FCC TEST REPORT

On Behalf of

Amiigo Inc.

Wavelet Charger

Model No.: C1001

FCC ID: 2AKLD-C1001

Prepared for	:	Amiigo Inc.
Address	:	465 Fairchild Drive, Suite 228 Mountain Veiw CA 94043, USA

Prepared By	:	Shenzhen Alpha Product Testing Co., Ltd.
Address	:	2B/F., Building B, No.99, East Area of Nanchang Second Industrial Zone, Gushu 2nd Road, Bao' an District, Shenzhen, Guangdong, China

Report Number	:	T1862416 01
Date of Receipt	:	November 24, 2016
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Date of Report	:	June 23, 2017
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TEST REPORT DECLARATION

Applicant	:	Amiigo Inc.		
Manufacturer	:	Amiigo Inc.		
EUT Description	:	Wavelet Charger		
		(A) Model No.	:	C1001
		(B) Trademark	:	**Wavelet**
		(C) Ratings Supply	:	DC 5V from USB port
		(D) Test Voltage	:	DC 5V from USB port with AC 120V/60Hz Input
		(E) Rated Output	:	DC 5V, 0.5A

Measurement Standard Used:

FCC Rules and Regulations Part 15 Subpart C:2016, ANSI C63.10:2013

The device described above is tested by Shenzhen Alpha Product Testing Co., Ltd. to determine the maximum emission levels emanating from the device and the severe levels of the device can endure and its performance criterion. The test results are contained in this test report and Shenzhen Alpha Product Testing Co., Ltd. is assumed full responsibility for the accuracy and completeness of test. Also, this report shows that the EUT is technically compliant with the FCC Part15 requirements.

This report applies to above tested sample only. This report shall not be reproduced in parts without written approval of Shenzhen Alpha Product Testing Co., Ltd.

Tested by (name + signature).....…..:	Reak Yang Test Engineer	Reak Yang ……..……
Approved by (name + signature)…....:	Simple Guan Project Manager	…….
Date of issue…… ……..:	June 23, 2017	

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**
Power Line Conducted Emission Test	FCC Part 15:2016	Section 15.209	**P**
Radiated Emission Test	FCC Part 15:2016	Section 15.207	**P**
Occupied bandwidth	FCC Part 15:2016	Section 15.215	**P**
Note: 1. P is an abbreviation for Pass. 2. F is an abbreviation for Fail. 3. N/A is an abbreviation for Not Applicable.			

2. GENERAL INFORMATION

2.1.Description of Device (EUT)

Description	:	Wavelet Charger
Model Number	:	C1001
Diff	:	N/A
Modulation Type	:	MSK
Operation Frequency	:	120-205KHz
Antenna type	:	Integrated Antenna
Antenna gain	:	0dBi
Test Voltage	:	DC 5V from USB port with AC 120V/60Hz Input
Trademark	:	Wavelet
Applicant	:	Amiigo Inc.
Address	:	465 Fairchild Drive, Suite 228 Mountain Veiw CA 94043, USA
Manufacturer	:	Amiigo Inc.
Address	:	465 Fairchild Drive, Suite 228 Mountain Veiw CA 94043, USA
Sample Type	:	Prototype production

2.2.Tested Supporting System Details

No.	Description	Manufacturer	Model	Serial Number	Certification or DOC
1	Adapter	Wopow	A9-501000	N/A	VOC

2.3.Block Diagram of connection between EUT and simulators

Signal Cable Description of the above Support Units					
No.	**Port Name**	**Cable**	**Length**	**Shielded (Yes or No)**	**Detachable (Yes or No)**
(a)	N/A	N/A	N/A	N/A	N/A

EUT: Wavelet Charger

2.4.Test mode Description

No.	Test Mode				
※1.	Full Load	2	Half Load for wrist band	3	Half Load for wrist band
4	No Load				
Note: Mode “1” is worst case mode, so this report only reflected the worst mode.					

2.5.Test Facility

Shenzhen Alpha Product Testing Co., Ltd.
2B/F., Building B, No.99, East Area of Nanchang Second Industrial Zone, Gushu 2nd Road, Bao’ an District, Shenzhen, Guangdong, China

March 25, 2015 File on Federal Communication Commission
Registration Number: 203110

July 18, 2014 Certificated by IC
Registration Number: 12135A

2.6.Measurement Uncertainty

(95% confidence levels, k=2)

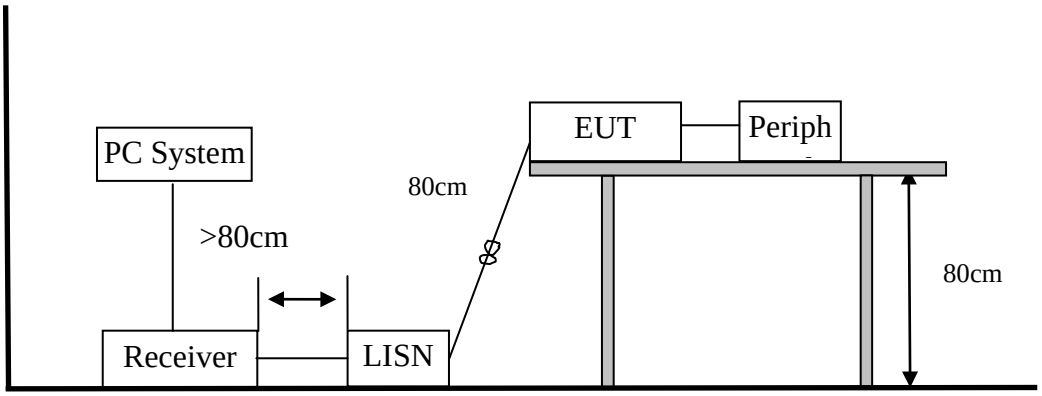
Test Item	Uncertainty
Uncertainty for Conduction emission test	2.71dB
Uncertainty for Radiation Emission test (<1G)	3.90 dB (Distance: 3m Polarize: V)
	3.92 dB (Distance: 3m Polarize: H)
Uncertainty for Radiation Emission test(>1G)	4.26 dB (Distance: 3m Polarize: V)
	4.28 dB (Distance: 3m Polarize: H)

3. POWER LINE CONDUCTED EMISSION TEST

3.1.Test Equipment

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Test Receiver	Rohde & Schwarz	ESCI	101165	2017.09.29	1 Year
2.	L.I.S.N.#1	Schwarzbeck	NSLK8126	8126466	2017.09.29	1 Year
3.	L.I.S.N.#2	ROHDE&SCHWARZ	ENV216	101043	2017.09.29	1 Year
4.	Pulse Limiter	Schwarzbeck	9516F	9618	2017.09.29	1 Year
5	Cable	Resenberger	SUCOFLEX 104	MY6562/4	2017.09.29	1 Year

3.2.Block Diagram of Test Setup



3.3.Power Line Conducted Emission Test Limits

Frequency	Maximum RF Line Voltage	
	Quasi-Peak Level dB(μV)	Average Level dB(μV)
150kHz ~ 500kHz	66 ~ 56*	56 ~ 46*
500kHz ~ 5MHz	56	46
5MHz ~ 30MHz	60	50

Notes: 1. Emission level=Read level + LISN factor-Preamp factor + Cable loss

2. * Decreasing linearly with logarithm of frequency.

3. The lower limit shall apply at the transition frequencies.

3.4.Configuration of EUT on Test

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

3.5.Operating Condition of EUT

（1） Setup the EUT as shown as Section 3.2.

（2） Turn on the power of all equipment.

（3） Let the EUT work in test mode and 15 minutes before taking the test.

3.6.Test Procedure

（1） The EUT was placed on a non-metallic table, 80cm above the ground plane. The EUT Power connected to the power mains through a line impedance stabilization network (L.I.S.N. 1#). This provided a 50-ohm coupling impedance for the EUT (Please refer to the block diagram of the test setup and photographs). The other peripheral devices power cord connected to the power mains through a line impedance stabilization network (L.I.S.N.#2). Both sides of power line were checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipments and all of the interface cables were changed according to ANSI C63.10:2013 on conducted Emission test.

（2） The frequency range from 150kHz to 30MHz is checked, the bandwidth of test receiver (R&S TEST RECEIVER ESCI) is set at 9kHz.

（3） The frequency range from 30MHz to 1000MHz was pre-scanned with a Peak detector and all final readings of measurement from Test Receiver are Quasi-Peak and Average values.

（4） The test results are reported on Section 3.7.

3.7.Conducted Disturbance at Mains Terminals Test Results

EUT	:	Wavelet Charger	Test Date	:	2017-06-15
M/N	:	C1001	Temperature	:	23.3℃
Test Engineer	:	Eirc Huang	Humidity	:	50%
Test Mode	:	Full Load			
Test Results	:	**PASS**			

Note: 1. The test results are listed in next pages.

2. This mode is worst case mode, so this report only reflected the worst mode.

3. If the limits for the measurement with the average detector are met when using a receiver with a peak detector, the test unit shall be deemed to meet both limits and the measurement with the average detector and quasi-peak detector need not be carried out.

4. If the limits for the measurement with the average detector are met when using a receiver with a quasi-peak detector, the test unit shall be deemed to meet both limits and the measurement with the average detector need not be carried out.

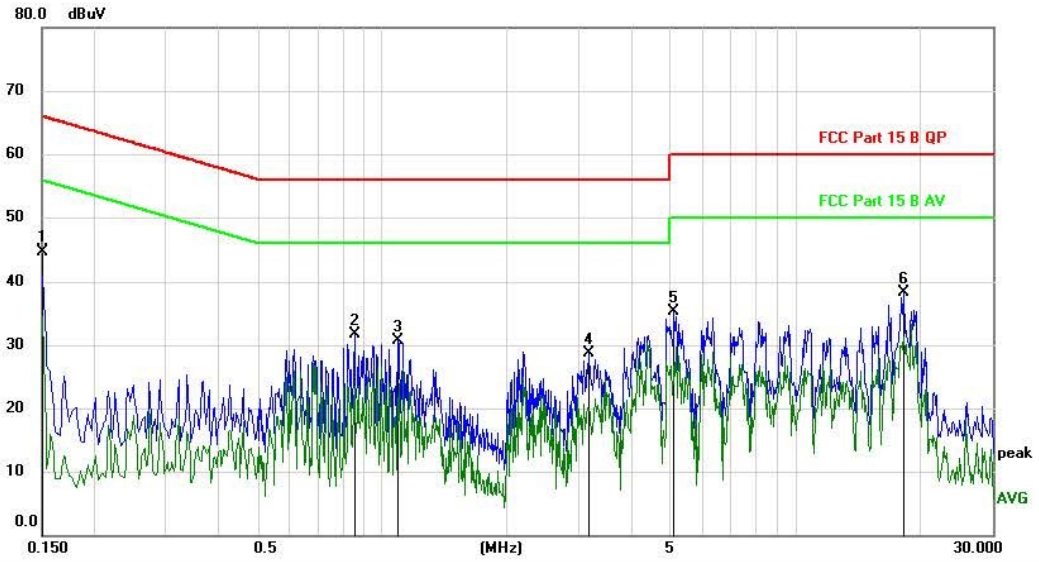
Site LAB
Limit: FCC Part 15 B QP
EUT: Wavelet Charger
M/N: C1001
Mode: Working
Note:

Phase: L1
Power: DC 5V

Temperature: 24.1
Humidity: 54 %

Conducted Emission Measurement

File :C1001 Data :#1 Date: 2017-3-9 Time: 10:50:55

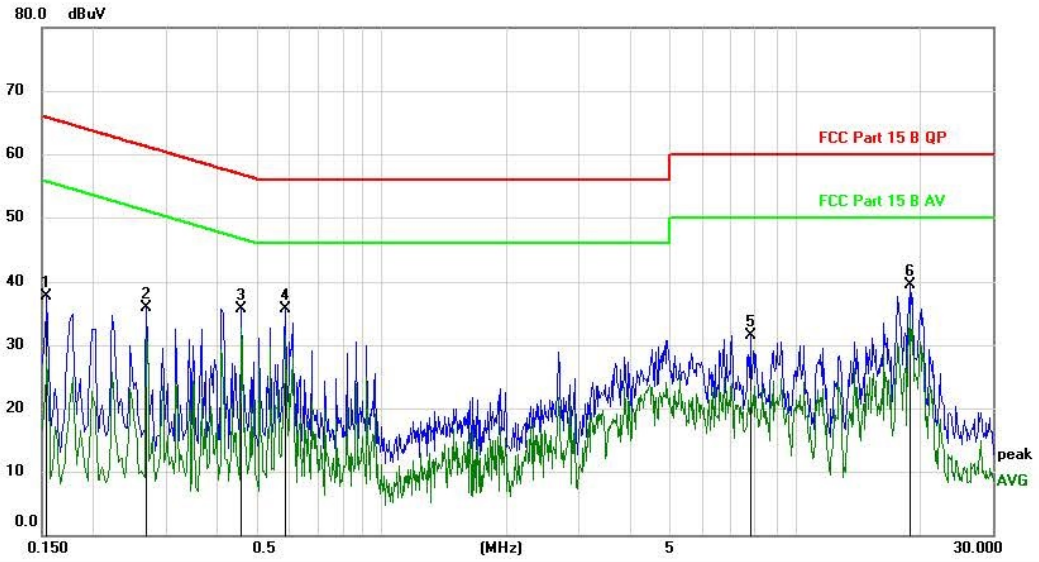


No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1	*	0.1500	34.98	9.73	44.71	66.00	-21.29	peak	
2		0.8540	21.84	9.82	31.66	56.00	-24.34	peak	
3		1.0900	20.83	9.84	30.67	56.00	-25.33	peak	
4		3.1660	18.58	10.05	28.63	56.00	-27.37	peak	
5		5.0900	25.14	10.19	35.33	60.00	-24.67	peak	
6		18.3180	27.76	10.46	38.22	60.00	-21.78	peak	

Site LAB	Phase:	*N*	Temperature: 24.1
Limit: FCC Part 15 B QP	Power:	DC 5V	Humidity: 54 %
EUT: Wavelet Charger			
M/N: C1001			
Mode: Working			
Note:			

Conducted Emission Measurement

File :C1001 Data :#2 Date: 2017-3-9 Time: 10:51:31



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1539	28.07	9.73	37.80	65.79	-27.99	peak	
2		0.2700	26.13	9.76	35.89	61.12	-25.23	peak	
3		0.4580	25.88	9.78	35.66	56.73	-21.07	peak	
4	*	0.5860	26.00	9.79	35.79	56.00	-20.21	peak	
5		7.7660	21.30	10.28	31.58	60.00	-28.42	peak	
6		18.8779	28.98	10.47	39.45	60.00	-20.55	peak	

4. RADIATED EMISSION TEST

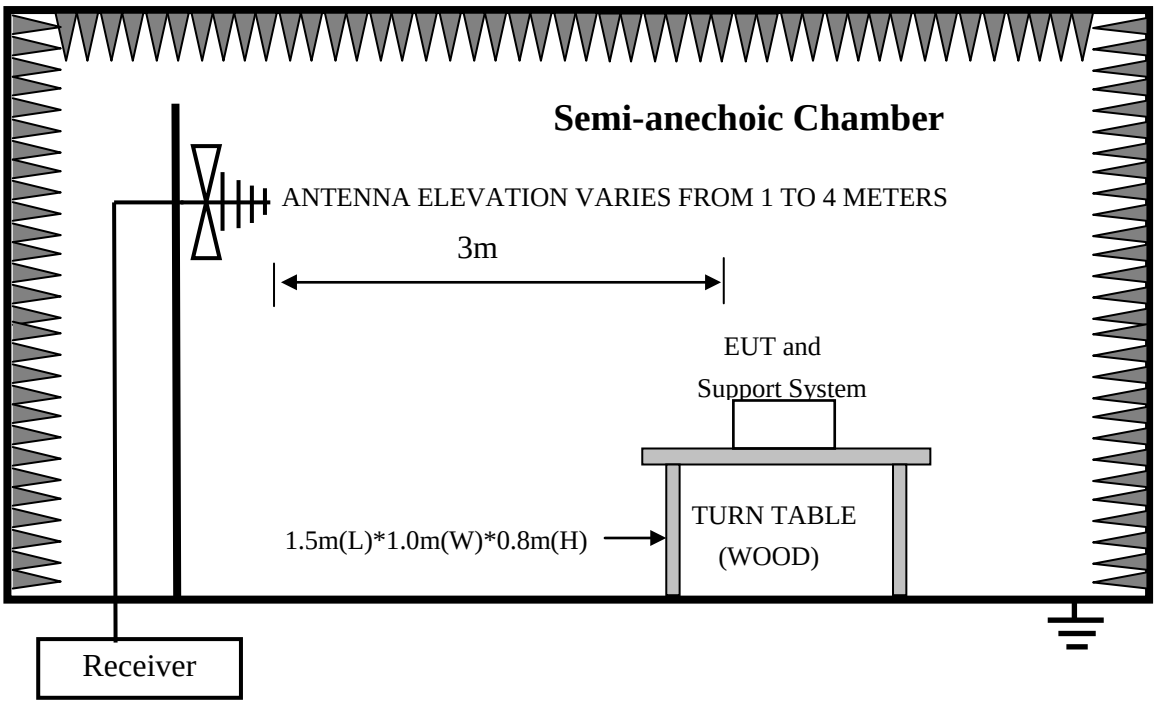
4.1.Test Equipment

For frequency range 30MHz~1GHz (At Semi Anechoic Chamber)						
Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1	Test Receiver	Rohde&Schwarz	ESR	1316.3003K03-102082-Wa	2017.09.29	1 Year
2	Amplifier	HP	HP8347A	2834A00455	2017.09.30	1 Year
3	Bilog Antenna	Schwarzbeck	VULB 9168	9168-438	2017.09.30	2 Year
4	Cable	Resenberger	SUCOFLEX 104	309972/4	2017.09.29	1 Year

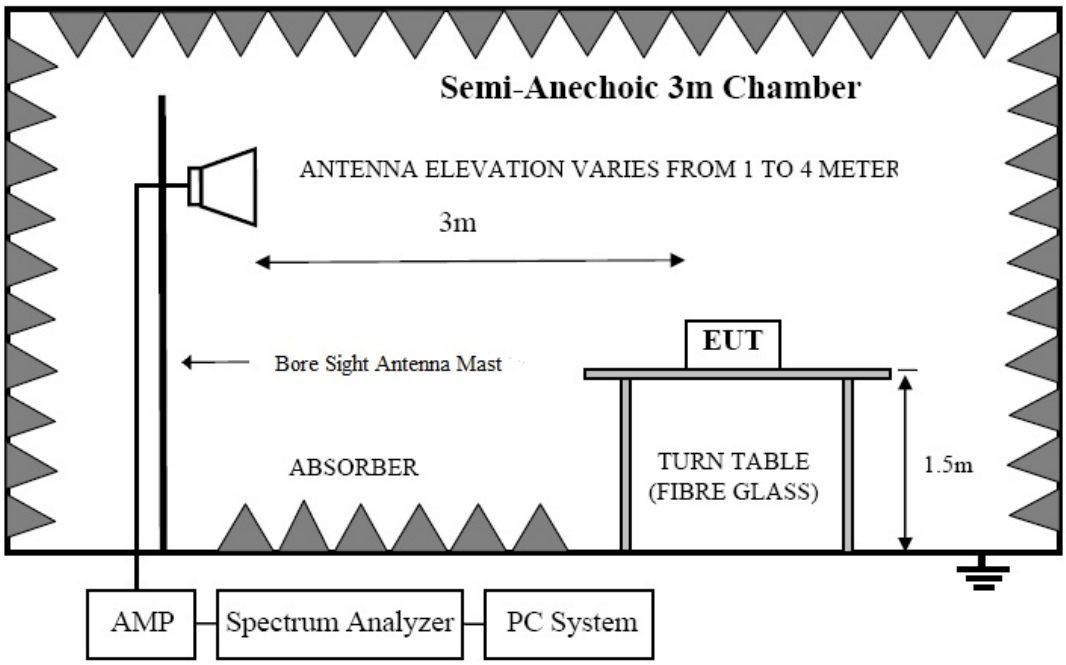
For frequency range above 1GHz (At Semi Anechoic Chamber (3m))						
Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1	Spectrum Analyzer	Agilent	E4407B	MY49510055	2017.09.29	1 Year
2	Horn Antenna	Schwarzbeck	BBHA 9120 D	BBHA 9120 D(1201)	2017.01.20	1 Year
3	Amplifier	Agilent	8449B	3008A02664	2017.09.30	1 Year
4	Cable	Resenberger	SUCOFLEX 104	329112/4	2017.09.29	1 Year

4.2.Block Diagram of Test Setup

In Semi Anechoic Chamber (3m) Test Setup Diagram for 30MHz~1000MHz



In Semi Anechoic Chamber (3m) Test Setup Diagram for Above 1GHz



4.3.Radiated Emission Limit

Frequency MHz	Distance (Meters)	Field Strengths Limits dB(μV)/m
30 ~ 88	3	40.0
88 ~ 216	3	43.5
216 ~ 960	3	46.0
960 ~ 1000	3	54.0
Above 1GHz	3	74(Peak) 54(Average)

Notes: 1. Emission level = Read level + Antenna Factor - Preamp Factor + Cable Loss

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.

4. Frequency range of radiated measurements:

Highest frequency generated or used in the device or on which the device operates or tunes (MHz)	Upper frequency of measurement range (MHz)
Below 1.705	30
1.705-108	1000
108-500	2000
500-1000	5000
Above 1000	5th harmonic of the highest frequency or 40 GHz, whichever is lower.

4.4.Configuration of EUT on Test

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

4.5.Operating Condition of EUT

（1） Setup the EUT as shown as Section 4.2.

（2） Turn on the power of all equipment.

（3） Let the EUT work in test mode and 15 minutes before taking the test.

4.6.Test Procedure

（1） The EUT was placed on a non-metallic table, 80 cm above the ground plane inside a semi-anechoic chamber. An antenna was located 3m from the EUT on an adjustable mast. A pre-scan was first performed in order to find prominent radiated emissions. For final emissions measurements at each frequency of interest, the EUT were rotated and the antenna height was varied between 1m and 4m in order to maximize the emission. Measurements in both horizontal and vertical polarities were made and the data was recorded. In order to find the maximum emission, the relative positions of equipments and all of the interface cables were changed according to ANSI C63.10:2013 on Radiated Emission test.

（2） For the radiated emission test above 1GHz:

Place the measurement antenna away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response. The measurement antenna may have to be higher or lower than the EUT, depending on the radiation pattern of the emission and staying aimed at the emission source for receiving the maximum signal. The final measurement antenna elevation shall be that which maximizes the emissions. The measurement antenna elevation for maximum emissions shall be restricted to a range of heights of from 1 m to 4 m above the ground or reference ground plane.

（3） The frequency range from 30MHz to 1000MHz is checked, the bandwidth of test receiver (R&S TEST RECEIVER ESCI) is set at 120kHz.

（4） The frequency range from above 1GHz is checked, the bandwidth of spectrum analyzer (Analyzer Spectrum Analyzer E4407B) is set at 1MHz.

（5） The frequency range from 30MHz to 1000MHz was pre-scanned with a peak detector and all final readings of measurement from Test Receiver are Quasi-Peak values, the frequency range from 1GHz to 6GHz was pre-scanned with a peak detector and all final readings of measurement from Spectrum Analyzer are peak and average values checked, all measurement distance is 3m in 3m semi anechoic chamber.

（6） The test results are reported on Section 4.7.

4.7.Radiated Disturbance Test Results

Frequency Range	:	**9KHz~30MHz**			
EUT	:	Wavelet Charger	Test Date	:	2017-06-15
M/N	:	C1001	Temperature	:	23.9℃
Test Engineer	:	Eirc Huang	Humidity	:	46%
Test Mode	:	TX 170.8KHz For Full Load			
Test Results	:	**PASS**			

Note: 1. The test results are listed in next pages.

2. This mode is worst case mode, so this report only reflected the worst mode.

3. If the limits for the measurement with the average detector are met when using a receiver with a peak detector, the test unit shall be deemed to meet both limits and the measurement with the quasi-peak detector need not be carried out.

Freq.	Reading	Antenna Factor	Cable loss	Amp Factor	Result	Limit	Margin	Detector	State
(MHz)	(dBuV/m)	dB/m	dB	dB	(dBuV/m)	(dBuV/m) at 3 m	(dB)		P/F
0.11	73.39	48.34	0.16	29.87	92.02	126.77	-34.75	PK	PASS
0.11	62.77	48.34	0.16	29.87	81.40	106.77	-25.37	AV	PASS
0.155	67.78	48.34	0.16	29.87	86.41	123.79	-37.38	PK	PASS
0.155	57.30	48.34	0.16	29.87	75.93	103.79	-27.86	AV	PASS
0.1708	87.64	48.34	0.16	29.87	106.27	122.95	-16.68	PK	PASS
0.1708	65.83	48.34	0.16	29.87	84.46	102.95	-18.49	AV	PASS
0.205	66.32	48.38	0.17	29.89	84.98	121.37	-36.39	PK	PASS
0.205	55.81	48.38	0.17	29.89	74.47	101.37	-26.90	AV	PASS
0.22	70.80	48.38	0.17	29.89	89.46	120.76	-31.30	PK	PASS
0.22	59.77	48.38	0.17	29.89	78.43	100.76	-22.33	AV	PASS
0.31	67.27	48.44	0.19	29.89	86.01	117.78	-31.77	PK	PASS
0.31	57.89	48.44	0.19	29.89	76.63	97.78	-21.15	AV	PASS
0.41	64.93	48.47	0.19	29.89	83.70	115.35	-31.65	PK	PASS
0.41	54.99	48.47	0.19	29.89	73.76	95.35	-21.59	AV	PASS
1.963	18.74	49.12	0.2	29.94	38.12	60	-21.88	QP	PASS
1.958	20.64	49.12	0.2	29.94	40.02	60	-19.98	QP	PASS

Frequency Range	:	**30MHz~1000MHz**		
EUT	:	Wavelet Charger	Test Date	: 2017-06-15
M/N	:	C1001	Temperature	: 23.9℃
Test Engineer	:	Eirc Huang	Humidity	: 46%
Test Mode	:	Full Load		
Test Results	:	**PASS**		

Note: 1. The test results are listed in next pages.

2. This mode is worst case mode, so this report only reflected the worst mode.

3. If the limits for the measurement with the average detector are met when using a receiver with a peak detector, the test unit shall be deemed to meet both limits and the measurement with the quasi-peak detector need not be carried out.

Frequency Range	:	**Above 1GHz**		
EUT	:	/	Test Date	: /
M/N	:	/	Temperature	: /
Test Engineer	:	/	Humidity	: /
Test Mode	:	/		
Test Results	:	**N/A**		

Note: 1. The highest frequency of the internal sources of the EUT is less than 108 MHz, the measurement shall only be made up to 1 GHz. So the frequency rang above 1GHz radiation test not applicable.

Site LAB
Limit: FCC Class B Radiation
EUT: Wavelet Charger
M/N: C1001
Mode:Working
Note:

Polarization: *Vertical*
Power: DC 5V
Distance: 3m

Temperature: 23
Humidity: 48 %

Radiated Emission Measurement

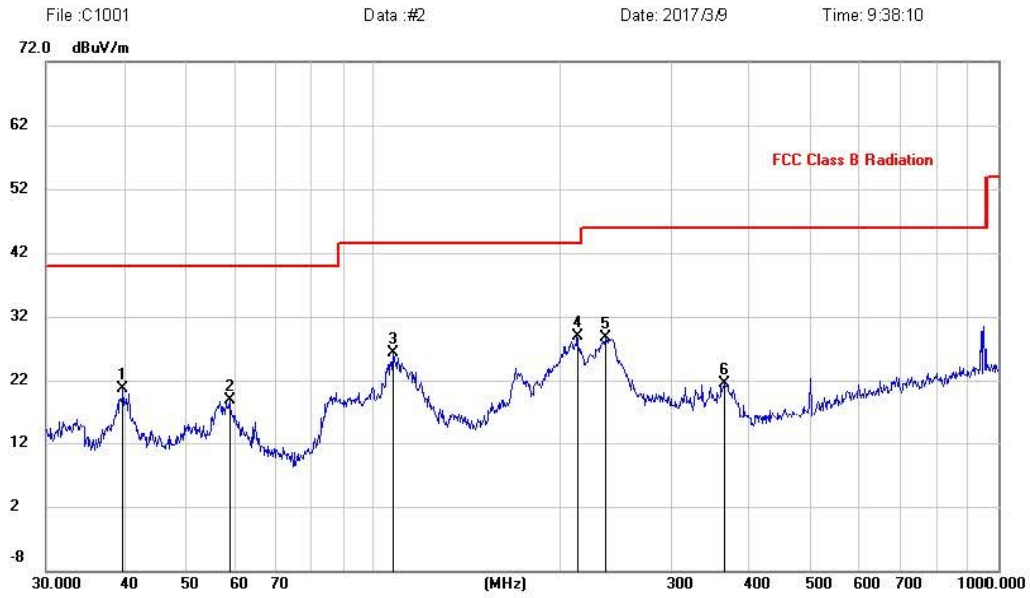
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		33.6802	19.47	13.45	32.92	40.00	-7.08	peak			
2	*	39.9942	20.62	14.24	34.86	40.00	-5.14	peak			
3		58.8185	18.80	13.08	31.88	40.00	-8.12	peak			
4		94.7601	24.46	10.18	34.64	43.50	-8.86	peak			
5		207.1226	21.56	10.59	32.15	43.50	-11.35	peak			
6		240.8304	18.60	11.99	30.59	46.00	-15.41	peak			

Site LAB
Limit: FCC Class B Radiation
EUT: Wavelet Charger
M/N: C1001
Mode:Working
Note:

Polarization: *Horizontal*
Power: DC 5V
Distance: 3m

Temperature: 23
Humidity: 48 %

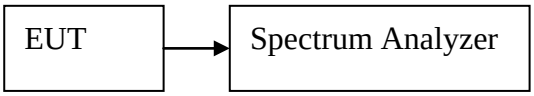
Radiated Emission Measurement



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		39.8542	6.47	14.23	20.70	40.00	-19.30	peak			
2		58.8185	5.77	13.08	18.85	40.00	-21.15	peak			
3		107.5101	14.98	11.29	26.27	43.50	-17.23	peak			
4	*	212.2695	17.99	10.83	28.82	43.50	-14.68	peak			
5		234.9909	16.77	11.88	28.65	46.00	-17.35	peak			
6		365.5391	6.59	14.89	21.48	46.00	-24.52	peak			

5. OCCUPIED BANDWIDTH TEST

5.1.Block Diagram of Test Setup



5.2.Test Limit

N/A

5.3.Test Procedure

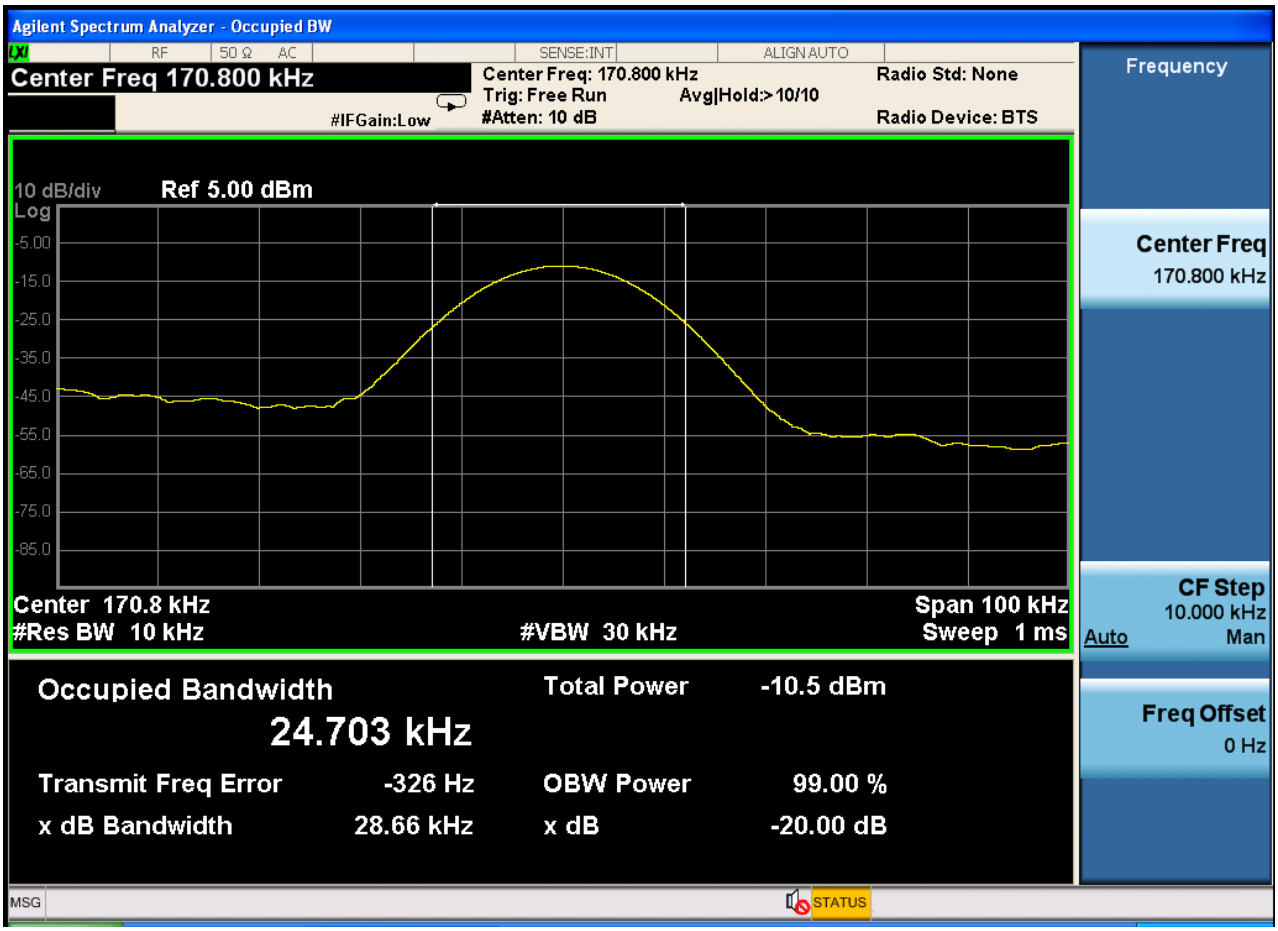
（1） The bandwidth is measured at an amplitude level reduced 20dB from the reference level. The reference level is the level of the highest amplitude signal observed from the transmitter at the fundamental frequency. Once the reference level is established, the equipment is conditioned with typical modulating signal to produce the worst-case (i.e. the widest) bandwidth.

（2） The test receiver RBW set 10KHz,VBW set 30KHz,Sweep time set auto.

5.4.Test Results

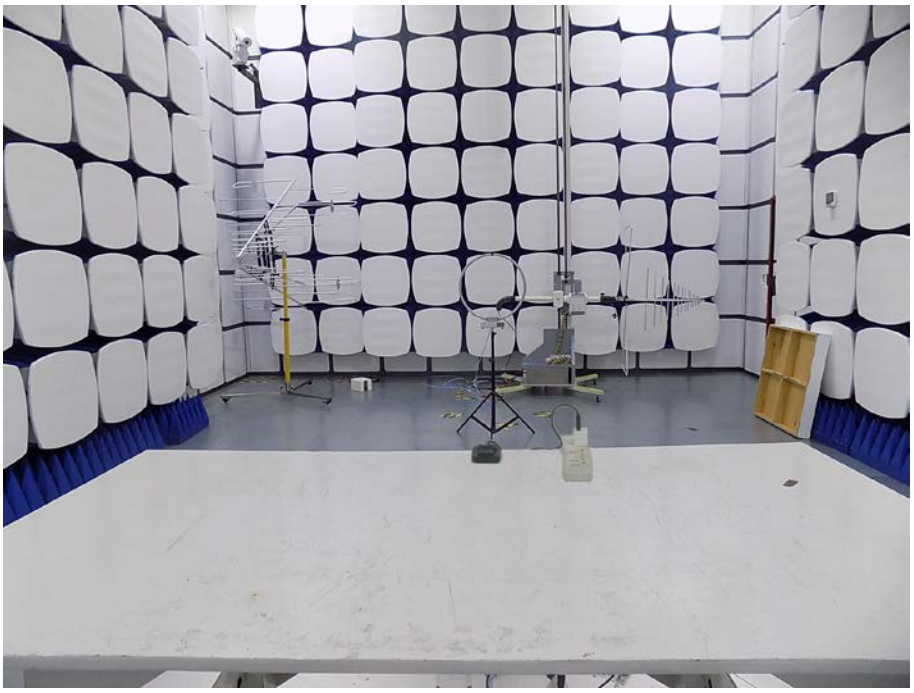
EUT	: Wavelet Charger		Test Date	: 2017-06-15
M/N	: C1001		Temperature	: 23.9℃
Test Engineer	: Eirc Huang		Humidity	: 46%
Test Mode	: TX 170.8KHz			
Test Results	: **PASS**			
Mode	Frequency KHz	20dB Bandwidth (KHz)	99% Bandwidth (KHz)	Limit (kHz)
MSK	170.8	28.66	24.703	/
Note: 1. The test results are listed in next pages.				

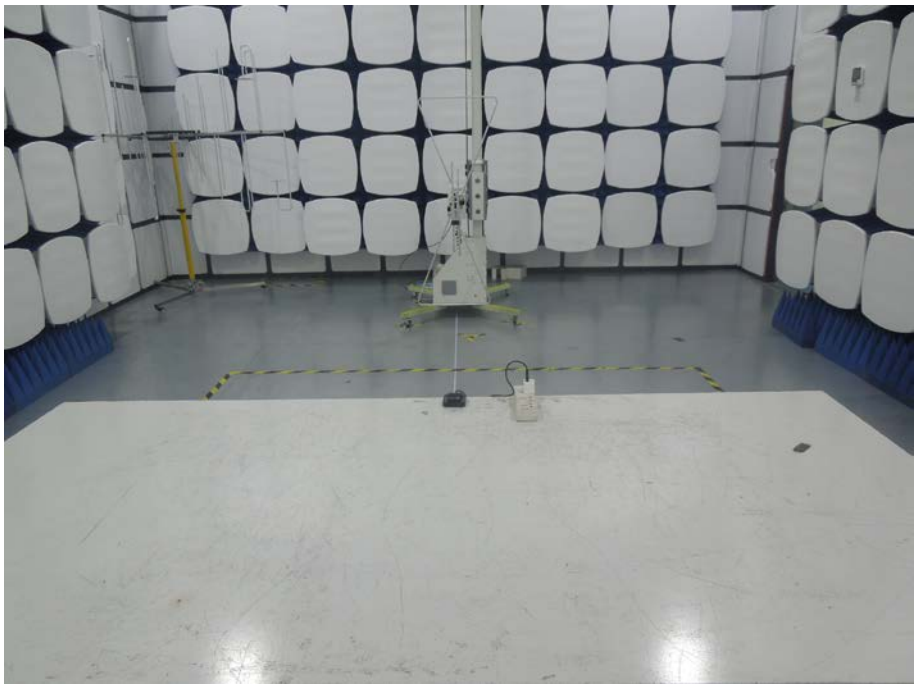
Frequency: 170.8KHz



6. PHOTOGRAPH

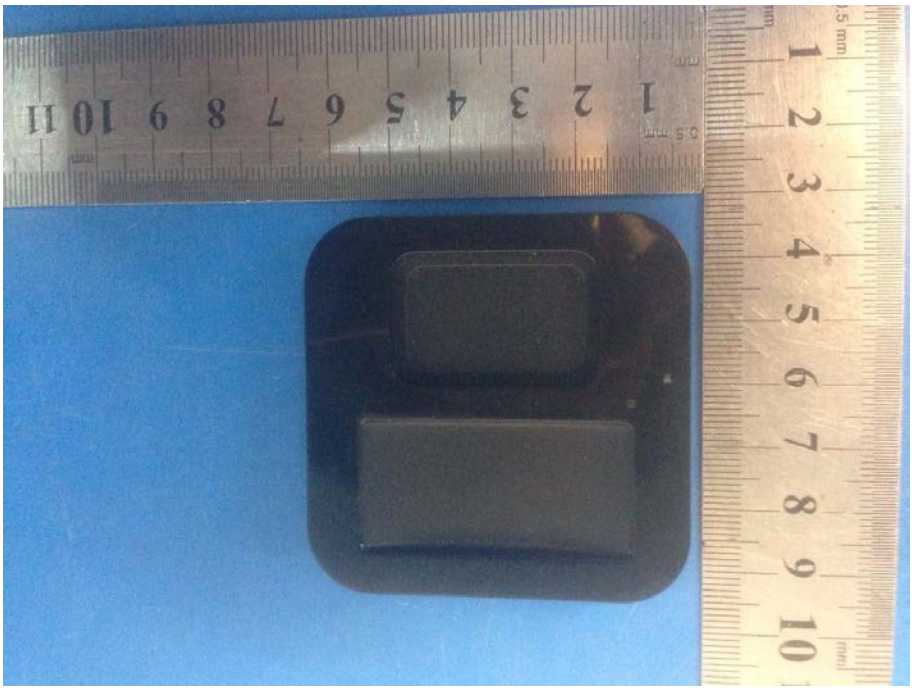
6.1.Photos of Radiated Emission Test (In Semi Anechoic Chamber)

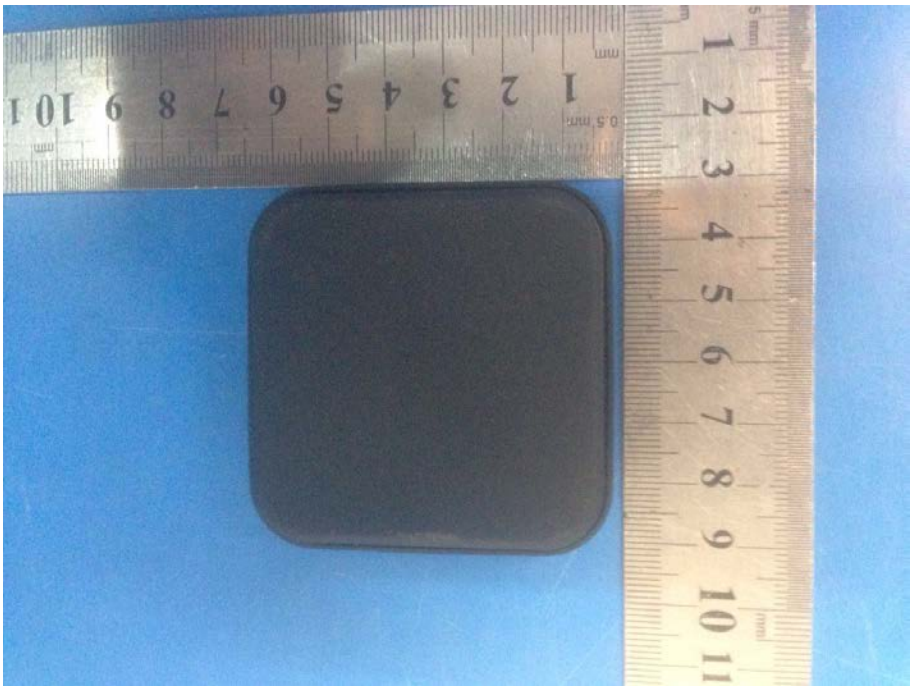


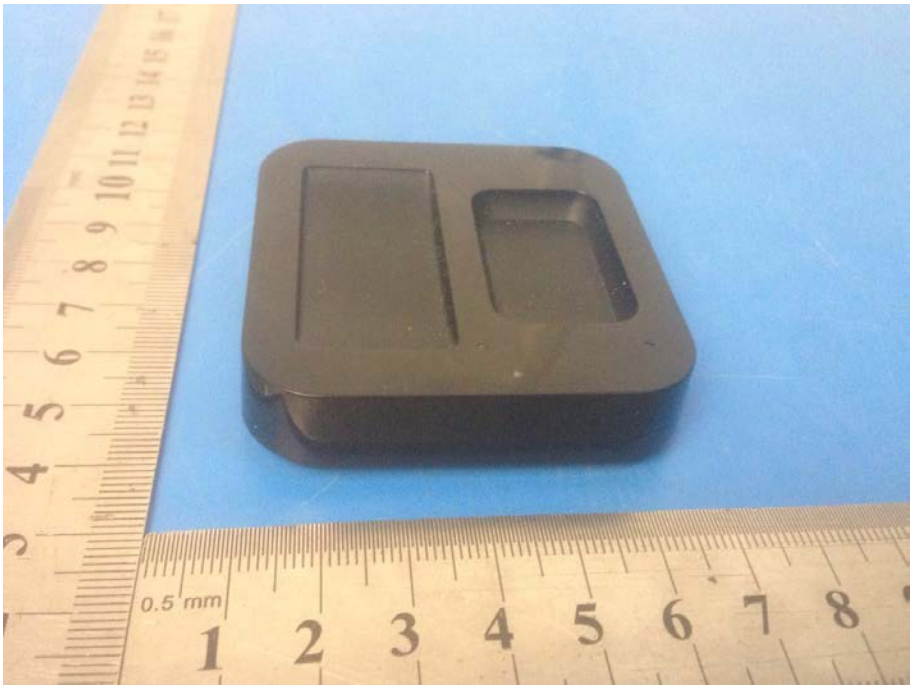


6.2.Photos of Power Line Conducted Emission Test

7. PHOTOS OF THE EUT



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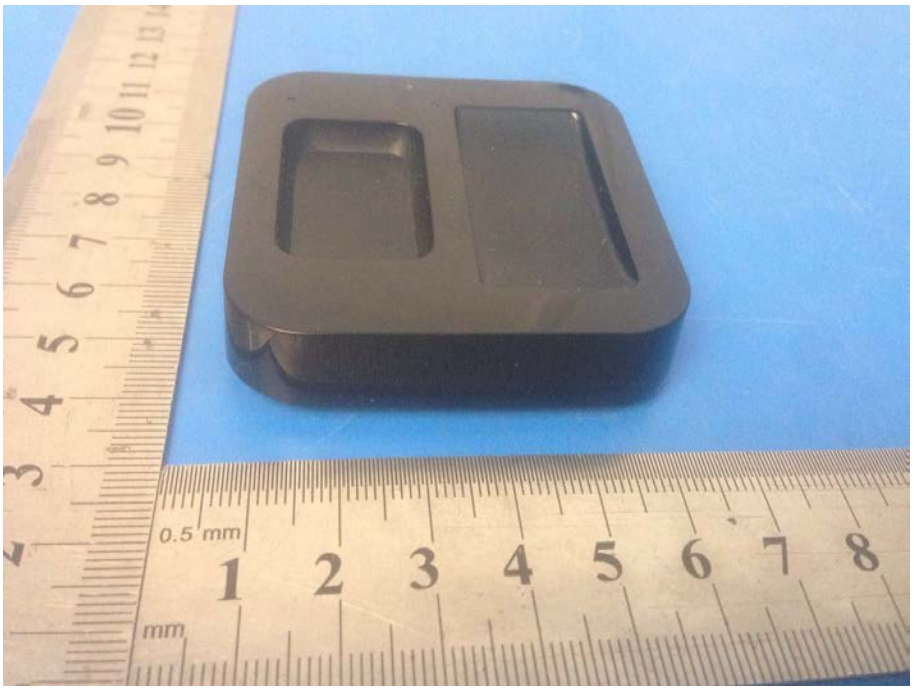
1 2 3 4 5 6 7 8


0.5 mm
1 2 3 4 5 6 7 8
mm


0.5 mm
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mm


0.5 mm
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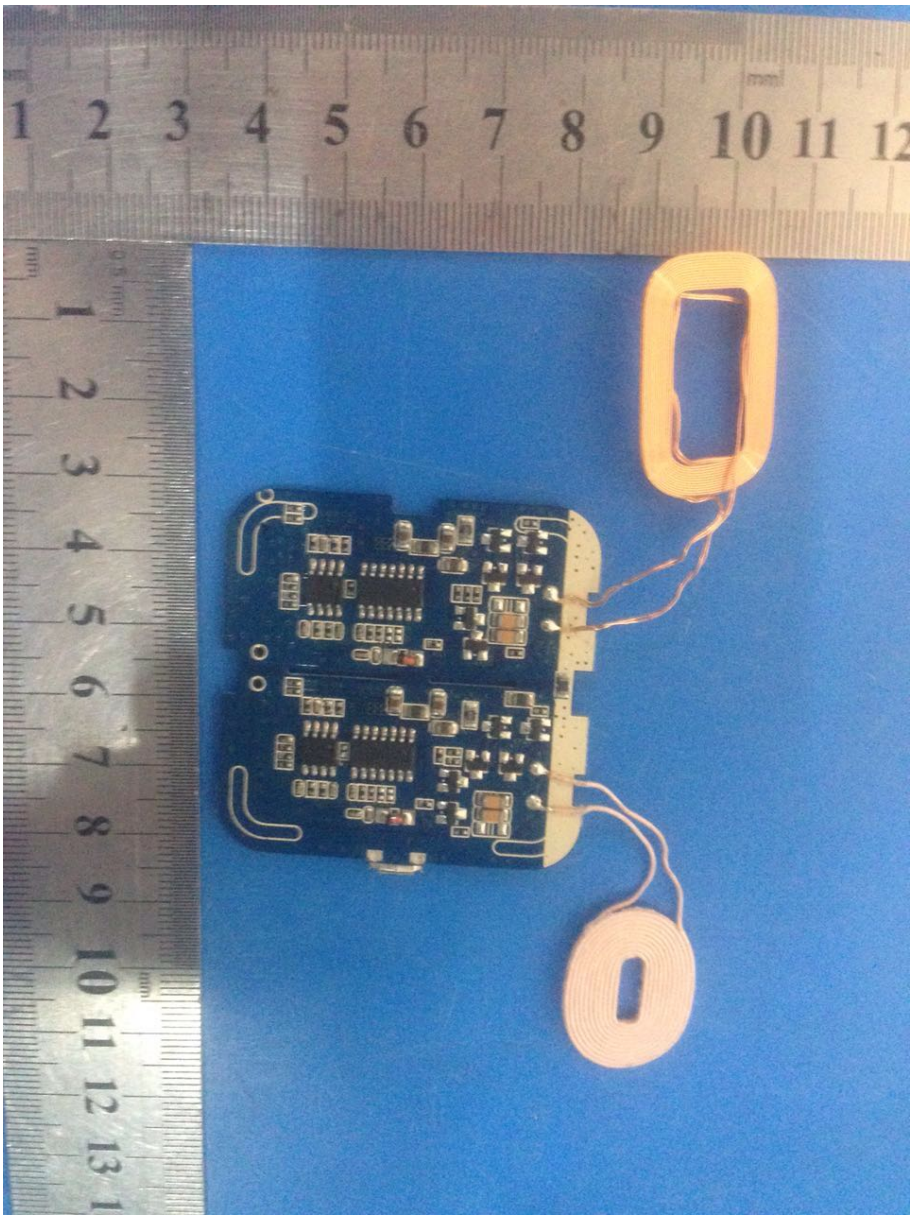
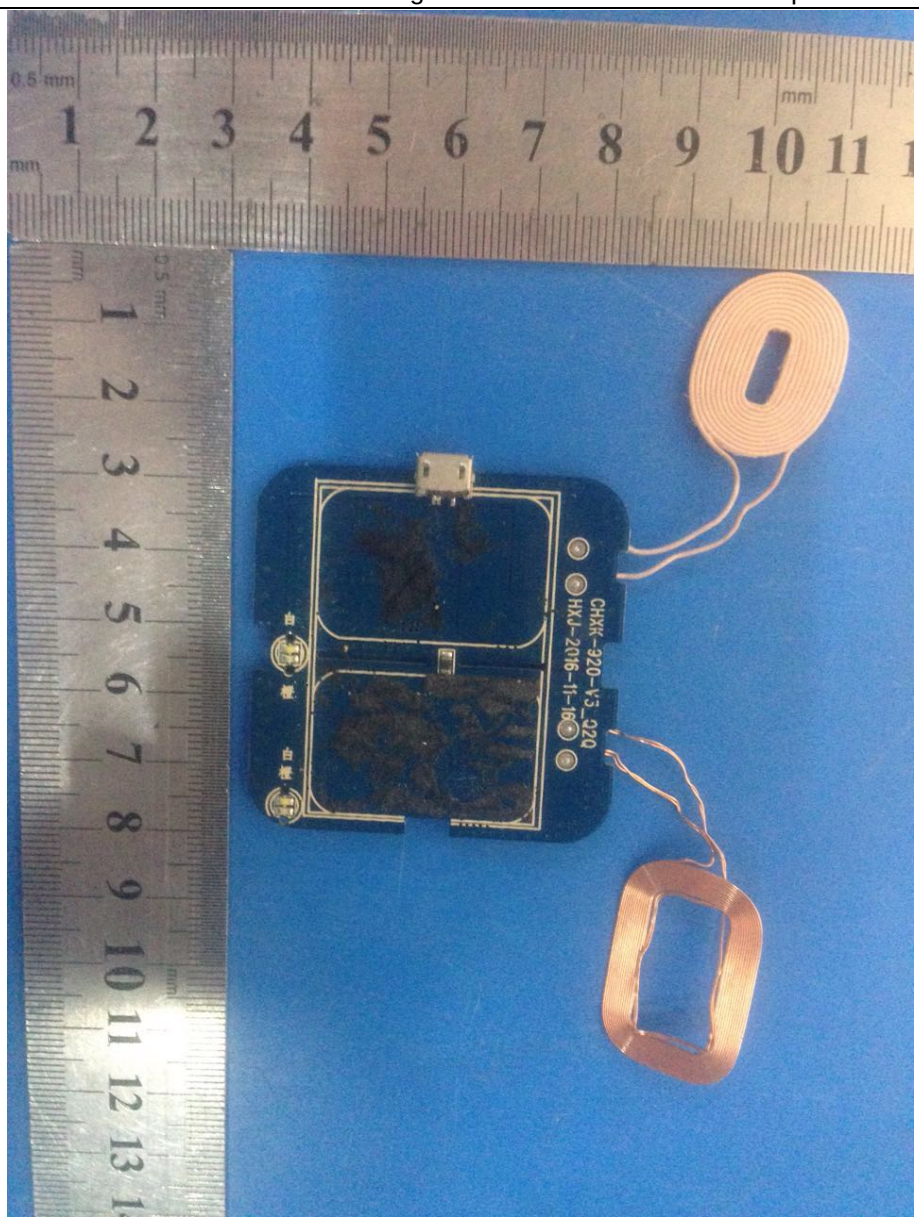
mm


1 2 3 4 5 6 7 8 9 10 11 12



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