



FCC TEST REPORT

FCC ID: 2AW2S-BT001

On Behalf of

BAOLEI TOYS FACTORY

Dinosaur toys

Model No.: See model list on page 5

Prepared for : BAOLEI TOYS FACTORY
Address : NO.8 LANE 8 PUMEI MEIHU DISTRICT, CHENGHAI DISTRICT,
SHANTOU CITY, GUANGDONG PROVINCE, CHINA

Prepared By : Shenzhen Alpha Product Testing Co., Ltd.
Address : Building i, No.2, Lixin Road, Fuyong Street, Bao'an District,
518103, Shenzhen, Guangdong, China

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TEST REPORT DECLARATION

Applicant : BAOLEI TOYS FACTORY

Address : NO.8 LANE 8 PUMEI MEIHU DISTRICT, CHENGHAI DISTRICT, SHANTOU
CITY, GUANGDONG PROVINCE, CHINA

Manufacturer : BAOLEI TOYS FACTORY

Address : NO.8 LANE 8 PUMEI MEIHU DISTRICT, CHENGHAI DISTRICT, SHANTOU
CITY, GUANGDONG PROVINCE, CHINA

EUT Description : Dinosaur toys

(A) Model No. : See model list on page 5

(B) Trademark : N/A

Measurement Standard Used:

FCC Rules and Regulations Part 15 Subpart C Section 15.227
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. The maximum emission levels are compared to the FCC Part 15C limits both conducted and radiated emissions. The test results are contained in this test report and Shenzhen Alpha Product Testing Co., Ltd. is assumed of full responsibility for the accuracy and completeness of these tests. After the test, our opinion is that EUT compliance with the requirement of the above standards.

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).....: Lucas Pang
Project Engineer



Approved by (name + signature).....: Simple Guan
Project Manager



Date of issue.....: July 29, 2020

Revision History

Revision	Issue Date	Revisions	Revised By
V0	July 29, 2020	Initial released Issue	Lucas Pang

1. General Information

1.1. Description of Device (EUT)

EUT : Dinosaur toys

Model No. : 60108A, 60109, 60110, 60111, 60112, 60113, 60114, 60115, 60116, 60117, 60119, 60120, 60121, 60122, 60122A, 60123, 60123A, 60125, 60126, 60127, 60128, 60129, 60130, 60131, 60132, 60133, 60134, 60135, 60136, 60137, 60138, 60150, 60150A, 60151, 60151A, 60152, 60152A, 60153, 60153A, 60154, 60154A, 60155, 60155A, 60156, 60156A, 60099, 60098, 60098A, 60097, 60097A, 60096, 60096A, 60095, 60095A, 90049, 90049A, 80100, 80200, 80300, 80400, 80500, 80600, 80700, 80800, 80900, 80901, 80902A, 80903, 80904, 80905, 80906, 80907, 80908, 80909, 80910, 90501, 90502, 90503, 90504, 90505, 90506, 90508-1, 90508-2, 90013, 90014, 90017, 90018, 90041, 60018, , 60100, 60101, 60102, 60103, 60104, 60105, 60106, 60107, 60109, 60110, 60111, 60112, 60113, 60114, 60115, 60116, 60117, 60152, 60152A, 60154, 60154A, 60156, 60156A, PT2011, PT2012, 746072, MT1320

DIFF : There is no difference between the models except the appearance color. So all the test were performed on the model 60100.

Power supply : DC 3V by battery

Operation frequency : 27.15MHz

Channel No. 1 Channel

Modulation : ASK

Antenna Type : External antenna, max gain 0dBi.

Software Version : V1.0

Hardware Version : V1.0

1.2. Accessories of Device (EUT)

Accessories1 : N/A
Manufacturer : N/A
Model : N/A
Input : N/A
Output : N/A

1.3. Ancillary Equipment Details

No.	Description	Manufacturer	Model	Serial Number	Certification or SDOC
1	N/A	N/A	N/A	N/A	N/A

1.4. Test Lab Information

Shenzhen Alpha Product Testing Co., Ltd
Building i, No.2, Lixin Road, Fuyong Street, Bao'an District, 518103,
Shenzhen, Guangdong, China

June 21, 2018 File on Federal Communication Commission
Registration Number: 293961

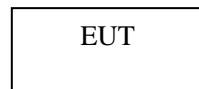
July 15, 2019 Certificated by IC
Registration Number: CN0085

2. Summary of test

2.1. Summary of test result

Description of Test Item	Standard	Results
Occupied bandwidth and 20dB Bandwidth	PART 15.215	PASS
Radiated Emission (9KHz-1GHz)	PART 15.227	PASS
Power Line Conducted Emissions (150KHz-30MHz)	PART 15.207	N/A
Antenna Requirement	Section 15.203	PASS
RF Exposure evaluation	KDB 447498 D01 v06	PASS

2.2. Block Diagram



2.3. Test mode

Tested mode, channel, and data rate information		
Mode	Channel	Frequency (MHz)
1	CH1	27.15
Note: According exploratory test, EUT will have maximum output power in those data rate. so those data rate were used for all test.		

2.4. Test Conditions

Temperature range	21-25℃
Humidity range	40-75%
Pressure range	86-106kPa

2.5. Measurement Uncertainty (95% confidence levels, k=2)

Item	Uncertainty
Uncertainty for Power point Conducted Emissions Test	2.74dB
Uncertainty for Radiation Emission test in 3m chamber (below 30MHz)	2.13 dB(Polarize: V)
	2.57dB(Polarize: H)
Uncertainty for Radiation Emission test in 3m chamber (30MHz to 1GHz)	3.77dB(Polarize: V)
	3.80dB(Polarize: H)
Uncertainty for Radiation Emission test in 3m chamber (1GHz to 25GHz)	4.13B(Polarize: H)
	4.16B(Polarize: V)
Uncertainty for radio frequency	5.4×10^{-8}
Uncertainty for conducted RF Power	0.37dB
Uncertainty for temperature	0.2°C
Uncertainty for humidity	1%
Uncertainty for DC and low frequency voltages	0.06%

2.6. Test Equipment

Equipment	Manufacture	Model No.	Serial No.	Last cal.	Cal Interval
9*6*6 anechoic chamber	CHENYU	9*6*6	N/A	2019.09.06	3Year
Spectrum analyzer	ROHDE&SCHWARZ	FSV40-N	102137	2019.09.05	1 Year
Spectrum analyzer	Agilent	N9020A	MY499100060	2019.09.05	1 Year
Receiver	ROHDE&SCHWARZ	ESR	1316.3003K03-10208 2-Wa	2019.09.06	1 Year
Receiver	R&S	ESCI	101165	2019.09.05	1 Year
Bilog Antenna	Schwarzbeck	VULB 9168	VULB9168-438	2019.09.07	2Year
Horn Antenna	SCHWARZBECK	BBHA 9120 D	BBHA 9120 D(1201)	2020.04.12	2Year
Active Loop Antenna	SCHWARZBECK	FMZB 1519B	00059	2019.09.07	2Year
Cable	Resenberger	N/A	No.1	2019.09.05	1 Year
Cable	Resenberger	N/A	No.2	2019.09.05	1 Year
Cable	Resenberger	N/A	No.3	2019.09.05	1 Year
Pre-amplifier	HP	HP8347A	2834A00455	2019.09.05	1 Year
Pre-amplifier	Agilent	8449B	3008A02664	2019.09.05	1 Year
L.I.S.N.#1	Schwarzbeck	NSLK8126	8126466	2019.09.05	1 Year
L.I.S.N.#2	ROHDE&SCHWARZ	ENV216	101043	2019.09.05	1 Year
20db Attenuator	ICPROBING	IATS1	82347	2019.08.26	1 Year
Horn Antenna	SCHWARZBECK	BBHA9170	00946	2019.09.07	2 Year
Preamplifier	SKET	LNPA_1840-50	SK2018101801	2019.09.06	1 Year
Power Meter	Agilent	E9300A	MY41496625	2019.09.06	1 Year
Temp. & Humid. Chamber	Wei Huang	WHTH-1000-40-8 80	100631	2019.09.06	1 Year
Switching Mode Power Supply	JUNKE	JK12010S	20140927-6	2019.09.05	1 Year

3. Occupied bandwidth and 20dB Bandwidth

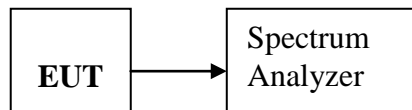
3.1. Limit

Intentional radiators operating under the alternative provisions to the general emission limits, as contained in FCC part 15.217 through 15.257 and in Subpart E of this part, must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated.

3.2. Test Procedure

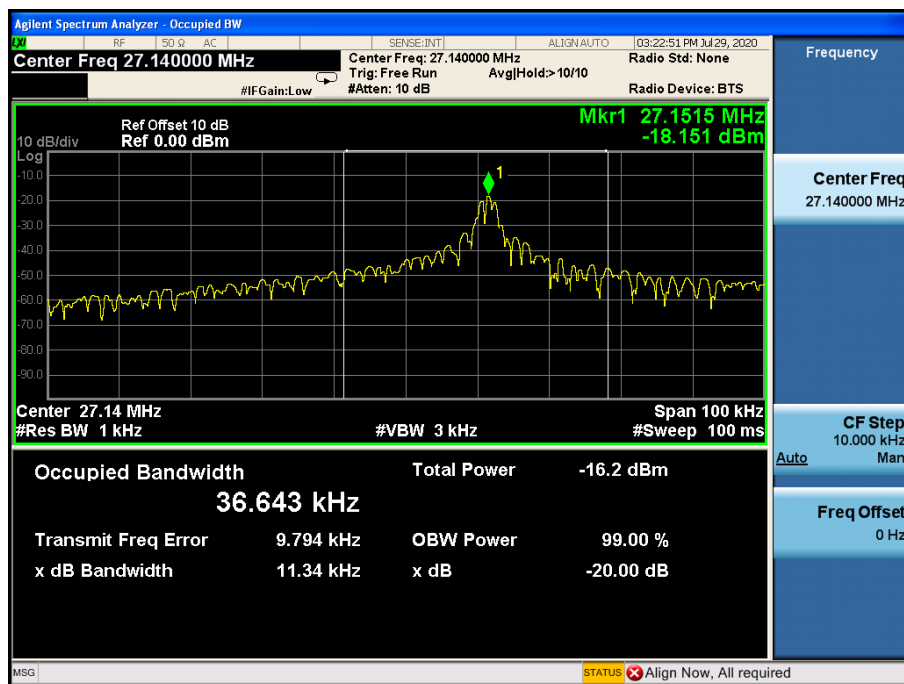
The transmitter output was directly connected to a spectrum analyzer with a 50Ω cable. The bandwidth of the fundamental frequency was measured by spectrum analyzer with 1kHz RBW and 3kHz VBW. The 20dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 20dB.

3.3. Test Setup



3.4. Test Result

Mode	Freq (MHz)	20dB Bandwidth (KHz)	99% Bandwidth (KHz)	Limit (kHz)	Conclusion
Tx Mode	27.15	11.34	36.643	/	PASS



4. Radiated emissions

4.1. 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:

- a) The tighter limit applies at the band edges.

For example: F.S limit at 88MHz is 100uV/m

- b) If measurement is made at 3m distance, then F.S Limit at 3m distance is adjusted by using the formula of $L_{d1} = L_{d2} * (d2/d1)^2$.

For example:

F.S Limit at 30m(d2) distance is 30uV/m(L_{d2}), then F.S Limit at 3m(d1) distance is

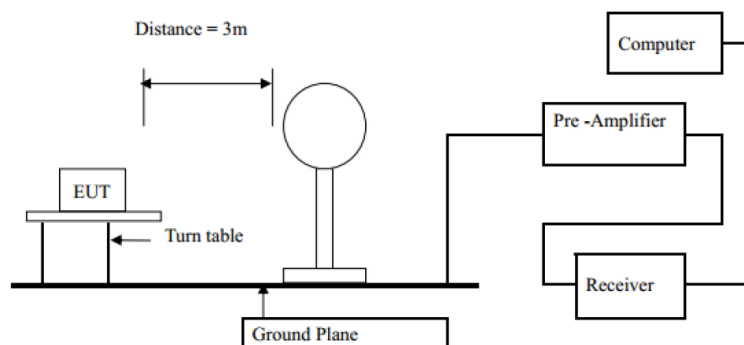
$$L_{d1} = 30\text{uV/m} * (30/3)^2 = 100 * 30\text{uV/m} = 69.54 \text{ dBuV/m}$$

(a) The field strength of any emission within this band shall not exceed 10,000 microvolts/meter at 3 meters. The emission limit in this paragraph is based on measurement instrumentation employing an average detector. The provisions in §15.35 for limiting peak emissions apply.

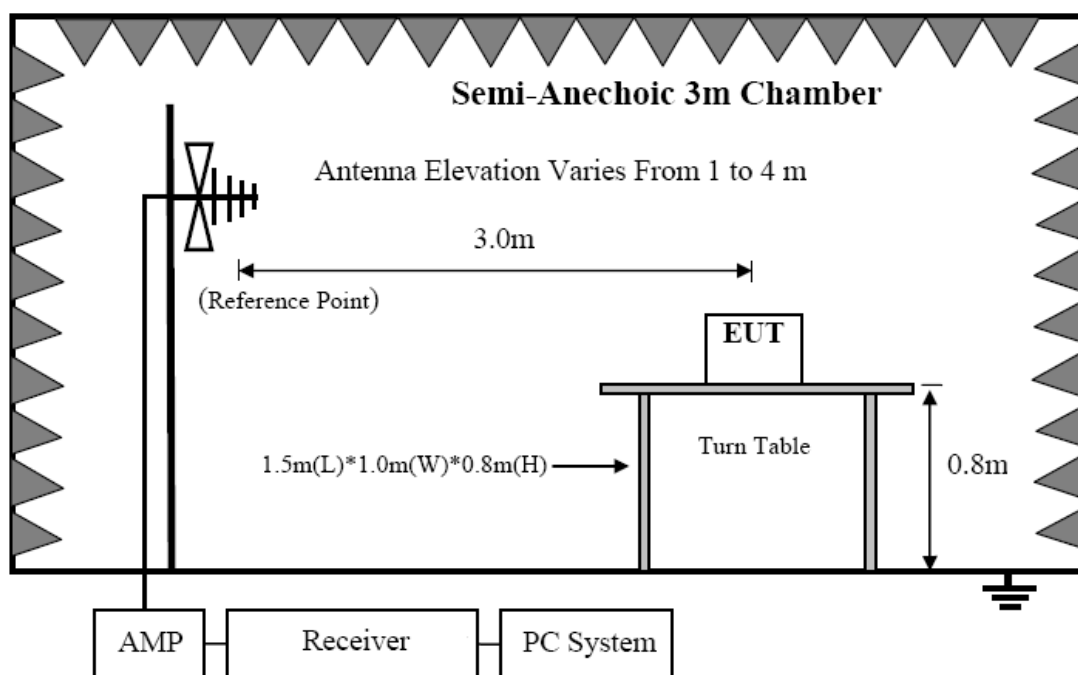
(b) The field strength of any emissions which appear outside of this band shall not exceed the general radiated emission limits in §15.209.

4.2. Block Diagram of Test setup

In 3m Anechoic Chamber Test Setup Diagram for below 30MHz



In 3m Anechoic Chamber Test Setup Diagram for frequency 30MHz-1GHz



4.3. Test Procedure

Procedure of Preliminary Test

The EUT and Support equipment, if needed, were put placed on a non-metallic table, 80cm above the ground plane.

Configuration EUT to simulate typical usage as described in clause 2.4 and test equipment as described in clause 4.2 of this report.

All I/O cables were positioned to simulate typical actual usage as per ANSI C63.10:2013.

Mains cables, telephone lines or other connections to auxiliary equipment located outside the test are shall drape to the floor, be fitted with ferrite clamps or ferrite tubes placed on the floor at the point where the cable reaches the floor and then routed to the place where they leave the turntable. No extension cords shall be used to mains receptacle.

The antenna was placed at 3 meter away from the EUT as stated in ANSI C63.10:2013. The antenna connected to the Spectrum Analyzer via a cable and at times a pre-amplifier would be used.

The Receiver quickly scanned from 9KHz to 30MHz and 30MHz to 1GHz The EUT test program was started. Emissions were scanned and measured rotating the EUT to 360 degrees and positioning the antenna 1 to 4 meters above the ground plane, in both the vertical and the horizontal polarization, to maximize the emission reading level.

The test mode(s) described in clause 2.4 were scanned during the preliminary test:

After the preliminary scan, we found the test mode producing the highest emission level. The EUT and cable configuration, antenna position, polarization and turntable position of the above highest emission level were recorded for the final test.

Procedure of Final Test

EUT and support equipment were set up on the turntable as per the configuration with highest emission level in the preliminary test.

The Receiver scanned from 9KHz to 30MHz and 30MHz to 1GHz. Emissions were scanned and measured rotating the EUT to 360 degrees, varying cable placement and positioning the antenna 1 to 4 meters above the ground plane, in both the vertical and the horizontal polarization, to maximize the emission reading level.

Recorded at least the six highest emissions. Emission frequency, amplitude, antenna position, polarization and turntable position were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit and only Q.P. reading is presented.

The test data of the worst-case condition(s) was recorded.

The bandwidth of test receiver is set at 200Hz for 9 KHz to 150 KHz measure, 10 KHz for 150 KHz to 30MHz measure and 120 KHz for 30 MHz to 1GHz measure.

4.4. Test Result

PASS. (See below detailed test result)

Detailed information please see the following page.

From 9KHz to 30MHz: Conclusion: PASS

Polarization: Horizontal

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Results (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	27.15	36.20	20.50	56.70	100	-43.30	Peak
2	27.15	26.46	20.50	46.96	80	-33.04	Average

Remark: 1. All readings are Quasi-Peak and Average values.

2. Margin=Result(Result=Reading + Factor)– Limit

3. When peak value applied to AVG limit, the AVG value is not calculated.

Polarization: Vertical

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Results (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	27.15	27.71	20.50	48.21	100	-51.79	Peak
2	27.15	12.71	20.50	33.21	80	-46.79	Average

Remark: 1. All readings are Quasi-Peak and Average values.

2. Margin=Result(Result=Reading + Factor)– Limit

3. When peak value applied to AVG limit, the AVG value is not calculated.

Note:

Y: rotate EUT by 90° vertically.

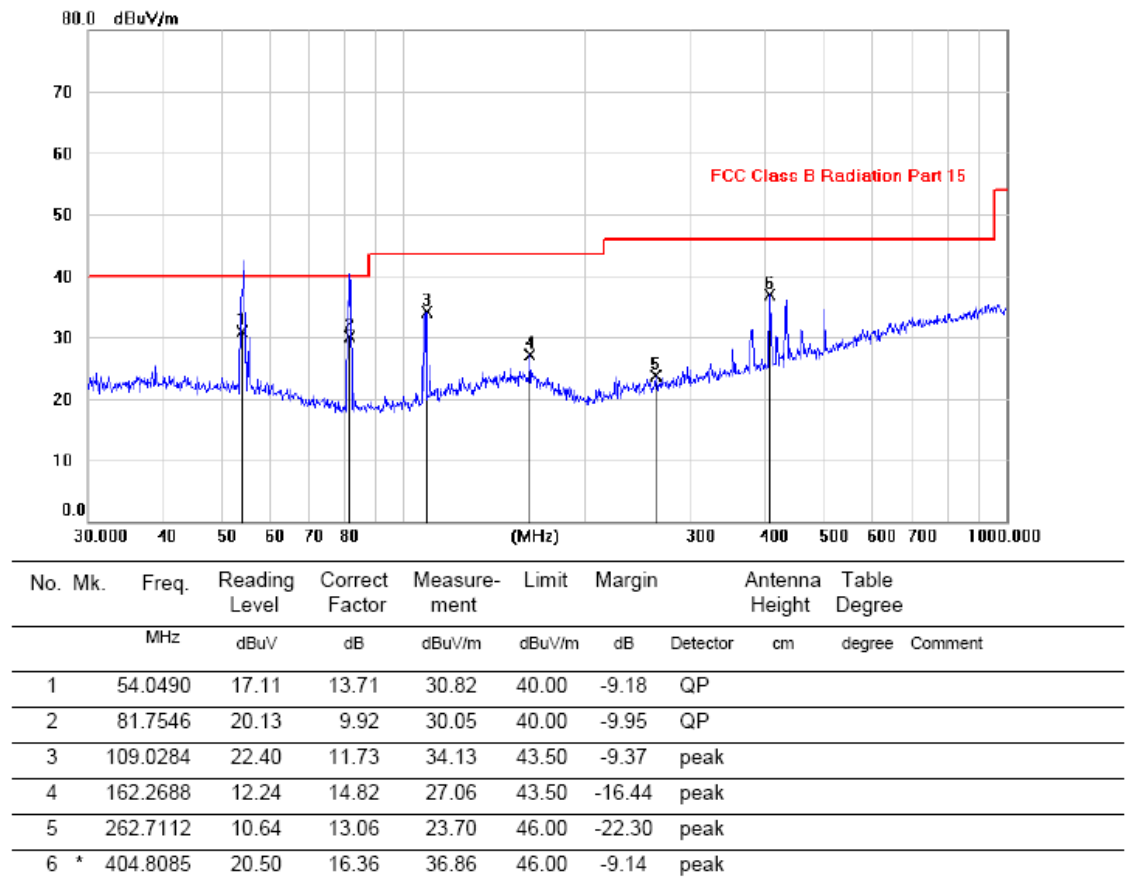
X: rotate EUT by 90° clockwise.

Z: EUT as Radiated Emission test setup photograph.

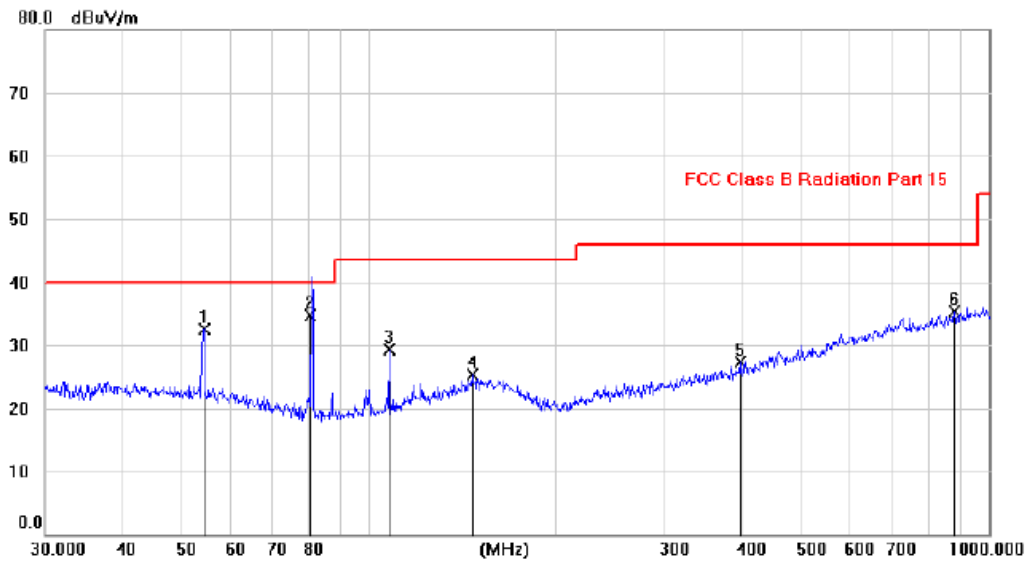
Radiated Emission test setup photograph is the worst case and reported.

From 30MHz to 1GHz: Conclusion: PASS

Vertical:



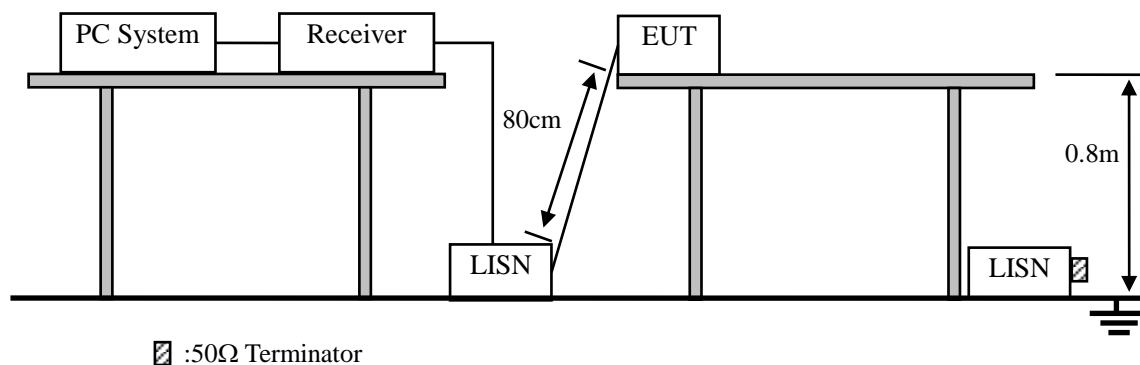
Horizontal:



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Margin	Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	cm	degree	Comment
1		54.1090	18.90	13.70	32.60	40.00	-7.40	peak		
2	*	80.4375	24.87	9.90	34.77	40.00	-5.23	QP		
3		108.1529	17.56	11.65	29.21	43.50	-14.29	peak		
4		146.6818	10.43	14.81	25.24	43.50	-18.26	peak		
5		396.3805	11.03	16.18	27.21	46.00	-18.79	peak		
6		879.2459	11.46	23.76	35.22	46.00	-10.78	peak		

5. Power Line Conducted Emissions

5.1. Block Diagram of Test Setup



5.2. Limit

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

Notes: 1. * Decreasing linearly with logarithm of frequency.

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

5.3. Test Procedure

- (1) The EUT was placed on a non-metallic table, 80cm above the ground plane.
- (2) Setup the EUT and simulator as shown in 10.1
- (3) The EUT Power connected to the power mains through a power adapter and a line impedance stabilization network (L.I.S.N1). The other peripheral devices power cord connected to the power mains through a line impedance stabilization network (L.I.S.N1), this provided a 50-ohm coupling impedance for the EUT (Please refer to the block diagram of the test setup and photographs). 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 C64.10:2013 on conducted Emission test.
- (4) The bandwidth of test receiver is set at 10KHz.
- (5) The frequency range from 150 KHz to 30MHz is checked.

5.4. Test Result

Not apply to battery operated products.

6. Antenna Requirements

6.1. Limit

For intentional device, according to RSS-Gen Section 6.8 and FCC 47 CFR Section 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. And according to FCC 47 CFR Section 15.209, if transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

6.2. Antenna Connected Construction

The antenna is fixed antenna and no consideration of replacement. Please see EUT photos for details.

6.3. Results

The EUT antenna is fixed Antenna. It complies with the standard requirement.

7. RF Exposure evaluation

According to 447498 D01 General RF Exposure Guidance v06

For frequencies below 100MHz, the following may be considered for SAR test exclusion

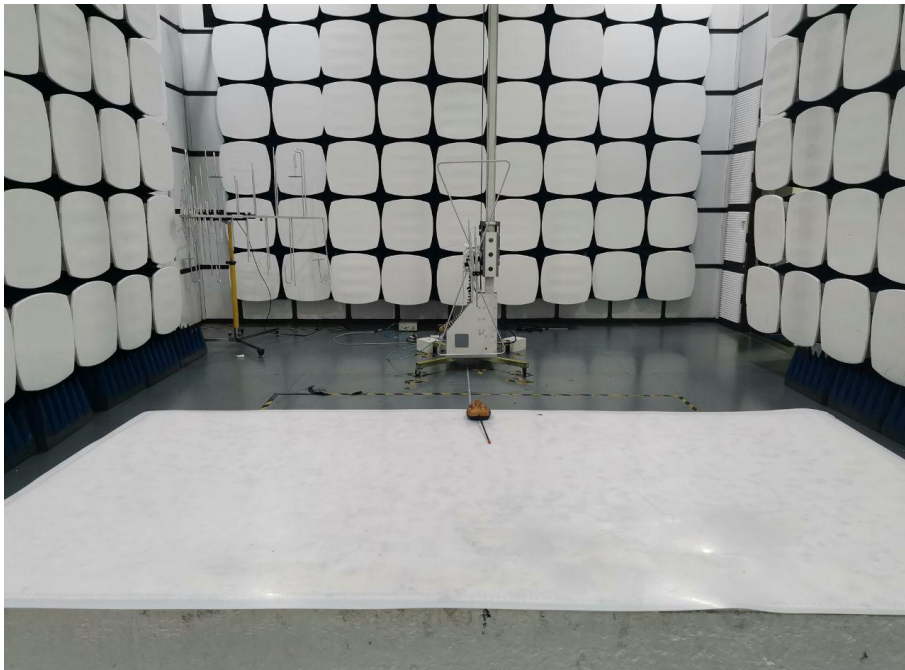
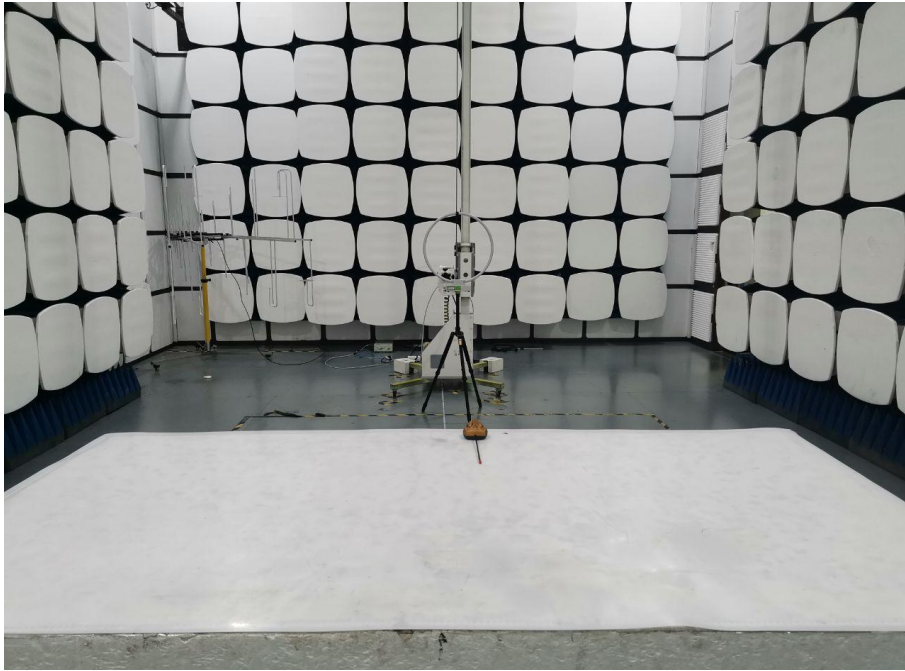
- 1) For test separation distances > 50 mm and < 200 mm, the power threshold at the corresponding test separation distance at 100 MHz in step b) is multiplied by $[1 + \log(100/f(\text{MHz}))]$
- 2) For test separation distances ≤ 50 mm, the power threshold determined by the equation in 1) for 50 mm and 100MHz is multiplied by $\frac{1}{2}$
- 3) SAR measurement procedures are not established below 100MHz.

When SAR test exclusion cannot be applied, a KDB inquiry is required to determine SAR evaluation requirements for any SAR test results below 100MHz to be acceptable.

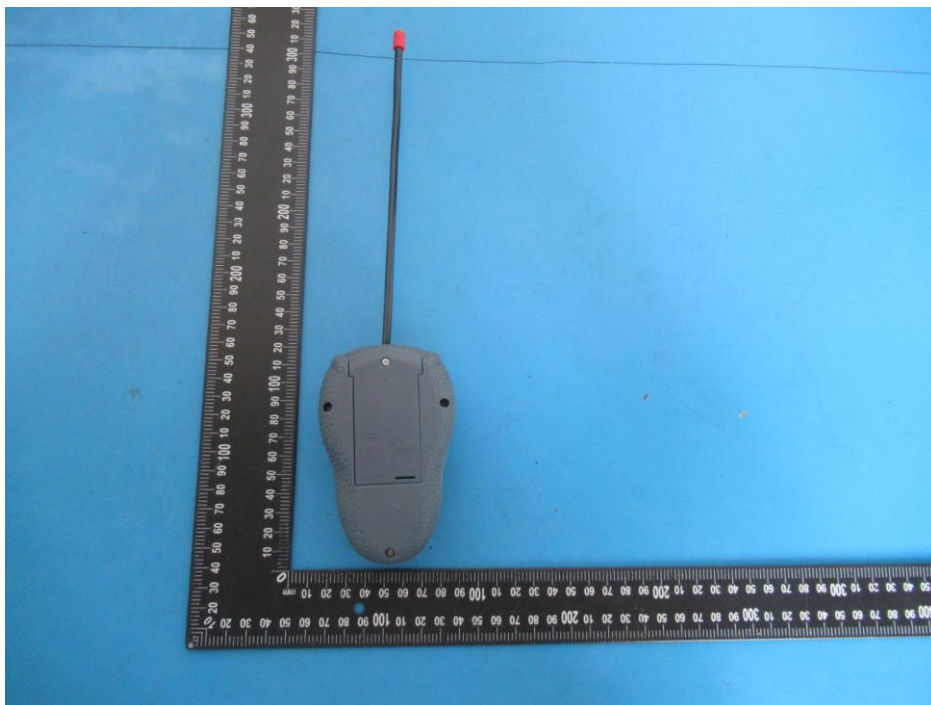
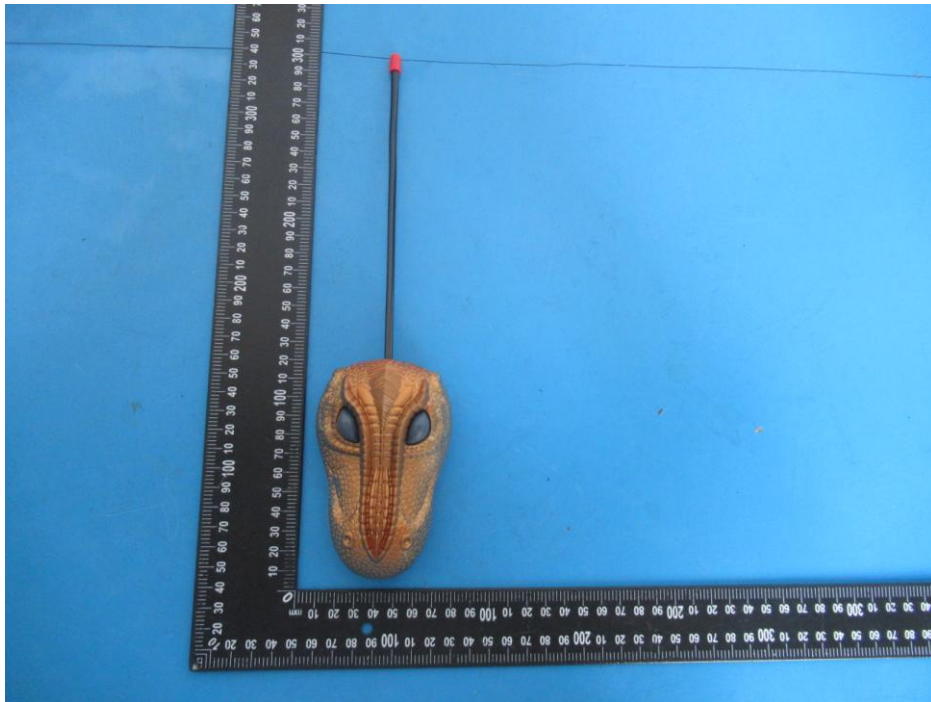
Certain SAR systems are beginning to support measurements at selected frequency ranges between 5MHz and 100MHz; however, tissue dielectric parameters and other measurement technical details remain unavailable. A KDB inquiry is required to determine the SAR measurement requirements on a case-by-case basis for individual circumstances.

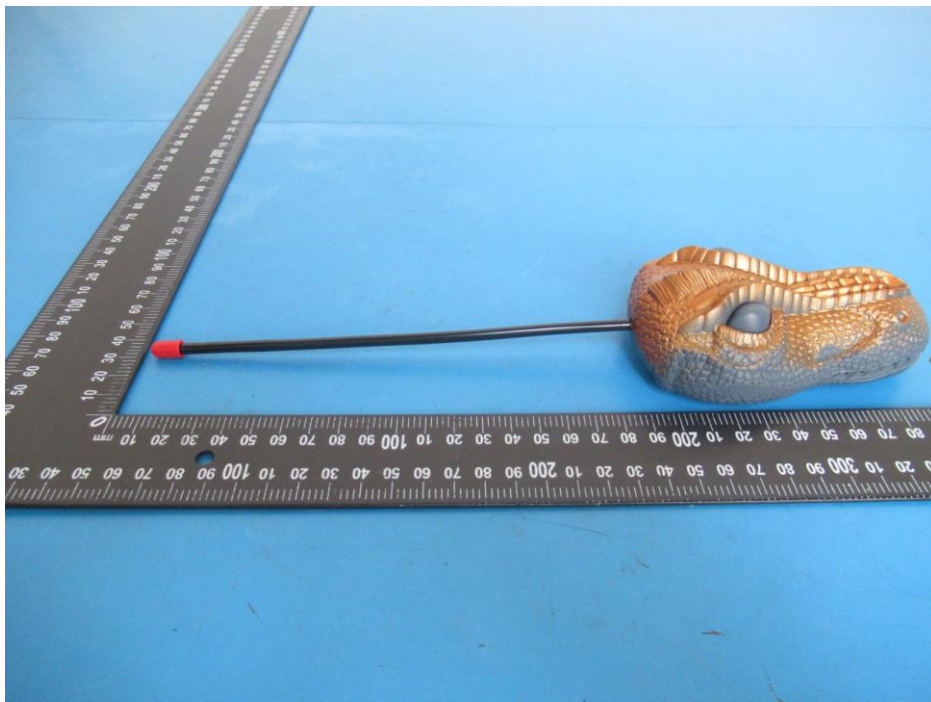
8. Test setup photo

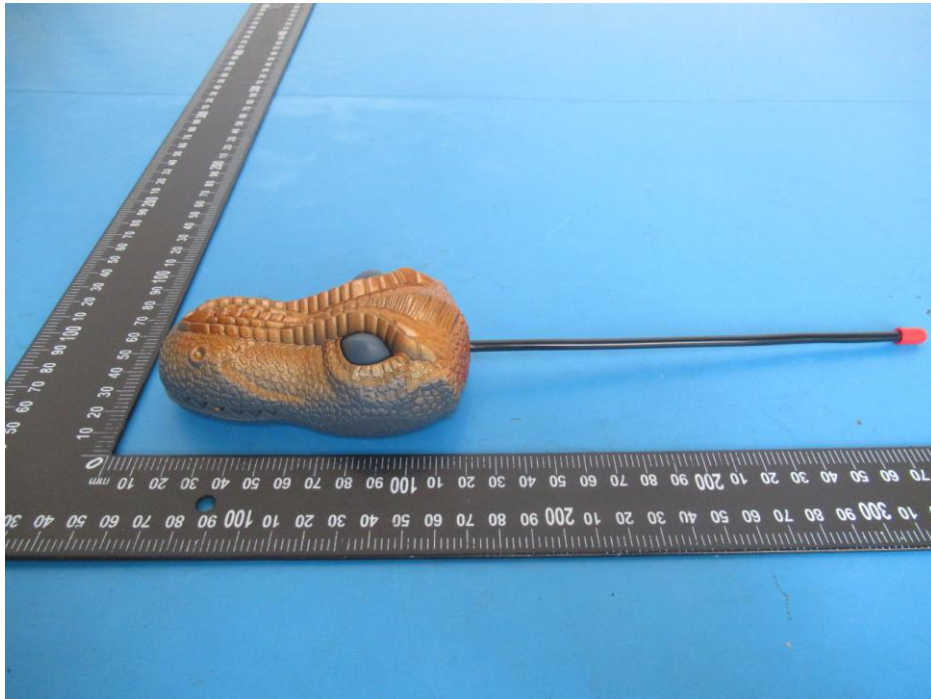
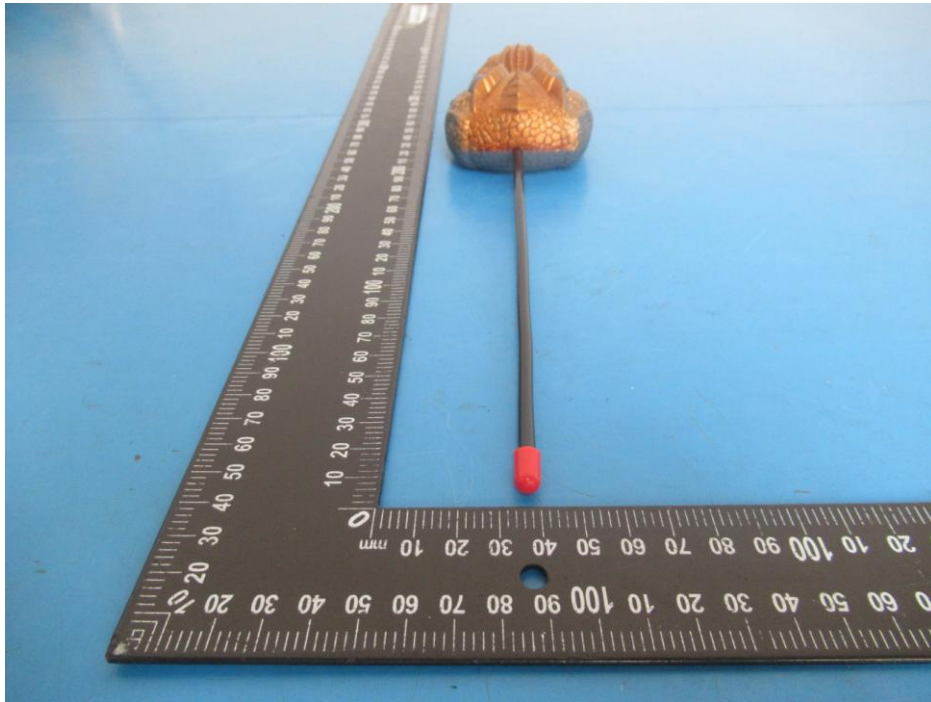
8.1. Photos of Radiated emission

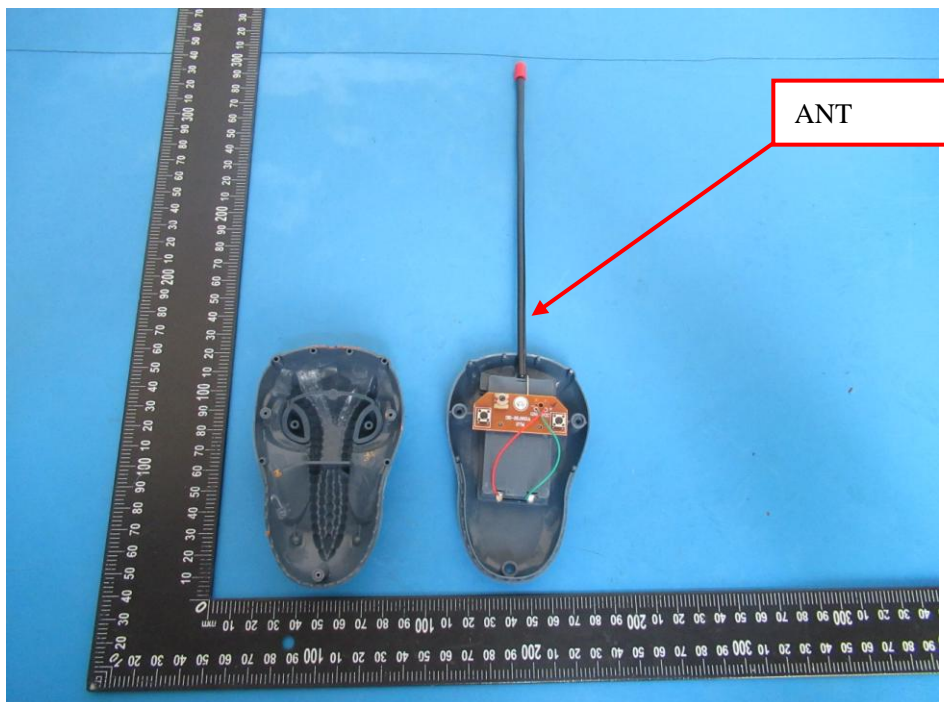
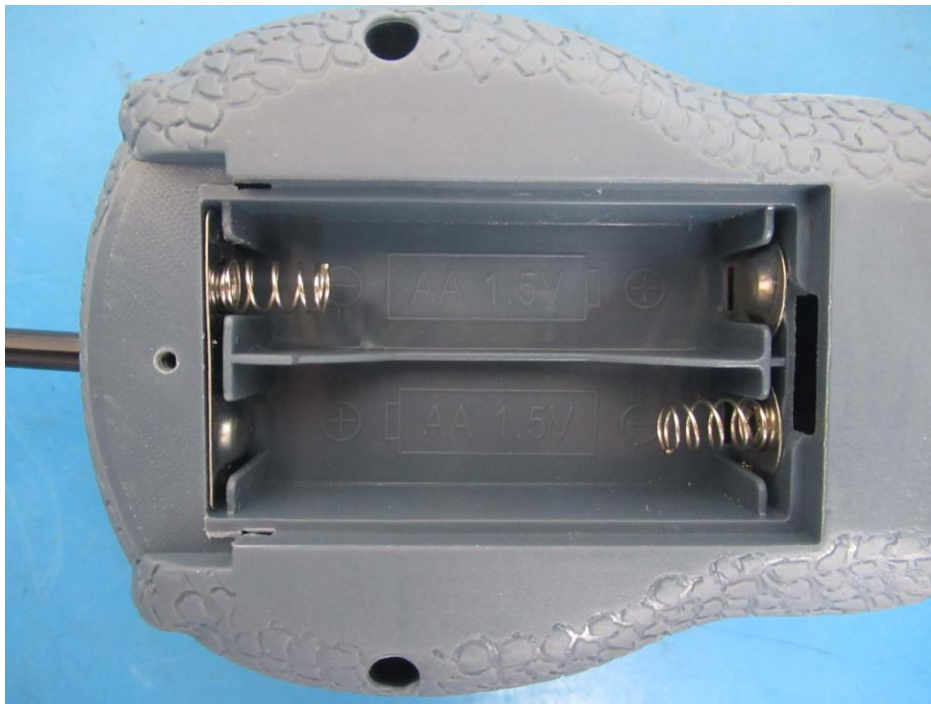


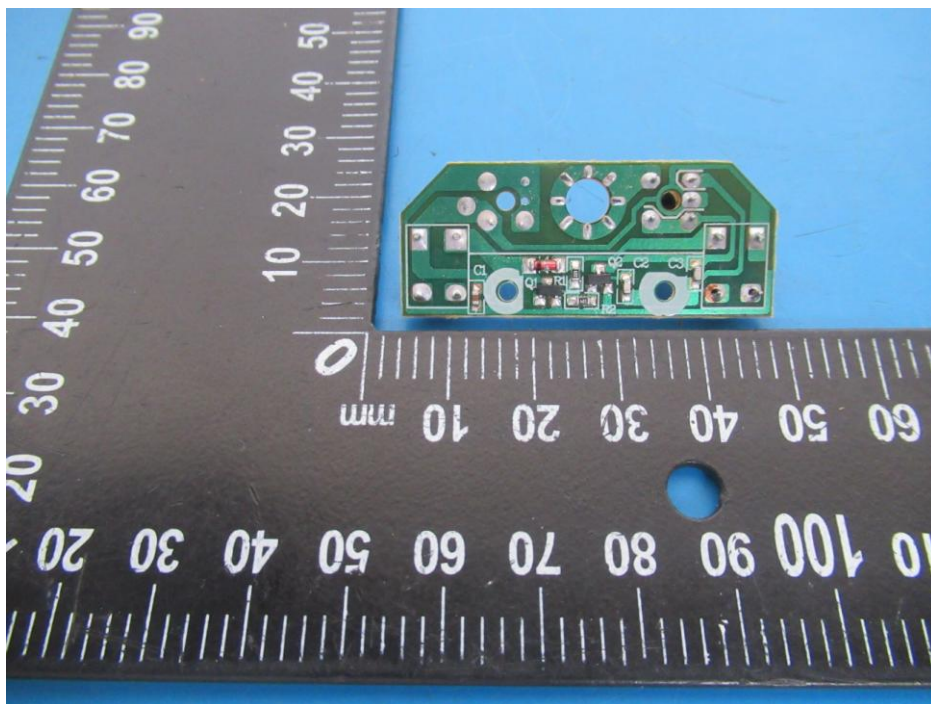
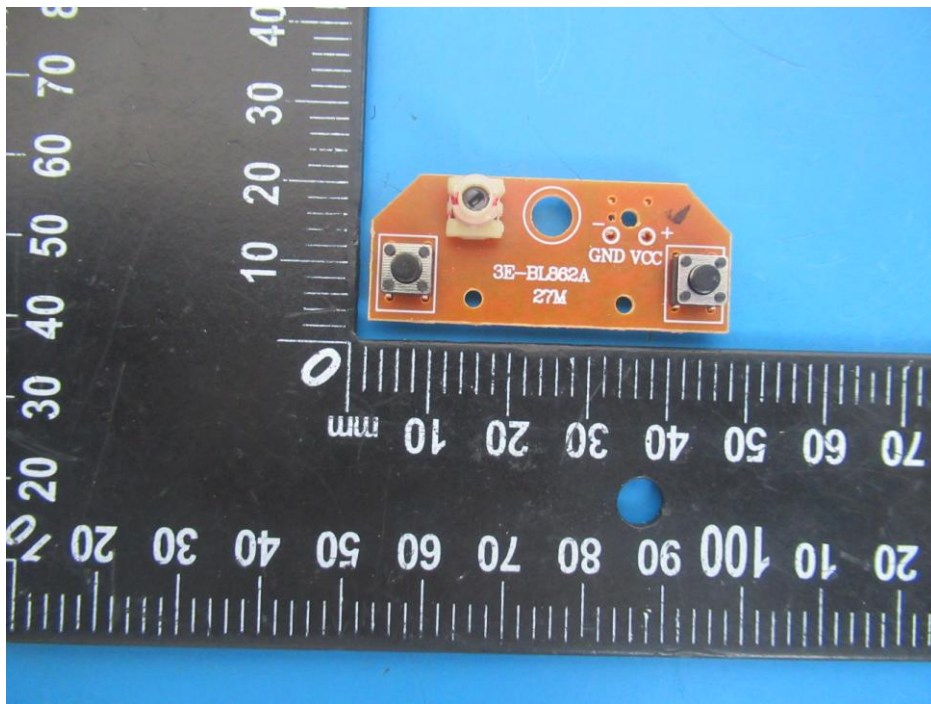
9. Photos of EUT











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