Shenzhen CTL Testing Technology Co., Ltd.
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FCC PART 15 SUBPART C TEST REPORT

Report Reference No.....:	**CTL1807023021-WF**	
Compiled by (position+printed name+signature)..:	Allen Wang (File administrators)	Allen Wang
Name of the organization performing the tests (position+printed name+signature)..:	Nice Nong (Test Engineer)	Nice Nong
Approved by (position+printed name+signature)..:	Ivan Xie (Manager)	Ivan Xie
Test Firm.....:	**Shenzhen CTL Testing Technology Co., Ltd.**	
Address.....:	Floor 1-A, Baisha Technology Park, No.3011, Shahexi Road, Nanshan District, Shenzhen, China 518055	
Applicant's name.....:	**Shenzhen Cheng Hui Da Electronics Co.,Ltd**	
Address.....:	7th Building, Fuqiao 5th Industrial Area, Qiaotou Community, Fuyong Town, Baoan District, Shenzhen, Guangdong, China 518103	
Test specification:		
Standard .....:	FCC Part 15C	
Master TRF.....:	Dated 2011-01	
Test item description ..... :	Apple Watch Charger+Wireless Charger+Power Bank	
FCC ID.....:	2APIQ-AP03	
Trade Mark .....:	VIDA	
Model/Type reference.....:	AP03	
Transmit Frequency.....:	115~205KHz	
Antenna type .....:	Loop antenna	
Date of Receipt.....:	July 05, 2018	
Date of Test Date .....:	July 05, 2018–July 17, 2018	
Data of Issue .....:	July 17, 2018	
Result.....:	**Pass**	

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TEST REPORT

Test Report No. :	CTL1807023021-WF	July 17, 2018 Date of issue

Equipment under Test	:	Apple Watch Charger+Wireless Charger+Power Bank
Type / Model(s)	:	AP03
Applicant	:	**Shenzhen Cheng Hui Da Electronics Co.,Ltd**
Address	:	7th Building, Fuqiao 5th Industrial Area, Qiaotou Community, Fuyong Town, Baoan District, Shenzhen, Guangdong, China 518103
Manufacturer	:	**Shenzhen Cheng Hui Da Electronics Co.,Ltd**
Address	:	7th Building, Fuqiao 5th Industrial Area, Qiaotou Community, Fuyong Town, Baoan District, Shenzhen, Guangdong, China 518103

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

Shenzhen CTL Testing Technology Co.,Ltd.

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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

Shenzhen CTL Testing Technology Co.,Ltd.

2. SUMMARY

2.1. General Remarks

Date of receipt of test sample	:	July 05, 2018
Testing commenced on	:	July 05, 2018
Testing concluded on	:	July 17, 2018

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 from USB

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

A Apple Watch Charger+Wireless Charger+Power Bank work frequency range 115-205 KHz.
For more details, refer to the user's manual of the EUT.
Serial number: Prototype

2.4. EUT operation mode

The EUT has been tested under typical operating condition. The Applicant provides communication tools software to control the EUT for staying in continuous transmitting mode for testing.

2.5. EUT configuration

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

○ - supplied by the manufacturer
● - supplied by the lab

●	Mobile Phone	Manufacturer :	APPLE
		Model No. :	iPhone 8
●	PC	Manufacturer :	DELL
		Model No. :	PP18L

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

This submittal(s) (test report) is intended for **FCC ID:** 2APIQ-AP03 fileing to comply with FCC Part 15, Subpart C Rules.

2.7. Modifications

No modifications were implemented to meet testing criteria.

2.8. Summary of Test Results

The EUT is wireless charger, The test summary of the EUT listed as below:

	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

Remark: The measurement uncertainty is not included in the test result.

检 检 华 测 Shenzhen CTL Testing Technology Co.,Ltd. CTL

3. TEST ENVIRONMENT

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 22/EN 55022 requirements.

3.2. Test Facility

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

IC Registration No.: 9618B

The 3m alternate test site of Shenzhen CTL Testing Technology Co., Ltd. EMC Laboratory has been registered by Certification and Engineer Bureau of Industry Canada for the performance of with Registration No.: 9618B on November 13, 2013.

FCC-Registration No.: 399832

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.

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 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	Range	Measurement Uncertainty	Notes
Radiated Emission	30~1000MHz	4.10dB	(1)
Radiated Emission	Above 1GHz	4.32dB	(1)
Conducted Disturbance	0.15~30MHz	3.20dB	(1)

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

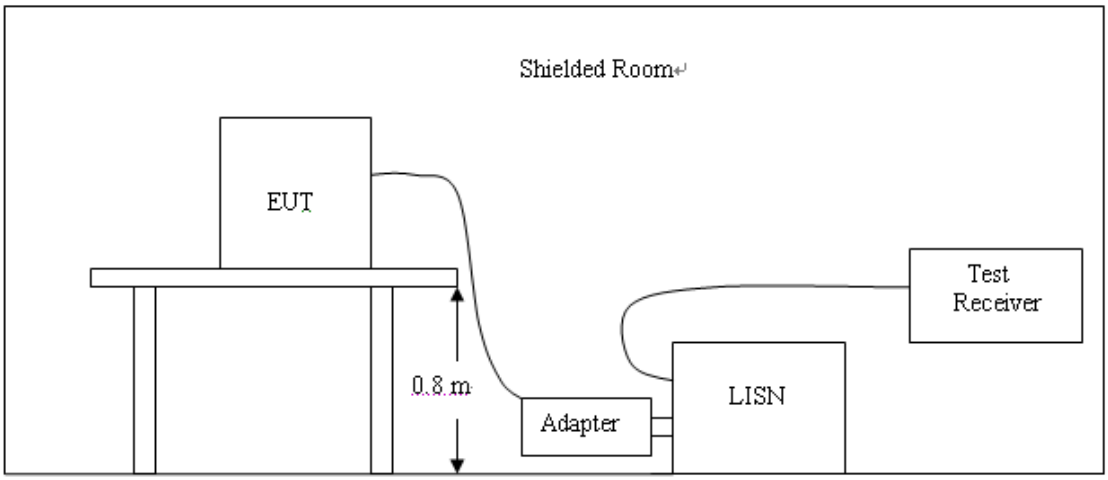
3.5. Equipments Used during the Test

Test Equipment	Manufacturer	Model No.	Serial No.	Calibration Date	Calibration Due Date
ULTRA-ROADBAND ANTENNA	Sunol Sciences Corp.	JB1	A061713	2018/05/20	2019/05/19
EMI Test Receiver	R&S	ESCI	103710	2018/05/20	2019/05/19
Spectrum Analyzer	Agilent	E4407B	MY41440676	2018/05/20	2019/05/19
Controller	EM Electronics	Controller EM 1000	N/A	2018/05/20	2019/05/19
Horn Antenna	Sunol Sciences Corp.	DRH-118	A062013	2018/05/20	2019/05/19
Active Loop Antenna	Daze	ZN30900A	N/A	2018/05/20	2019/05/19
LISN	R&S	ENV216	3560.6550.12	2018/05/20	2019/05/19
LISN	R&S	ESH2-Z5	860014/010	2018/05/20	2019/05/19
ISN	FCC	F-071115-1057-1-09	11229	2018/05/20	2019/05/19
Amplifier	Agilent	8349B	3008A02306	2018/05/20	2019/05/19
Amplifier	Agilent	8447D	2944A10176	2018/05/20	2019/05/19
Transient Limiter	SCHWARZCECK	VTSD 9561F	9666	2018/05/20	2019/05/19
Radio Communication Tester	R&S	CMU200	115419	2018/05/20	2019/05/19
Temperature/Humidity Meter	Gangxing	CTH-608	02	2018/05/20	2019/05/19
SIGNAL GENERATOR	Agilent	E4421B	US40051744	2018/05/20	2019/05/19
Power Meter	Agilent	U2531A	TW53323507	2018/05/20	2019/05/19
Power Sensor	Agilent	U2021XA	MY5365004	2018/05/20	2019/05/19
Climate Chamber	ESPEC	EL-10KA	A20120523	2018/05/20	2019/05/19
High-Pass Filter	K&L	9SH10-2700/X12750-O/O	N/A	2018/05/20	2019/05/19
High-Pass Filter	K&L	41H10-1375/U12750-O/O	N/A	2018/05/20	2019/05/19
RF Cable	HUBER+SUHNER	RG214	N/A	2018/05/20	2019/05/19

4. TEST CONDITIONS AND RESULTS

4.1. AC Power Conducted Emission

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 EUT received DC5V power from the adapter, 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.
Conducted emissions were investigated over the frequency range from 0.15MHz to 30MHz using a receiver bandwidth of 9kHz.

AC Power Conducted Emission Limit

For intentional device, according to § 15.207(a) AC Power Conducted Emission Limits is as following：

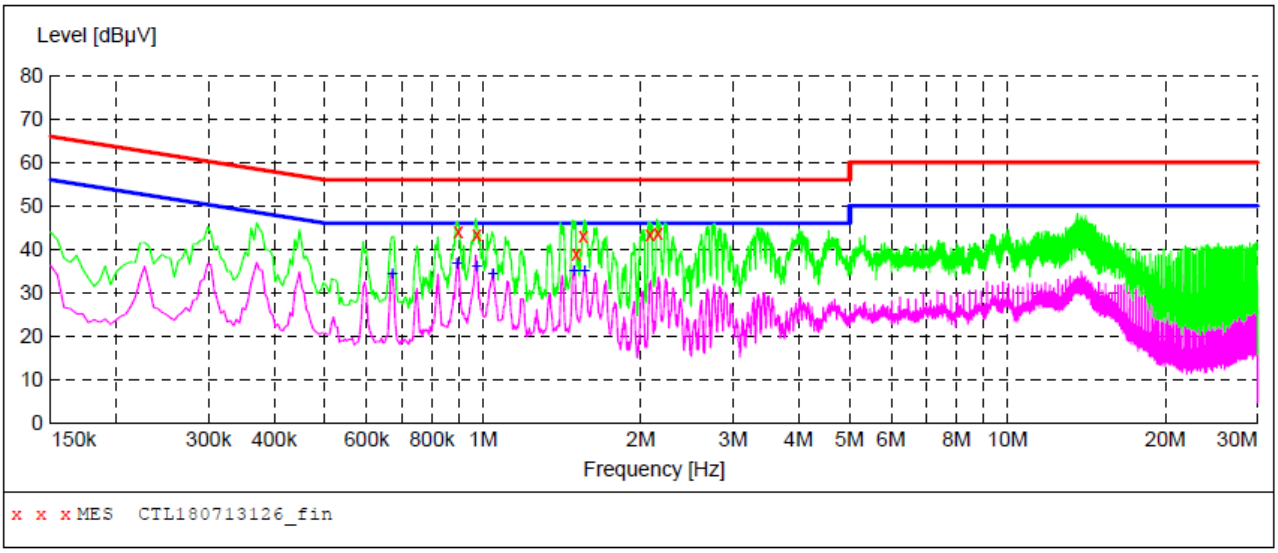
Frequency (MHz)	Maximum RF Line Voltage (dBμV)			
	CLASS A		CLASS B	
	Q.P.	Ave.	Q.P.	Ave.
0.15 - 0.50	79	66	66-56*	56-46*
0.50 - 5.00	73	60	56	46
5.00 - 30.0	73	60	60	50

* Decreasing linearly with the logarithm of the frequency

TEST RESULTS

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

Short Description: 150K-30M Voltage



MEASUREMENT RESULT: "CTL180713126_fin"

2018-7-13 04:27??

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.897000	44.00	10.2	56	12.0	QP	L1	GND
0.973500	43.30	10.3	56	12.7	QP	L1	GND
1.504500	38.80	10.3	56	17.2	QP	L1	GND
1.554000	43.10	10.3	56	12.9	QP	L1	GND
2.085000	43.50	10.4	56	12.5	QP	L1	GND
2.157000	43.90	10.4	56	12.1	QP	L1	GND

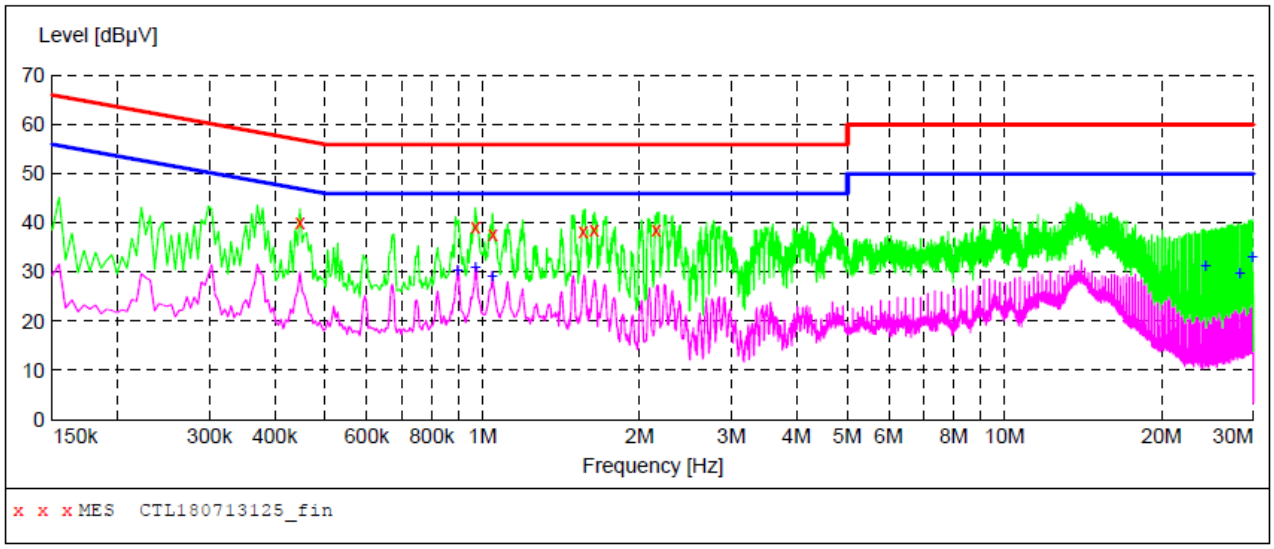
MEASUREMENT RESULT: "CTL180713126_fin2"

2018-7-13 04:27??

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.672000	34.60	10.2	46	11.4	AV	L1	GND
0.892500	37.00	10.2	46	9.0	AV	L1	GND
0.973500	36.20	10.3	46	9.8	AV	L1	GND
1.045500	34.60	10.3	46	11.4	AV	L1	GND
1.491000	35.10	10.3	46	10.9	AV	L1	GND
1.563000	35.00	10.3	46	11.0	AV	L1	GND

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

Short Description: 150K-30M Voltage



MEASUREMENT RESULT: "CTL180713125_fin"

2018-7-13 04:24??

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.447000	40.20	10.2	57	16.7	QP	N	GND
0.969000	39.20	10.3	56	16.8	QP	N	GND
1.045500	37.80	10.3	56	18.2	QP	N	GND
1.558500	38.30	10.3	56	17.7	QP	N	GND
1.635000	38.50	10.3	56	17.5	QP	N	GND
2.152500	38.50	10.4	56	17.5	QP	N	GND

MEASUREMENT RESULT: "CTL180713125_fin2"

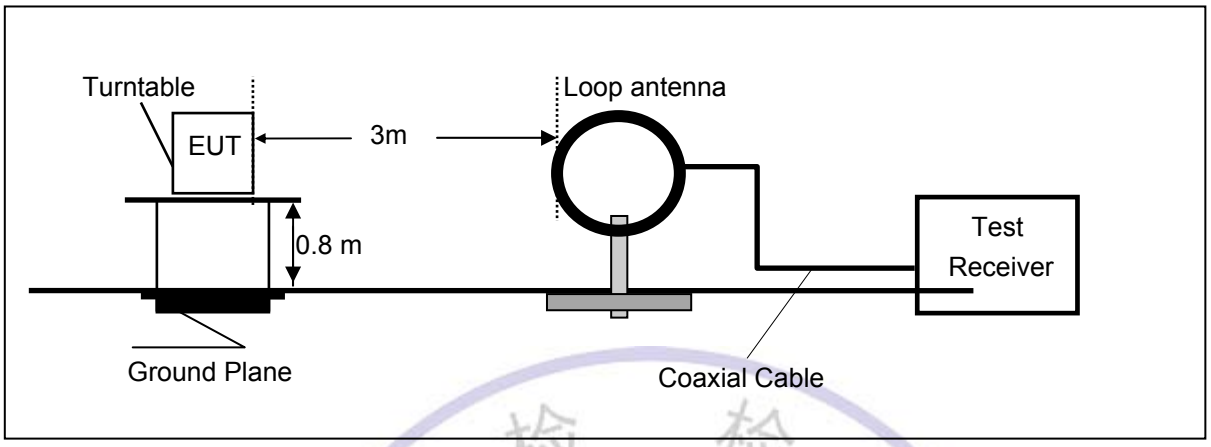
2018-7-13 04:24??

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.897000	30.50	10.2	46	15.5	AV	N	GND
0.969000	31.10	10.3	46	14.9	AV	N	GND
1.045500	29.30	10.3	46	16.7	AV	N	GND
24.301500	31.40	11.1	50	18.6	AV	N	GND
28.306500	29.70	11.2	50	20.3	AV	N	GND
29.872500	33.20	11.3	50	16.8	AV	N	GND

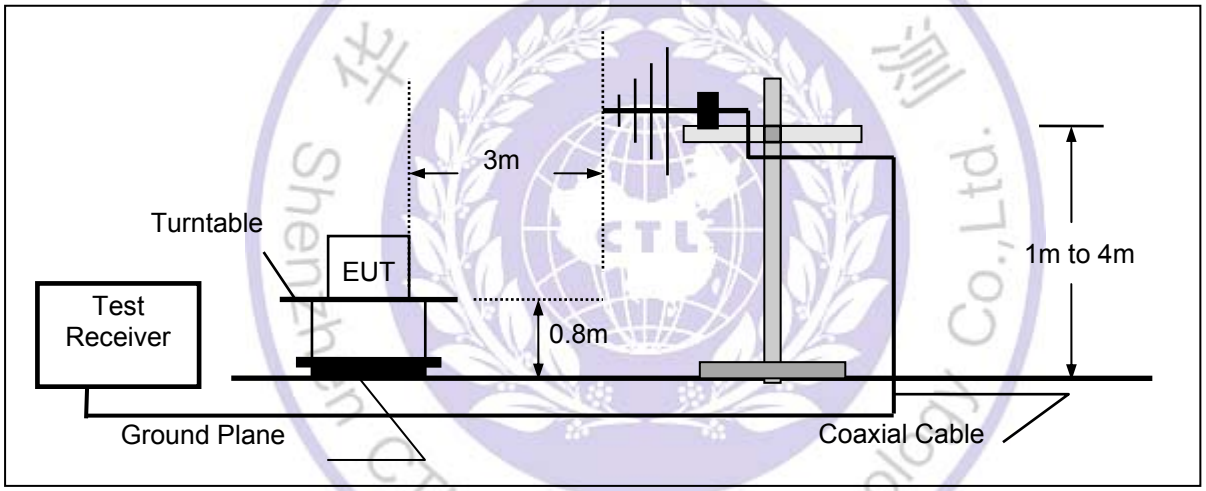
4.2. Radiated Emission

TEST CONFIGURATION

Radiated Emission Test Set-Up
Frequency range 9KHz – 30MHz



Frequency range 30MHz – 1000MHz



TEST PROCEDURE

1 The EUT was placed on a turn table which is 0.8m above ground plane.
2 Maximum procedure was performed by raising the receiving antenna from 1m to 4m and rotating the turn table from 0℃ to 360℃ to acquire the highest emissions from EUT
3 And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
4 Repeat above procedures until all frequency measurements have been completed.

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	

For example

Frequency (MHz)	FS (dBμV/m)	RA (dBμV/m)	AF (dB)	CL (dB)	AG (dB)	Transd (dB)
300.00	40	58.1	12.2	1.6	31.90	-18.1

Transd=AF +CL-AG

RADIATION LIMIT

Except as provided elsewhere in this Subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

9k~30MHz:

Frequency Range (MHz)	E-field Strength Limit @ 30m (mV/m)	E-field Strength Limit @ 3m (dBμV/m)
0.009-0.490	2400/F(kHz)	129-94
0.490-1.705	24000/F(kHz)	74-63
1.705-30	30	70
Note: Where the limits have been defined at one distance, and a signal level measured at another, the limits have been extrapolated using the following formula: $\text{Extrapolation(dB)} = 40\log_{10}(\text{Measurement Distance}/\text{Specification Distance})$		

Note:
(1) The tighter limit shall apply at the edge between two frequency bands.
(2) dBuV/m = 20*log(uV/m)

30M~1GHz:

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

Note:
(1) The tighter limit shall apply at the edge between two frequency bands.
(2) Distance refers to the distance in meters between the test instrument antenna and the closest point of any part of the E.U.T.

TEST RESULTS

WORST-CASE RADIATED EMISSION BELOW 30 MHz

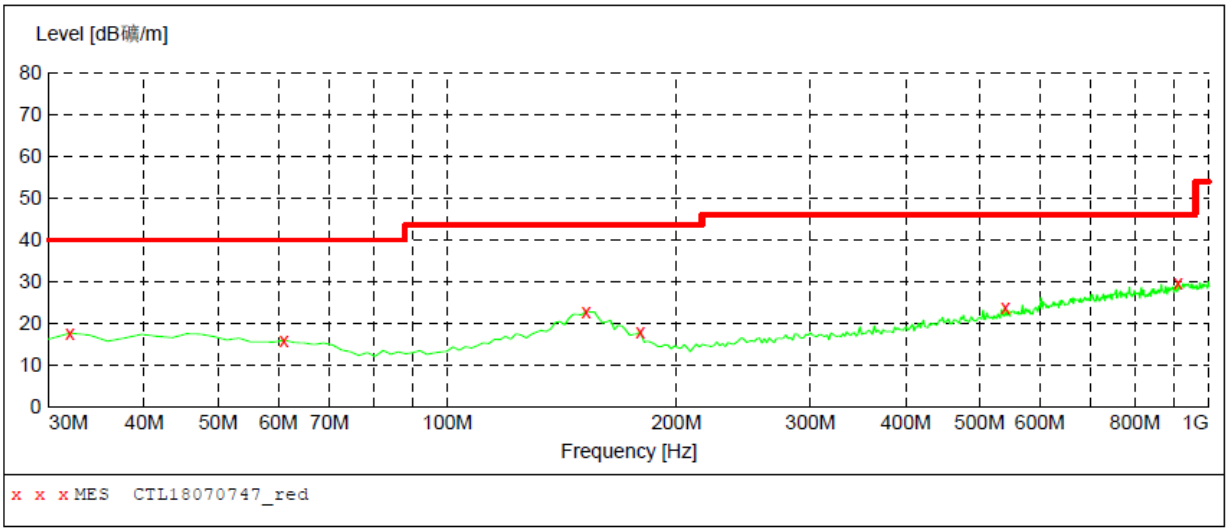
Frequency	Reading	Polar	Antenna Factor	Cable Loss	Emission Levels	Limits at 3m	Detector Mode
(MHz)	(dBμV/m)	Loop	(dB/m)	(dB)	(dBμV/m)	(dBμV/m)	
0.1352(F)	49.04	Loop	23.64	0.01	72.69	104.98	PK
0.1352(F)	45.71	Loop	23.64	0.01	69.36	84.98	AV
0.110	33.98	Loop	23.55	0.01	57.54	106.78	PK
0.110	25.65	Loop	23.55	0.01	49.21	86.78	AV
0.495	32.99	Loop	25.07	-0.17	57.89	73.71	QP
1.174	33.82	Loop	27.12	-0.25	60.69	66.21	QP
2.218	34.96	Loop	23.91	-0.24	58.63	69.54	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 or the field strength is too small to be measured.
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.

Radiated Emission Test Data 30-1000MHz:

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

Short Description:			Field Strength		
Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
30.0 MHz	1.0 GHz	MaxPeak	200.0 ms	120 kHz	VULB 9168



MEASUREMENT RESULT: "CTL18070747_red"

2018-7-7 9:42

Frequency MHz	Level dB磺/m	Transd dB	Limit dB磺/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
31.940000	17.60	13.4	40.0	22.4	---	0.0	0.00	HORIZONTAL
61.040000	15.90	12.9	40.0	24.1	---	0.0	0.00	HORIZONTAL
152.220000	22.90	15.2	43.5	20.6	---	0.0	0.00	HORIZONTAL
179.380000	17.90	12.9	43.5	25.6	---	0.0	0.00	HORIZONTAL
540.220000	23.70	19.8	46.0	22.3	---	0.0	0.00	HORIZONTAL
910.760000	29.70	25.4	46.0	16.3	---	0.0	0.00	HORIZONTAL

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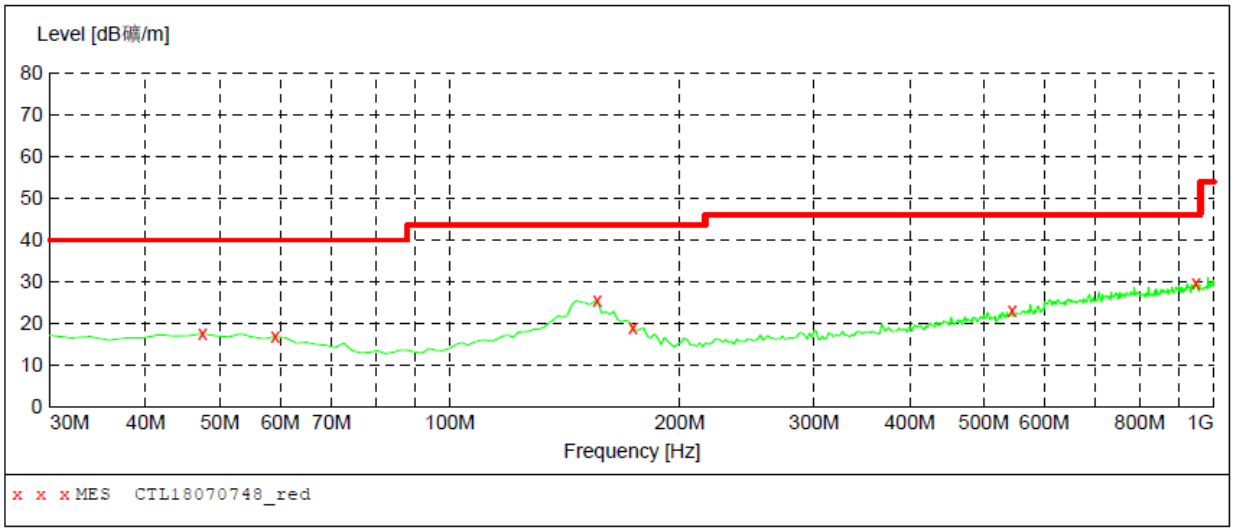
SWEEP TABLE: "test (30M-1G)"

Short Description: Field Strength

Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
30.0 MHz	1.0 GHz	MaxPeak	200.0 ms	120 kHz	VULB 9168



MEASUREMENT RESULT: "CTL18070748_red"

2018-7-7 9:44

Frequency MHz	Level dB磺/m	Transd dB	Limit dB磺/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
47.460000	17.50	13.8	40.0	22.5	---	0.0	0.00	VERTICAL
59.100000	16.80	13.1	40.0	23.2	---	0.0	0.00	VERTICAL
156.100000	25.50	15.2	43.5	18.0	---	0.0	0.00	VERTICAL
173.560000	19.00	13.8	43.5	24.5	---	0.0	0.00	VERTICAL
544.100000	23.00	19.9	46.0	23.0	---	0.0	0.00	VERTICAL
947.620000	29.70	25.8	46.0	16.3	---	0.0	0.00	VERTICAL

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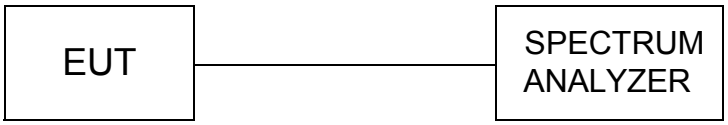
4.3. 20dB Bandwidth/99% Bandwidth

TEST CONFIGURATION



TEST PROCEDURE

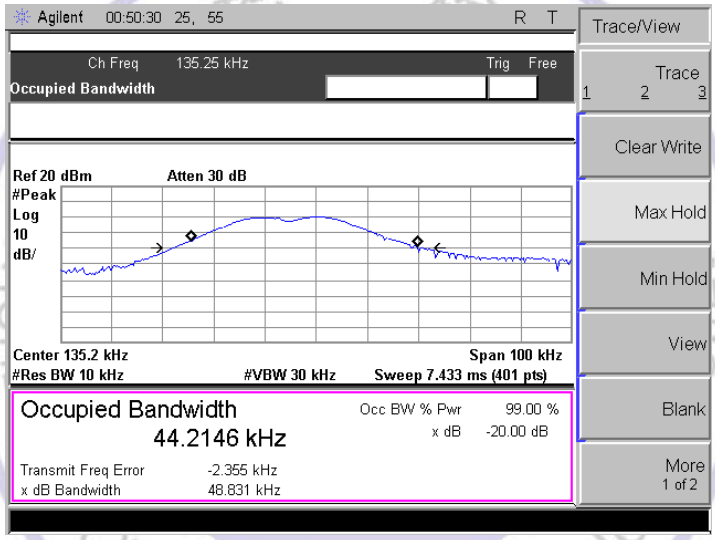
The bandwidth of the fundamental frequency was measured by spectrum analyzer with 10Hz RBW and 30Hz VBW. The 20dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 20dB.

LIMIT

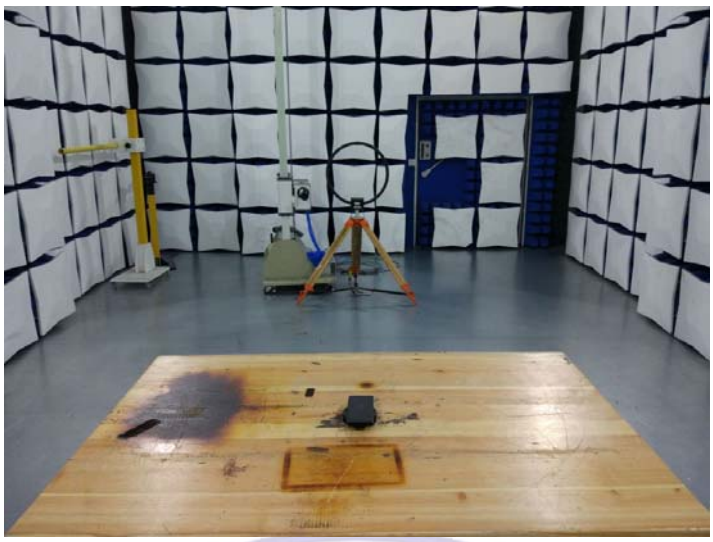
The 20dB bandwidth shall be less than 80% of the permitted frequency band.

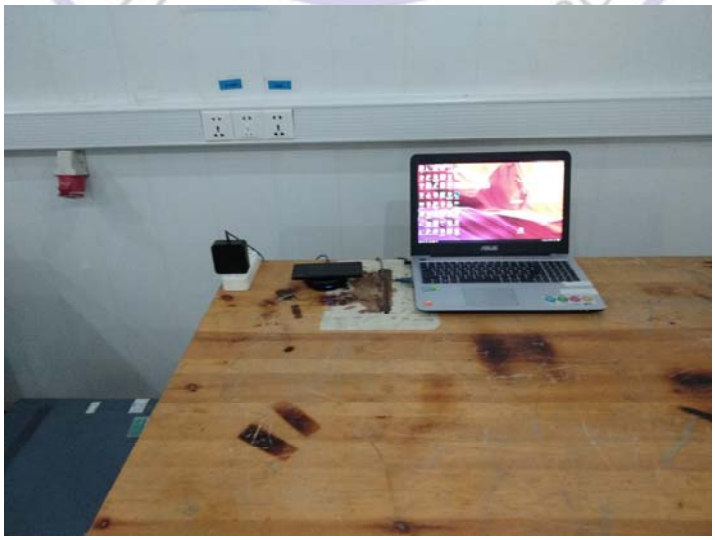
TEST RESULTS

135. 2 KHz



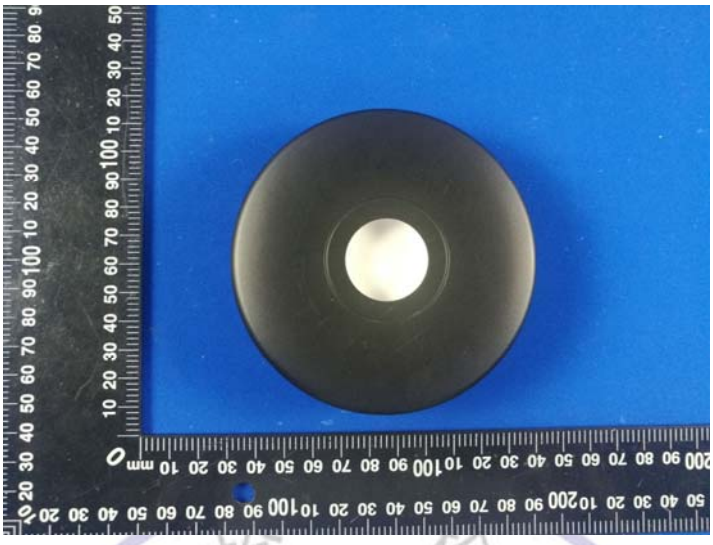
5. Test Setup Photos of the EUT

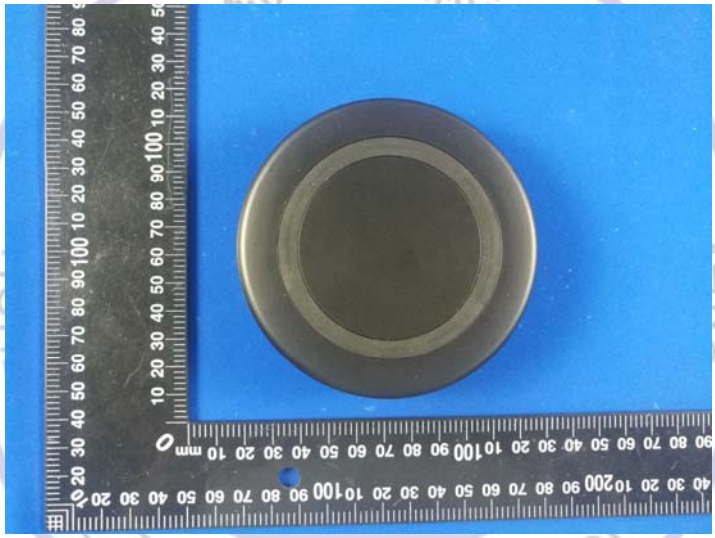


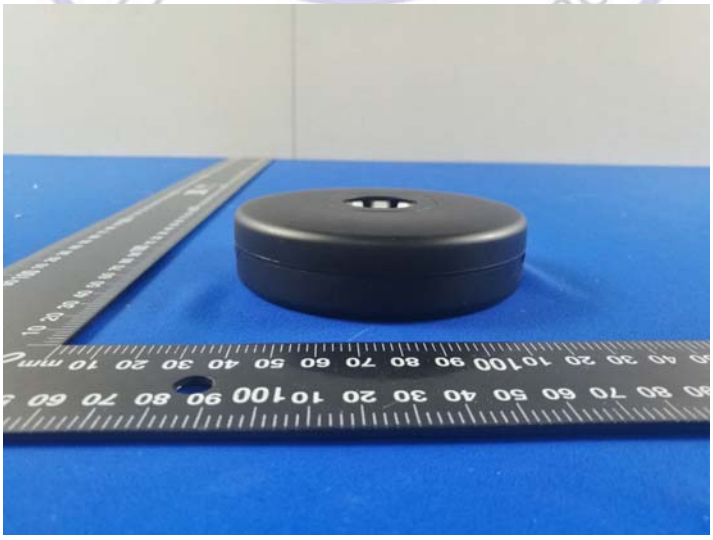


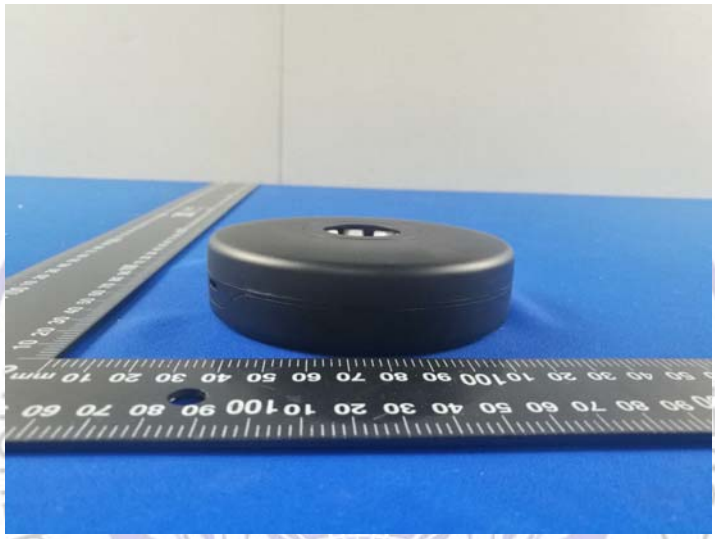
6. External and Internal Photos of the EUT

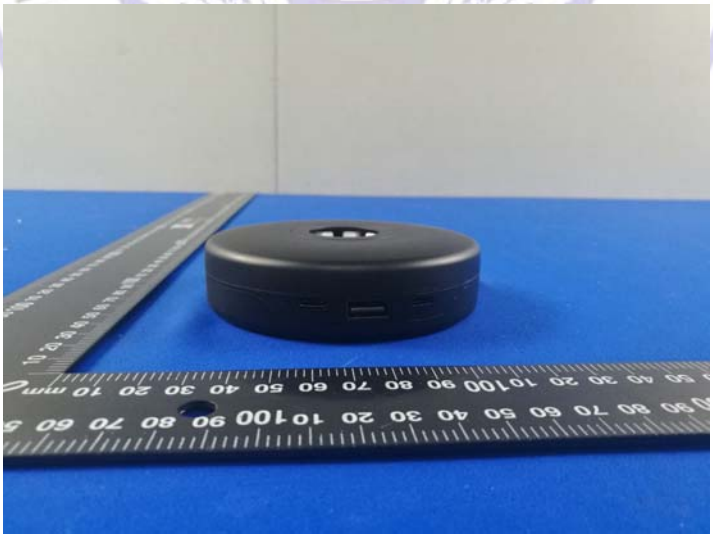
External Photos of EUT



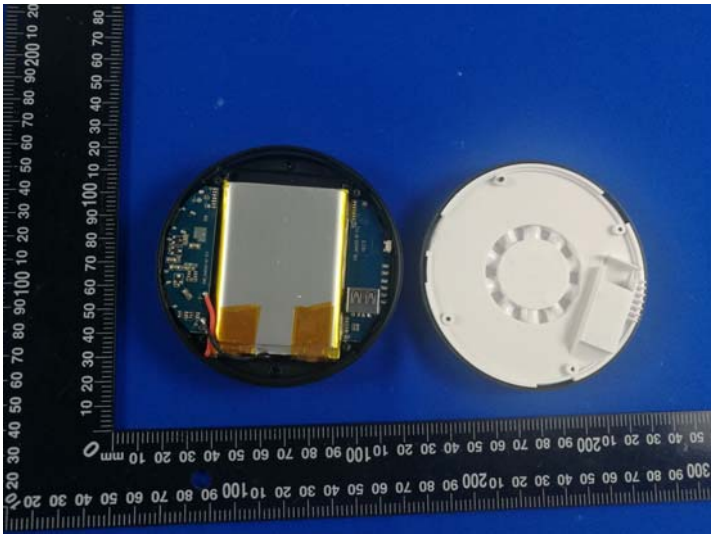


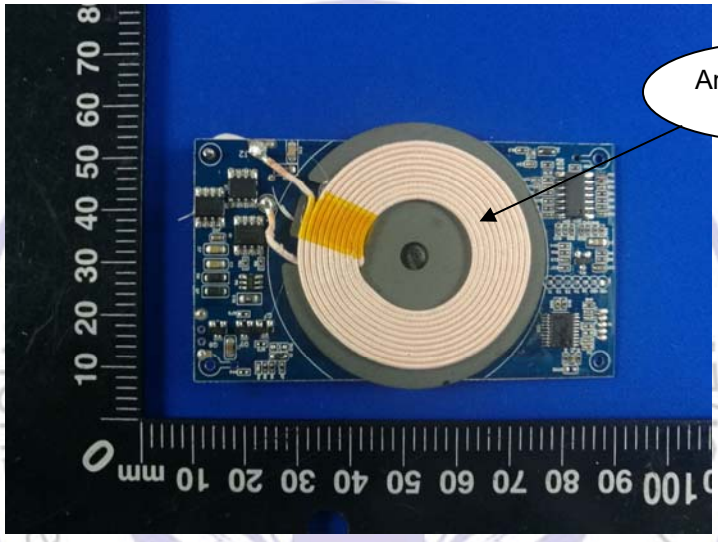


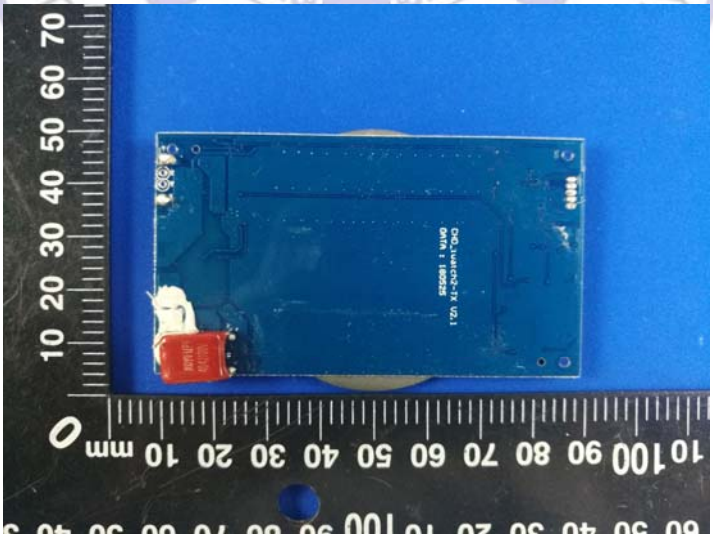


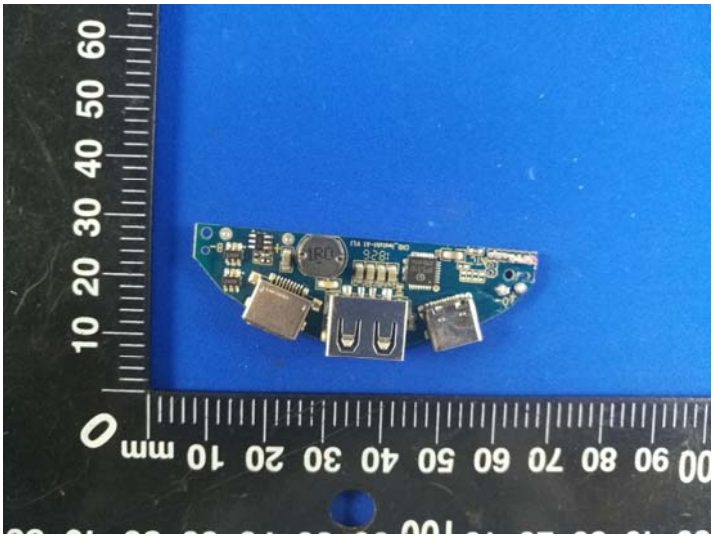


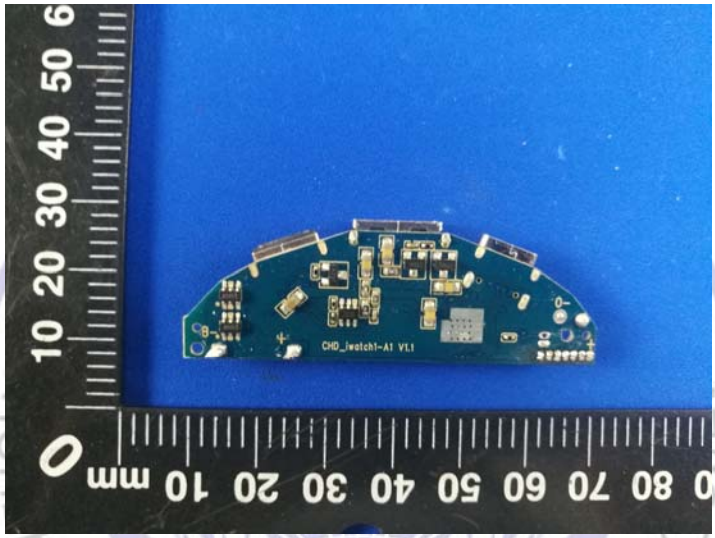
Internal Photos of EUT

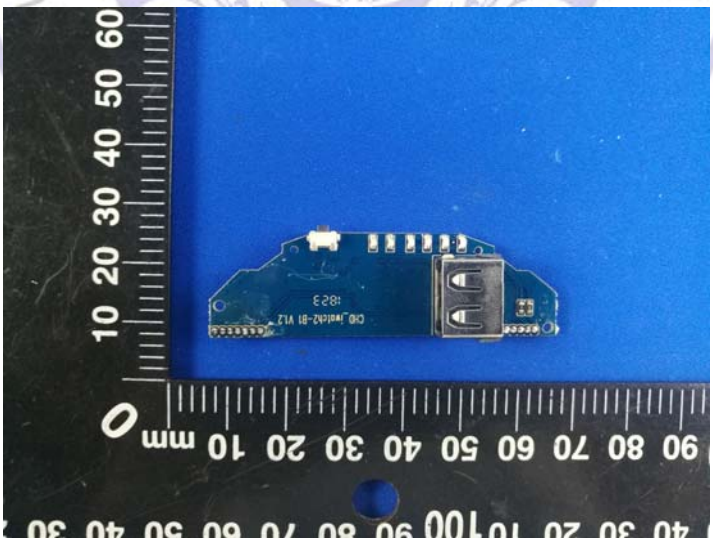


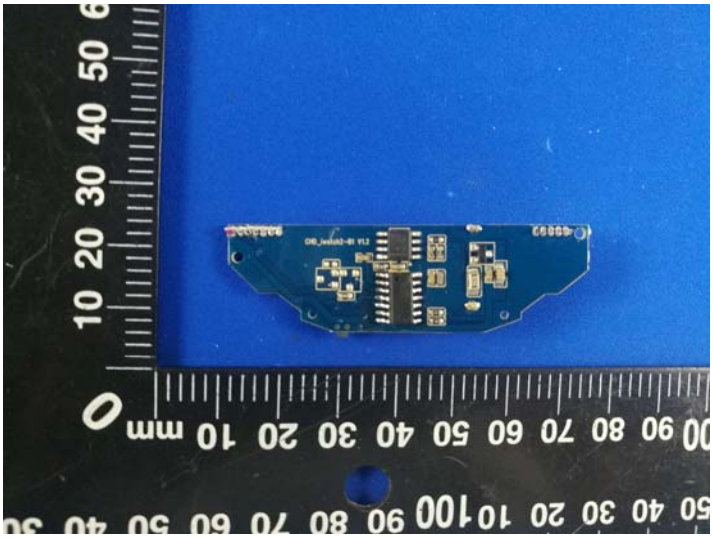


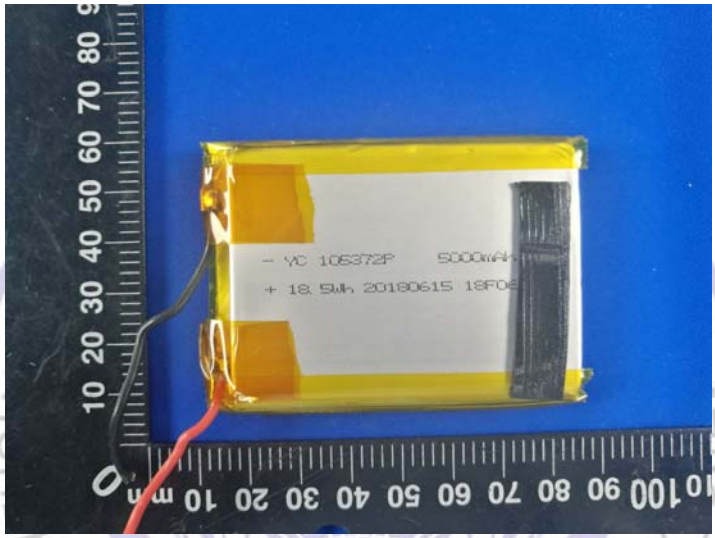





CHD_iwatch1-A1 V1.1







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

Shenzhen CTL Testing Technology