TEST REPORT

Reference No.	:	WTS17S1092231E
FCC ID	:	X2F-B-31
Applicant	:	GaoYi Tech Limited
Address	:	5th Floor, Building F2, Hua Feng Industrial Zone HangCheng Road, Xi Xiang Town, Bao An District, Shenzhen, China
Manufacturer	:	GaoYi Tech Limited
Address	:	Changsheng street,no.4,Tian mei Village,Huangjiang Town,Dongguan City,China
Product	:	FM player
Model(s)	:	B-31
Standards	:	FCC CFR47 Part 15 Section 15.239: 2016
Date of Receipt sample	:	2017-10-13
Date of Test	:	2017-10-13 to 2017-10-27
Date of Issue	:	2017-10-27
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.

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Compiled by:

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Approved by:

Philo Zhong / Manager

2 Laboratories Introduction

Waltek Services Test Group Ltd. is one of the largest and the most comprehensive third party testing organizations in China, our headquarter located in Shenzhen (CNAS Registration No. L3110, A2LA Certificate Number: 4243.01) and have branches in Foshan (CNAS Registration No. L6478), Dongguan (CNAS Registration No. L9950), Zhongshan, Suzhou (CNAS Registration No. L7754), Ningbo and Hong Kong, Our test capability covered four large fields: safety test. Electronic Magnetic Compatibility(EMC), reliability and energy performance, Chemical test. Meanwhile, Waltek has got recognition as registration and accreditation laboratory from EMSD (Electrical and Mechanical Services Department), and American Energy star, FCC(The Federal Communications Commission), CPSC(Consumer Product Safety Commission), CEC(California energy efficiency), IC(Industry Canada) and ELI(Efficient Lighting Initiative). It's the strategic partner and data recognition laboratory of international authoritative organizations, such as UL, Intertek(ETL-SEMKO), CSA, TÜV Rheinland, TÜV SÜD, etc. As a professional, comprehensive, justice international test organization, we still keep the scientific and rigorous work attitude to help each client satisfy the international standards and assist their product enter into globe market smoothly.

Waltek Services (Shenzhen) Co., Ltd.

A. Accreditations for Conformity Assessment (International)

Country/Region	Accreditation Body	Scope	Note
USA	**CNAS (Registration No.: L3110) A2LA (Certificate No.: 4243.01)**	FCC ID \ DOC \ VOC	1
Canada		IC ID \ VOC	2
Japan		MIC-T \ MIC-R	-
Europe		EMCD \ RED	-
Taiwan		NCC	-
Hong Kong		OFCA	-
Australia		RCM	-
India	**International Services**	WPC	-
Thailand		NTC	-
Singapore		IDA	-
Note: 1. FCC Designation No.: CN1201. Test Firm Registration No.: 523476. 2. IC Canada Registration No.: 7760A			

B. TCBs and Notify Bodies Recognized Testing Laboratory.

Recognized Testing Laboratory of …	Notify body number
TUV Rheinland	Optional.
Intertek	
TUV SUD	
SGS	
Phoenix Testlab GmbH	0700
Element Materials Technology Warwick Ltd	0891
Timco Engineering, Inc.	1177
Eurofins Product Service GmbH	0681

3 Revision History

Test report No.	Date of Receipt sample	Date of Test	Date of Issue	Purpose	Comment	Approved
WTS17S1092231E	2017-10-13	2017-10-13 to 2017-10-27	2017-10-27	original	-	Valid

4 Test Summary

Test Items	Test Requirement	Result
Radiated Emission	15.209 15.239	C
Bandwidth requirement	15.239a	C
Band edge requirement	15.239a	C
Antenna Requirement	15.203	C

Note : denote that for more details of the EUT , please refer to the relating test items as below .

Remark : the methods of measurement in all the test items were according to the ANSI C63.4: 2014

In this whole report, TX(or tx) means transmitter.

5 Contents

6 General Information

6.1 General Description of E.U.T.

Product	: FM player
Model(s)	: B-31
Model Differences	: N/A
Type of Modulation	: FM
Frequency Range	: 88.1~107.9MHz
Antenna installation	: Integrated Antenna

6.2 Details of E.U.T

Ratings	: Input: DC 12V-24V

6.3 Test Mode

All test mode(s) and condition(s) mentioned were considered and evaluated respectively by performing full tests, the worst data were recorded and reported.

Test mode	Lower channel	Middle channel	Upper channel
FM	88.1MHz	98.1MHz	107.9MHz

7 Equipment Used during Test

7.1 Equipment List

3m Semi-anechoic Chamber for Radiation Emissions						
Item	**Equipment**	**Manufacturer**	**Model No.**	**Serial No.**	**Last Calibration Date**	**Calibration Due Date**
1	EMC Analyzer	Agilent	E7405A	MY45114943	2017-10-16	2018-10-15
2	Active Loop Antenna	Beijing Dazhi	ZN30900A	-	2017-10-16	2018-10-15
3	Trilog Broadband Antenna	SCHWARZBECK	VULB9163	336	2017-04-09	2018-04-08
4	Coaxial Cable (below 1GHz)	Top	TYPE16(13M)	-	2017-09-12	2018-09-11
5	Broad-band Horn Antenna	SCHWARZBECK	BBHA 9120 D	667	2017-04-09	2018-04-08
6	Broadband Preamplifier	COMPLIANCE DIRECTION	PAP-1G18	2004	2017-04-13	2018-04-12
7	Coaxial Cable (above 1GHz)	Top	1GHz-25GHz	EW02014-7	2017-04-13	2018-04-12

7.2 Description of Support Units

Equipment	Manufacturer	Model No.
/	/	/

7.3 Measurement Uncertainty

Parameter	Uncertainty
Radio Frequency	± 1 x 10^{-6}
RF Power	± 1.0 dB
RF Power Density	± 2.2 dB
Radiated Spurious Emissions test	± 5.03 dB (Bilog antenna 30M~1000MHz)
	± 5.47 dB (Horn antenna 1000M~25000MHz)

7.4 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.

8 Radiation Emission Test

Test Requirement: FCC Part15 Paragraph 15.239&15.209

Test Method: ANSI 63.4: 2014

Measurement Distance: 3m

Test Result: PASS

15.209 Limit:

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	$20\log^{(500)}$

Note: RF Voltage(dBuV)=20 $\log_{10}$ RF Voltage(uV)

8.1 EUT Operation

Operating Environment **:**

Temperature: 23.5 °C

Humidity: 51.1 % RH

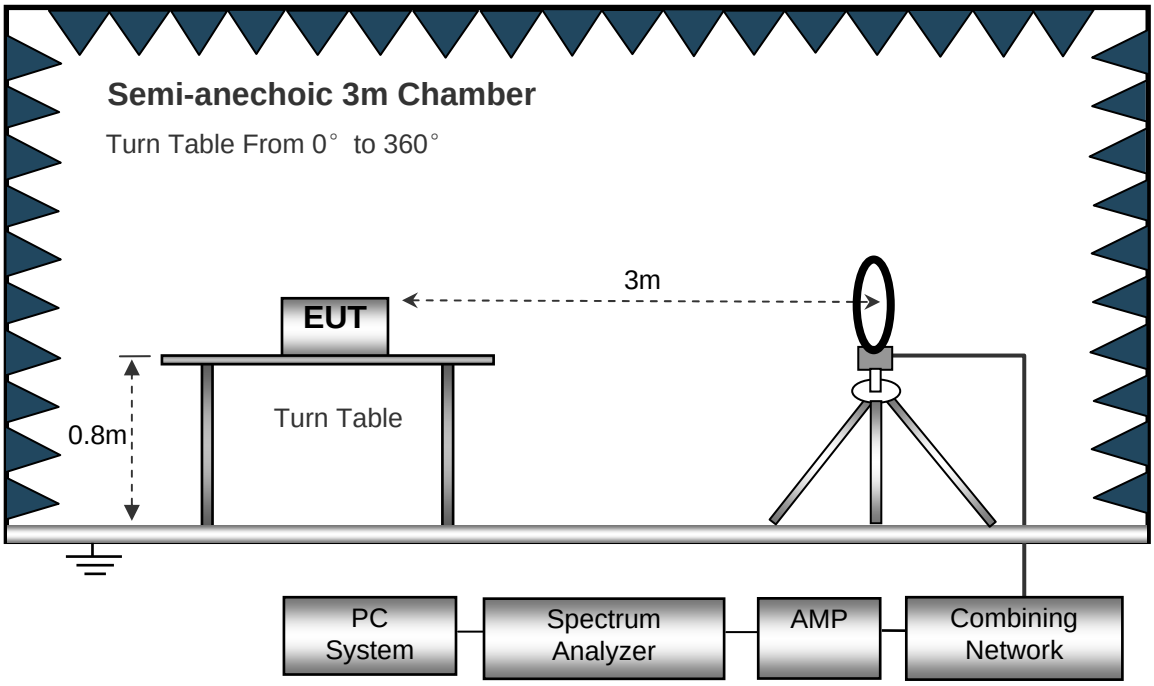
Atmospheric Pressure: 101.2kPa

EUT Operation **:**

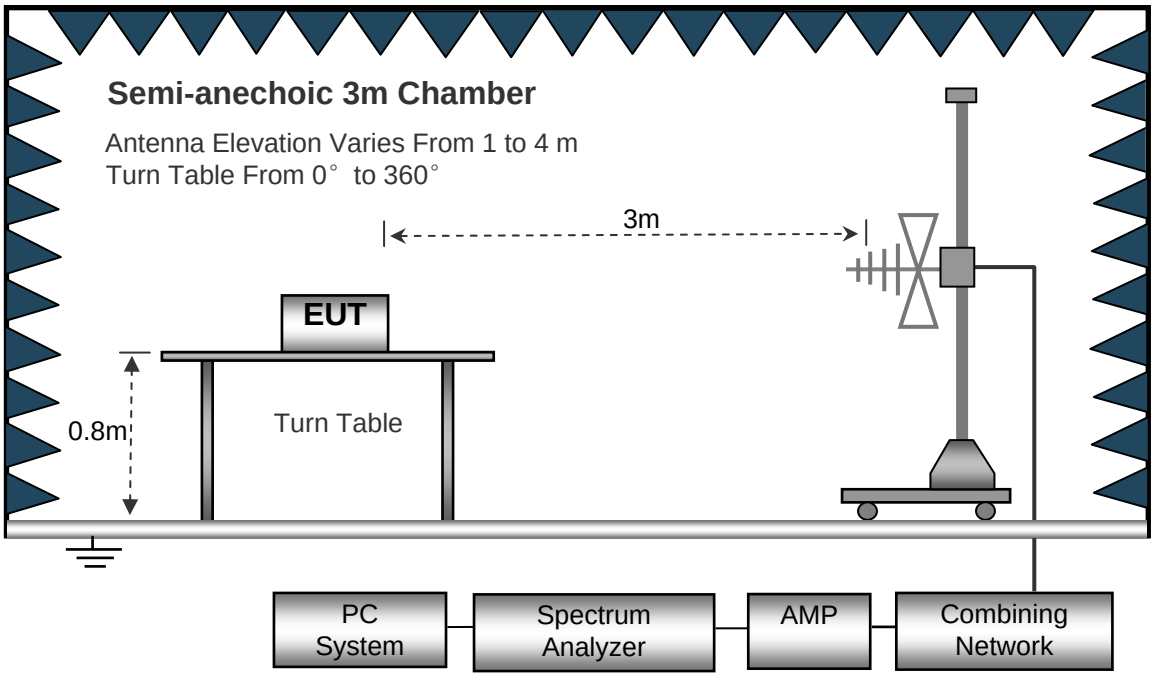
The test was performed in FM mode, the test data were shown in the report.

8.2 Test Setup

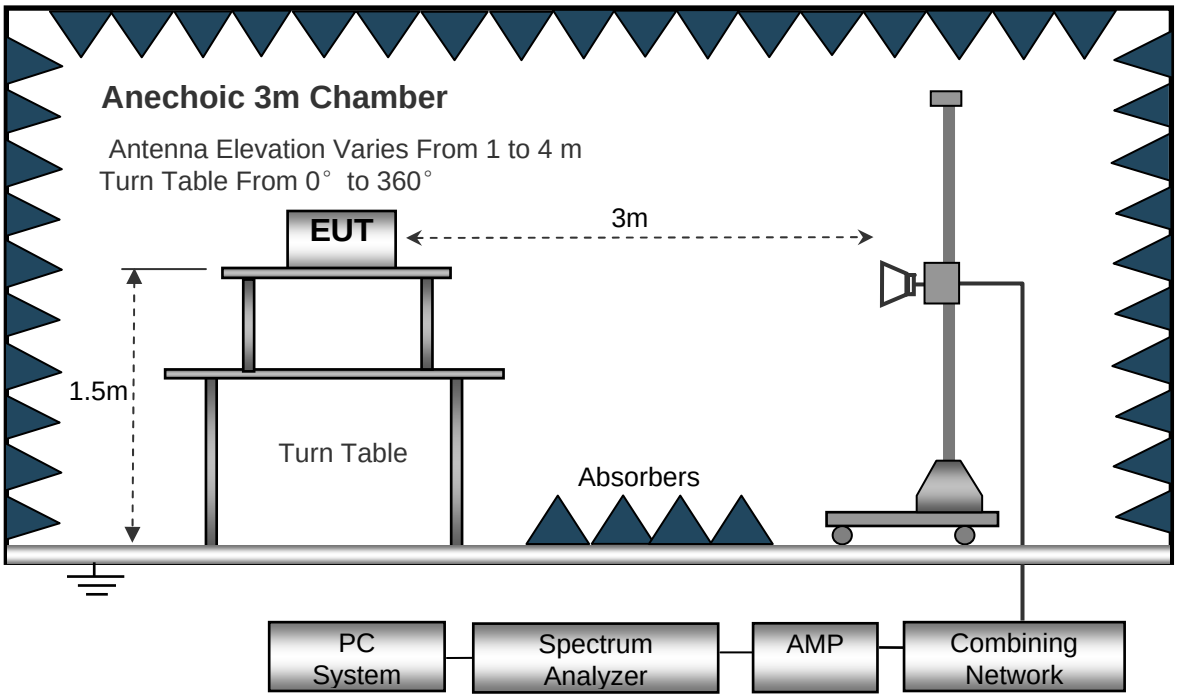
The radiated emission tests were performed in the 3m Semi- Anechoic Chamber test site, using the setup accordance with the ANSI C63.10: 2013.
The test setup for emission measurement below 30MHz.



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



The test setup for emission measurement above 1 GHz.



8.3 Spectrum Analyzer Setup

Below 30MHz

Sweep Speed ..... Auto
IF Bandwidth..... 10kHz
Video Bandwidth 10kHz

Resolution Bandwidth 10kHz

30MHz ~ 1GHz

Sweep Speed ..... Auto
Detector ..... PK
Resolution Bandwidth..... 100kHz
Video Bandwidth 300kHz

Above 1GHz

Sweep Speed ..... Auto
Detector ..... PK
Resolution Bandwidth..... 1MHz
Video Bandwidth 3MHz
Detector ..... Ave.
Resolution Bandwidth..... 1MHz
Video Bandwidth 10Hz

8.4 Test Procedure

1. The EUT is placed on a turntable. For below 1GHz, the EUT is 0.8m above ground plane;
For above1GHz, the EUT is 1.5m 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.
8. New battery is used during test.

8.5 Test Result

Test Frequency : 9kHz ~ 30MHz

The measurements were more than 20 dB below the limit and not reported.

Test Frequency: 30MHz ~ 1.08GHz

Peak Detector

Test Frequency	Peak(dBuV/m)		Limits dBuV/m	Margin(dB)	
	Vertical	Horizontal		Vertical	Horizontal
88.1	34.25	34.68	68	-33.75	-33.32
98.1	35.62	35.40	68	-32.38	-32.60
107.9	34.21	34.98	68	-33.79	-33.02

Average Detector

Test Frequency	Peak(dBuV/m)		Limits dBuV/m	Margin(dB)	
	Vertical	Horizontal		Vertical	Horizontal
88.1	29.46	28.62	48	-18.54	-19.38
98.1	29.71	28.45	48	-18.29	-19.55
107.9	28.71	29.24	48	-19.29	-18.76

Frequency (MHZ)	Detector	Antenna Polarity	Result dBuV/m	Limit dBuV/m	Margin (dB)	Antenna Hight(m)	Turntable Angle (°)
Lowest Channel:88.1MHZ							
353.25	QP	V	26.19	46	-19.81	1.4	49
440.75	QP	V	20.98	46	-25.02	1.4	66
529.28	QP	V	17.67	46	-28.33	1.1	92
617.23	QP	V	16.23	46	-29.77	1.6	83
705.31	QP	V	13.93	46	-32.07	1.6	126
793.39	QP	V	20.13	46	-25.87	1.5	118
881.49	QP	V	15.42	46	-30.58	1.1	86
176.81	QP	H	37.25	43.5	-6.25	1.4	69
264.75	QP	H	28.59	46	-17.41	1.7	54
392.43	QP	H	23.88	46	-22.12	1.3	48
491.03	QP	H	19.38	46	-26.62	2.0	45

588.67	QP	H	17.30	46	-28.70	1.6	114
687.22	QP	H	14.21	46	-31.79	1.7	126
785.49	QP	H	23.10	46	-22.90	1.3	133
882.94	QP	H	17.79	46	-28.21	1.7	50
981.26	QP	H	18.78	46	-27.22	1.5	48
Middle Channel:98.1MHZ							
196.67	QP	V	33.99	43.5	-9.51	1.5	55
294.63	QP	V	26.35	46	-19.65	1.5	78
393.39	QP	V	22.73	46	-23.27	1.5	102
491.18	QP	V	19.13	46	-26.87	1.2	140
589.12	QP	V	20.74	46	-25.26	1.2	125
687.32	QP	V	13.28	46	-32.72	1.3	81
785.80	QP	V	22.58	46	-23.42	1.6	49
883.14	QP	H	21.21	46	-24.79	1.4	79
981.03	QP	H	20.02	46	-25.98	1.2	128
196.26	QP	H	37.32	43.5	-6.18	1.4	137
294.84	QP	H	27.88	46	-18.12	1.5	75
393.24	QP	H	23.81	46	-22.19	1.2	52
490.60	QP	H	19.52	46	-26.48	1.7	53
588.73	QP	H	23.23	46	-22.77	1.7	111
687.63	QP	H	22.09	46	-23.91	1.6	122
784.99	QP	H	20.07	46	-25.93	1.4	138
Highest Channel:107.9MHZ							
216.44	QP	V	35.20	43.5	-8.30	1.6	142
323.81	QP	V	29.35	46	-16.65	1.3	48
432.21	QP	V	21.55	46	-24.45	1.4	114
540.26	QP	V	16.59	46	-29.41	1.3	53
647.64	QP	V	20.84	46	-25.16	1.5	74
755.98	QP	V	23.55	46	-22.45	1.7	79
863.48	QP	V	26.58	46	-19.42	1.2	52
972.09	QP	H	21.64	46	-24.36	1.7	44
216.61	QP	H	32.85	43.5	-10.65	1.6	123
324.55	QP	H	27.78	46	-18.22	1.7	51

432.12	QP	H	25.60	46	-20.40	1.9	78
539.57	QP	H	20.75	46	-25.25	1.4	60
647.68	QP	H	22.26	46	-23.74	1.8	70
756.24	QP	H	24.03	46	-21.97	1.3	82
863.76	QP	H	26.31	46	-19.69	1.8	49
971.65	QP	H	25.16	46	-20.84	1.4	45

9 Bandwidth Test

Test Requirement:	FCC Part15 C
Test Method:	ANSI 63.4: 2014
Receiver setup:	RBW: 10kHz, VBW: 10kHz, Span: 500kHz, Sweep time: 300ms
Limit:	200kHz
Test Result:	PASS

9.1 Test Setup

Same as 8.2

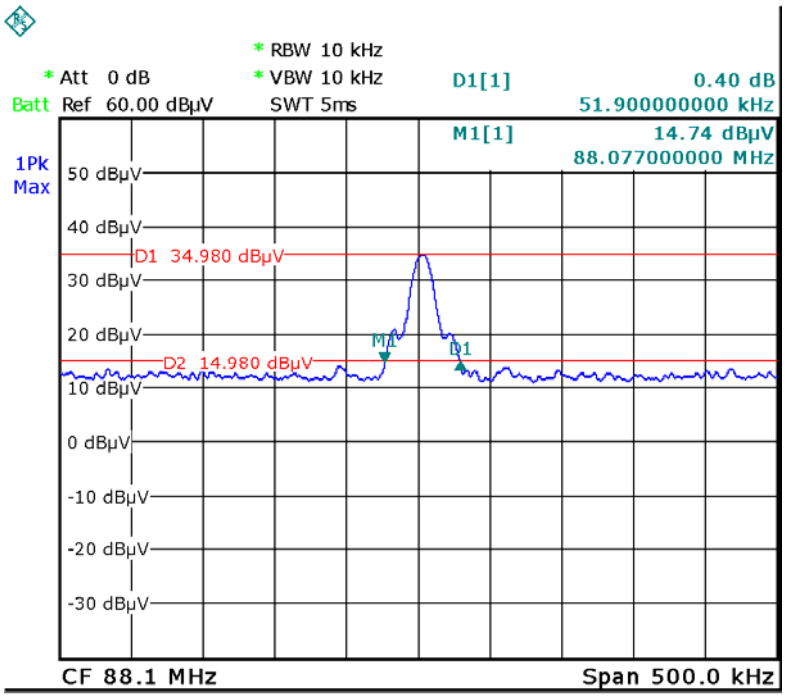
9.2 Method of Measurement

a) 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.

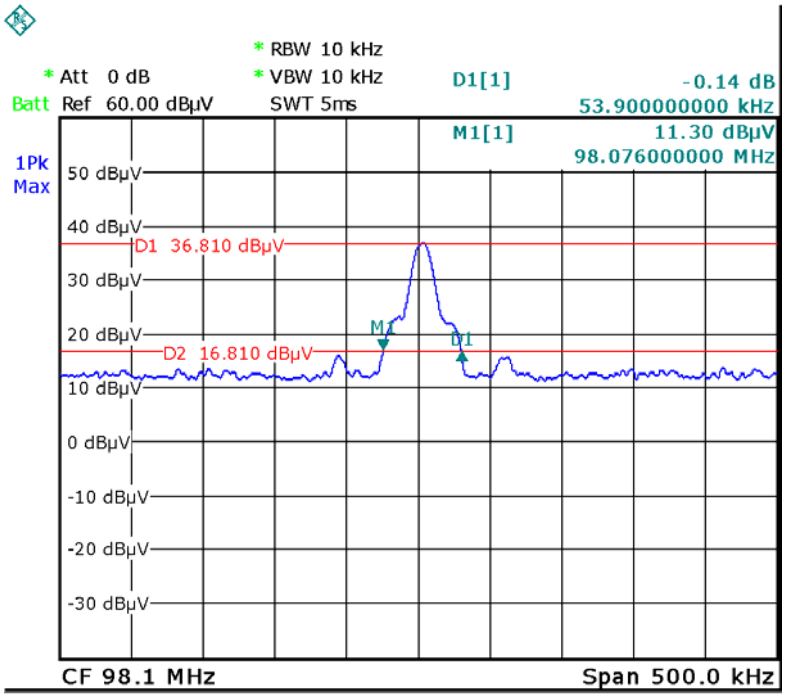
9.3 Test Results

Channel Frequency (MHZ)	20dB bandwidth (KHZ)	Limit (KHZ)
88.1	51.90	200
98.1	53.90	200
107.9	54.90	200

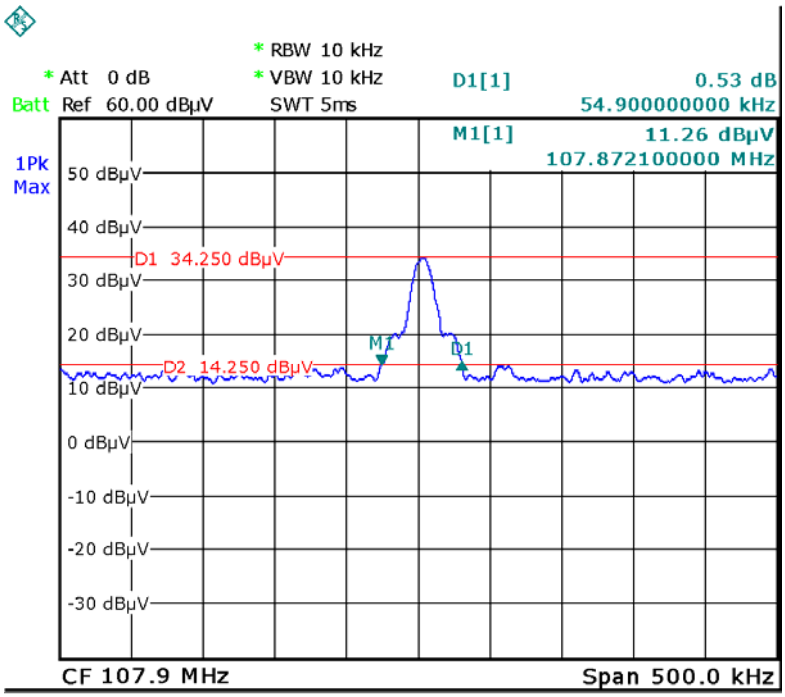
88.1MHZ Test plot



98.1MHZ Test plot



107.9MHZ Test plot



10 Band edge Test

10.1 Test Limit

Please see the Part15.239a

10.2 Test Setup

Same as 8.2

10.3 Method of measurement

a) Put the EUT on a 0.8m high table, power on the EUT. Emissions were scanned and measured rotating the EUT to 360 degrees, find the maximum Emission

b) Turning to Low and High frequency, then 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.

c) Check the spurious emissions out of band.

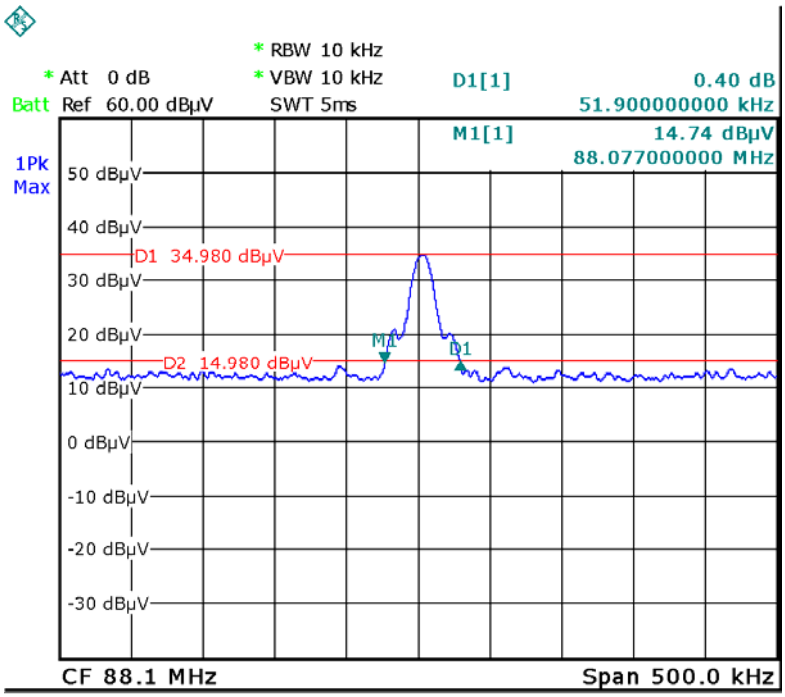
d) RBW,VBW Setting, please see the following test plot.

10.4 Test Results

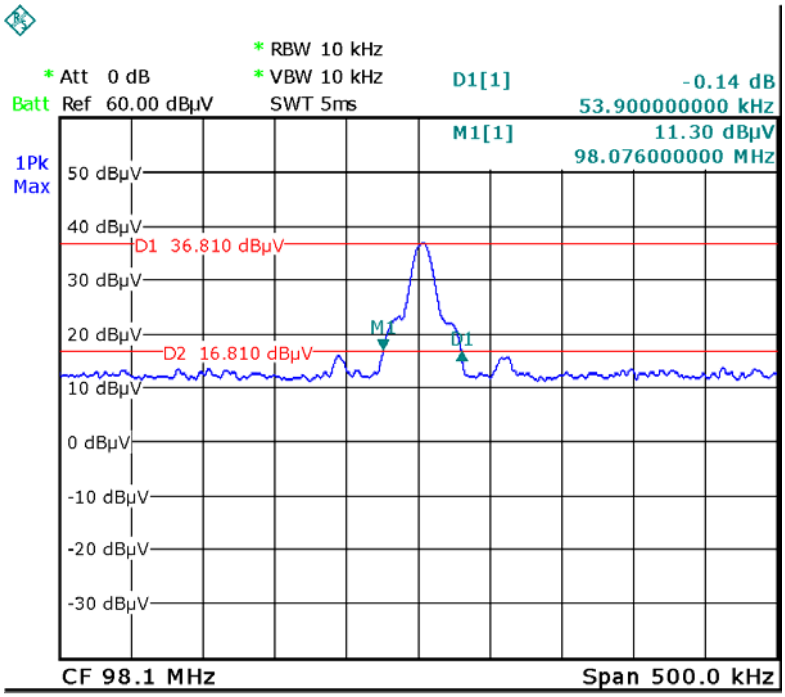
Compliance

For more details, please see the following page.

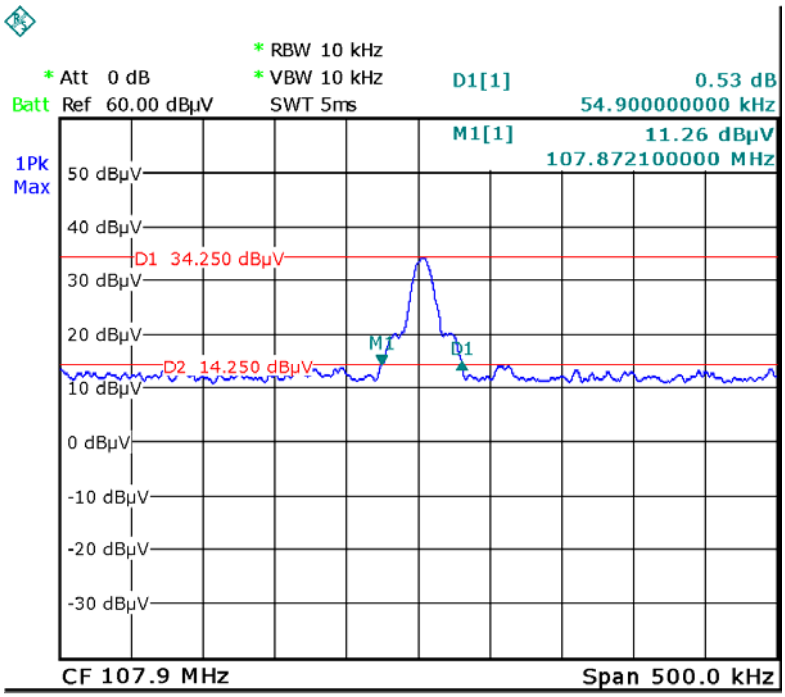
88.1MHZ Test plot



98.1MHZ Test plot

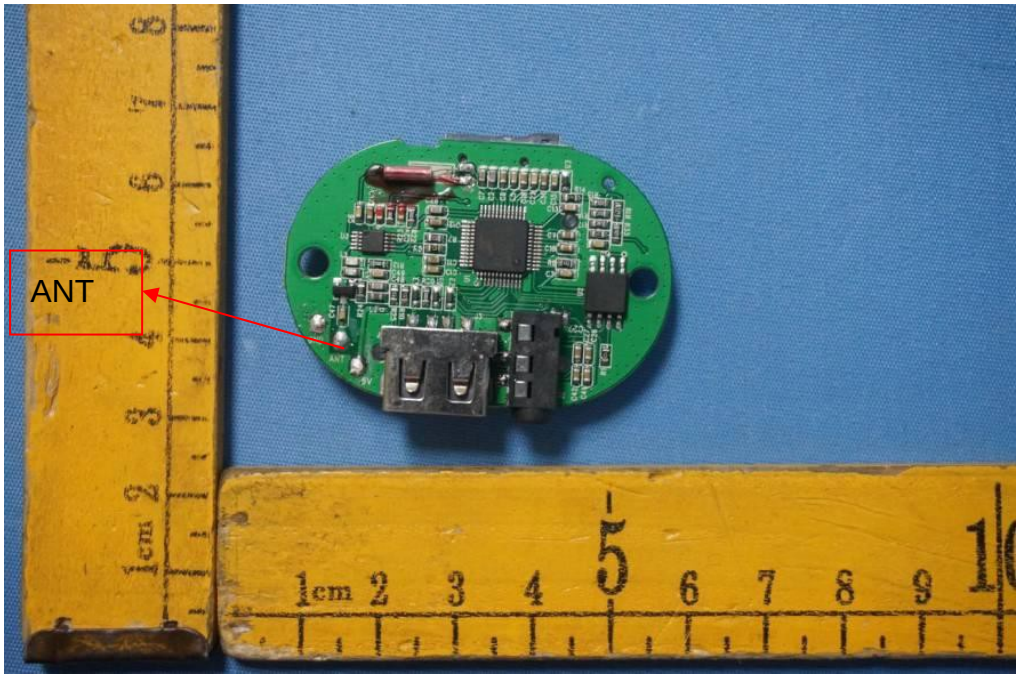


107.9MHZ Test plot



11 Antenna Requirement

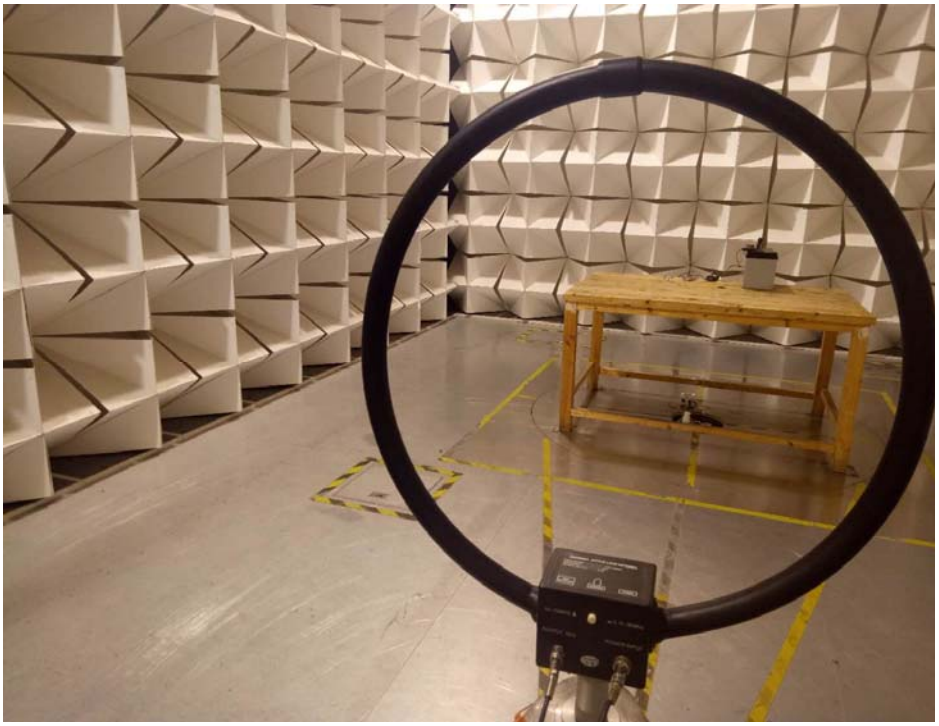
According to the FCC Part 15 Paragraph 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. This product has a Integrated Antenna, fulfil the requirement of this section.



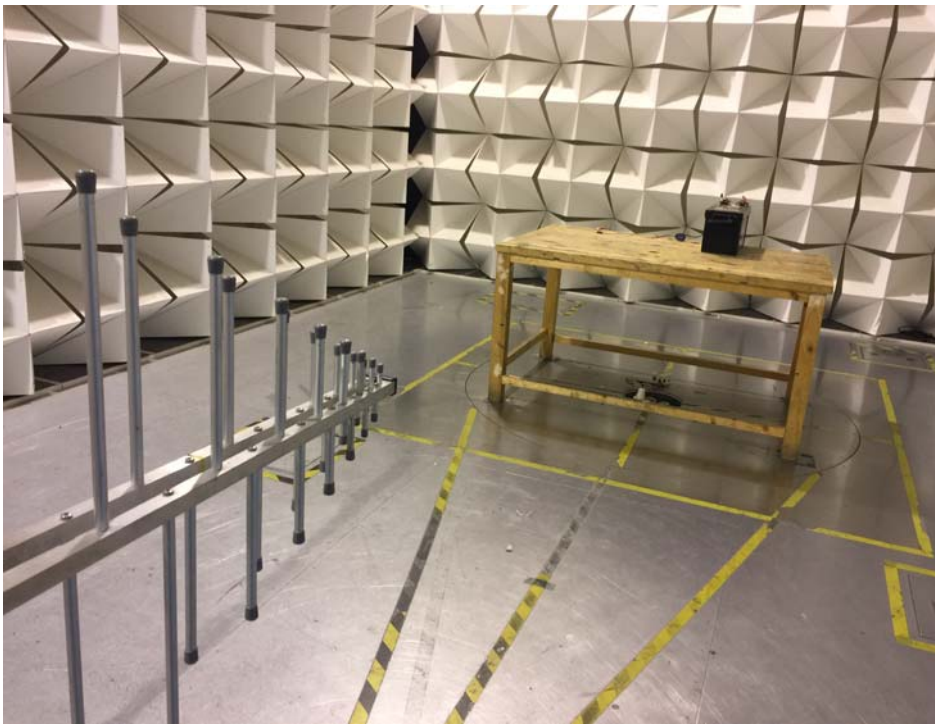
12 Photographs Test Setup

12.1 Radiation Emission

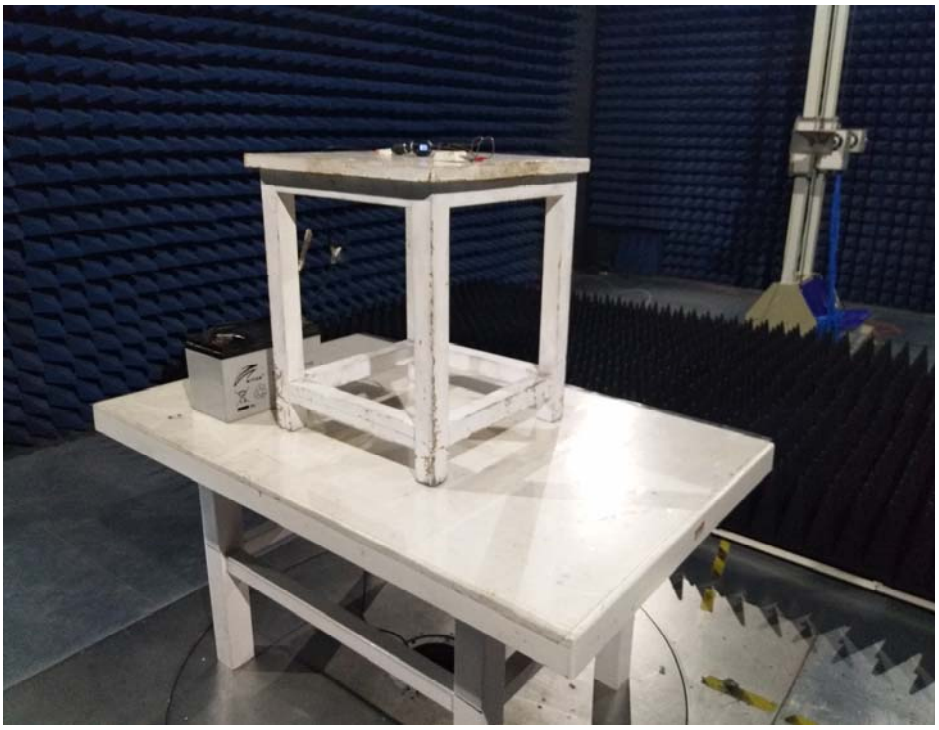
Test frequency Below 30MHz



Test frequency from 30MHz to 1GHz



Test frequency Above 1GHz



13 Photographs - Constructional Details

13.1 External Photos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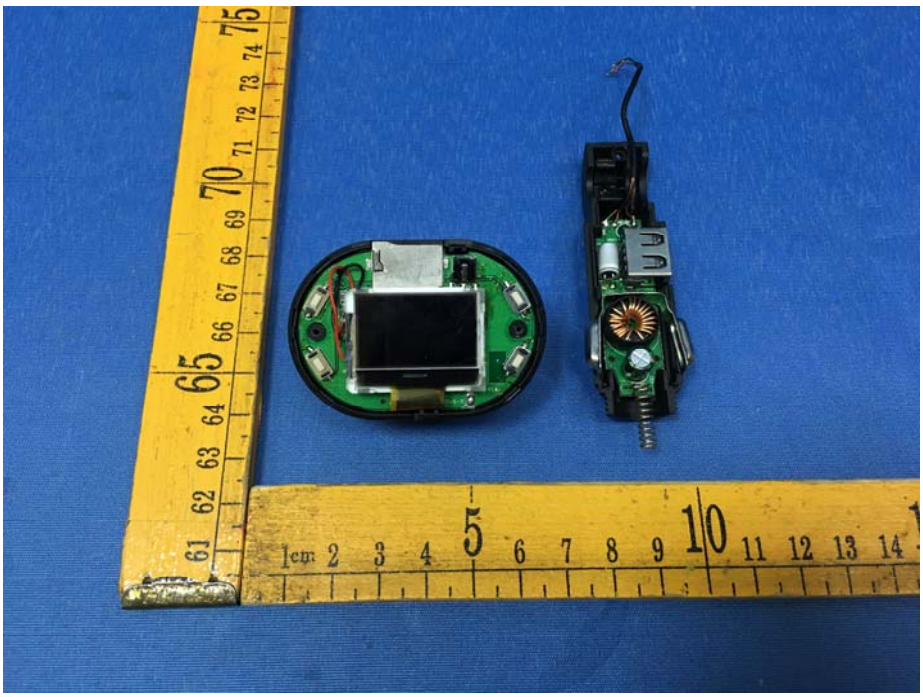
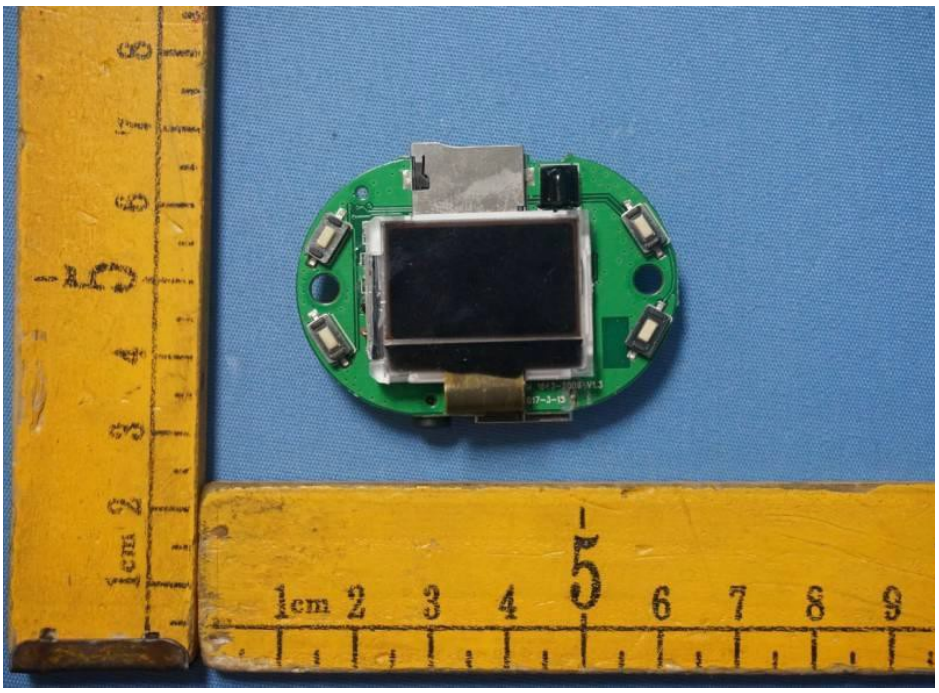
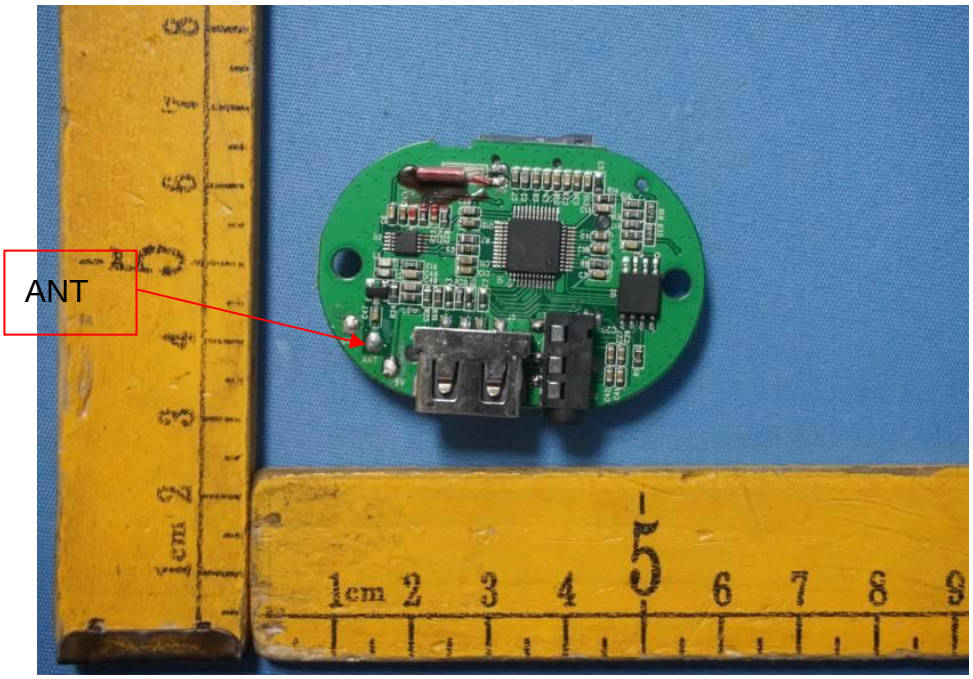
71
70
69
68
67
66
65
64
63
62
61
1cm
2
3
4
5
6
7
8
9
10
11
12

13.2 Internal Photos



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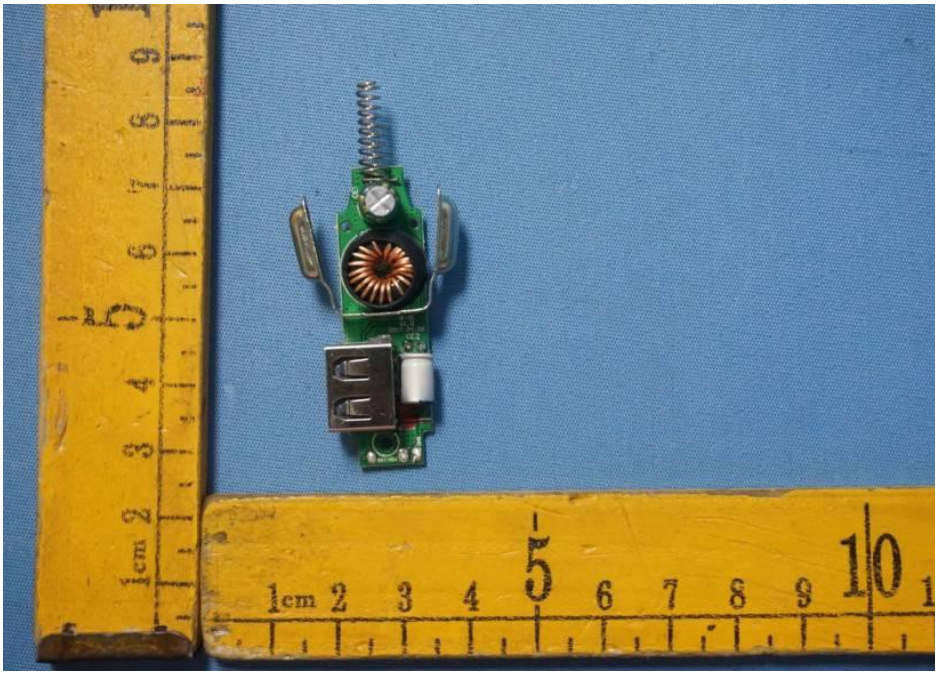

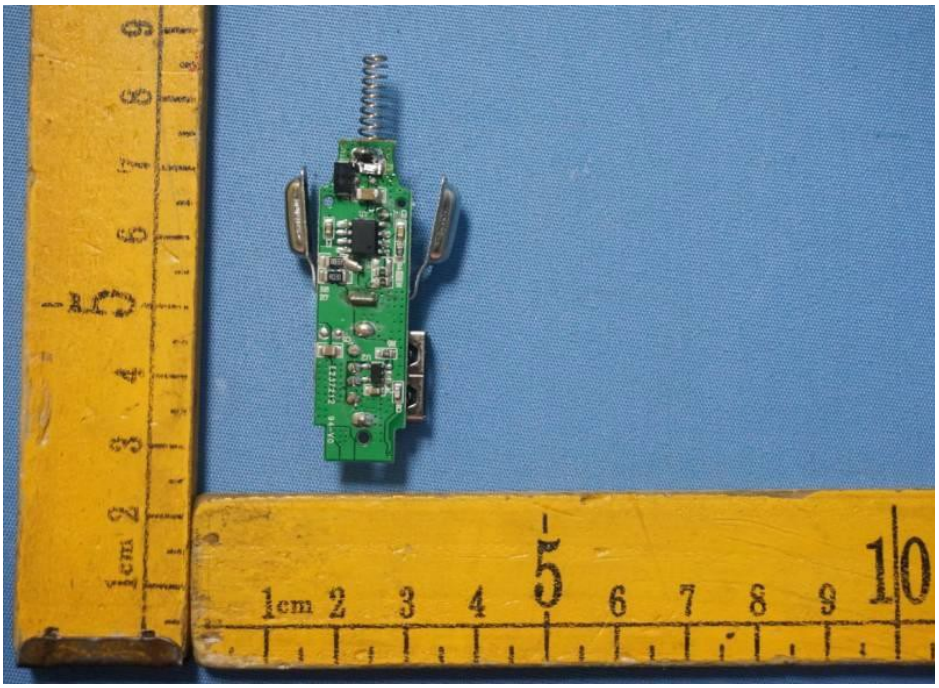

======End of Report======