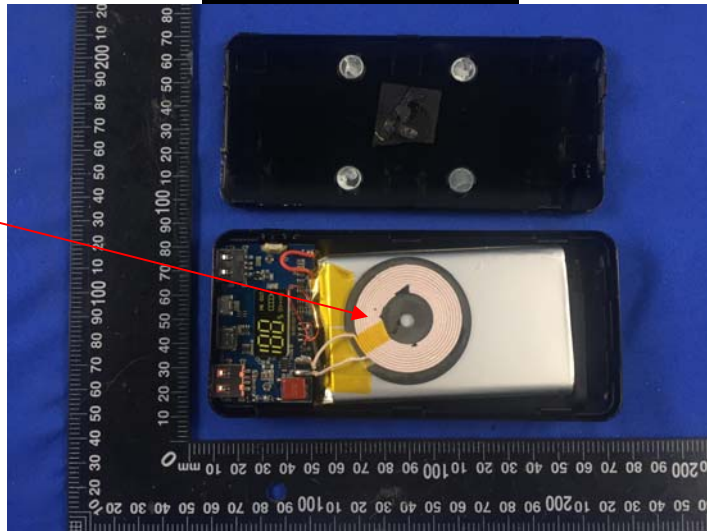
External Photos of EUT

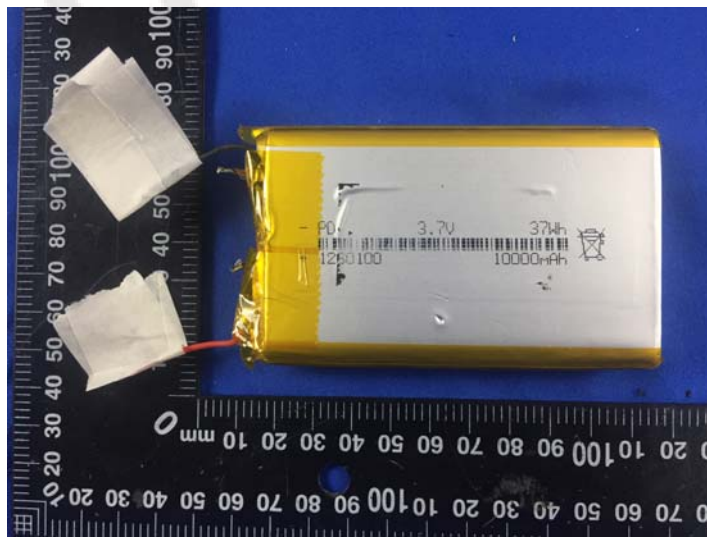
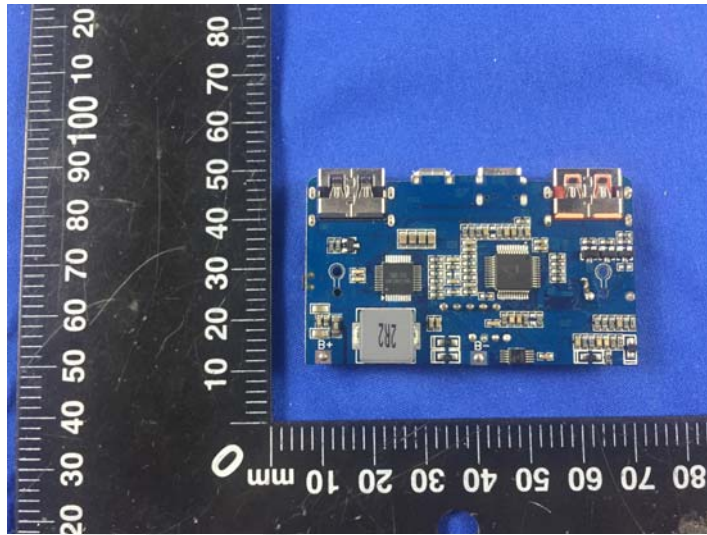




Internal Photos of EUT

Loop Antenna





***** End of Report *****