TEST REPORT

Applicant	GuangDong XinYu Technology Industrial Co., Ltd
Address	Laimei Industrial zone, Chenghai District, Shantou, Guangdong

Manufacturer or Supplier	GuangDong XinYu Technology Industrial Co., Ltd
Address	Laimei Industrial zone, Chenghai District, Shantou, Guangdong
Product	RC TOYS
Brand Name	N/A
Models	XQRC18-2AA
Additional Model & Model Difference	XQRC24-13, XQRC18-2PAA, XQ063-AA, etc. ; See items 2.1
Date of tests	May 24, 2017 ~ Jun. 07, 2017

The submitted sample of the above equipment has been tested according to the requirements of the following standard:

☒ **EN 300 440 V2.1.1 (2017-03)**

CONCLUSION: The submitted sample was found to COMPLY with the test requirement

Tested by Andy Zhu Project Engineer / EMC Department	Approved by Glyn He Supervisor / EMC Department
Andy	Date: Jun. 27, 2017

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RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
RE170524N091	Original release	Jun. 27, 2017

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1 SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

APPLIED STANDARD: ETSI EN 300 440 V2.1.1 (2017-03)			
Standard Subclause	**Test Type and Limit**	**Result**	**Remark**
	TRANSMITTER PARAMETERS		
4.2.2	Equivalent Isotropic Radiated Power	PASS	Applicable
4.2.3	Permitted range of operating frequency	PASS	Applicable
4.2.4	Measurement radiated spurious emission	PASS	Applicable
4.2.5	Duty Cycle	N/A	N/A
	PARAMETERS		
4.3.5	Measurement spurious emission	PASS	Applicable

Receiver categories

Receiver category	Relevant receiver clauses	Risk assessment of receiver performance	The EUT Category
1	4.3.3, 4.3.4 and 4.3.5	Highly reliable SRD communication media; e.g. serving human life inherent systems (may result in a physical risk to a person).	-
2	4.3.4 and 4.3.5	Medium reliable SRD communication media e.g. causing inconvenience to persons, which cannot simply be overcome by other means.	-
3	4.3.5	Standard reliable SRD communication media e.g. Inconvenience to persons, which can simply be overcome by other means (e.g. manual).	√

If receiver category 1 or 2 is selected, this shall be stated in both the test report and in the user's manual for the equipment.

1.1 TEST INSTRUMENTS

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
EMI Test Receiver	Rohde&Schwarz	ESU40	100449	Mar. 11,17	Mar. 10,18
Signal and Spectrum Analyzer	Rohde&Schwarz	FSV40	101094	Apr. 05,17	Apr. 04,18
Bilog Antenna	Teseq	CBL 6111D	30643	Jul. 14, 16	Jul. 13, 17
Horn Antenna	ETS-Lindgren	3117	00062558	May 18,17	May 17,18
GPS Generator+ Antenna	TOJOIN	GNSS-5000A	E1-010119	Aug. 08, 16	Aug. 07, 17
3m Semi-anechoic Chamber	ETS-LINDGREN	9m*6m*6m	NSEMC003	Mar. 06,17	Mar. 05,18
Test Software	ADT	ADT_Radiated _V7.6.15.9.2	N/A	N/A	N/A
Horn Antenna (15GHz-40GHz)	SCHWARZBECK	BBHA 9170	BBHA9170147	Mar. 15,17	Mar. 14,18
Amplifier	Burgeon	BPA-530	100220	Apr. 05,17	Apr. 04,18
Broadband Preamplifier (1GHz~18GHz)	SCHWARZBECK	BBV9718	305	Mar. 06,17	Mar. 05,18
Pre-Amplifier (18GHz-40GHz)	EMCI	EMC 184045	980102	Nov. 04,16	Nov. 03,17
Power Sensor	Keysight	U2021XA	MY55060016	May 27,17	May 26,18
Power Sensor	Keysight	U2021XA	MY55060018	May 27,17	May 26,18
Digital Multimeter	FLUKE	15B	A1220010DG	Oct. 13, 16	Oct.12, 17
Humid & Temp Programmable Tester	Haida	HD-2257	110807201	Sep.05,16	Sep. 04,17
Oscilloscope	Agilent	DSO9254A	MY51260160	Nov. 04,16	Nov. 03,17
Signal and Spectrum Analyzer	Rohde&Schwarz	FSV7	102331	Nov. 04,16	Nov. 03,17
Spectrum Analyzer	Keysight	N9020A	MY55400499	Apr. 05,17	Apr. 04,18
Signal Generator	Agilent	N5183A	MY50140980	Nov. 04,16	Nov. 03,17
MXG-B RF Vector Signal Generator	Keysight	N5182B	MY56200288	Dec.05, 16	Dec. 04, 17
Wireless Connectivity Tester	Rohde&Schwarz	CMW270	100908	Jan. 09, 17	Jan. 08, 18
Attenuator	MINI	BW-S10W2+	S130129FGE2	N/A	N/A

NOTE:

1. The test was performed in 966 Chamber and RF Oven room.
2. The calibration interval of the above test instruments are 12 months and the calibrations are traceable to CEPREI/CHINA, GRGT/CHINA and NIM/CHINA.
3. The horn antenna is used only for the measurement of emission frequency above 1GHz if tested.

1.2 MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT:

Parameter	Uncertainty
Radio frequency	±1.06x10^{-8}
Radiated emission of transmitter, valid up to 26.5GHz	±4.81dB
Radiated emission of receiver, valid up to 26.5GHz	±4.81dB
Temperature	±0.23 °C
Humidity	±0.3 %
Voltages(DC)	±0.1 %
Voltages(AC, <10kHz)	±0.22 %

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

1.3 MAXIMUM MEASUREMENT UNCERTAINTY

For the test methods, according to ETSI EN 300 440 standard, the measurement uncertainty figures shall be calculated in accordance with TR 100 028 [7] and shall correspond to an expansion factor (coverage factor) k = 1,96 or k = 2 (which provide confidence levels of respectively 95 % and 95,45 % in the case where the distributions characterizing the actual measurement uncertainties are normal (Gaussian)).

Maximum measurement uncertainty

Parameter	Uncertainty
Radio frequency	±1x10^{-7}
Radiated emission of transmitter, valid up to 26.5GHz	±6.0 dB
Radiated emission of receiver, valid up to 26.5GHz	±6.0 dB
Temperature	±1°C
Humidity	±5.0 %
Voltages(DC)	±1.0 %
Voltages(AC, <10kHz)	±2.0 %

2 GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

PRODUCT	RC TOYS		
MODEL NO.	XQRC18-2AA		
ADDITIONAL MODELS	XQRC24-13, XQRC18-2PAA, XQ063-AA, XQRC18-7AA, XQRC18-9AA, XQRC18-23AA, 3708, 3709, XQRC18-3AA, XQRC18-4AA, XQRC18-4PAA, 3285, 3331, 3438, 3439, XQRC18-1AA, XQRC18-5AA, XQRC18-16AA, XQRC18-20AA, XQRC18-11AA, XQRC18-11PAA, 3490(3284), 3444, XQRC18-15AA, 3429, 3144, 3435, 3440, 3443, 3803, 3330, XQRC24-13AAA, 3710, 3711, XQRC24-18AA, 3431, 3810, 3811, 3812, 3803		
NOMINAL VOLTAGE	Remote Control(TX): DC 3V(1.5V*AA*2) from Battery Car(RX): DC 6V(1.5V*AA*4) from Battery		
OPERATING VOLTAGE RANGE	Vnom= 3V	Vmin=2.55V	Vmax=3V
OPERATING TEMPERATURE RNAGE	-20 ~ +60°C		
MODULATION TYPE	GFSK		
OPERATING FREQUENCY	2407-2477MHz		
EIRP POWER	-5.22dBm (Max.)		
ANTENNA TYPE	Integral Antenna, with 0dBi gain		
CABLE SUPPLIED	N/A		

NOTE:

1. For a more detailed features description, please refer to the manufacturer's specifications or the user's manual.
2. For the test results, the EUT had been tested with all conditions, but only the worst case was shown in test report.
3. Please refer to the EUT photo document (Reference No.: 170524N091) for detailed product photo.
4. Additional models (see about table) are identical with the test model XQRC18-2AA except the model no. for trading purpose.

2.2 DESCRIPTION OF TEST MODES

SAMPLE	MODE	FREQUENCY
TX	Transmitting	2407MHz-2477MHz
RX	Receiving	2407MHz-2477MHz

Channel	Freq. (MHz)
Low	2407
Middle	2443
High	2477

Note: The more detailed channel, please refer to the product specifications

2.3 GENERAL DESCRIPTION OF APPLIED STANDARDS

The EUT is a RF Product, according to the specifications of the manufacturers; it must comply with the requirements of the following standards:

EN 300 440 V2.1.1 (2017-03)

All test items have been performed and recorded as per the above standards.

2.4 DESCRIPTION OF SUPPORT UNITS

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	DC source	LONG WEI	PS-6403D	010934269	N/A

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	DC Line: Unshielded, Detachable 1.0m

NOTE: All power cords of the above support units are non shielded (1.8m).

3 TEST TYPES AND RESULTS

TRANSMITTER PARAMETERS

3.1 EQUIVALENT ISOTROPIC RADIATED POWER

3.1.1 LIMITS OF EQUIVALENT ISOTROPIC RADIATED POWER

Condition	Limit (e.i.r.p)
Generic use	10 mW e.i.r.p.

For Extreme temperature ranges:

Category	Temperature range	The EUT Category
I (General)	-20°C to +55°C	-
II (Portable)	-10°C to +55°C	-
III (Equipment for normal indoor use)	5°C to +35°C	-
Other(Declared by the manufacturer)	-20°C to +60°C	√

3.1.2 TEST PROCEDURES

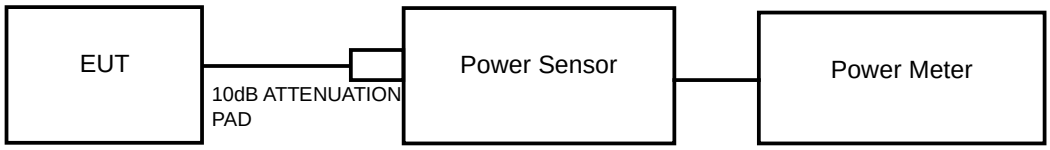
Refer to chapter 4.2.2.3 of ETSI EN 300 440 V2.1.1 (2017-03).

3.1.3 DEVIATION FROM TEST STANDARD

No deviation.

3.1.4 TEST SETUP

1. Ran a test program to control EUT transmit at specific channel
2. A power meter was used to read the response of the power sensor.
3. Record the power level.
4. EIRP = antenna gain + power level of step 3.



The -6dB bandwidth is less than 20 MHz, so determine the appropriate method of measurement: see clauses 4.2.2.3.1

3.1.5 TEST RESULTS

TEST CONDITION			EQUIVALENT ISOTROPIC RADIATED POWER (dBm)		
			(Low) 2407MHz	(Middle) 2443MHz	(High) 2477MHz
T_{nom}(°C)	+25	V_{nom}(v)	-5.84	-5.91	-5.86
T_{min}(°C)	-20	V_{min}(v)	**-5.22**	-5.30	-5.48
		V_{max}(v)	-5.27	-5.33	-5.47
T_{max}(°C)	+60	V_{min}(v)	-6.21	-6.08	-6.22
		V_{max}(v)	-6.21	-6.04	-6.19

3.2 PERMITTED RANGE OF OPERATING FREQUENCIES

3.2.1 LIMITS OF PERMITTED RANGE OF OPERATING FREQUENCIES

The width of the power envelope is f_H –f_L for a give operating frequency. In equipment that allow adjustment or selection of different frequencies, the power envelope take up different positions in the allowed band. The frequency range is determined by the lowest value of f_L and the highest value of f_H resulting from the adjustment of the equipment to the lowest and highest operating frequency.

CONDITION	LIMIT
Under all test conditions	F_L >2400.0MHz F_H < 2483.5MHz

3.2.2 TEST PROCEDURES

Refer to chapter 4.2.3.3 of ETSI EN 300 440 V2.1.1 (2017-03).

3.2.3 DEVIATION FROM TEST STANDARD

No deviation.

3.2.4 TEST SETUP

The EUT and probe antenna were placed into the temperature oven. The probe has to be connected with spectrum analyzer. The power source of the EUT has to be connected with the power supply for voltage change. The frequency has to be recorded for the right and left end above threshold of highest and lowest channel respectively.

3.2.5 TEST RESULTS

TEST CONDITION			FREQUENCY (MHz)	
			LOWEST	HIGHEST
T_{nom}(°C)	+25	V_{nom}(v)	2406.41	2477.65
T_{min}(°C)	-20	V_{min}(v)	2406.25	2477.76
		V_{max}(v)	2406.25	2477.72
T_{max}(°C)	+60	V_{min}(v)	2406.49	2477.60
		V_{max}(v)	2406.50	2477.59
Measured frequency (lowest and highest)			FL = 2406.25	FH = 2477.76

3.3 MEASUREMENT RADIATED SPURIOUS EMISSION

3.3.1 LIMITS OF MEASUREMENT RADIATED SPURIOUS EMISSION

Frequency Range	47MHz to 74MHz 87.5MHz to 108MHz 174MHz to 230MHz 470MHz to 862MHz	Other Frequencies Below 1GHz	>1GHz
Limit (Operating)	4nW (–54dBm)	250nW (–36dBm)	1 μW (–30dBm)
Limit (Standby)	2nW (–57dBm)	2nW (–57dBm)	20nW (–47dBm)

3.3.2 TEST PROCEDURES

Refer to chapter 4.2.4.3 of ETSI EN 300 440 V2.1.1 (2017-03).

3.3.3 DEVIATION FROM TEST STANDARD

No deviation.

3.3.4 TEST SETUP

1. For the actual test configuration, please refer to the related Item in this test report (Photographs of the Test Configuration).
2. The test setup has been constructed as the normal use condition. Controlling software (provided by manufacturer) has been activated to set the EUT on specific status.

3.3.5 TEST RESULTS

TX BELOW 1GHz DATA

SPURIOUS EMISSION FREQUENCY RANGE	30MHz ~ 1GHz	OPERATING CHANNEL	Low

SPURIOUS EMISSION LEVEL				
Frequency (MHz)	Antenna Polarization	Level (dBm)	Limit (dBm)	Margin (dB)
28.61	H	-64.43	-36.00	-28.43
28.61	V	-75.04	-36.00	-39.04
46.03	H	-79.47	-36.00	-43.47
70.66	H	-85.11	-54.00	-31.11
84.86	V	-81.63	-36.00	-45.63
108.82	V	-79.22	-54.00	-25.22
128.12	V	-76.76	-36.00	-40.76
248.86	H	-82.56	-36.00	-46.56
460.99	H	-76.94	-36.00	-40.94
464.01	V	-76.38	-36.00	-40.38
539.09	V	-75.02	-54.00	-21.02
563.65	H	-73.56	-54.00	-19.56

NOTE: The emission behavior belongs to narrowband spurious emission.

TX ABOVE 1GHz DATA

SPURIOUS EMISSION FREQUENCY RANGE	1GHz ~ 12.75GHz	OPERATING CHANNEL	Low , High

SPURIOUS EMISSION LEVEL					
Channel	Frequency (MHz)	Antenna Polarization	Level (dBm)	Limit (dBm)	Margin (dB)
Low	4813.20	H	-42.01	-30.00	-12.01
	4814.48	V	-42.41	-30.00	-12.41
	7213.98	H	-37.76	-30.00	-7.76
	7221.99	V	-37.71	-30.00	-7.71
High	4953.20	H	-41.13	-30.00	-11.13
	4953.55	V	-39.91	-30.00	-9.91
	7434.37	V	-37.14	-30.00	-7.14
	7439.59	H	-38.22	-30.00	-8.22

NOTE: The emission behavior belongs to narrowband spurious emission.

3.4 DUTY CYCLE (NOT APPLY)

3.4.1 LIMITS OF DUTY CYCLE

Frequency Band	Duty Cycle	Application
2400MHz to 2483.5MHz	No Restriction	Generic use
2400MHz to 2483.5MHz	No Restriction	Detection, movement and alert applications
(a) 2446MHz to 2454MHz	No Restriction	RFID
(b) 2446MHz to 2454MHz	15%	RFID
5725MHz to 5875MHz	No Restriction	Generic use
9200MHz to 9500MHz	No Restriction	Detection, movement and alert applications
9500MHz to 9975MHz	No Restriction	Detection, movement and alert applications
10.5GHz to 10.6GHz	No Restriction	Detection, movement and alert applications
13.4GHz to 14.0GHz	No Restriction	Detection, movement and alert applications
17.1GHz to 17.3GHz	DDA or equivalent techniques	GBSAR detecting and movement and alert applications
24.00GHz to 24.25GHz	No Restriction	Detection, movement and alert applications

3.4.2 TEST PROCEDURES

Refer to chapter 4.2.5.3 of ETSI EN 300 440 V2.1.1 (2017-03).

3.4.3 DEVIATION FROM TEST STANDARD

No deviation.

3.4.4 TEST SETUP

The test setup has been constructed as the normal use condition. Controlling software (provided by manufacturer) has been activated to set the EUT on specific status.

3.4.5 TEST RESULTS

This product does not apply.

RECEIVER PARAMETERS

3.5 RECEIVER SPURIOUS EMISSIONS

3.5.1 LIMITS OF RECEIVER SPURIOUS EMISSIONS

Frequency range	Frequencies below 1GHz	Frequencies above 1GHz
Limit	2nW or -57dBm	20nW or -47dBm

3.5.2 TEST PROCEDURES

Refer to chapter 4.3.5.3 of ETSI EN 300 440 V2.1.1 (2017-03).

3.5.3 DEVIATION FROM TEST STANDARD

No deviation.

3.5.4 TEST SETUP

1. For the actual test configuration, please refer to the related Item in this test report (Photographs of the Test Configuration).
2. The test setup has been constructed as the normal use condition. Controlling software (provided by manufacturer) has been activated to set the EUT on specific status.

3.5.5 TEST RESULTS

RX BELOW 1GHz DATA

SPURIOUS EMISSION FREQUENCY RANGE	30MHz ~ 1GHz	OPERATING CHANNEL	Low

SPURIOUS EMISSION LEVEL				
Frequency (MHz)	Antenna Polarization	Level (dBm)	Limit (dBm)	Margin (dB)
28.61	V	-75.33	-57.00	-18.33
28.64	H	-63.84	-57.00	-6.84
39.49	H	-73.24	-57.00	-16.24
84.86	V	-82.34	-57.00	-25.34
128.06	V	-77.04	-57.00	-20.04
298.19	V	-76.36	-57.00	-19.36
320.04	H	-75.50	-57.00	-18.50
336.02	H	-77.68	-57.00	-20.68
368.07	H	-78.02	-57.00	-21.02
372.94	V	-78.38	-57.00	-21.38
541.10	H	-74.86	-57.00	-17.86
661.15	V	-72.29	-57.00	-15.29

NOTE: The emission behavior belongs to narrowband spurious emission.

RX ABOVE 1GHz DATA

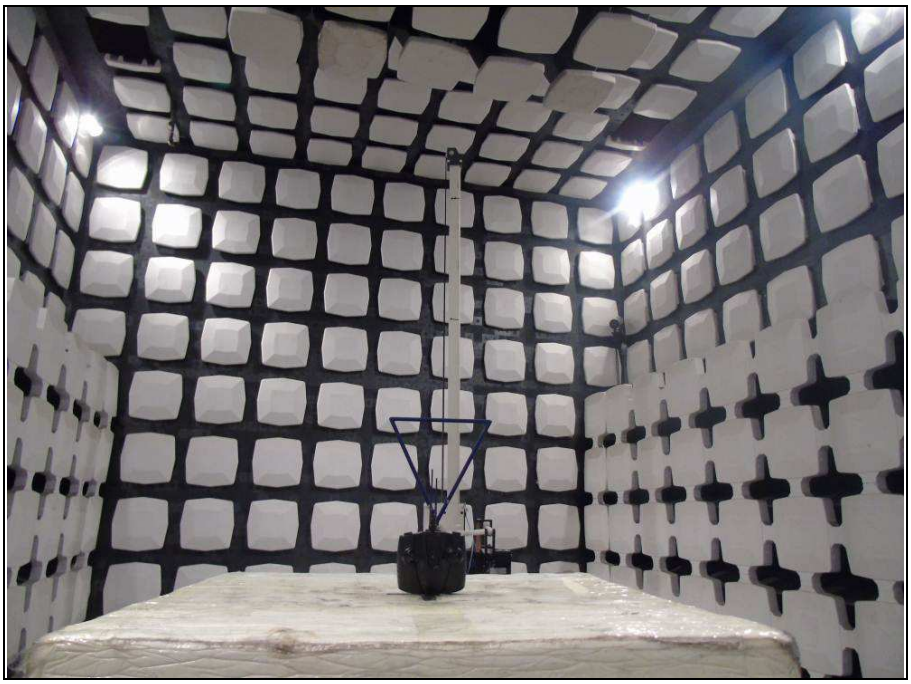
SPURIOUS EMISSION FREQUENCY RANGE	1GHz ~ 12.75GHz	OPERATING CHANNEL	Low , High

SPURIOUS EMISSION LEVEL					
Channel	Frequency (MHz)	Antenna Polarization	Level (dBm)	Limit (dBm)	Margin (dB)
Low	1991.84	H	-51.75	-47.00	-4.75
	2761.07	**V**	**-50.18**	**-47.00**	**-3.18**
	3722.61	H	-50.77	-47.00	-3.77
	4068.76	V	-50.49	-47.00	-3.49
High	2722.61	V	-51.51	-47.00	-4.51
	2914.91	H	-50.91	-47.00	-3.91
	3953.37	V	-52.30	-47.00	-5.30
	4337.99	H	-51.87	-47.00	-4.87

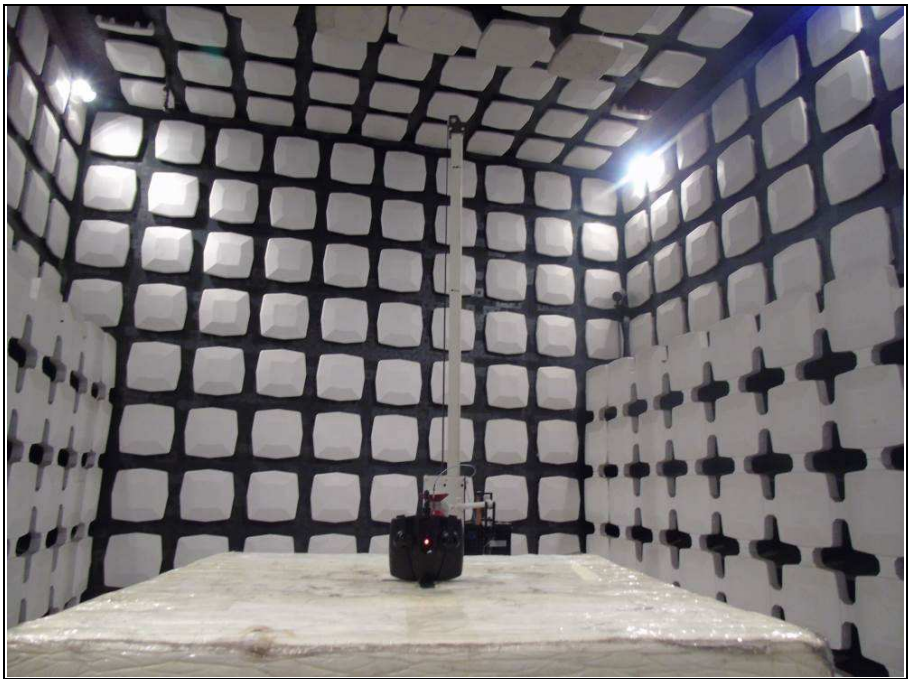
NOTE: The emission behavior belongs to narrowband spurious emission.

4 PHOTOGRAPHS OF THE TEST CONFIGURATION

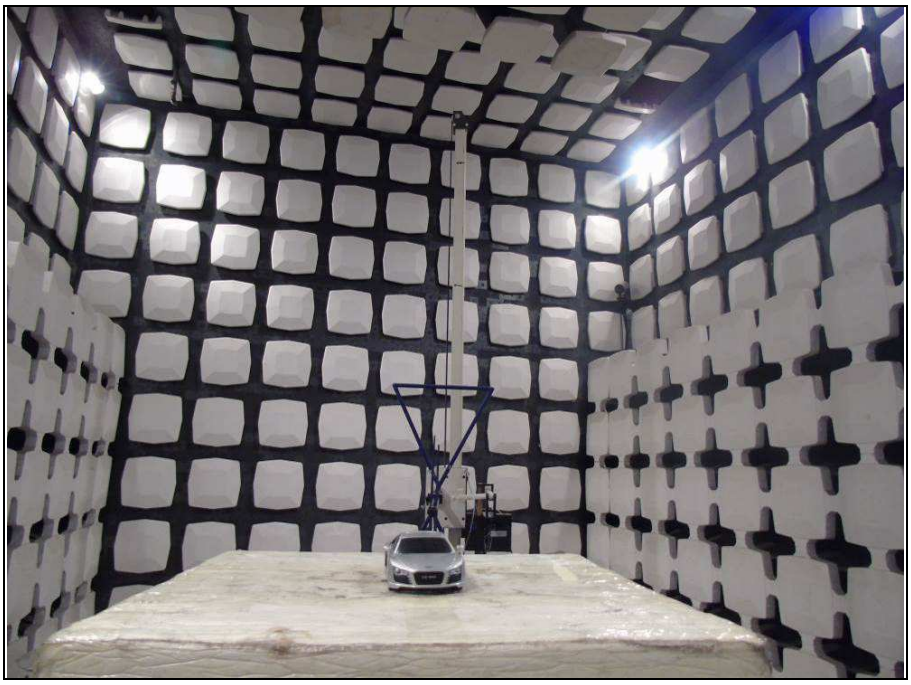
TX SPURIOUS EMISSION TEST BELOW 1GHz



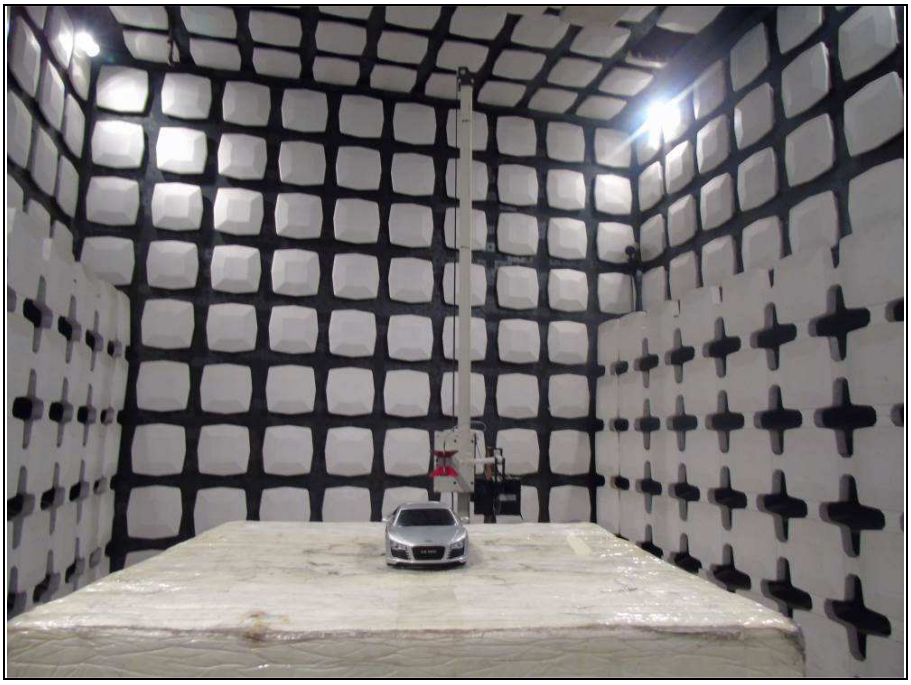
TX SPURIOUS EMISSION TEST ABOVE 1GHz



RX SPURIOUS EMISSION TEST BELOW 1GHz



RX SPURIOUS EMISSION TEST ABOVE 1GHz



5 APPENDIX A – MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB

No any modifications were made to the EUT by the lab during the test.

---END---