TEST REPORT

Reference No......	:	WTF17S0683066E
FCC ID.....	:	2AM5J-RG1209L
Applicant.....	:	FOSHAN CITY RUGUO ELECTRONIC TECHNOLOGY CO., LTD
Address.....	:	Room1, 1st Floor, N Building, No.1 North Sanle Road, Beijiao Town, Shunde Dist., Foshan, Guangdong, China.
Manufacturer.....	:	FOSHAN KAWA ELECTRONIC TECHNOLOGY CO., LTD
Address	:	Room2, 1st Floor, N Building, No.1 North Sanle Road, Sanhongqi neighborhood, Beijiao Town, Shunde District, Foshan City, Guangdong, China.
Product Name.....	:	HOME EMOTIONAL LAMP
Model No.	:	RG-L021R(RX), RG-L022R(TX); RG-L010R(RX), RG-L012R(TX); RG-L026R(RX), RG-L027R(TX); RG-L035R(RX), RG-L037R(TX)
Standards.....	:	FCC CFR47 Part 15 Section 15.231: 2016
Date of Receipt sample....	:	Jun. 26, 2017
Date of Test.....	:	Jun. 27, 2017– Aug. 03, 2017
Date of Issue.....	:	Aug. 04, 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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Compiled by:

Jack Wen

Jack Wen /Test Engineer

Approved by:

Philo Zhong

Philo Zhong / Manager

2 Test Summary

Test Items	Test Requirement	Result
Radiated Spurious Emissions	15.205(a) 15.209 15.231(a)	PASS
Conducted Emissions	15.207(a)	PASS
Periodic Operation	15.231(a)	PASS
Emission Bandwidth	15.231(c)	PASS
Antenna Requirement	15.203	PASS

3 Contents

Page

4 General Information

4.1 General Description of E.U.T

Product Name	HOME EMOTIONAL LAMP
Model No.	RG-L021R(RX), RG-L022R(TX); RG-L010R(RX), RG-L012R(TX); RG-L026R(RX), RG-L027R(TX); RG-L035R(RX), RG-L037R(TX)
Model Difference	Only the model names and silicon rubber case shape are different. Model RG-L021R, RG-L022R is the test sample.
Type of Modulation	OOK
Frequency Range	433.92 MHz
The Lowest Oscillator	32.768kHz
Antenna installation	Integrated Antenna

4.2 Details of E.U.T

Technical Data : TX & RX: Input: DC 5V 1000mA Power 1W

4.3 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
Transmitting	/	433.92MHz	/

4.4 Test Facility

Waltek Services (Shenzhen) Co., Ltd.

Accreditations for Conformity Assessment			
Country/Region	Accreditation Body	Scope	Note
USA	A2LA (Certificate No.: 4243.01) CNAS (Registration No. : L3110)	FCC ID\DOC\VOC	1
Canada		IC ID\VOC	2
Japan		MIC-T\MIC-R \ PSE	-
Europe		EMCD\LVD\RED	-
Taiwan		BSMI\NCC	-
Hong Kong		OFCA	-
Australia		RCM	-
South Korea		KC	-
Thailand		NTC	-
Singapore		IDA	-
Note: 1. FCC Designation No.: CN1201. Test Firm Registration No.: 523476, test Firm Registration No.: 328995. 2. IC Canada Registration No.: 7760A			

5 Equipment Used during Test

5.1 Equipments List

3m Semi-anechoic Chamber for Radiation Emissions Test site 1#						
Item	**Equipment**	**Manufacturer**	**Model No.**	**Serial No.**	**Last Calibration Date**	**Calibration Due Date**
1	EMC Analyzer	Agilent	E7405A	MY45114943	Sep.15,2016	Sep.14,2017
2	Active Loop Antenna	Beijing Dazhi	ZN30900A	-	Sep.15,2016	Sep.14,2017
3	Trilog Broadband Antenna	SCHWARZBECK	VULB9163	336	Apr.07,2017	Apr.06,2018
4	Coaxial Cable (below 1GHz)	Top	TYPE16(13M)	-	Sep.15,2016	Sep.14,2017
5	Broad-band Horn Antenna	SCHWARZBECK	BBHA 9120 D	667	Apr.07,2017	Apr.06,2018
6	Broad-band Horn Antenna	SCHWARZBECK	BBHA 9170	335	Apr.07,2017	Apr.06,2018
7	Broadband Preamplifier	COMPLIANCE DIRECTION	PAP-1G18	2004	Apr.07,2017	Apr.06,2018
8	Coaxial Cable (above 1GHz)	Top	1GHz-25GHz	EW02014-7	Apr.07,2017	Apr.06,2018
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	Trilog Broadband Antenna	SCHWARZBECK	VULB9160	9160-3325	Apr.07,2017	Apr.06,2018
3	Amplifier	Compliance pirection systems inc	PAP-0203	22024	Sep.15,2016	Sep.14,2017
4	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.12, 2016	Sep.11, 2017
3.	Signal Analyzer (9k~26.5GHz)	Agilent	N9010A	MY50520207	Apr.06,2017	Apr.05,2018

5.2 Measurement Uncertainty

Test Item	Frequency Range	Uncertainty	Note
Conducted Emissions	150kHz~30MHz	±3.64dB	(1)
Radiated Spurious Emissions	30MHz~1000MHz	±5.03dB	(1)
	1000M~5000MHz	± 5.47 dB	(1)

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

5.3 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&ANSI C63.4:2014
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 **:**

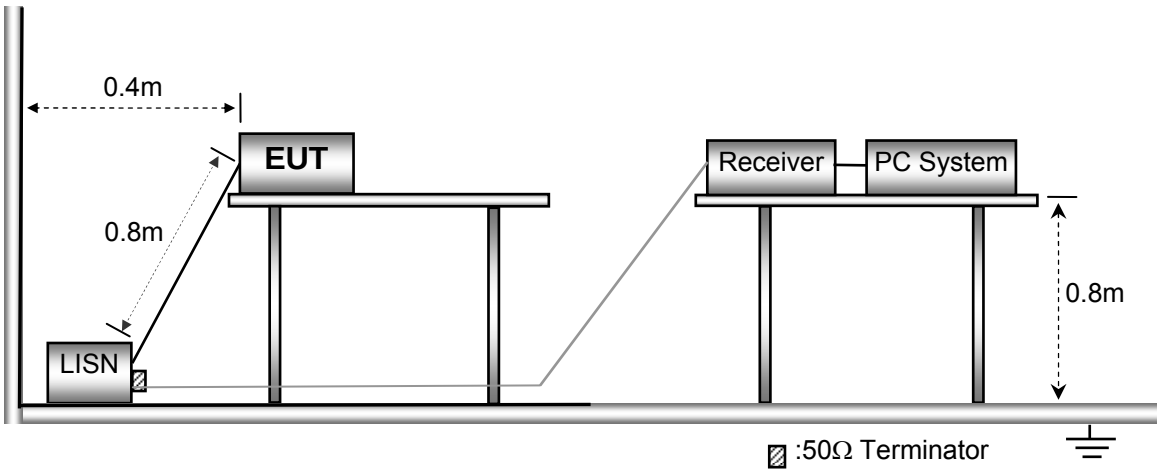
Temperature:	25.5 °C
Humidity:	51 % RH
Atmospheric Pressure:	101.2kPa

EUT Operation **:**

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

6.2 EUT Setup

The conducted emission tests were performed using the setup accordance with the ANSI C63.10:2013.

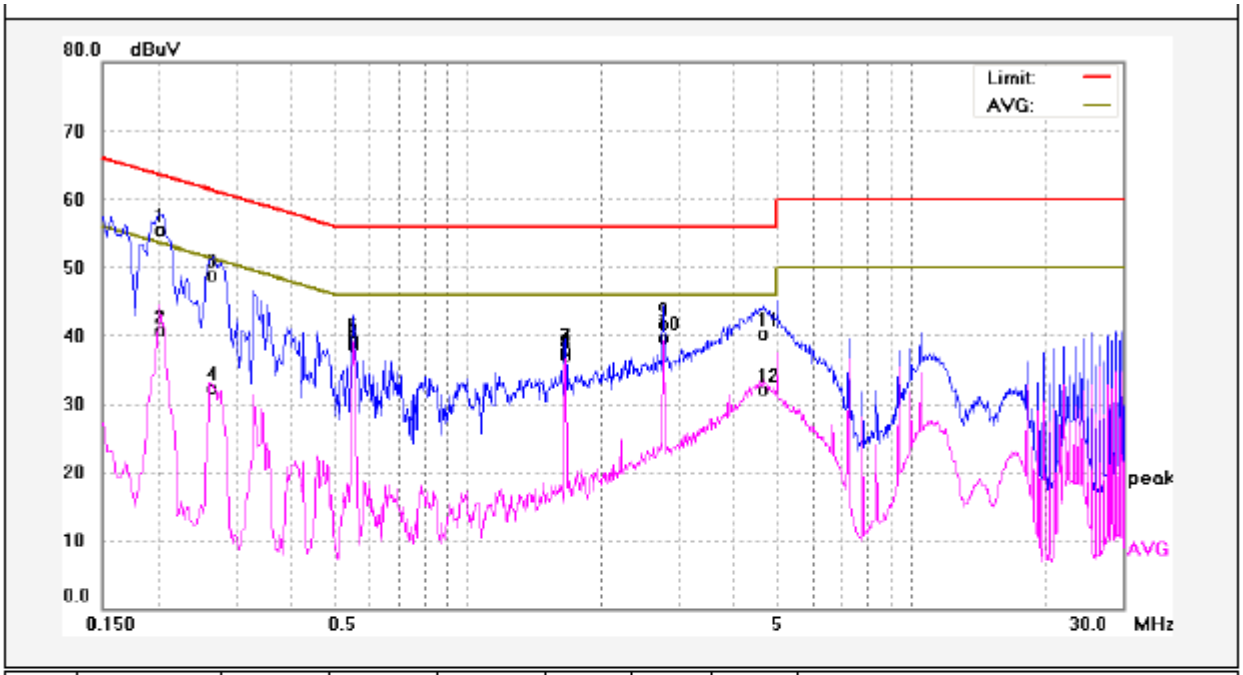


6.3 Measurement Description

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.

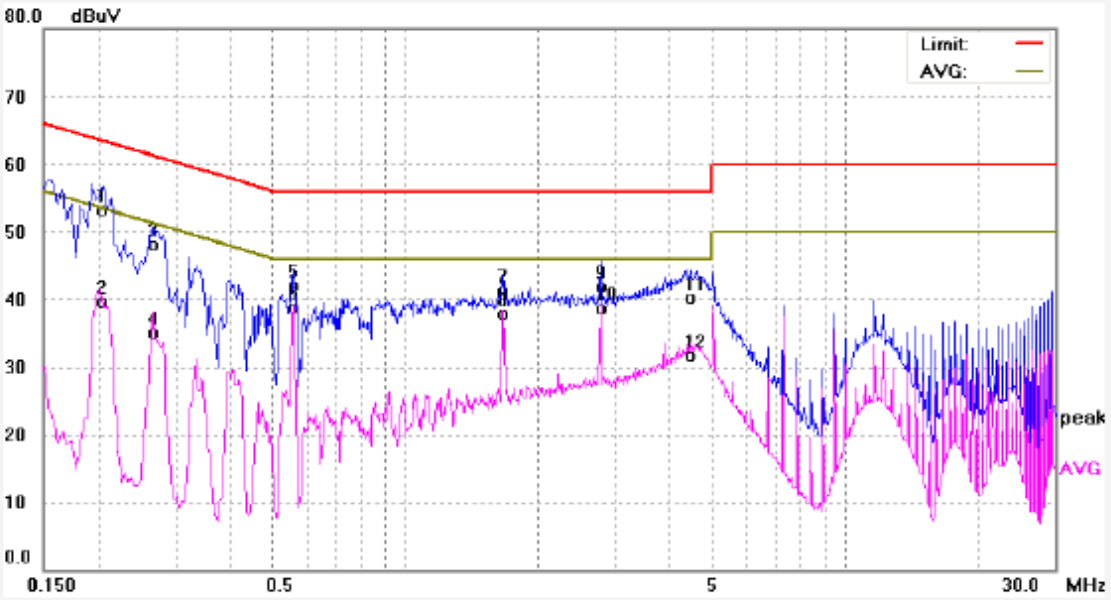
6.4 Conducted Emission Test Result

Live line:



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit dBuV	Margin (dB)	Detector	Remark
1	0.2020	45.80	9.62	55.42	63.52	-8.10	QP	
2	0.2020	31.10	9.62	40.72	53.52	-12.80	AVG	
3	0.2660	39.20	9.64	48.84	61.24	-12.40	QP	
4	0.2660	22.58	9.64	32.22	51.24	-19.02	AVG	
5	0.5540	29.76	9.69	39.45	56.00	-16.55	QP	
6	0.5540	28.90	9.69	38.59	46.00	-7.41	AVG	
7	1.6660	27.99	9.92	37.91	56.00	-18.09	QP	
8	1.6660	27.27	9.92	37.19	46.00	-8.81	AVG	
9	2.7740	31.71	9.93	41.64	56.00	-14.36	QP	
10	2.7740	29.71	9.93	39.64	46.00	-6.36	AVG	
11	4.6779	30.37	10.01	40.38	56.00	-15.62	QP	
12	4.6779	22.17	10.01	32.18	46.00	-13.82	AVG	

Neutral line:



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit dBuV	Margin (dB)	Detector	Remark
1	0.2060	43.59	9.62	53.21	63.36	-10.15	QP	
2	0.2060	30.17	9.62	39.79	53.36	-13.57	AVG	
3	0.2660	38.55	9.64	48.19	61.24	-13.05	QP	
4	0.2660	25.53	9.64	35.17	51.24	-16.07	AVG	
5	0.5580	32.35	9.69	42.04	56.00	-13.96	QP	
6	0.5580	29.30	9.69	38.99	46.00	-7.01	AVG	
7	1.6700	31.45	9.92	41.37	56.00	-14.63	QP	
8	1.6700	28.00	9.92	37.92	46.00	-8.08	AVG	
9	2.7820	31.94	9.93	41.87	56.00	-14.13	QP	
10	2.7820	28.84	9.93	38.77	46.00	-7.23	AVG	
11	4.3940	30.33	9.98	40.31	56.00	-15.69	QP	
12	4.3940	21.73	9.98	31.71	46.00	-14.29	AVG	

7 Radiated Spurious Emissions

Test Requirement: FCC Part15 Paragraph 15.231(a)

Test Method: ANSI C63.10:2013

Test Result: PASS

Measurement Distance: 3m

Limit:

Fundamental Frequency (MHz)	Field Strength of Fundamental (uV/m)	Field Strength of Fundamental (dBuV/m)	Field Strength of Spurious Emission (uV/m)	Field Strength of Spurious Emission (dBuV/m)
44.66-40.70	2250	67	225	47
70-130	1250	62	125	42
130-174	1250 to 3750	62 to 71.48	125 to 375	42 to 51.48
174-260	3750	71.48	375	51.48
260-470	3750 to 12500	71.48 to 81.94	375 to 1250	51.48 to 61.94
Above 470	12500	81.94	1250	61.94
aa** linear interpolations				

7.1 EUT Operation

Operating Environment **:**

Temperature: 23.5 °C

Humidity: 51.1 % RH

Atmospheric Pressure: 101.2kPa

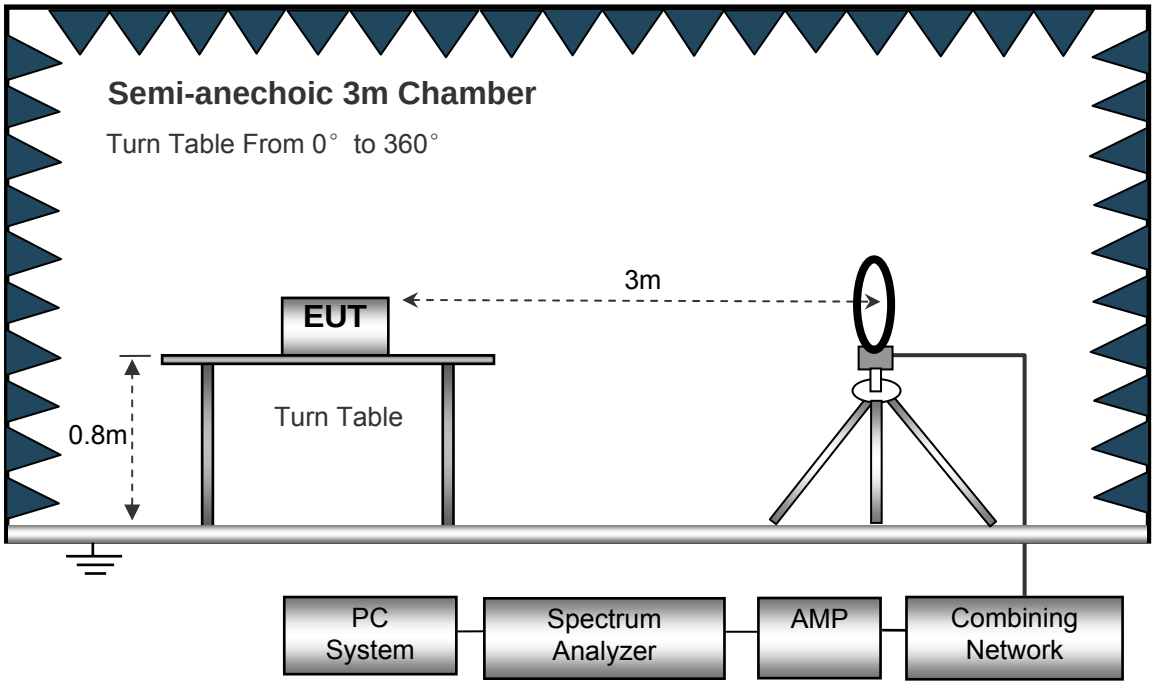
EUT Operation **:**

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

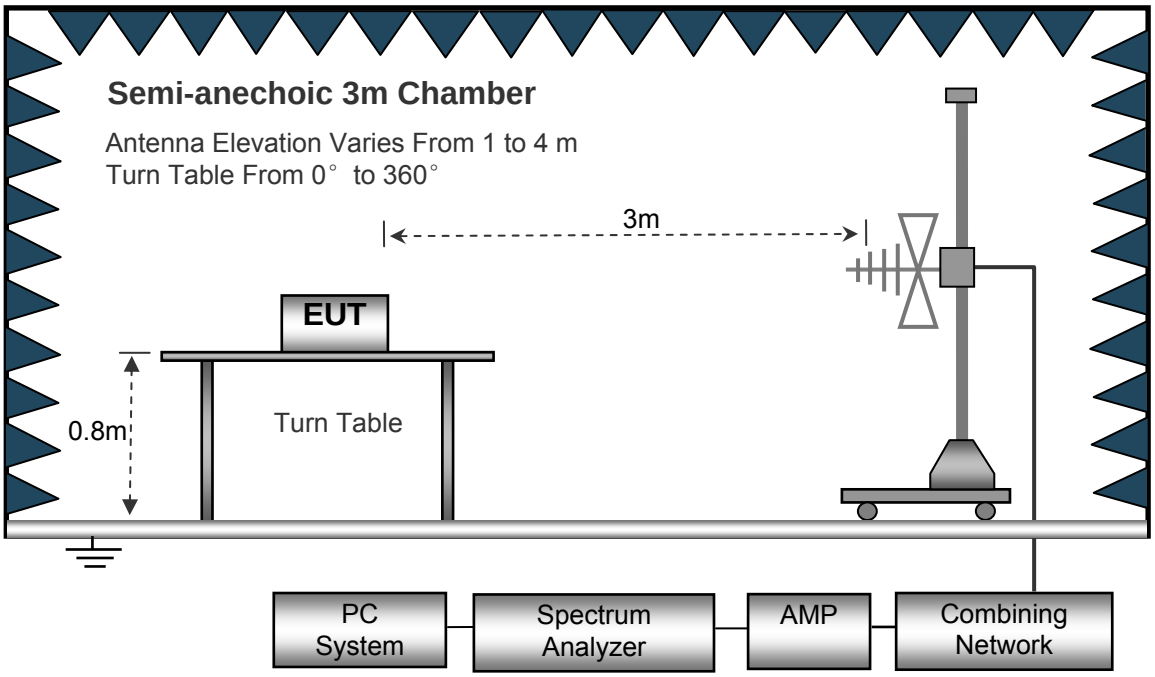
7.2 Test Setup

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

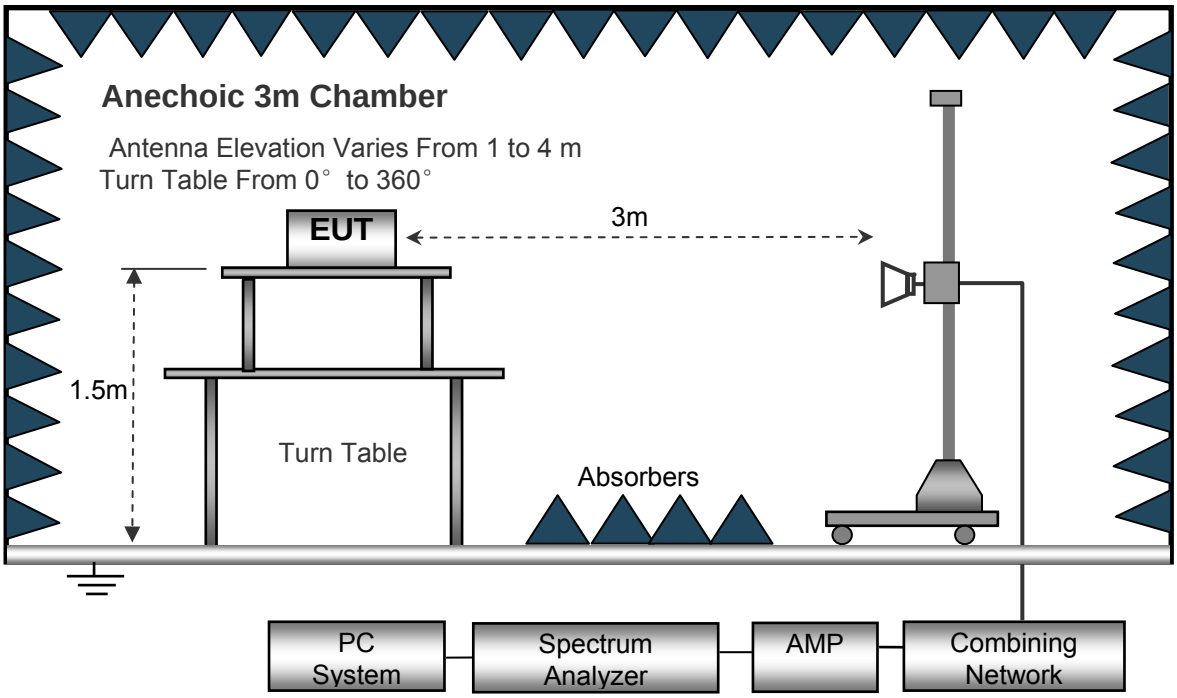
The test setup for emission measurement below 30MHz.



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



The test setup for emission measurement above 1 GHz.



7.3 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

7.4 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.

7.5 Summary of Test Results

Test Frequency : 32.768kHz ~ 5GHz

Frequency	Receiver Reading (PK)	Turn table Angle	RX Antenna		Corrected Factor	Corrected Amplitude (PK)	FCC Part 15.231/15.209/205	
			Height	Polar			Limit	Margin
(MHz)	(dBμV)	Degree	(m)	(H/V)	(dB/m)	(dBμV/m)	(dBμV/m)	(dB)
433.92	91.57	10	1.5	H	-7.31	84.26	100.82	-16.56
433.92	84.12	76	1.6	V	-7.31	76.81	100.82	-24.01
867.84	54.02	273	1.7	H	0.04	54.06	80.82	-26.76
867.84	54.71	124	1.2	V	0.04	54.75	80.82	-26.07
1816.80	56.75	89	1.5	H	-16.38	40.37	74.00	-33.63
1816.80	53.35	16	1.9	V	-16.38	36.97	74.00	-37.03
2725.20	56.67	189	1.0	H	-14.87	41.80	74.00	-32.20
2725.20	57.36	158	1.4	V	-14.87	42.49	74.00	-31.51

AV = Peak +20Log$_{10}$(duty cycle) =PK+(-7.41) [refer to section 8 for more detail]

Frequency	PK	RX Antenna Polar	Duty cycle Factor	Calculated AV	FCC Part 15.231/209/205	
					Limit	Margin
(MHz)	(dBμV/m)	(H/V)	(dB)	(dBμV/m)	(dBμV/m)	(dB)
433.92	84.26	H	-7.41	76.85	80.82	-3.97
433.92	76.81	V	-7.41	69.40	80.82	-11.42
867.84	54.06	H	-7.41	46.65	60.82	-14.17
867.84	54.75	V	-7.41	47.34	60.82	-13.48
1816.80	40.37	H	-7.41	32.96	54.00	-21.04
1816.80	36.97	V	-7.41	29.56	54.00	-24.44
2725.20	41.80	H	-7.41	34.39	54.00	-19.61
2725.20	42.49	V	-7.41	35.08	54.00	-18.92

8 Periodic Operation

The duty cycle was determined by the following equation:

To calculate the actual field intensity, The duty cycle correction factor in decibel is needed for later use and can be obtained from following conversion

Duty Cycle(%)=Total On interval in a complete pulse train/ Length of a complete pulse train * %

Duty Cycle Correction Factor(dB)=20 * Log_{10}(Duty Cycle(%))

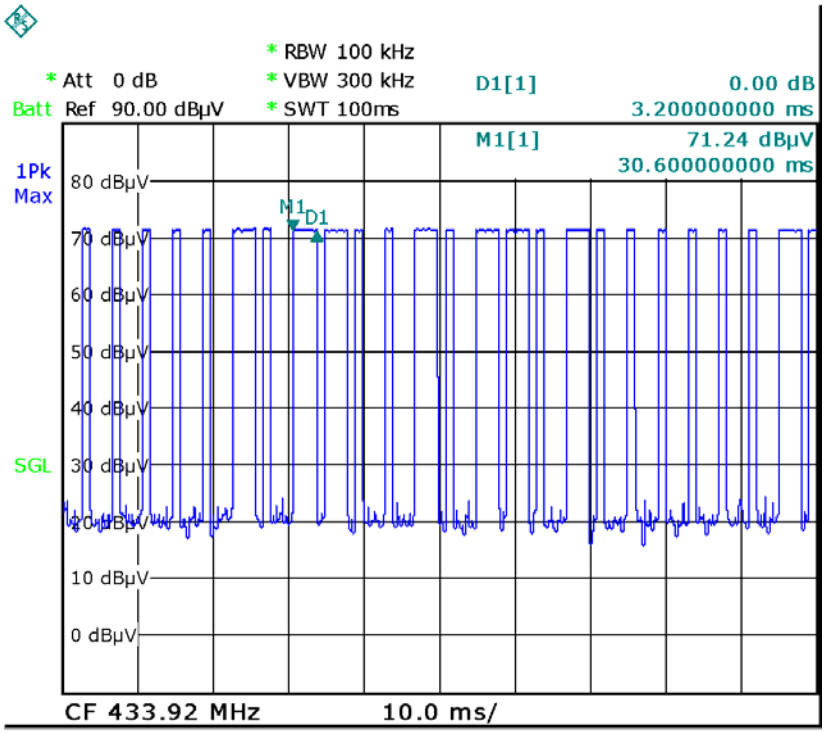
Total transmission time(ms)	3.2*8+1.0*17=42.60
Length of a complete transmission period(ms)	100
Duty Cycle (%)	42.60
Duty Cycle Correction Factor(dB)	-7.41

Refer to the duty cycle plot (as below),This device meets the FCC requirement.

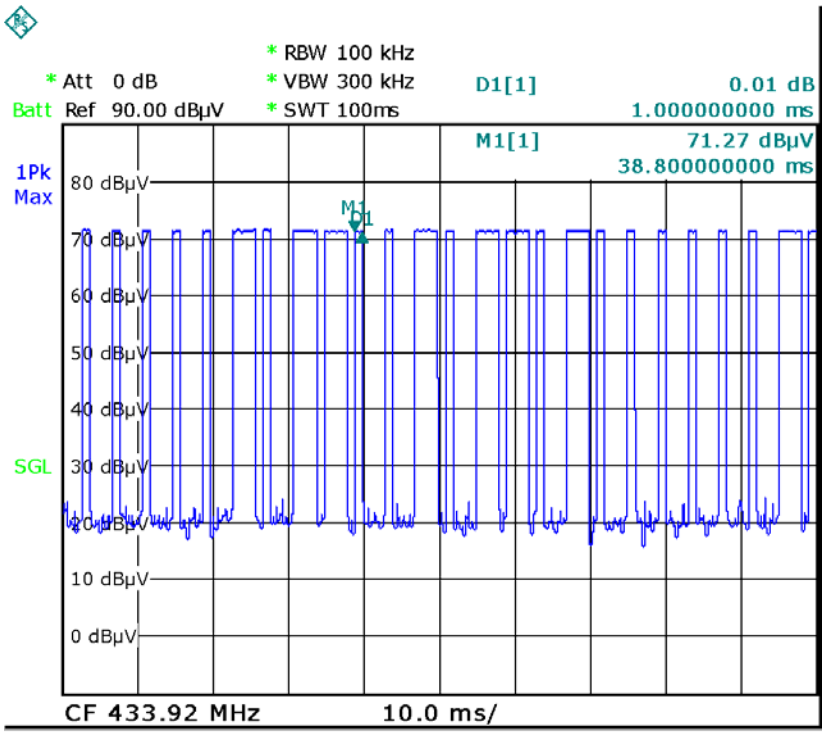
Length of a complete pulse train:

Remark: FCC part15.35(c) required that a complete pulse train is more than 0.1 seconds, the measured field strength shall be determined from the average absolute voltage during a 0.1 second interval during which the field strength is at its maximum value.

Pulse 1

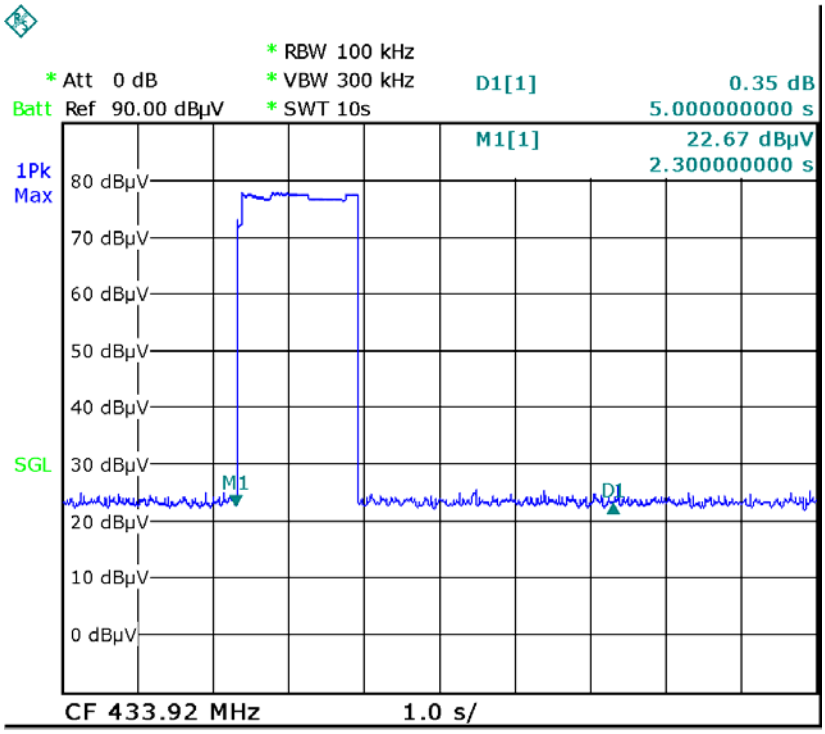


Pulse 2



FCC Part15.231(a)(1) A manually operated transmitter shall employ a switch that will automatically deactivate the transmitter within not more than 5 seconds of being released.

(2)A transmitter activated automatically shall cease transmission within 5 seconds after activation.



9 Emission Bandwidth

Test Requirement: FCC Part15.231(c)

Test Method: FCC Part15.231(c)

Limit The bandwidth of the emission shall be no wider than 0.25% of the center frequency for devices operating above 70 MHz and below 900 MHz. For devices operating above 900 MHz, the emission shall be no wider than 0.5% of the center frequency.

9.1 Test Procedure

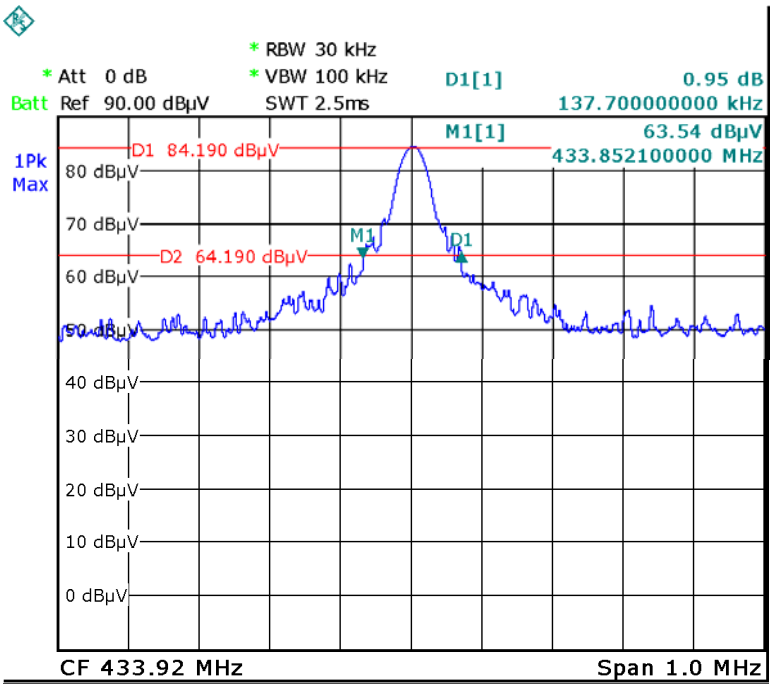
1. The transmitter output (antenna port) was connected to the spectrum analyzer.EUT and its simulators are placed on a table, let EUT working in test mode, then test it.
2. The bandwidth of the fundamental frequency was measure by spectrum analyser with 30kHz RBW and 100kHz VBW. The 20 dB bandwidth was recorded.

9.2 Test Result

Frequency (MHz)	20 dB Bandwidth Emission(KHz)	Limit (KHz)	Result
433.92	137.70	1084.80	Pass

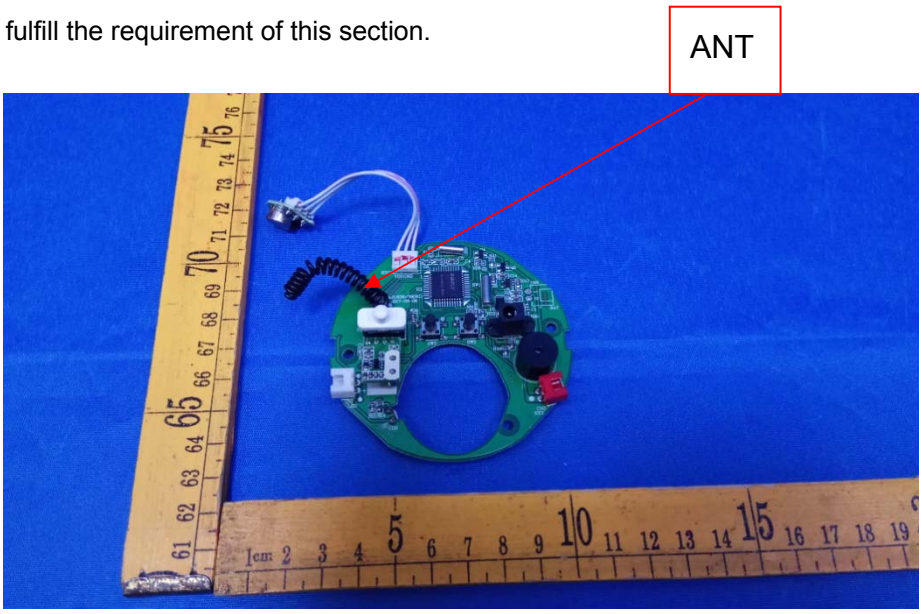
Limit=Center Frequency*0.25%

Test Plot



10 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 Integrated Antenna, it only apply to this model, fulfill the requirement of this section.

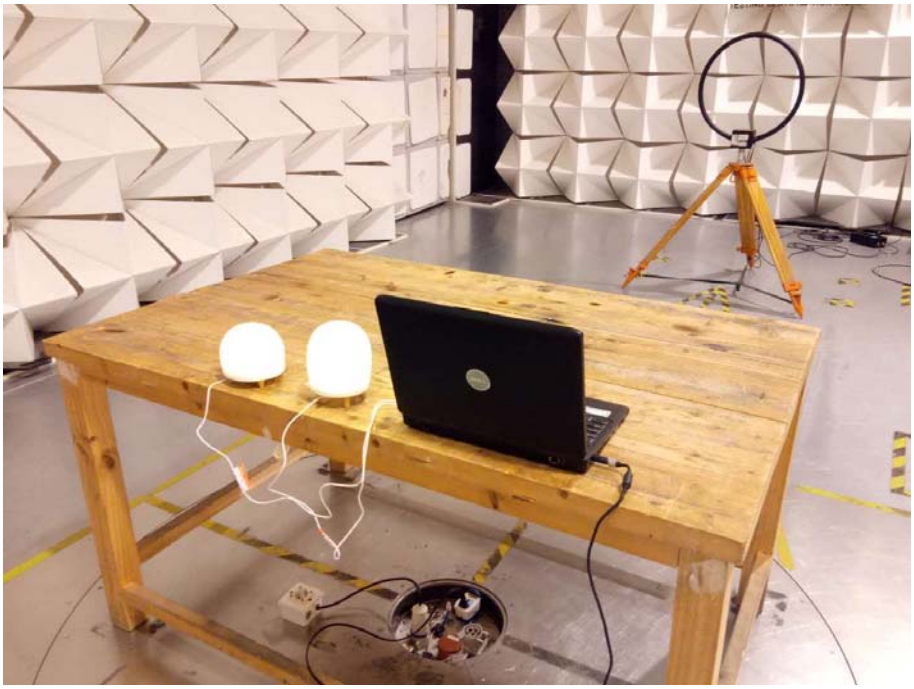


11 Photographs – Test Setup

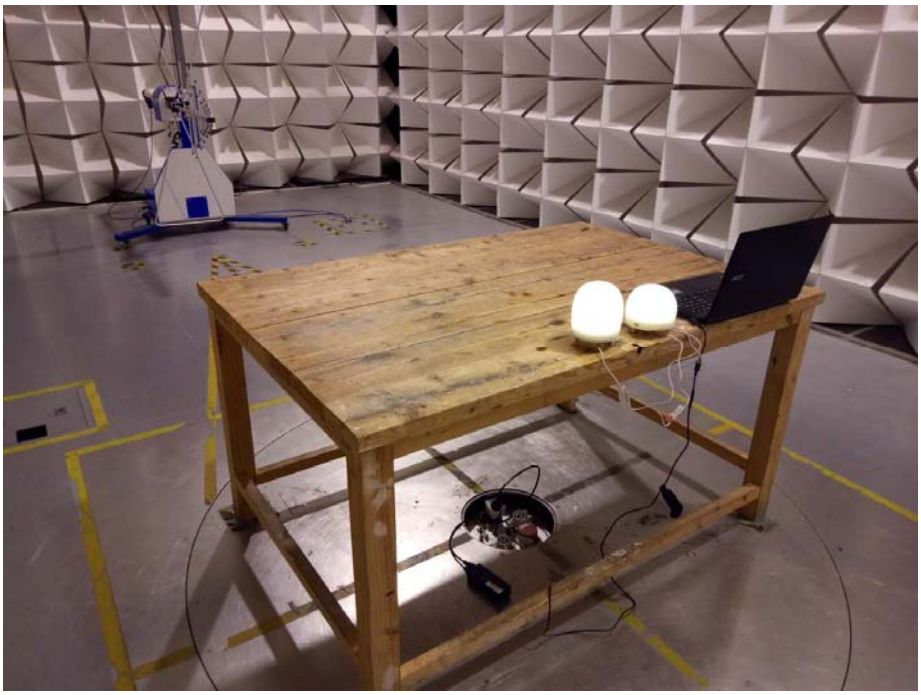
11.1 Conducted Emission

11.2 Photograph – Radiation Spurious Emission Test Setup

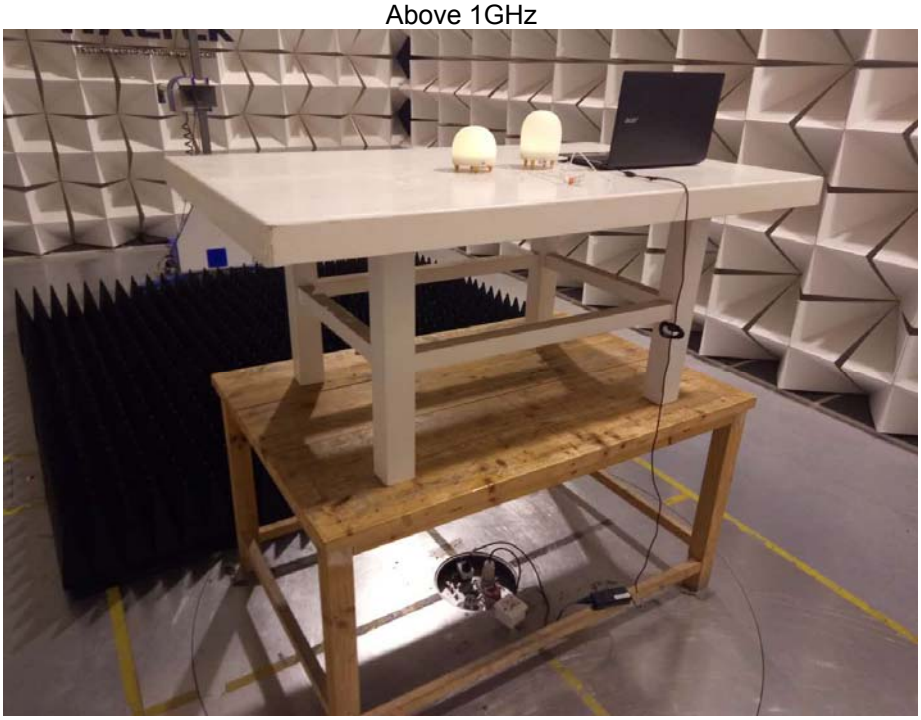
Below 30MHz



From 30MHz to 1GHz



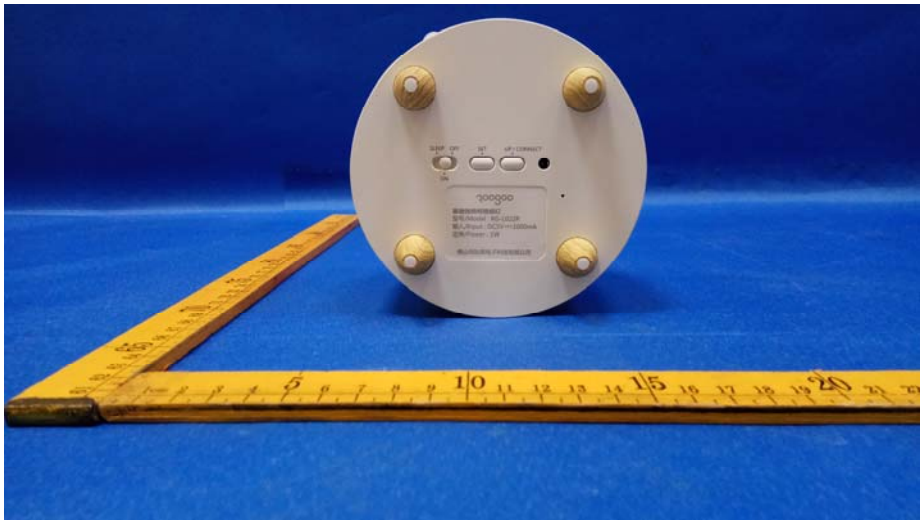
Above 1GHz



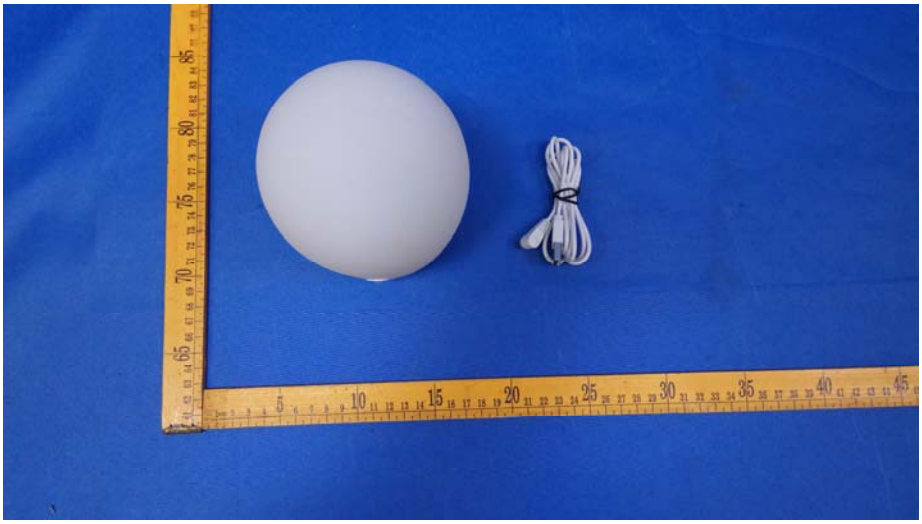
12 Photographs - Constructional Details

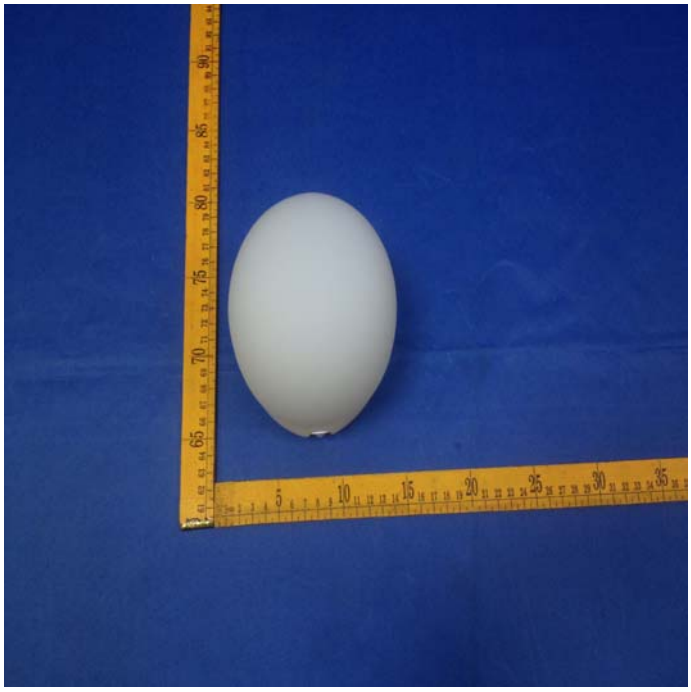
12.1 External Photos

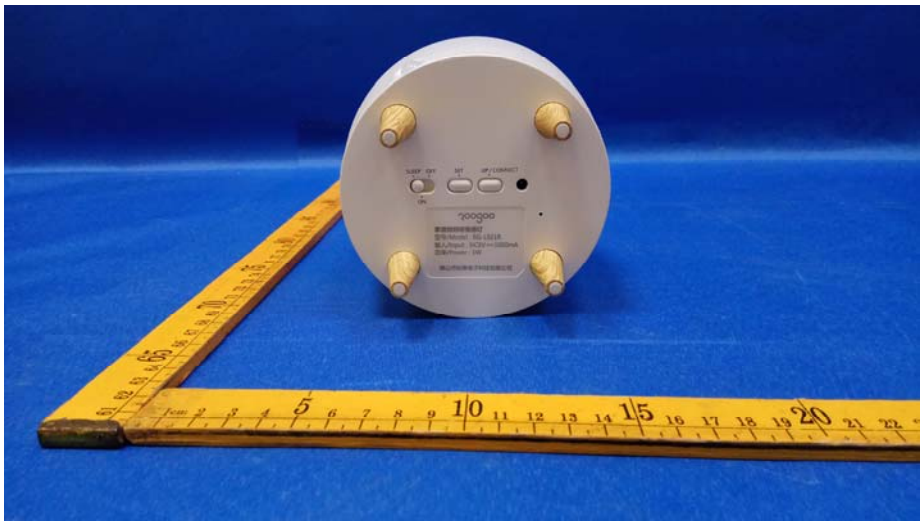
TX

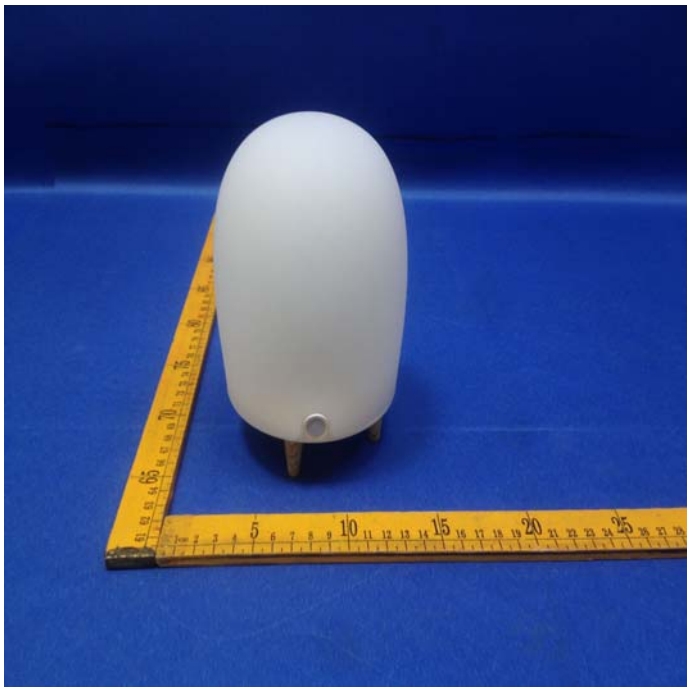


RX



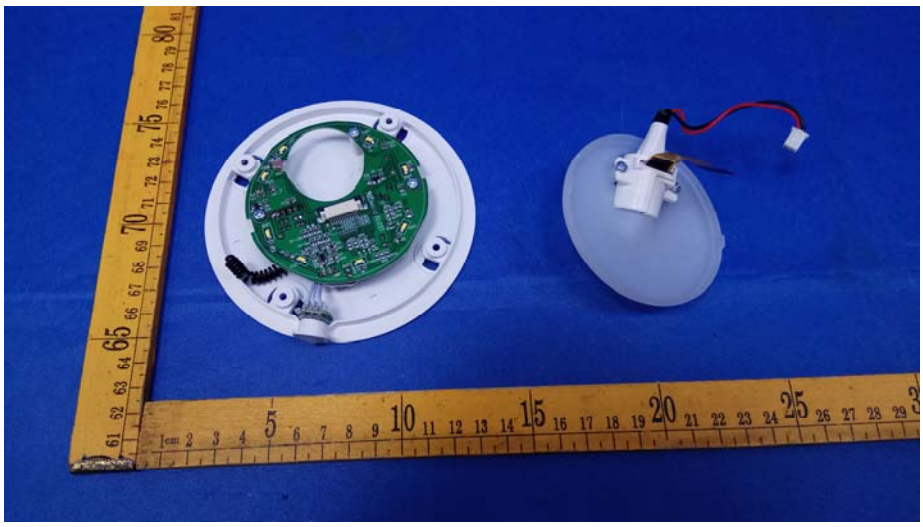


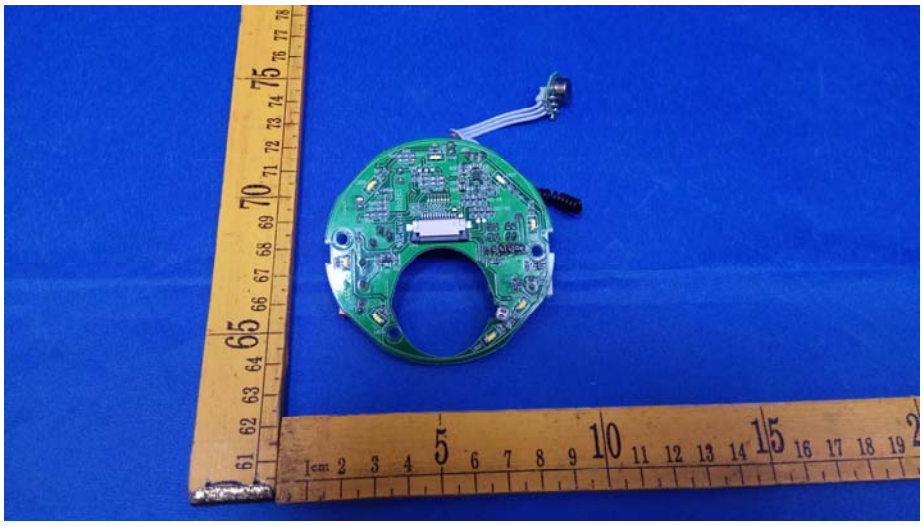


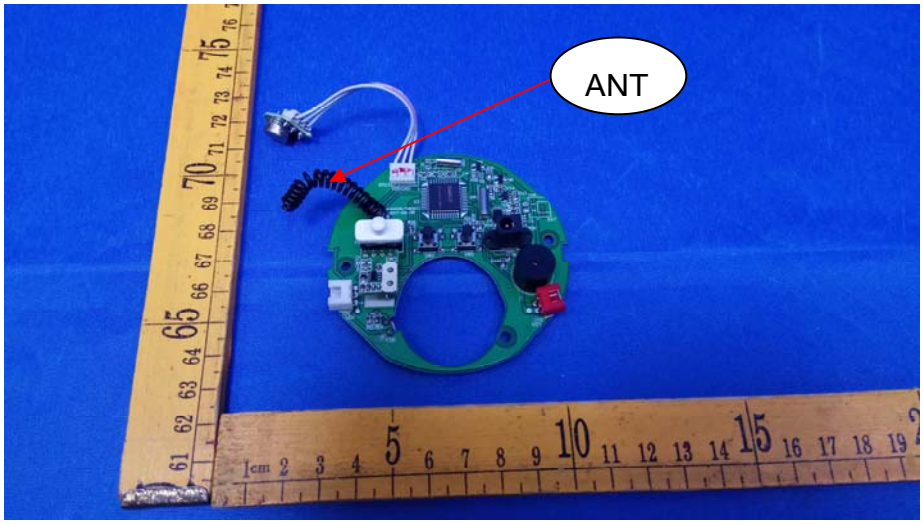


12.2 Internal Photos

TX



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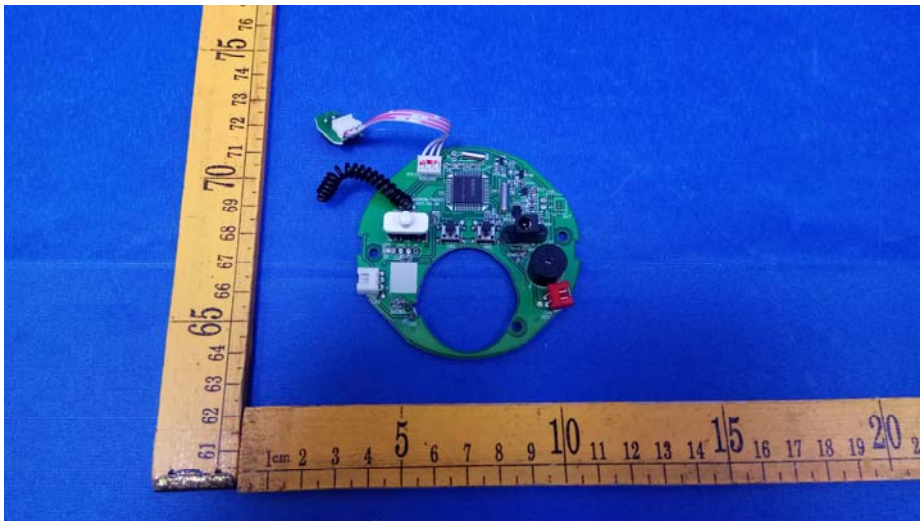

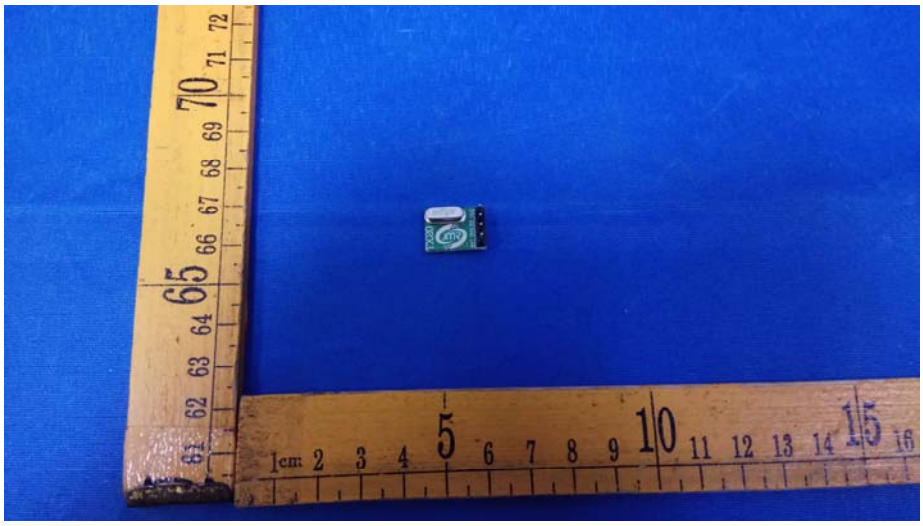

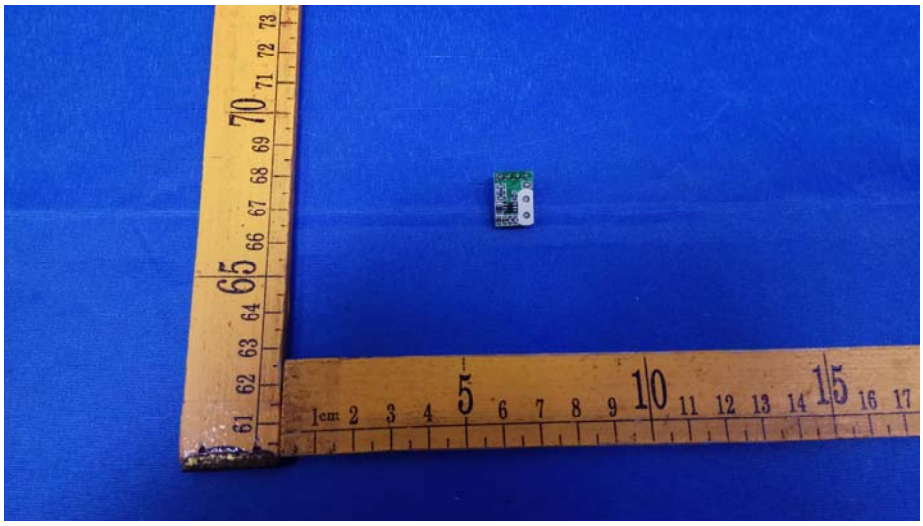

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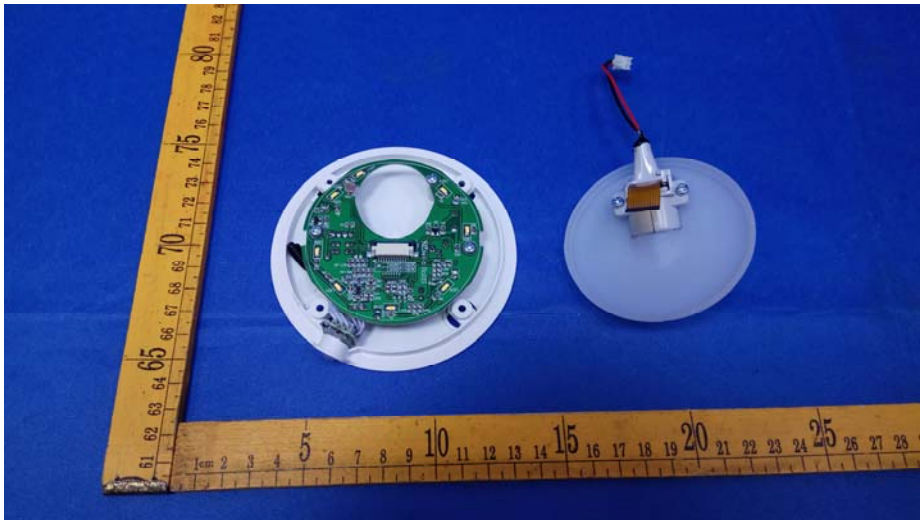

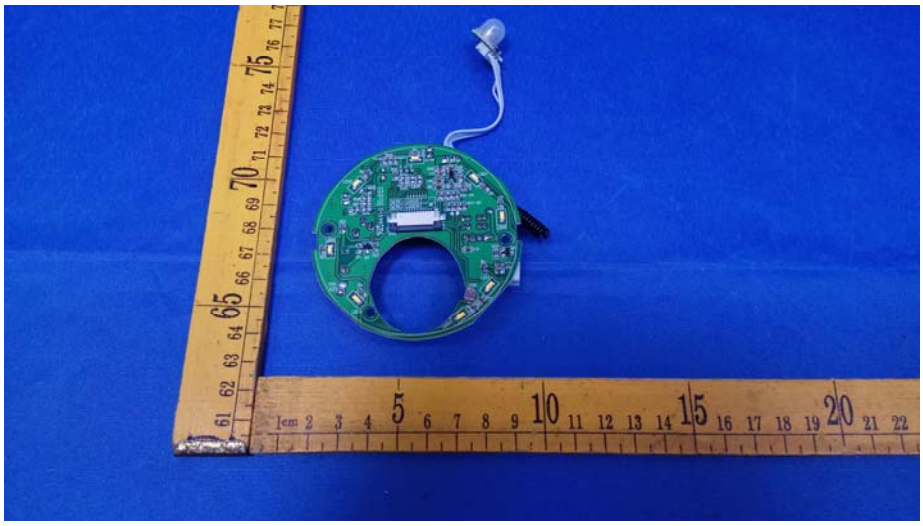

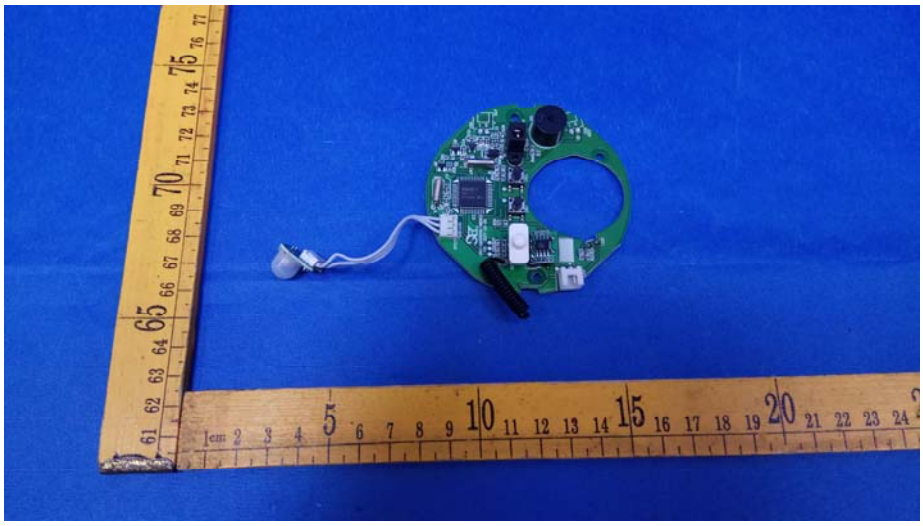

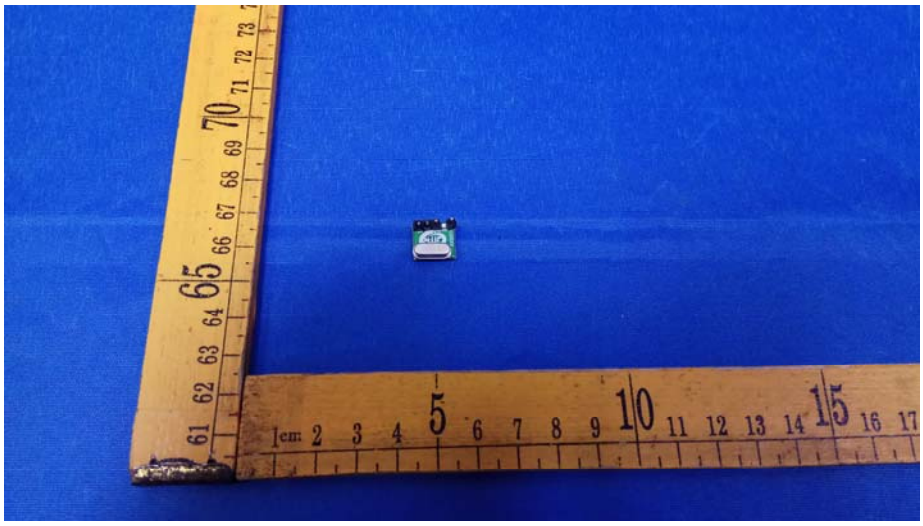

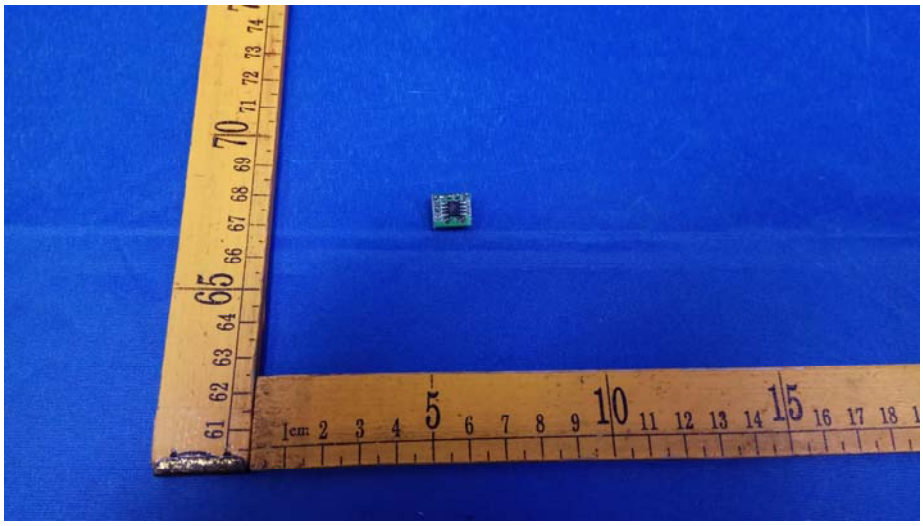

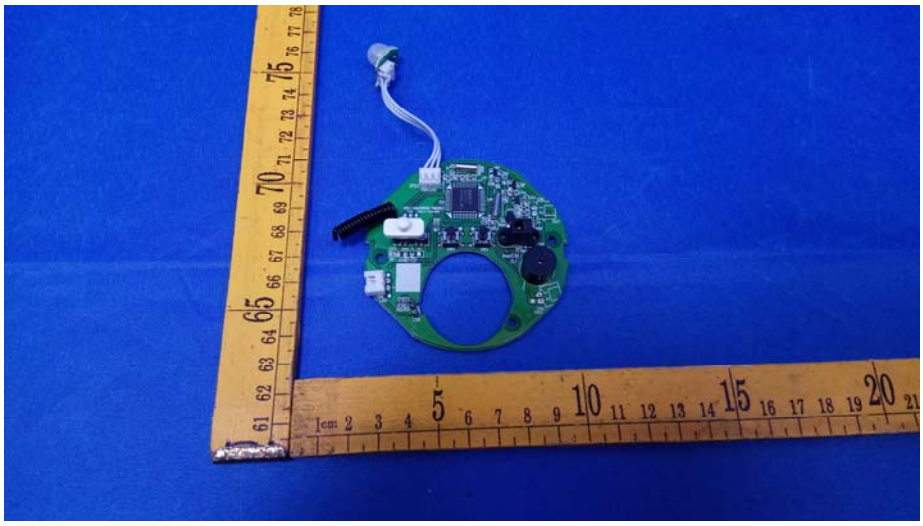

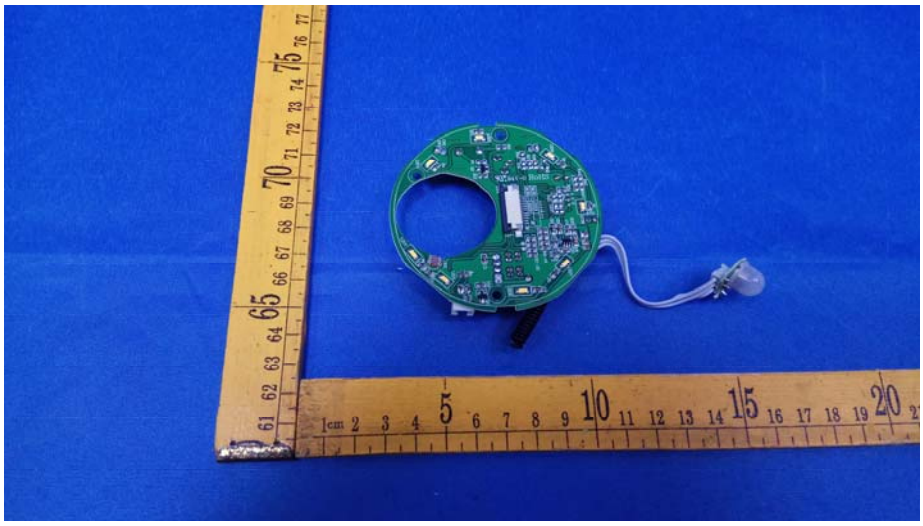

======End of Report======