

TEST REPORT

Reference No...... : WTS17S0476225-1E
FCC ID : 2ALUK-QI1606A
Applicant..... : LF centennial service limited
Address..... : 8F, HK Spinners Industrial Building, Phases I 7 UU, 800 Cheung Sha Wan Road, Kowloon, Hong Kong
Manufacturer : CCA Designing&manufacturing limited
Address..... : Bld 120-121th, pinghuan ind.city pingshan town, shenzhen, 518118
Product Name..... : Wireless Power Bank
Model No...... : Qi-Clip, Qi-Clip-BK, Qi-Clip-OR, QI-1606A, QI-1606A-BK, QI-1606A-OR
Standards..... : FCC Part 15 subpart C
Date of Receipt sample : Apr. 12, 2017
Date of Test : Apr. 13 – May. 01, 2017
Date of Issue..... : May. 02, 2017
Test Result..... : **Pass**

Remarks:

The results shown in this test report refer only to the sample(s) tested, this test report cannot be reproduced, except in full, without prior written permission of the company. The report would be invalid without specific stamp of test institute and the signatures of compiler and approver.

Prepared By:

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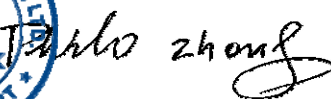
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Compiled by:



Zero Zhou / Test Engineer

Approved by:



Philo Zhong / Manager

2 Test Summary

Test Items	Test Requirement	Result
Conducted Emissions	15.207	PASS
Radiated Spurious Emissions	15.209	PASS
Occupied Bandwidth	15.215	PASS
Antenna Requirement	15.203	PASS

3 Contents

	Page
1 COVER PAGE.....	1
2 TEST SUMMARY	2
3 CONTENTS	3
4 GENERAL INFORMATION.....	4
4.1 GENERAL DESCRIPTION OF E.U.T.....	4
4.2 DETAILS OF E.U.T.....	4
4.3 TEST FACILITY	4
5 EQUIPMENT USED DURING TEST	5
5.1 EQUIPMENTS LIST	5
5.2 DESCRIPTION OF AUXILIARY EQUIPMENT	5
5.3 MEASUREMENT UNCERTAINTY.....	6
5.4 TEST EQUIPMENT CALIBRATION	6
6 CONDUCTED EMISSION	7
6.1 E.U.T. OPERATION	7
6.2 EUT SETUP	7
6.3 MEASUREMENT DESCRIPTION	7
6.4 CONDUCTED EMISSION TEST RESULT.....	8
7 RADIATED SPURIOUS EMISSIONS.....	10
7.1 EUT OPERATION.....	10
7.2 TEST SETUP	11
7.3 SPECTRUM ANALYZER SETUP	12
7.4 TEST PROCEDURE.....	12
7.5 SUMMARY OF TEST RESULTS	13
8 BANDWIDTH MEASUREMENT.....	14
8.1 TEST PROCEDURE.....	14
8.2 TEST RESULT PLOT:.....	14
9 ANTENNA REQUIREMENT	15
10 PHOTOGRAPHS- QI-1606A TEST SETUP.....	16
10.1 RADIATION EMISSION TEST SETUP.....	16
10.2 PHOTOGRAPH – CONDUCTED EMISSION TEST SETUP.....	17
11 PHOTOGRAPHS - CONSTRUCTIONAL DETAILS	18
11.1 QI-1606A - APPEARANCE VIEW	18
11.2 QI-1606A - INTERNAL VIEW.....	25

4 General Information

4.1 General Description of E.U.T

Product Name:	Wireless Power Bank
Model No.:	Qi-Clip, Qi-Clip-BK, Qi-Clip-OR, QI-1606A, QI-1606A-BK, QI-1606A-OR
Model Difference:	Only the model names and colors are different. Model QI-1606A is the test sample.
Type of Modulation:	ASK
Frequency Range:	0.112~0.205MHz
The Lowest Oscillator:	N/A
Antenna installation:	Coil Antenna

4.2 Details of E.U.T.

Technical Data:	Input: 5V $\overline{=}$ 2A Output (USB-A): 5V $\overline{=}$ 2.1A; Output (QI): 5V $\overline{=}$ 1A Max; Battery: 3.7V, 5000mAh
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4.3 Test Facility

The test facility has a test site registered with the following organizations:

- **IC – Registration No.: 7760A**

Waltek Services (Shenzhen) Co., Ltd. has been registered and fully described in a report filed with the Industry Canada. The acceptance letter from the Industry Canada is maintained in our files. Registration 7760A, October 15, 2015.

- **FCC Test Site 2#– Registration No.: 328995**

Waltek Services(Shenzhen) 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 328995, December 3, 2014.

5 Equipment Used during Test

5.1 Equipments List

Conducted Emissions Test Site 1#						
Item	Equipment	Manufacturer	Model No.	Serial No.	Last Calibration Date	Calibration Due Date
1.	EMI Test Receiver	R&S	ESCI	100947	Sep.12, 2016	Sep.11, 2017
2.	LISN	R&S	ENV216	101215	Sep.12, 2016	Sep.11, 2017
3.	Cable	Top	TYPE16(3.5M)	-	Sep.12, 2016	Sep.11, 2017
3m Semi-anechoic Chamber for Radiation Emissions Test site 2#						
Item	Equipment	Manufacturer	Model No.	Serial No	Last Calibration Date	Calibration Due Date
1	Test Receiver	R&S	ESCI	101296	Apr.06, 2017	Apr.05, 2018
2	Active Loop Antenna	Beijing Dazhi	ZN30900A	-	Oct.17, 2016	Oct.16, 2017
3	Trilog Broadband Antenna	SCHWARZBECK	VULB9160	9160-3325	Apr.07, 2017	Apr.06, 2018
4	Amplifier	ANRITSU	MH648A	M43381	Apr.07, 2017	Apr.06, 2018
5	Amplifier	Compliance pirection systems inc	PAP-0203	22024	Sep.12, 2016	Sep.11, 2017
6	Cable	HUBER+SUHNER	CBL2	525178	Apr.07, 2017	Apr.06, 2018
RF Conducted Testing						
Item	Equipment	Manufacturer	Model No.	Serial No.	Last Calibration Date	Calibration Due Date
1.	EMC Analyzer (9k~26.5GHz)	Agilent	E7405A	MY45114943	Sep.15,2016	Sep.14,2017
2.	Spectrum Analyzer (9k-6GHz)	R&S	FSL6	100959	Sep.15,2016	Sep.14,2017
3.	Signal Analyzer (9k~26.5GHz)	Agilent	N9010A	MY50520207	Sep.15,2016	Sep.14,2017
4.	Humidity Chamber	GF	GTH-225-40-1P	IAA061213	Sep.15,2016	Sep.14,2017

5.2 Description of Auxiliary Equipment

Equipment	Manufacturer	Model No.	Series No.
Acer computer	/	E1-570G	/
Iphone	apple	A1530	/
Qi Clip (Receiver)	CCA Designing&manufacturing limited	Qi Clip	/

5.3 Measurement Uncertainty

Test Item	Frequency Range	Uncertainty	Note
Conducted Emissions	150kHz~30MHz	$\pm 3.64\text{dB}$	(1)
Radiated Spurious Emissions	26KHz~30MHz	$\pm 3.03\text{dB}$	(1)
Radiated Spurious Emissions	30MHz~1000MHz	$\pm 5.03\text{dB}$	(1)

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

5.4 Test Equipment Calibration

All the test equipments used are valid and calibrated by GUANG ZHOU GRG METROLOGY & TEST CO., LTD. address is No.163, Pingyun Rd. West of Huangpu Ave, Tianhe District, Guangzhou, Guangdong, China.

6 Conducted Emission

Test Requirement:	FCC CFR 47 Part 15 Section 15.207
Test Method:	ANSI C63.10:2013
Test Result:	PASS
Frequency Range:	150kHz to 30MHz
Class/Severity:	Class B
Limit:	66-56 dBμV between 0.15MHz & 0.5MHz 56 dBμV between 0.5MHz & 5MHz 60 dBμV between 5MHz & 30MHz
Detector:	Peak for pre-scan (9kHz Resolution Bandwidth)

6.1 E.U.T. Operation

Operating Environment :

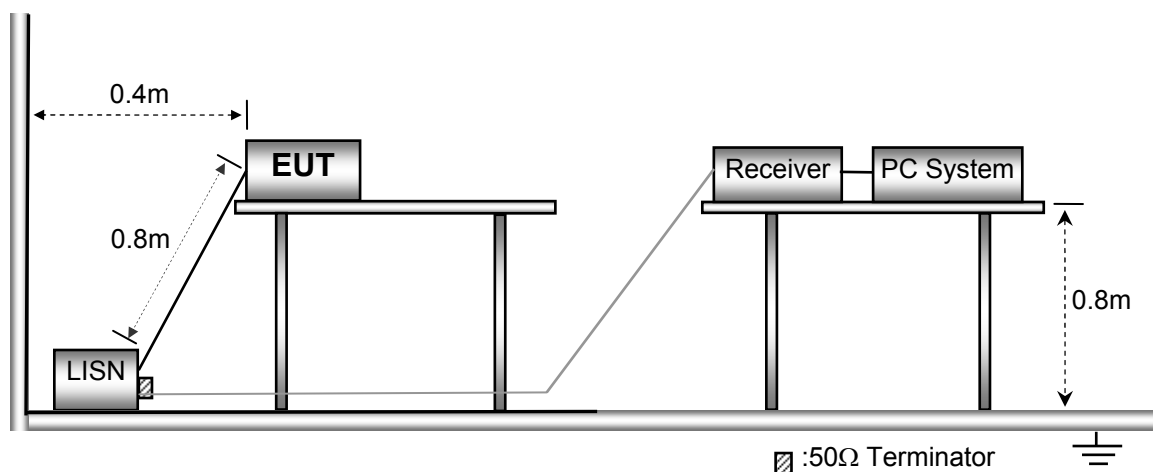
Temperature: 25.5 °C
Humidity: 51 % RH
Atmospheric Pressure: 101.2kPa

EUT Operation :

The test was performed in transmitting mode, the test data were shown in the report.

6.2 EUT Setup

The EUT was placed on the test table in shielding room.

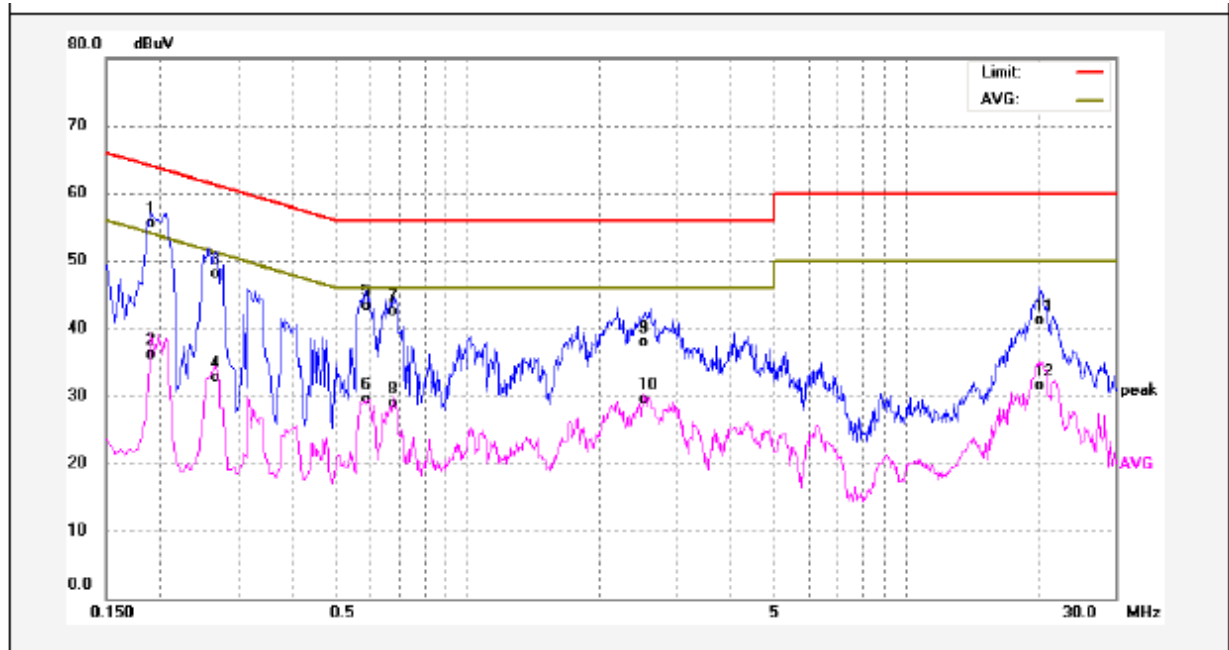


6.3 Measurement Description

The maximised peak emissions from the EUT was scanned and measured for both the Live and Neutral Lines. Quasi-peak & average measurements were performed if peak emissions were within 6dB of the average limit line.

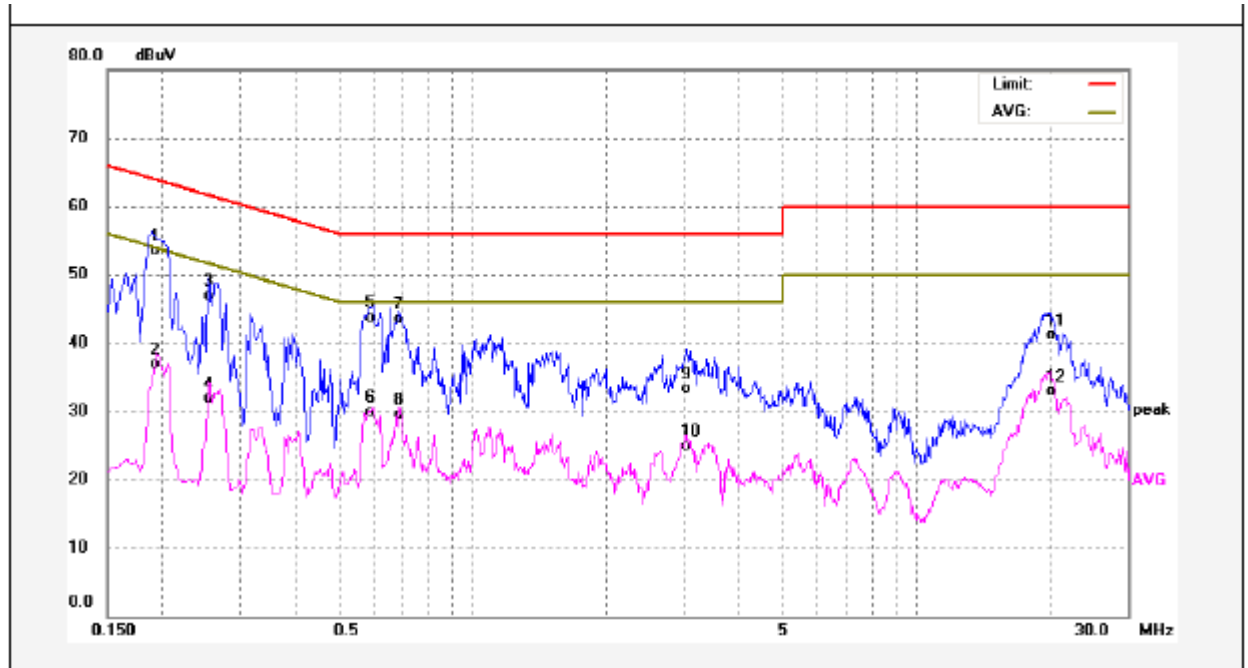
6.4 Conducted Emission Test Result

Live line:



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit dBuV	Margin (dB)	Detector	Remark
1	0.1900	45.55	9.90	55.45	64.03	-8.58	QP	
2	0.1900	26.18	9.90	36.08	54.03	-17.95	AVG	
3	0.2660	38.01	10.00	48.01	61.24	-13.23	QP	
4	0.2660	22.62	10.00	32.62	51.24	-18.62	AVG	
5	0.5940	33.23	10.06	43.29	56.00	-12.71	QP	
6	0.5940	19.54	10.06	29.60	46.00	-16.40	AVG	
7	0.6820	32.34	10.10	42.44	56.00	-13.56	QP	
8	0.6820	18.77	10.10	28.87	46.00	-17.13	AVG	
9	2.5260	27.65	10.23	37.88	56.00	-18.12	QP	
10	2.5260	19.26	10.23	29.49	46.00	-16.51	AVG	
11	20.2580	30.65	10.47	41.12	60.00	-18.88	QP	
12	20.2580	21.04	10.47	31.51	50.00	-18.49	AVG	

Neutral line:



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit dBuV	Margin (dB)	Detector	Remark
1	0.1940	43.61	9.90	53.51	63.86	-10.35	QP	
2	0.1940	27.08	9.90	36.98	53.86	-16.88	AVG	
3	0.2540	36.84	10.01	46.85	61.62	-14.77	QP	
4	0.2540	21.88	10.01	31.89	51.62	-19.73	AVG	
5	0.5940	33.72	10.06	43.78	56.00	-12.22	QP	
6	0.5940	19.94	10.06	30.00	46.00	-16.00	AVG	
7	0.6860	33.31	10.10	43.41	56.00	-12.59	QP	
8	0.6860	19.50	10.10	29.60	46.00	-16.40	AVG	
9	3.0260	23.13	10.24	33.37	56.00	-22.63	QP	
10	3.0260	14.63	10.24	24.87	46.00	-21.13	AVG	
11	19.9500	30.54	10.47	41.01	60.00	-18.99	QP	
12	19.9500	22.39	10.47	32.86	50.00	-17.14	AVG	

7 Radiated Spurious Emissions

Test Requirement: FCC CFR47 Part 15 Section 15.209

Test Method: ANSI C63.10:2013

Test Result: PASS

Measurement Distance: 3m

Limit:

FCC Part15 Paragraph 15.209

Frequency (MHz)	Field Strength		Field Strength Limit at 3m Measurement Dist	
	uV/m	Distance (m)	uV/m	dBuV/m
0.009 ~ 0.490	2400/F(kHz)	300	10000 * 2400/F(kHz)	$20\log^{(2400/F(kHz))} + 80$
0.490 ~ 1.705	24000/F(kHz)	30	100 * 24000/F(kHz)	$20\log^{(24000/F(kHz))} + 40$
1.705 ~ 30	30	30	100 * 30	$20\log^{(30)} + 40$
30 ~ 88	100	3	100	$20\log^{(100)}$
88 ~ 216	150	3	150	$20\log^{(150)}$
216 ~ 960	200	3	200	$20\log^{(200)}$
Above 960	500	3	500	$20\log^{(500)}$

7.1 EUT Operation

Operating Environment :

Temperature: 23.5 °C

Humidity: 51.1 % RH

Atmospheric Pressure: 101.2kPa

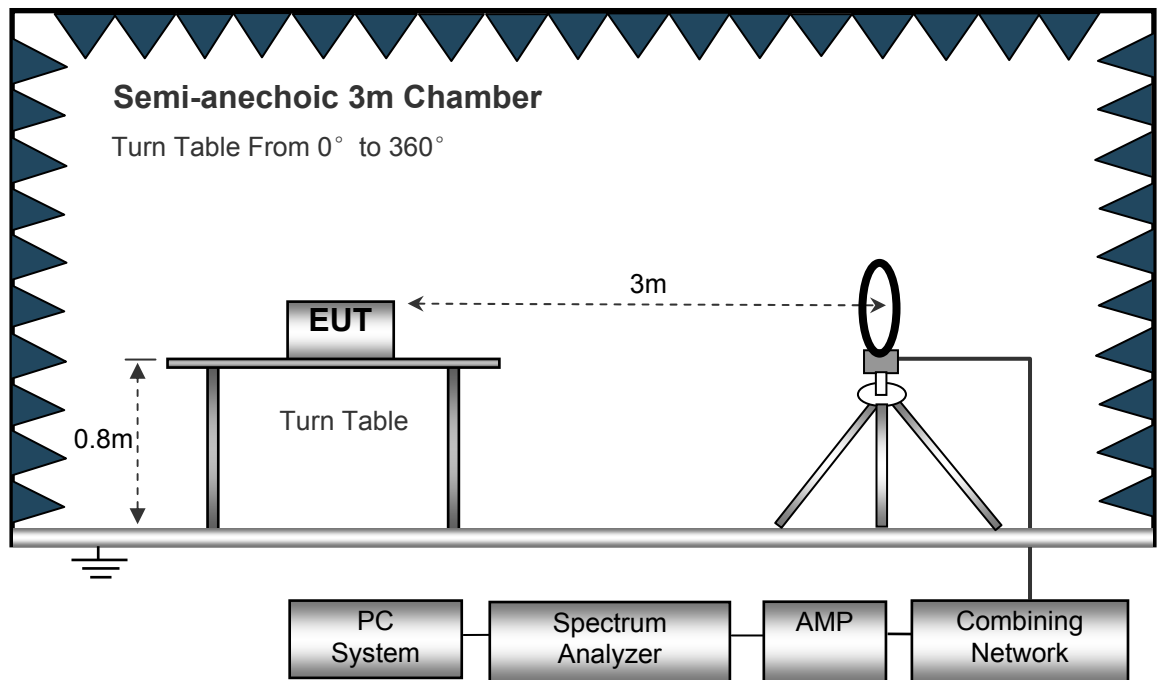
EUT Operation :

Only the worst case transmitting mode were record in the report.

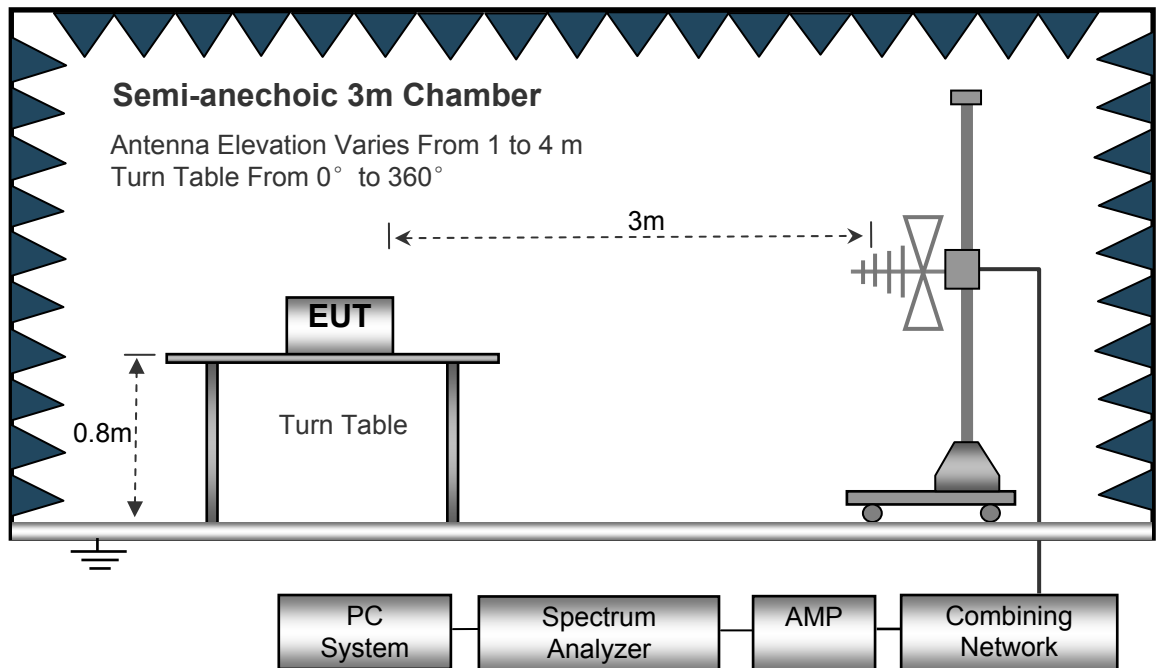
7.2 Test Setup

The radiated emission tests were performed in the 3m Semi- Anechoic Chamber test site, using the setup accordance with the ANSI C63.10: 2013.

The test setup for emission measurement below 30MHz.



The test setup for emission measurement from 30 MHz to 1 GHz.



7.3 Spectrum Analyzer Setup

Below 30MHz

Sweep SpeedAuto
IF Bandwidth..... 10kHz
Video Bandwidth..... 10kHz
Resolution Bandwidth..... 10kHz

30MHz ~ 1GHz

Sweep SpeedAuto
DetectorPK
Resolution Bandwidth..... 100kHz
Video Bandwidth..... 300kHz

7.4 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 moved from 1m to 4m to find out the maximum emissions. The spectrum was investigated from the lowest radio frequency signal generated in the device, without going below 9 kHz, up to the tenth harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower.
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.
7. The radiation measurements are tested under 3-axes(X, Y, Z) position(X denotes lying on the table, Y denotes side stand and Z denotes vertical stand). After pre-test, It was found that the worse radiation emission was get at the X position. So the data shown was the X position only.

7.5 Summary of Test Results

Test Frequency: 9KHz ~ 30MHz, Note: Correct factor = Cable loss + Antenna factor

Frequency	Receiver Reading (AV)	Turn table Angle	RX Antenna		Corrected Factor	Corrected Amplitude (AV)	FCC Part 15.209	
			Height	Polar			Limit	Margin
(MHz)	(dBμV@3m)	Degree	(m)	(H/V)	(dB/m)	(dBμV/m)	(dBμV/m)@3m	(dB)
0.140	44.17	125	1.7	H	20.58	64.75	104.68	-39.93
0.140	30.90	214	1.8	V	28.37	59.27	104.68	-45.41

Frequency (MHz)	Measurement results	Detector	Correct factor	Extrapolation factor	Measurement results (calculated)	Limits	Margin
	dBμV @3m	PK/QP	dB/m	dB	dBμV/m @3m	dBμV/m @3m	dB
2.896	20.04	QP	24.27	40.00	4.31	29.54	-25.23
4.508	7.89	QP	24.65	40.00	-7.46	29.54	-37.00

Test Frequency: 30MHz ~ 1GHz

Frequency	Receiver Reading	Detector	Turn table Angle	RX Antenna		Corrected Factor	Corrected Amplitude	FCC Part 15. 209	
				Height	Polar			Limit	Margin
(MHz)	(dBμV)	(PK/QP /Ave)	Degree	(m)	(H/V)	(dB)	(dBμV/m)	(dBμV /m)	(dB)
34.22	32.51	QP	17	2.0	H	-14.30	18.21	40.00	-21.79
34.22	34.47	QP	241	1.3	V	-14.30	20.17	40.00	-19.83
220.34	37.16	QP	186	1.2	H	-13.58	23.58	46.50	-22.92
220.34	42.21	QP	187	1.6	V	-13.58	28.63	46.50	-17.87
519.67	37.73	QP	75	1.9	H	-5.63	32.10	46.50	-14.40
519.67	43.58	QP	212	1.5	V	-5.63	37.95	46.50	-8.55

8 Bandwidth Measurement

Test Requirement: FCC CFR47 Part 15 Section 15.215

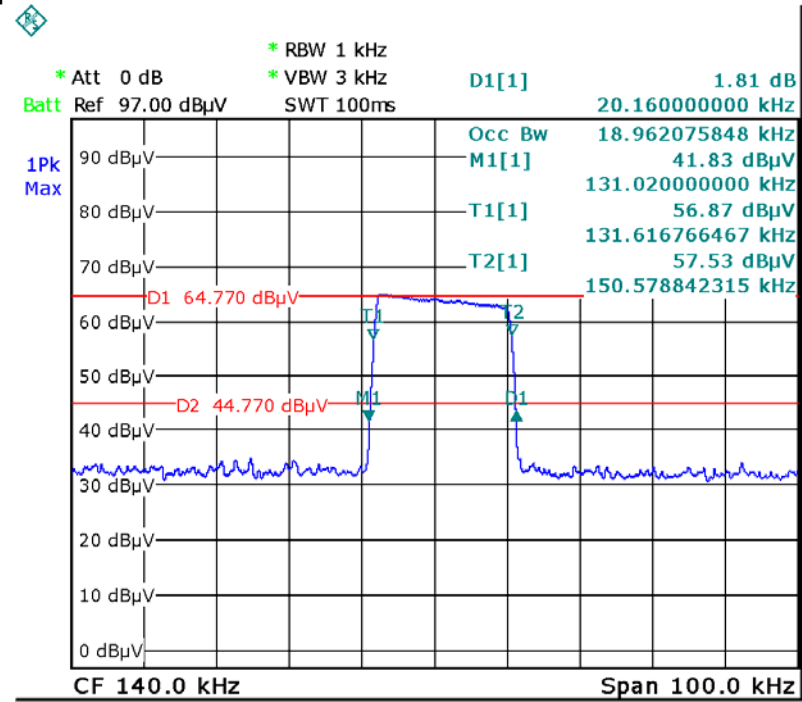
8.1 Test Procedure

- 1. The transmitter shall be operated at its maximum carrier power measured under normal test conditions;
- 2. The span of the analyzer shall be set to capture all products of the modulation process,including the emission skirts.
- 3. The resolution bandwidth (RBW) shall be in the range of 1% to 5% of the occupied bandwidth (OBW) and video bandwidth (VBW) shall be approximately 3x RBW.

8.2 Test Result Plot:

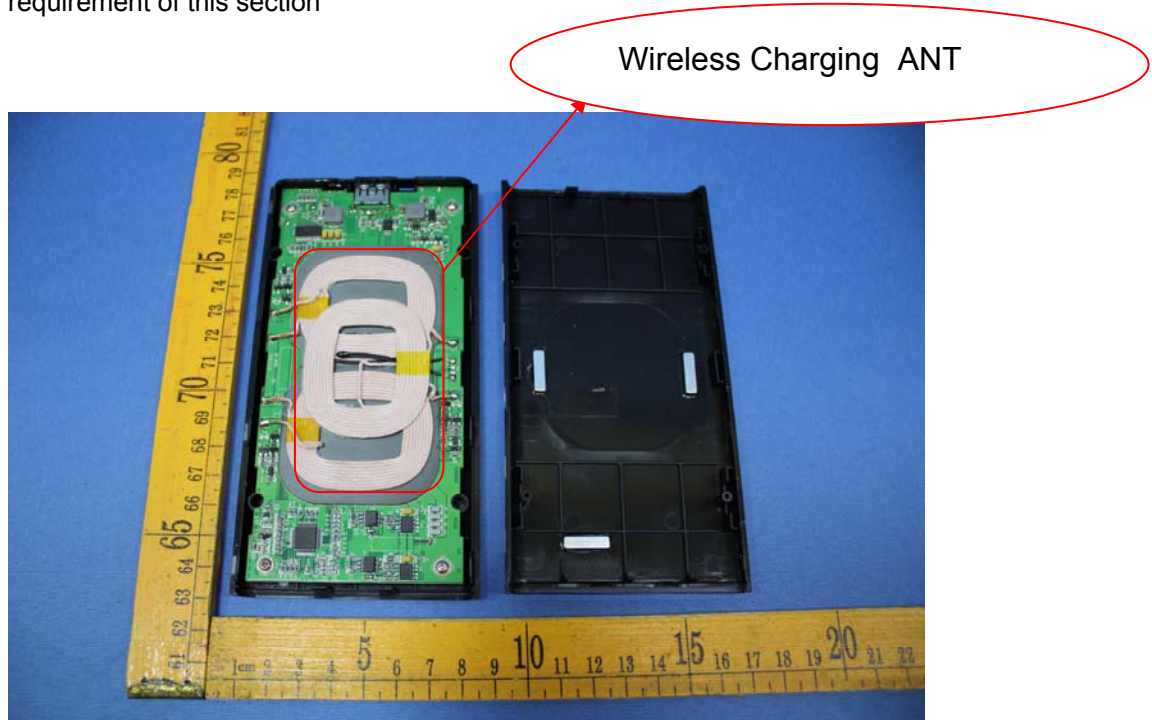
Test Channel(kHz)	99% Bandwidth(kHz)	20dB Bandwidth Emission(KHz)
140.00	18.962	20.160

Test result plot as follows:



9 Antenna Requirement

According to the FCC Part 15 Paragraph 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna to the intentional radiator shall be considered sufficient to comply with the provisions of this section. This product has a permanent Coil antenna, fulfill the requirement of this section



10 Photographs- QI-1606A Test Setup

10.1 Radiation Emission Test Setup

Below 30MHz at Test Site 2#



From 30MHz to 1GHz at Test Site 2#



10.2 Photograph – Conducted Emission Test Setup

Conducted Emissions Test Site 1#



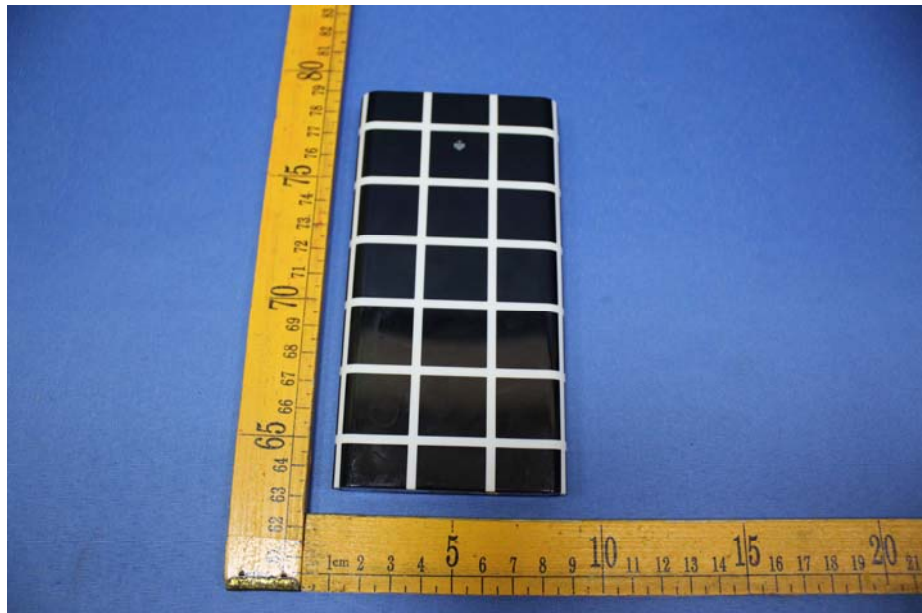
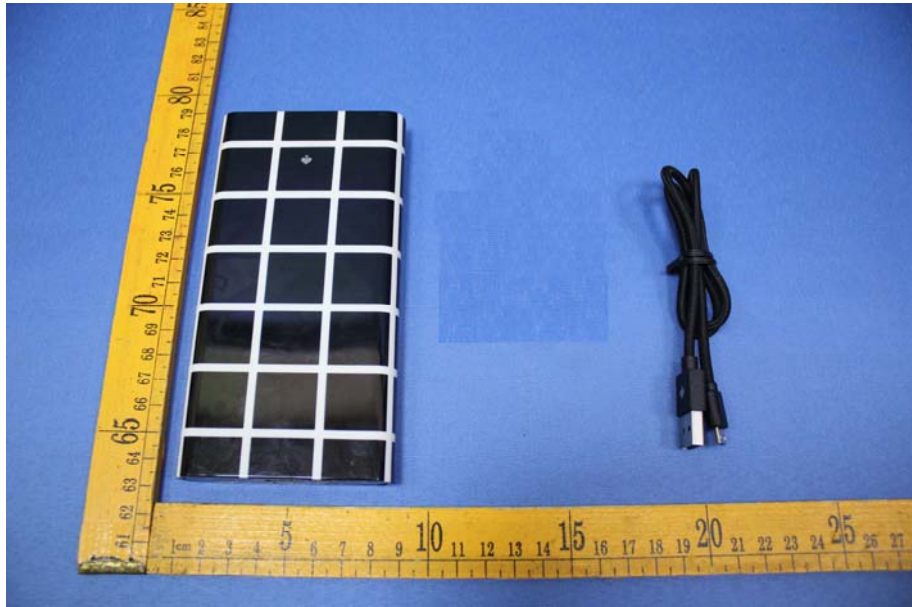
11 Photographs - Constructional Details

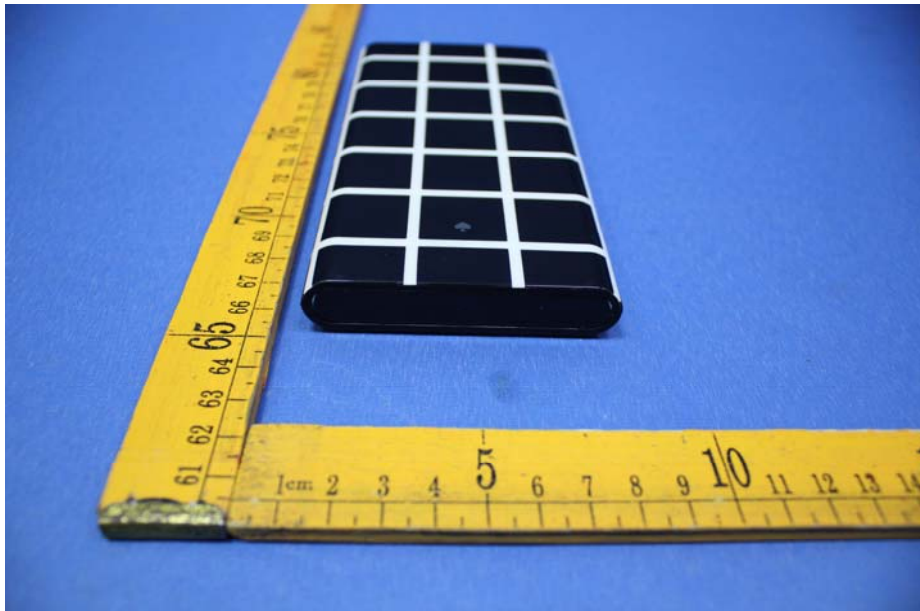
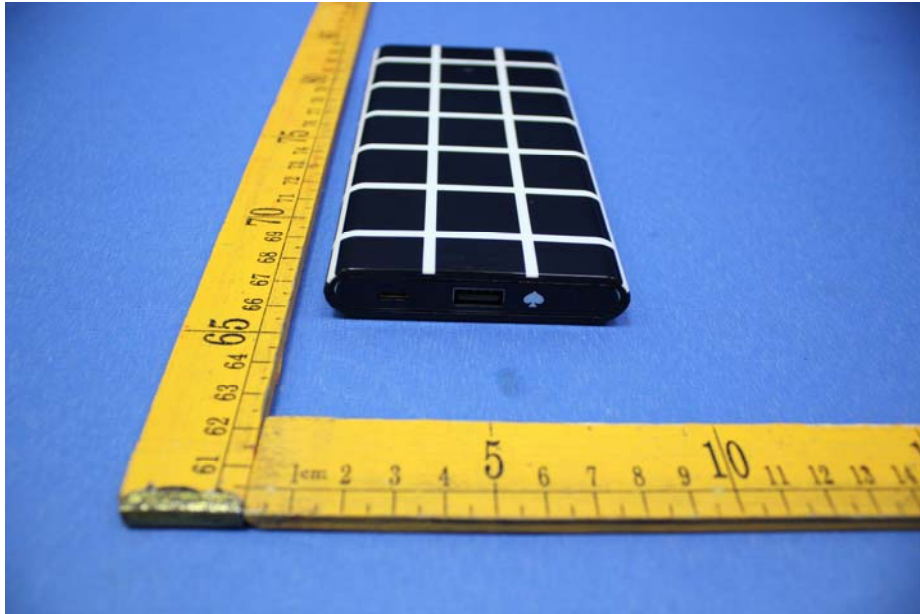
11.1 QI-1606A - Appearance View

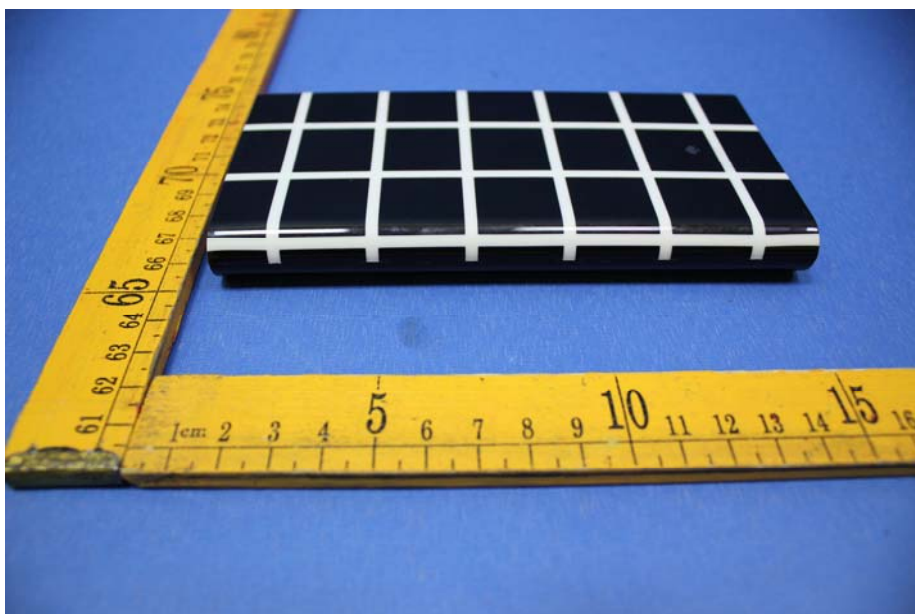
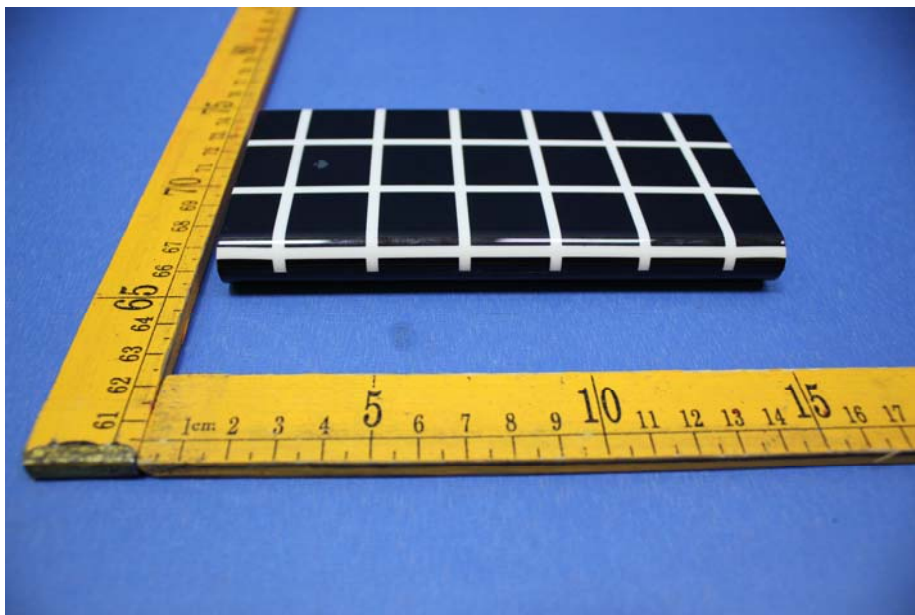






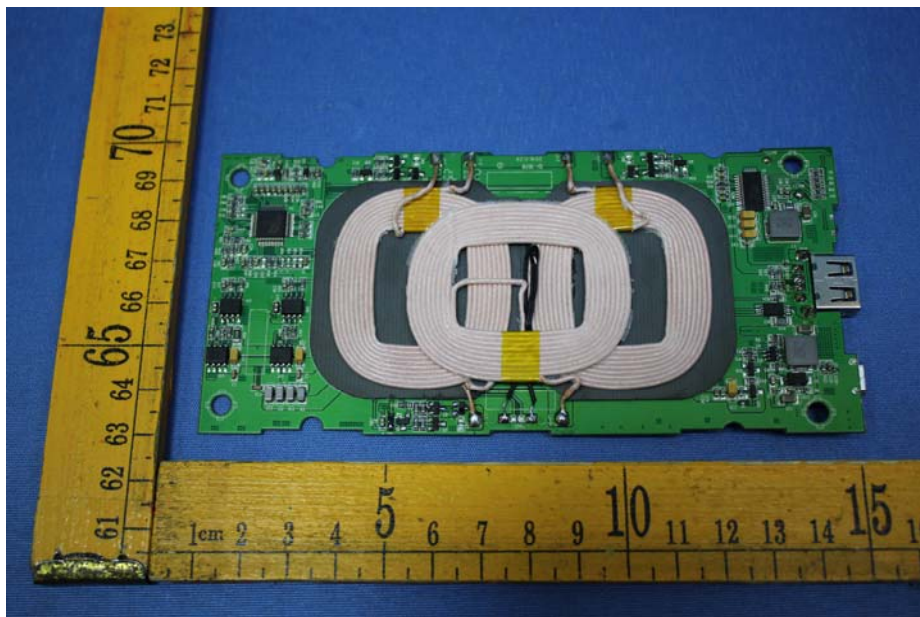
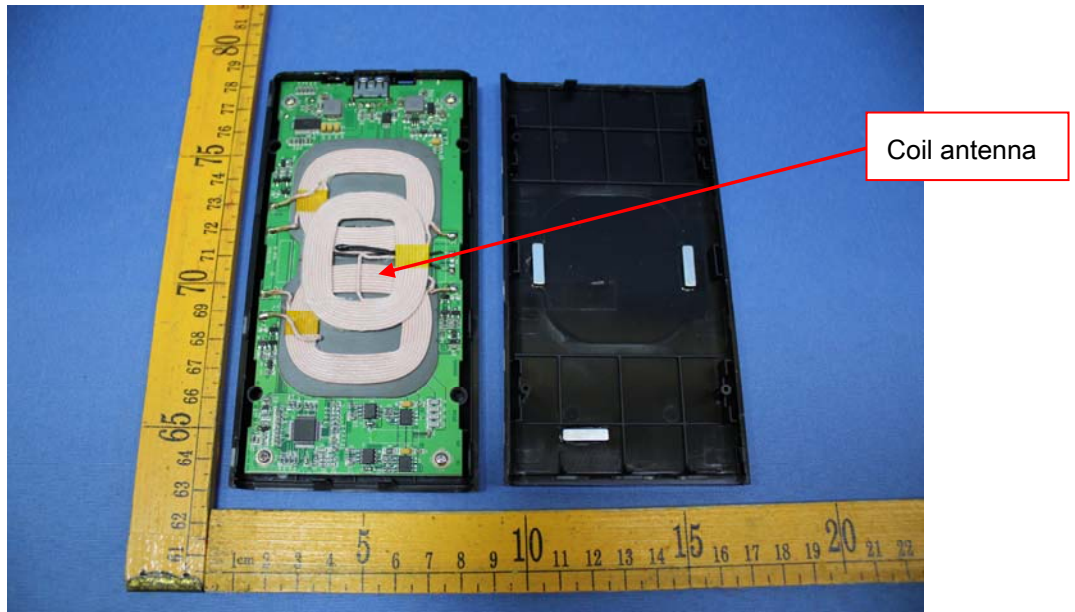


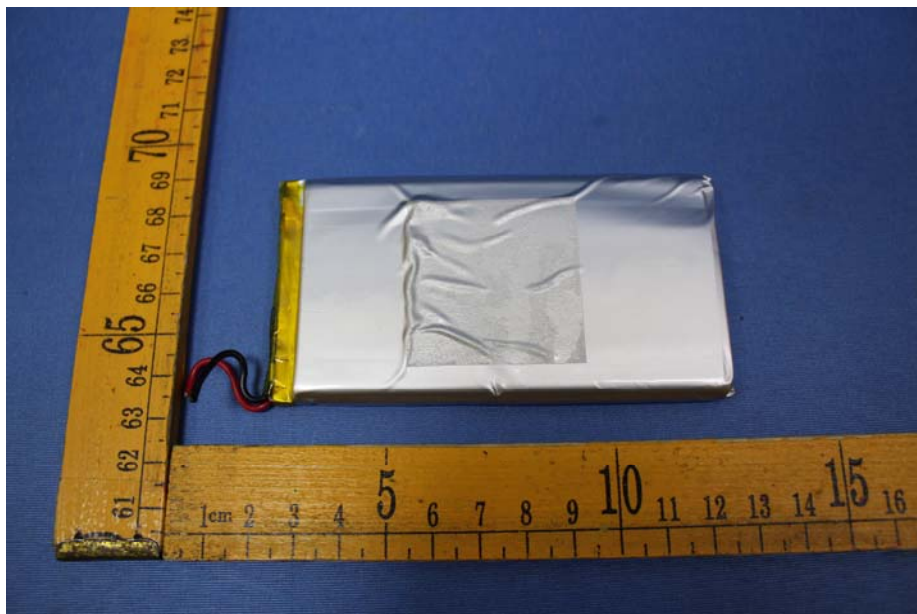
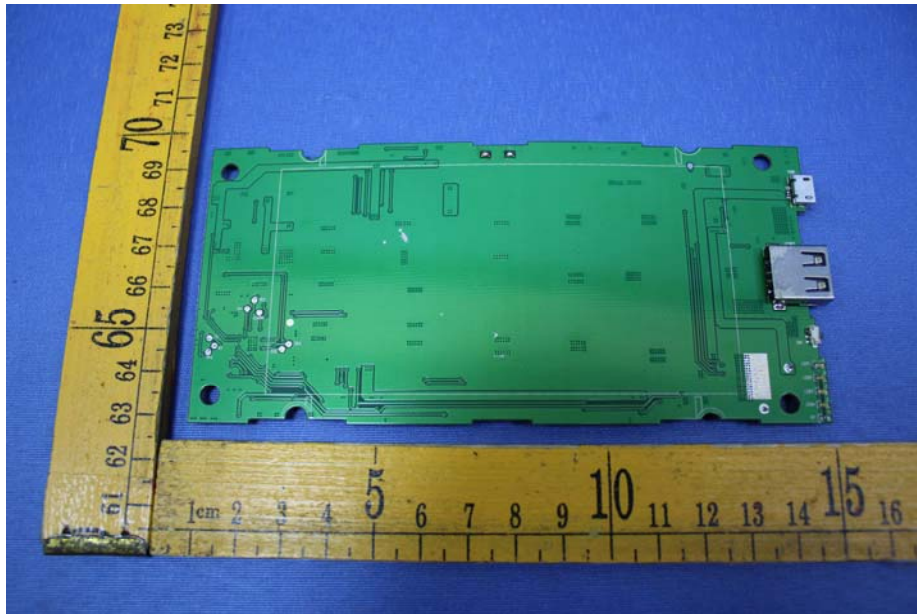






11.2 QI-1606A - Internal View







====End of Report====