FCC Test Report

Report No.: AGC07814210504FE03

FCC ID	:	2AZCSSL-303A
APPLICATION PURPOSE	:	Original Equipment
PRODUCT DESIGNATION	:	Remote control car
BRAND NAME	:	N/A
MODEL NAME	:	Please see page 4
APPLICANT	:	GUANGDONG HAOYUAN SCIENCE EDUCATION TOYS CO., LTD
DATE OF ISSUE	:	Jun. 03, 2021
STANDARD(S) TEST PROCEDURE(S)	:	FCC Part 15 Rules
REPORT VERSION	:	V1.0

Attestation of Global Compliance (Shenzhen) Co., Ltd

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Attestation of Global Compliance(Shenzhen)Co., Ltd
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REPORT REVISE RECORD

Report Version	Revise Time	Issued Date	Valid Version	Notes
V1.0	/	Jun. 03, 2021	Valid	Initial Release

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1. VERIFICATION OF CONFORMITY

Applicant	GUANGDONG HAOYUAN SCIENCE EDUCATION TOYS CO., LTD
Address	MIDDLE SECTION OF FU'AN ROAD, CHENGHAI DISTRICT, SHANTOU CITY, GUANGDONG PROVINCE, CHINA
Manufacturer	GUANGDONG HAOYUAN SCIENCE EDUCATION TOYS CO., LTD
Address	MIDDLE SECTION OF FU'AN ROAD, CHENGHAI DISTRICT, SHANTOU CITY, GUANGDONG PROVINCE, CHINA
Factory	GUANGDONG HAOYUAN SCIENCE EDUCATION TOYS CO., LTD
Address	MIDDLE SECTION OF FU'AN ROAD, CHENGHAI DISTRICT, SHANTOU CITY, GUANGDONG PROVINCE, CHINA
Product Designation	Remote control car
Brand Name	N/A
Test Model	SL-303A
Series Model	See page 6
Difference Description	All the series models are the same as the test model except for the model names and the color of appearance.
Date of test	May 21, 2021 to Jun. 03, 2021
Deviation	No any deviation from the test method
Condition of Test Sample	Normal
Test Result	Pass
Report Template	AGCRT-US-BR/RF

We hereby certify that:

The above equipment was tested by Attestation of Global Compliance (Shenzhen) Co., Ltd. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.10 (2013) and the energy emitted by the sample EUT tested as described in this report is in compliance with radiated emission limits of FCC Rules Part 15.249.

Prepared By	Eddy Liu (Project Engineer)	Jun. 03, 2021
Reviewed By	Max Zhang (Reviewer)	Jun. 03, 2021
Approved By	Forrest Lei (Authorized Officer)	Jun. 03, 2021

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2. GENERAL INFORMATION

2.1. PRODUCT DESCRIPTION

A major technical description of EUT is described as following

Operation Frequency	2410MHz-2473MHz
Maximum field strength	80.45dBuV/m(Average)@3m
Modulation	GFSK
Number of channels	32
Antenna Gain	0dBi
Antenna Designation	Internal Antenna
Hardware Version	20190818
Software Version	N/A
Power Supply	Remote control: DC 3V by battery Receiver: DC 6V by battery

Series Model	SL-230A, SL-231A, SL-232A, SL-275A, SL-276A, SL-277A, SL-278A, SL-279A, SL-280A, SL-297A, SL-298A, SL-299A, SL-300A, SL-301A, SL-302A, SL-304A, SL-313A, SL-314A, SL-315A, SL-320A, SL-321A, SL-322A, SL-253A, SL-254A, SL-255A, SL-256A, SL-257A, SL-258A, SL-259A, SL-260A, SL-261A, SL-262A, SL-263A, SL-264A, SL-265A, SL-266A, SL-267A, SL-268A, SL-210A, SL-211A, SL-229A, SL-233A, SL-274A, SL-332A, SL-333A, SL-334A, SL-335A, SL-336A, SL-337A, SL-338A, SL-339A, SL-340A, SL-341A, SL-342A, SL-343A, SL-344A, SL-345A, SL-346A, SL-347A, SL-348A, SL-349A, SL-350A, SL-351A, SL-352A, SL-353A, SL-354A, SL-355A, SL-356A, SL-357A, SL-358A, SL-359A, SL-360A, SL-361A, SL-362A, SL-363A, SL-364A, SL-365A, SL-366A, SL-367A, SL-368A, SL-369A, SL-370A, SL-371A, SL-372A, SL-373A, SL-374A, SL-375A, SL-376A, SL-377A, SL-378A, SL-379A, SL-380A, SL-381A, SL-382A, SL-383A, SL-384A, SL-385A, SL-386A

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2.2. TABLE OF CARRIER FREQUENCY

Frequency Band	Channel Number	Frequency(MHZ)	Channel Number	Frequency(MHZ)
2400~2483.5MHZ	1	2410	17	2441
	2	2414	18	2442
	3	2415	19	2444
	4	2416	20	2446
	5	2417	21	2450
	6	2418	22	2452
	7	2419	23	2454
	8	2421	24	2456
	9	2426	25	2458
	10	2428	26	2462
	11	2429	27	2464
	12	2430	28	2465
	13	2431	29	2466
	14	2433	30	2467
	15	2434	31	2469
	16	2439	32	2473

2.3. ANTENNA REQUIREMENT

This intentional radiator is designed with a permanently attached antenna of an antenna to ensure that no antenna other than that furnished by the responsible party shall be used with the device.
For more information of the antenna, please refer to the APPENDIX B: PHOTOGRAPHS OF EUT.

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3. MEASUREMENT UNCERTAINTY

The uncertainty is calculated using the methods suggested in the “Guide to the Expression of Uncertainty in measurement” (GUM) published by CISPR and ANSI.

- Uncertainty of Conducted Emission, Uc = ±3.1 dB
- Uncertainty of Radiated Emission below 1GHz, Uc = ±4.0 dB
- Uncertainty of Radiated Emission above 1GHz, Uc = ±4.8 dB

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4. DESCRIPTION OF TEST MODES

NO.	TEST MODE DESCRIPTION
1	TX mode at 2410MHz
2	TX mode at 2442MHz
3	TX mode at 2473MHz

Note:
1. All the test modes can be supply by battery, only the result of the worst case was recorded in the report, if no other cases.
2. For Radiated Emission, 3axis were chosen for testing for each applicable mode.
3. Set the EUT into the individual test modes by pressing the EUT buttons.
4. For battery operated equipment, the equipment tests are performed using a new battery.

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5. SYSTEM TEST CONFIGURATION

5.1. CONFIGURATION OF EUT SYSTEM

Configure:

EUT

5.2 EQUIPMENT USED IN TESTED SYSTEM

Item	Equipment	Model No.	ID or Specification	Remark
1	Remote control car	SL-303A	2AZCSSL-303A	EUT

5.3. SUMMARY OF TEST RESULTS

FCC RULES	DESCRIPTION OF TEST	RESULT
§15.249&15.209	Radiated Emission	Compliant
§15.249	Band Edges	Compliant
§15.215	20dB bandwidth	Compliant
§15.207	Conducted Emission	Not applicable

Note: The conducted emission tests at AC port are not required for devices which only employ battery power for operation.

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6. TEST FACILITY

Test Site	Attestation of Global Compliance (Shenzhen) Co., Ltd
Location	1-2/F, Building 19, Junfeng Industrial Park, Chongqing Road, Heping Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China
Designation Number	CN1259
FCC Test Firm Registration Number	975832
A2LA Cert. No.	5054.02
Description	Attestation of Global Compliance(Shenzhen) Co., Ltd is accredited by A2LA

TEST EQUIPMENT OF RADIATED EMISSION TEST

Equipment	Manufacturer	Model	S/N	Cal. Date	Cal. Due
TEST RECEIVER	R&S	ESCI	10096	Apr. 14, 2021	Apr. 13, 2022
EXA Signal Analyzer	Aglient	N9010A	MY53470504	Dec. 07, 2020	Dec. 06, 2021
2.4GHz Fliter	EM Electronics	2400-2500MHz	N/A	Mar. 23, 2020	Mar. 22, 2022
Attenuator	ZHINAN	E-002	N/A	Sep. 03, 2020	Sep. 02, 2022
Horn antenna	SCHWARZBECK	BBHA 9170	#768	Sep.21, 2019	Sep. 20, 2021
Active loop antenna (9K-30MHz)	ZHINAN	ZN30900C	18051	May 22, 2020	May 21, 2022
Double-Ridged Waveguide Horn	ETS LINDGREN	3117	00154520	Oct. 26, 2019	Oct. 25, 2021
Broadband Preamplifier	ETS LINDGREN	3117PA	00225134	Oct. 15, 2019	Oct. 16, 2021
ANTENNA	SCHWARZBECK	VULB9168	494	Jan. 08, 2021	Jan. 07, 2023
Test software	Tonscend	JS32-RE (Ver.2.5)	N/A	N/A	N/A

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7. RADIATED EMISSION

7.1TEST LIMIT

Standard FCC15.249

Fundamental Frequency	Field Strength of Fundamental (millivolts/meter)	Field Strength of Harmonics (microvolts/meter)
900-928MHz	50	500
2400-2483.5MHz	50	500
5725-5875MHz	50	500
24.0-24.25GHz	250	2500

Standard FCC 15.209

Frequency (MHz)	Distance Meters	Field Strengths Limit	
		μ V/m	dB(μV)/m
0.009 ~ 0.490	300	2400/F(kHz)	---
0.490 ~ 1.705	30	24000/F(kHz)	---
1.705 ~ 30	30	30	---
30 ~ 88	3	100	40.0
88 ~ 216	3	150	43.5
216 ~ 960	3	200	46.0
960 ~ 1000	3	500	54.0
Above 1000	3	Other:74.0 dB(μV)/m (Peak) 54.0 dB(μV)/m (Average)	

Remark: (1) Emission level dB μ V = 20 log Emission level μ V/m

(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.

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7.2. MEASUREMENT PROCEDURE

1. The EUT was placed on the top of the turntable 0.8 or 1.5 meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turntable.
2. Power on the EUT and all the supporting units. The turntable was rotated by 360 degrees to determine the position of the highest radiation.
3. The height of the broadband receiving antenna was varied between one meter and four meters above ground to find the maximum emissions field strength of both horizontal and vertical polarization.
4. For each suspected emissions, the antenna tower was scan (from 1 M to 4 M) and then the turntable was rotated (from 0 degree to 360 degrees) to find the maximum reading.
5. Set the test-receiver system to Peak or CISPR quasi-peak Detect Function with specified bandwidth under Maximum Hold Mode.
6. For emissions above 1GHz, use minimum resolution bandwidth of 1 MHz. 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.
7. When the radiated emissions limits are expressed in terms of the average value of the emissions, and pulsed operation is employed, the measurement field strength shall be determined by averaging over one complete pulse train, including blanking intervals, as long as the pulse train does not exceed 0.1 seconds. As an alternative (provided the transmitter operates for longer than 0.1 seconds) or in cases where the pulse train exceeds 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 values.
8. If the emissions level of the EUT in peak mode was 3 dB lower than the average limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions which do not have 3 dB margin will be repeated one by one using the quasi-peak method for below 1GHz.
9. For testing above 1GHz, the emissions level of the EUT in peak mode was lower than average limit (that means the emissions level in peak mode also complies with the limit in average mode), then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.
10. In case the emission is lower than 30MHz, loop antenna has to be used for measurement and the recorded data should be QP measured by receiver. High - Low scan is not required in this case.

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The following table is the setting of spectrum analyzer and receiver.

Spectrum Parameter	Setting
Start ~Stop Frequency	9KHz~150KHz/RB 200Hz for QP
Start ~Stop Frequency	150KHz~30MHz/RB 9KHz for QP
Start ~Stop Frequency	30MHz~1000MHz/RB 120KHz for QP
Start ~Stop Frequency	1GHz~26.5GHz RBW 2.4MHz/ VBW 8MHz for Peak, RBW 2.4MHz/3MHz for Average

Receiver Parameter	Setting
Start ~Stop Frequency	9KHz~150KHz/RB 200Hz for QP
Start ~Stop Frequency	150KHz~30MHz/RB 9KHz for QP
Start ~Stop Frequency	30MHz~1000MHz/RB 120KHz for QP

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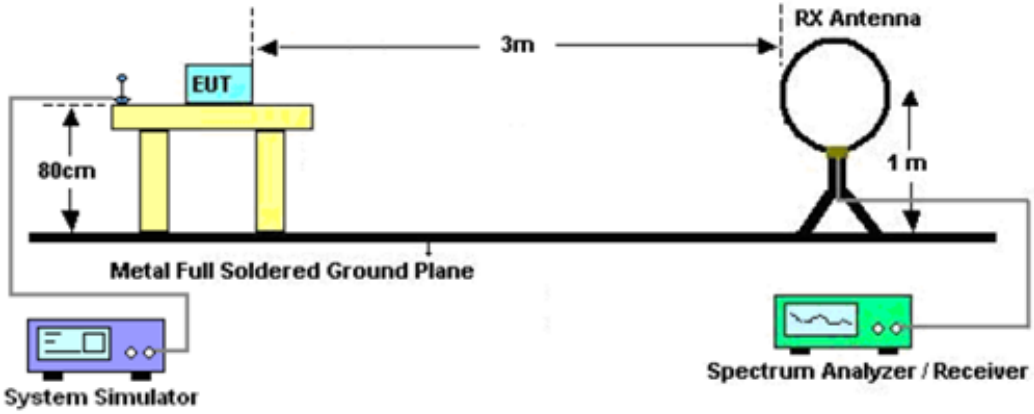
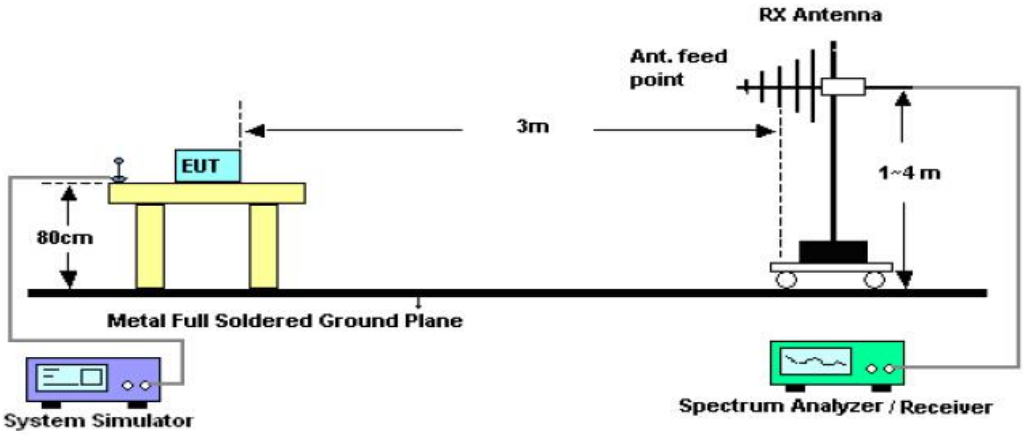
7.3. TEST SETUP

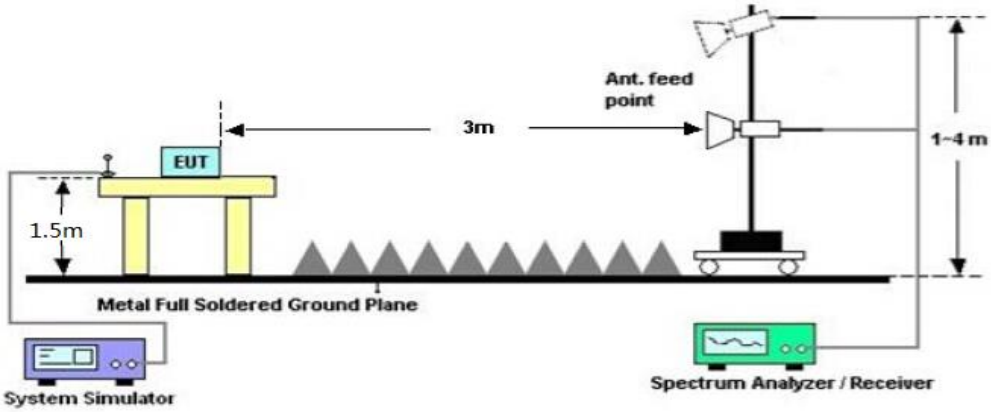
Radiated Emission Test-Setup Frequency Below 30MHz



RADIATED EMISSION TEST SETUP 30MHz-1000MHz



RADIATED EMISSION TEST SETUP ABOVE 1000MHz



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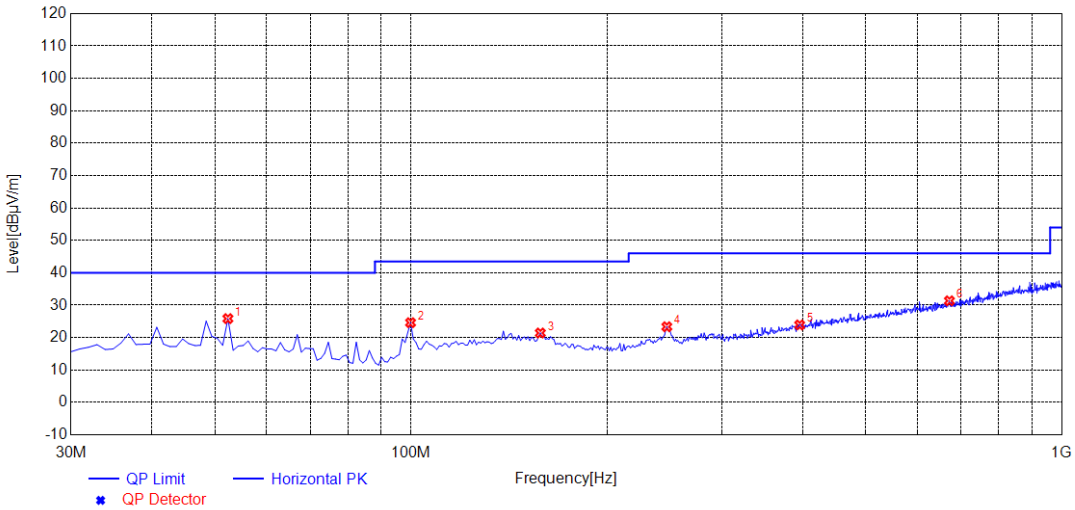
7.4. TEST RESULT

RADIATED EMISSION BELOW 30MHZ

The amplitude of spurious emissions from 9kHz to 30MHz which are attenuated more than 20 dB below the permissible value need not be reported.

RADIATED EMISSION 30MHz- 1GHZ

EUT	Remote control car	Model Name	SL-303A
Temperature	25℃	Relative Humidity	60%
Pressure	101kPa	Test Voltage	DC 3V
Test Mode	Mode 1	Polarization	Horizontal



NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	52.3100	25.87	11.49	40.00	14.13	100	254	Horizontal
2	99.8400	24.62	11.30	43.50	18.88	100	246	Horizontal
3	158.0400	21.43	14.93	43.50	22.07	100	194	Horizontal
4	247.2800	23.36	14.73	46.00	22.64	100	82	Horizontal
5	395.6900	23.92	19.60	46.00	22.08	100	20	Horizontal
6	672.1400	31.36	25.51	46.00	14.64	100	347	Horizontal

RESULT: PASS

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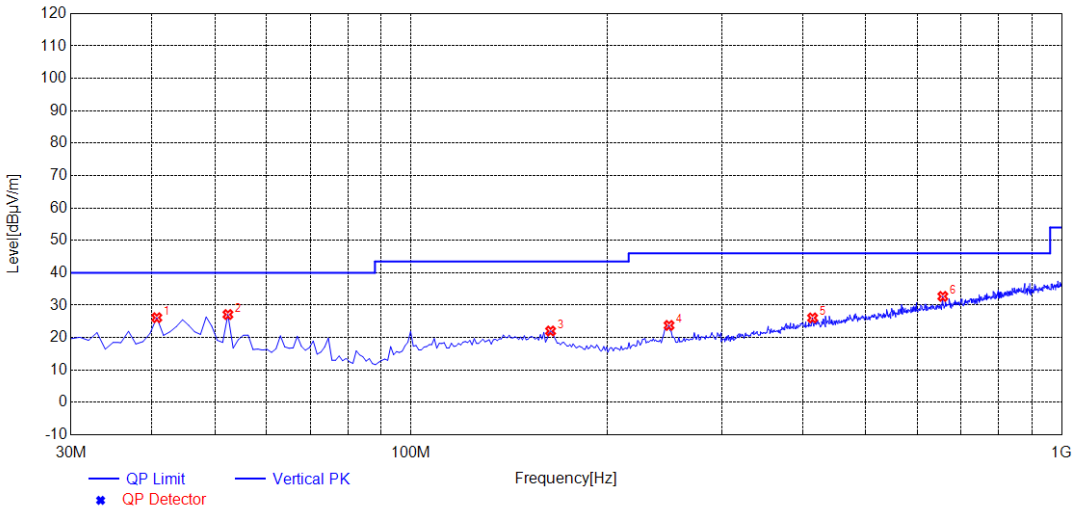
EUT	Remote control car	Model Name	SL-303A
Temperature	25℃	Relative Humidity	60%
Pressure	101kPa	Test Voltage	DC 3V
Test Mode	Mode 1	Polarization	Vertical



NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	40.6700	26.15	11.91	40.00	13.85	100	320	Vertical
2	52.3100	27.13	11.49	40.00	12.87	100	73	Vertical
3	163.8600	22.04	14.55	43.50	21.46	100	70	Vertical
4	249.2200	23.77	14.70	46.00	22.23	100	1	Vertical
5	414.1200	26.09	20.10	46.00	19.91	100	237	Vertical
6	656.6200	32.73	25.25	46.00	13.27	100	270	Vertical

RESULT: PASS

Note: Factor=Antenna Factor + Cable loss, Margin=Limit- Level.

The “Factor” value can be calculated automatically by software of measurement system.

All modes of each antenna are tested. The mode 1 is the worst case and recorded in the report.

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FIELD STRENGTH OF FUNDAMENTAL

EUT	Remote control car	Model Name	SL-303A
Temperature	25℃	Relative Humidity	60%
Pressure	101kPa	Test Voltage	DC 3V
Test Modulation	GFSK	Polarization	Horizontal

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Value Type
2410	43.71	49.05	92.76	114.00	-21.24	peak
2410	31.40	49.05	80.45	94.00	-13.55	AVG
2442	39.29	49.12	88.41	114.00	-25.59	peak
2442	30.12	49.12	79.24	94.00	-14.76	AVG
2473	43.19	49.25	92.44	114.00	-21.56	peak
2473	30.12	49.25	79.37	94.00	-14.63	AVG
Remark:						
Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

EUT	Remote control car	Model Name	SL-303A
Temperature	25℃	Relative Humidity	60%
Pressure	101kPa	Test Voltage	DC 3V
Test Modulation	GFSK	Polarization	Vertical

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Value Type
2410	44.37	49.05	90.77	114.00	-23.23	peak
2410	29.51	49.05	78.95	94.00	-15.06	AVG
2442	45.31	49.12	89.58	114.00	-24.42	peak
2442	30.11	49.12	70.37	94.00	-23.63	AVG
2473	40.78	49.25	90.42	114.00	-23.58	peak
2473	30.48	49.25	79.00	94.00	-15.00	AVG
Remark:						
Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

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RADIATED EMISSION ABOVE 1GHZ

EUT	Remote control car	Model Name	SL-303A
Temperature	25℃	Relative Humidity	60%
Pressure	101kPa	Test Voltage	DC 3V
Test Mode	Mode 1	Polarization	Horizontal

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Value Type
4820	41.68	0.08	41.76	74.00	-32.24	peak
4820	35.24	0.08	35.32	54.00	-18.68	AVG
7230	35.91	2.21	38.12	74.00	-35.88	peak
7230	30.95	2.21	33.16	54.00	-20.84	AVG
Remark:						
Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

EUT	Remote control car	Model Name	SL-303A
Temperature	25℃	Relative Humidity	60%
Pressure	101kPa	Test Voltage	DC 3V
Test Mode	Mode 1	Polarization	Vertical

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Value Type
4820	40.59	0.08	40.67	74.00	-33.33	peak
4820	36.45	0.08	36.53	54.00	-17.47	AVG
7230	36.74	2.21	38.95	74.00	-35.05	peak
7230	32.18	2.21	34.39	54.00	-19.61	AVG
Remark:						
Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

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EUT	Remote control car	Model Name	SL-303A
Temperature	25℃	Relative Humidity	60%
Pressure	101kPa	Test Voltage	DC 3V
Test Mode	Mode 2	Polarization	Horizontal

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Value Type
4884	42.41	0.14	42.55	74.00	-31.45	peak
4884	36.76	0.14	36.90	54.00	-17.10	AVG
7326	35.85	2.36	38.21	74.00	-35.79	peak
7326	31.48	2.36	33.84	54.00	-20.16	AVG
Remark:						
Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

EUT	Remote control car	Model Name	SL-303A
Temperature	25℃	Relative Humidity	60%
Pressure	101kPa	Test Voltage	DC 3V
Test Mode	Mode 2	Polarization	Vertical

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Value Type
4884	41.28	0.14	41.42	74.00	-32.58	peak
4884	36.90	0.14	37.04	54.00	-16.96	AVG
7326	35.46	2.36	37.82	74.00	-36.18	peak
7326	31.29	2.36	33.65	54.00	-20.35	AVG
Remark:						
Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

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EUT	Remote control car	Model Name	SL-303A
Temperature	25℃	Relative Humidity	60%
Pressure	101kPa	Test Voltage	DC 3V
Test Mode	Mode 3	Polarization	Horizontal

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Value Type
4946	40.18	0.22	40.40	74.00	-33.60	peak
4946	36.44	0.22	36.66	54.00	-17.34	AVG
7419	37.97	2.64	40.61	74.00	-33.39	peak
7419	33.65	2.64	36.29	54.00	-17.71	AVG
Remark:						
Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

EUT	Remote control car	Model Name	SL-303A
Temperature	25℃	Relative Humidity	60%
Pressure	101kPa	Test Voltage	DC 3V
Test Mode	Mode 3	Polarization	Vertical

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Value Type
4946	39.77	0.22	39.99	74.00	-34.01	peak
4946	35.31	0.22	35.53	54.00	-18.47	AVG
7419	36.85	2.64	39.49	74.00	-34.51	peak
7419	33.66	2.64	36.30	54.00	-17.70	AVG
Remark:						
Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

Note: The amplitude of other spurious emissions from 1G to 25 GHz which are attenuated more than 20 dB below the permissible value need not be reported.

Factor=Antenna Factor + Cable loss - Amplifier gain, Margin=Measurement-Limit.

The “Factor” value can be calculated automatically by software of measurement system.

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8. BAND EDGE EMISSION

8.1. MEASUREMENT PROCEDURE

1. The EUT operates at transmitting mode. The operate channel is tested to verify the largest transmission and spurious emissions power at the continuous transmission mode.

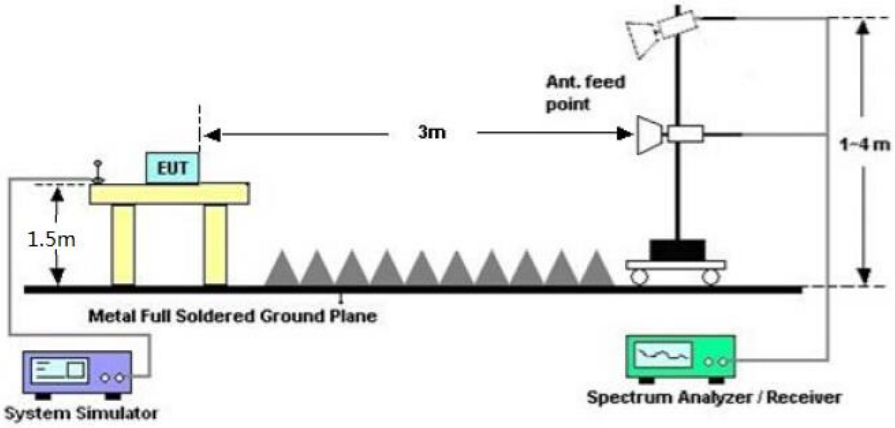
2. Set the spectrum analyzer in the following setting in order to capture the lower and upper band-edges of the emission: (a) PEAK: RBW=1MHz, VBW=3MHz / Sweep=AUTO

(b) AVERAGE: RBW=1MHz ; VBW=3MHz / Sweep=AUTO

3. Other procedures refer to clause 7.2.

8.2 TEST SETUP

RADIATED EMISSION TEST SETUP



8.3 RADIATED TEST RESULT

Note:

1. Factor=Antenna Factor + Cable loss - Amplifier gain. Field Strength=Factor + Reading level
2. The factor had been edited in the “Input Correction” of the Spectrum Analyzer. So the Amplitude of test plots is equal to Reading level plus the Factor in dB. Use the A dB(μV) to represent the Amplitude. Use the F dB(μV/m) to represent the Field Strength. So A=F.

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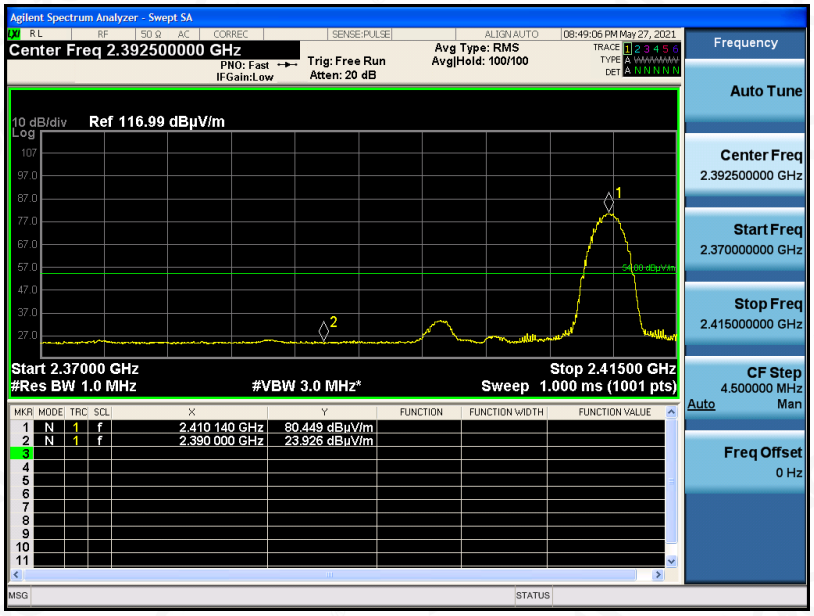
EUT	Remote control car	Model Name	SL-303A
Temperature	25℃	Relative Humidity	60%
Pressure	101kPa	Test Voltage	DC 3V
Test Mode	Mode 1	Polarization	Horizontal

Peak Value

Average Value



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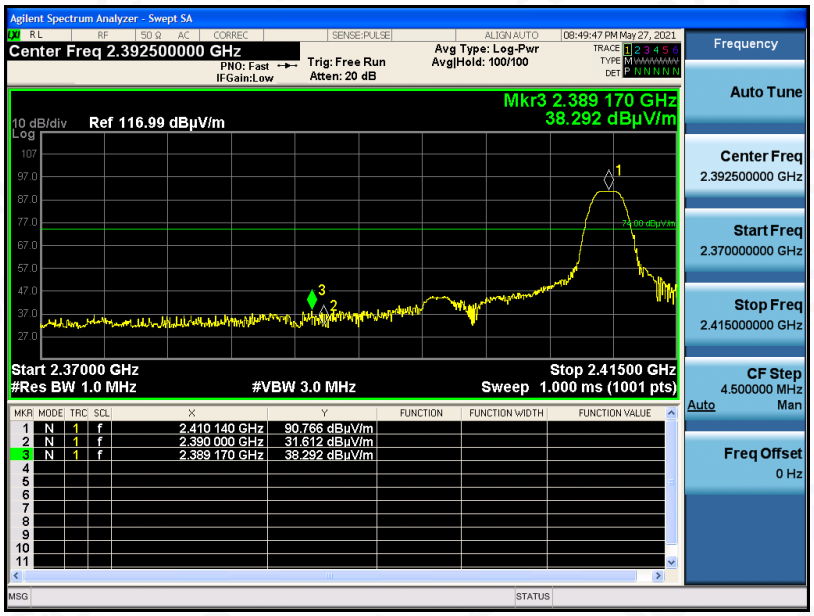
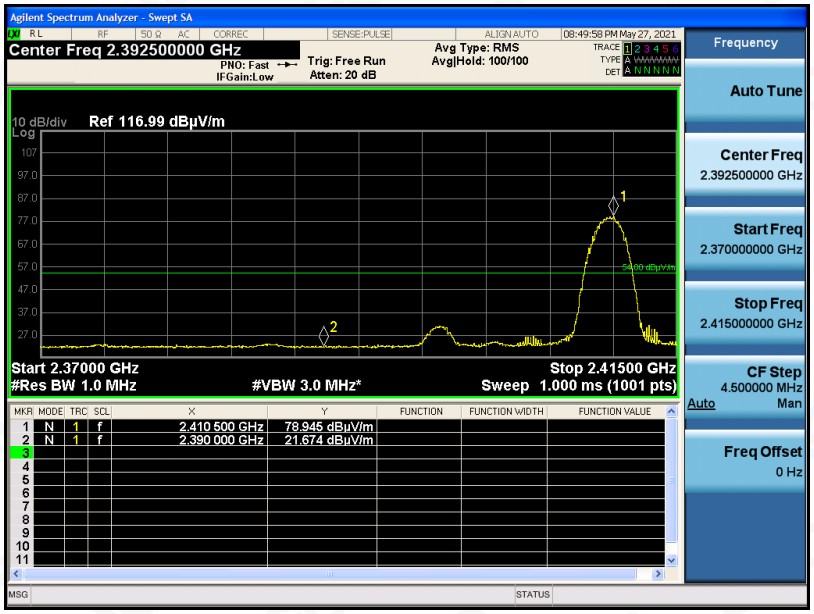
EUT	Remote control car	Model Name	SL-303A
Temperature	25℃	Relative Humidity	60%
Pressure	101kPa	Test Voltage	DC 3V
Test Mode	Mode 1	Polarization	Vertical

Peak Value



Average Value



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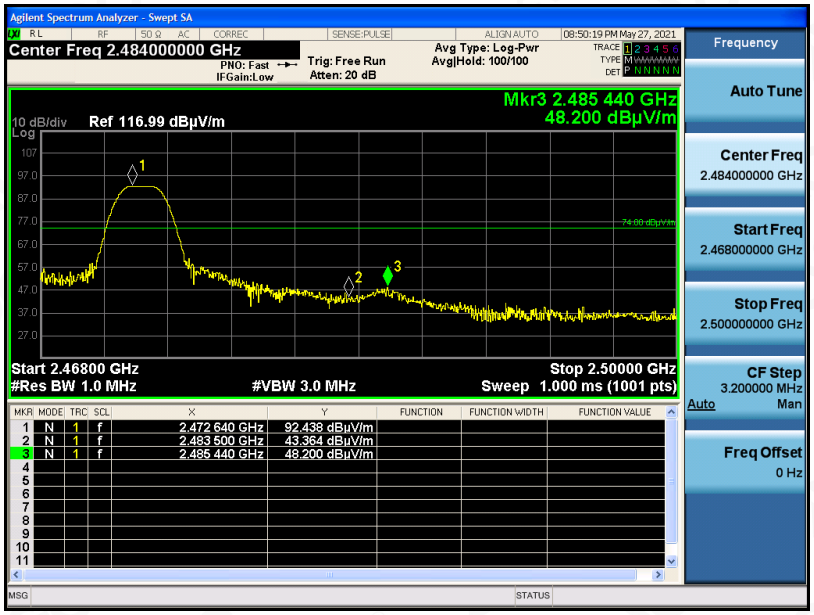
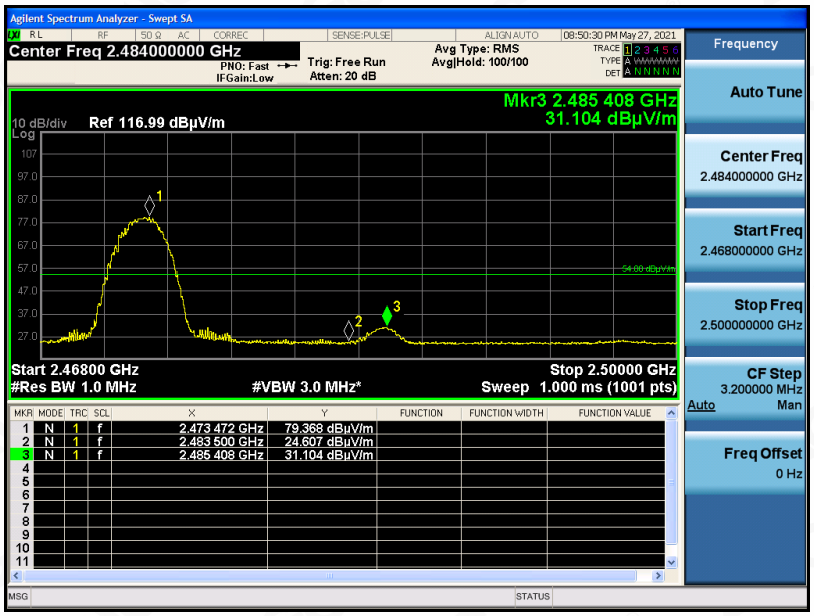
EUT	Remote control car	Model Name	SL-303A
Temperature	25℃	Relative Humidity	60%
Pressure	101kPa	Test Voltage	DC 3V
Test Mode	Mode 3	Polarization	Horizontal

Peak Value



Average Value



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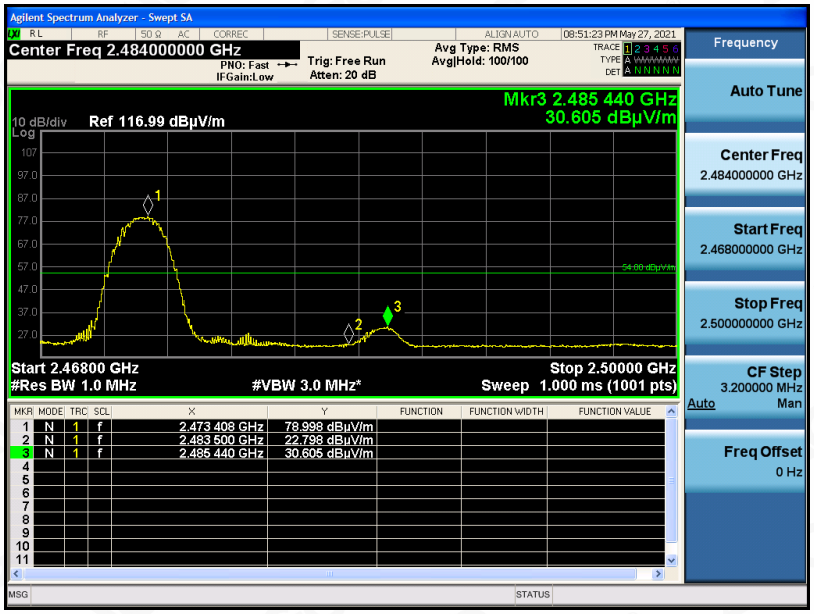
EUT	Remote control car	Model Name	SL-303A
Temperature	25℃	Relative Humidity	60%
Pressure	101kPa	Test Voltage	DC 3V
Test Mode	Mode 3	Polarization	Vertical

Peak Value

Average Value



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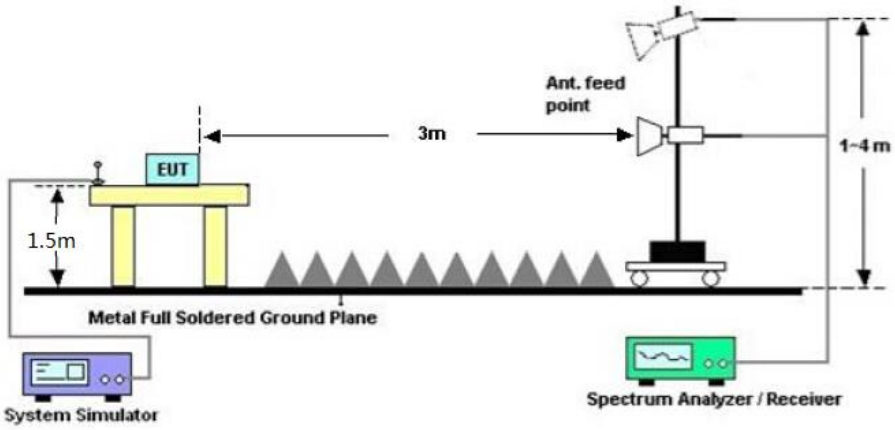
9. 20DB BANDWIDTH

9.1. MEASUREMENT PROCEDURE

1. Set the EUT Work on the top, the middle and the bottom operation frequency individually.
2. Set SPA Centre Frequency = Operation Frequency, RBW= 30 KHz, VBW≥3×RBW.
3. Set SPA Trace 1 Max hold, then View.

9.2. TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION)



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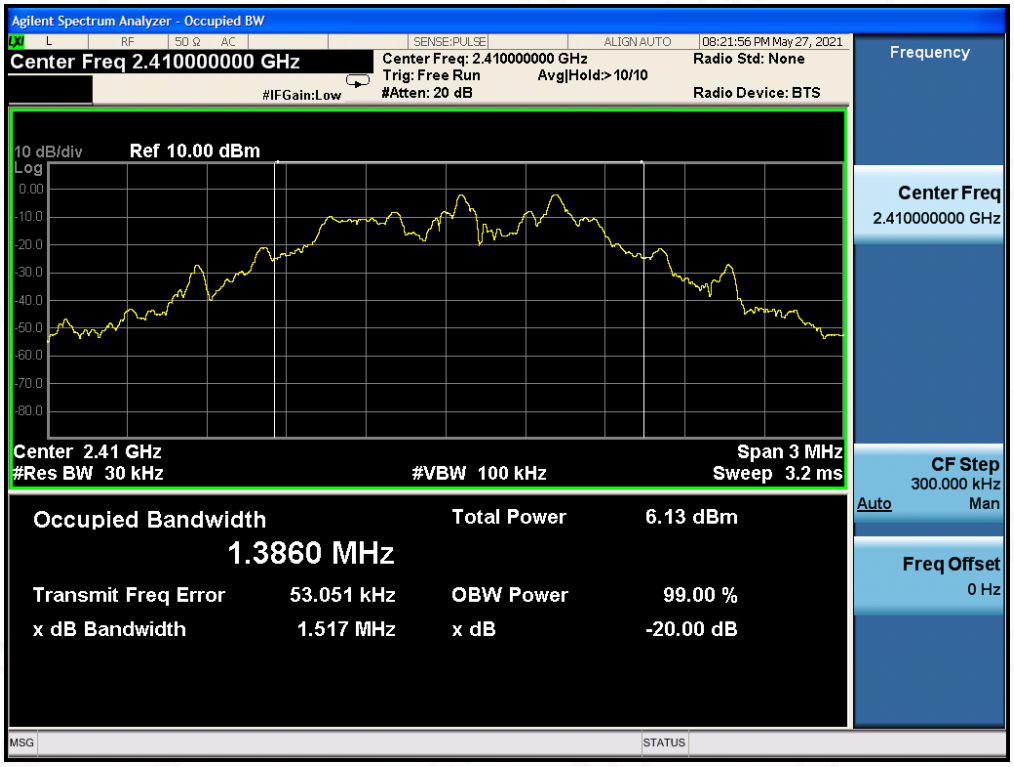
9.3. MEASUREMENT RESULTS

TEST ITEM	20DB BANDWIDTH
TEST MODULATION	GFSK

Test Channel (MHz)	20DB BANDWIDTH (MHz)	99% BANDWIDTH (MHz)	Criteria
2410	1.517	1.3860	PASS
2442	1.533	1.4487	PASS
2473	1.538	1.4806	PASS

TEST PLOT OF BANDWIDTH FOR LOW CHANNEL



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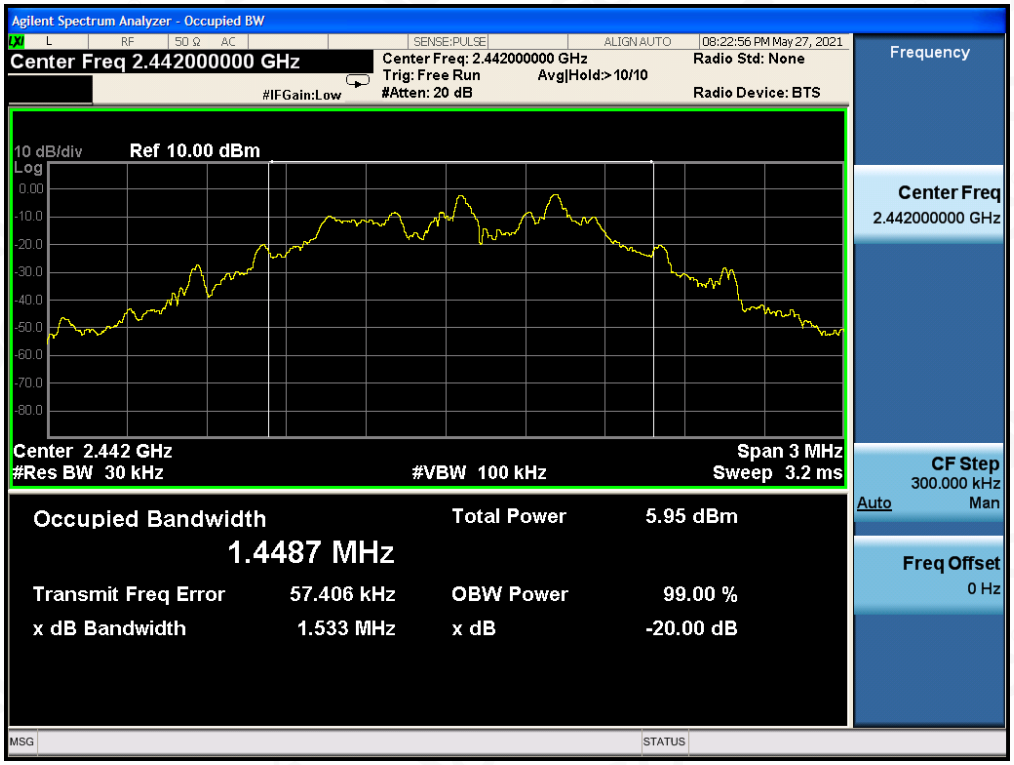
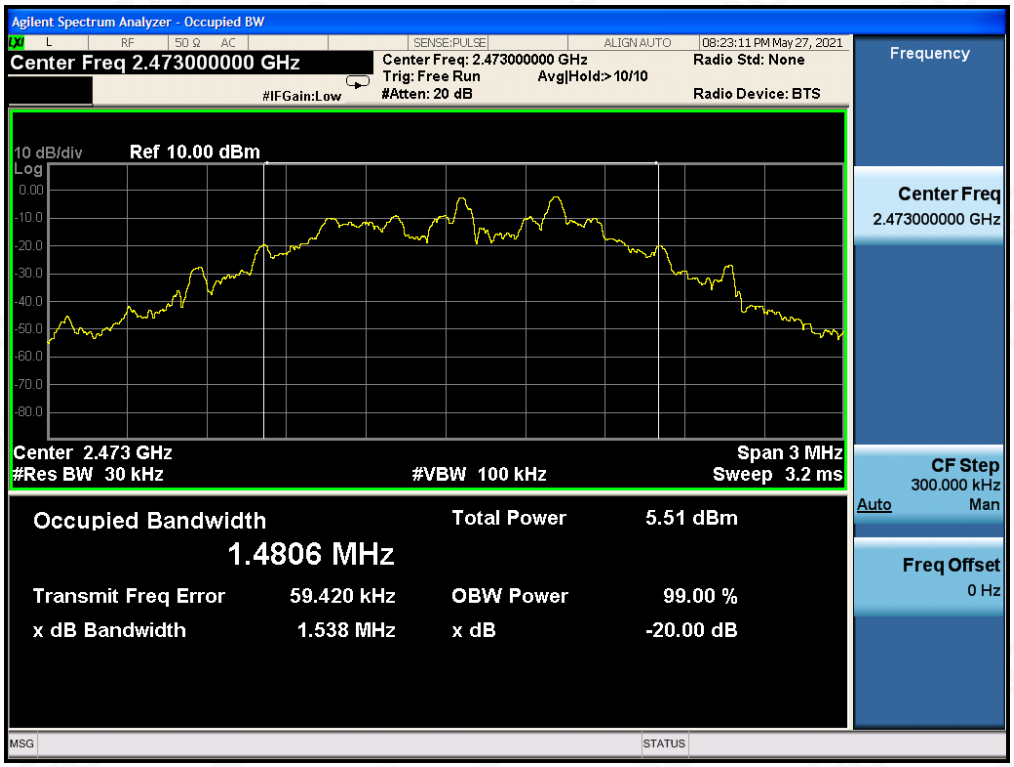
TEST PLOT OF BANDWIDTH FOR MIDDLE CHANNEL



TEST PLOT OF BANDWIDTH FOR HIGH CHANNEL



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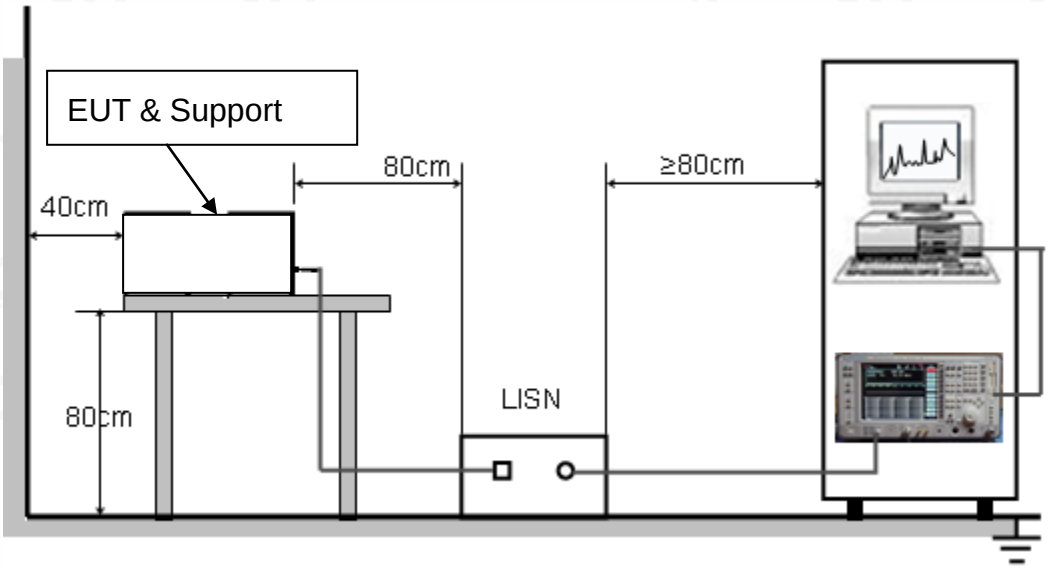
10. FCC LINE CONDUCTED EMISSION TEST

10.1. LIMITS OF LINE CONDUCTED EMISSION TEST

Frequency	Maximum RF Line Voltage	
	Q.P.(dBuV)	Average(dBuV)
150kHz~500kHz	66-56	56-46
500kHz~5MHz	56	46
5MHz~30MHz	60	50

Note:
1. The lower limit shall apply at the transition frequency.
2. The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz.

10.2. BLOCK DIAGRAM OF LINE CONDUCTED EMISSION TEST



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10.3. PRELIMINARY PROCEDURE OF LINE CONDUCTED EMISSION TEST

1. The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. When the EUT is a tabletop system, a wooden table with a height of 0.8 meters is used and is placed on the ground plane as per ANSI C63.10 (see Test Facility for the dimensions of the ground plane used). When the EUT is a floor-standing equipment, it is placed on the ground plane which has a 3-12 mm non-conductive covering to insulate the EUT from the ground plane.
2. Support equipment, if needed, was placed as per ANSI C63.10.
3. All I/O cables were positioned to simulate typical actual usage as per ANSI C63.10.
4. All support equipment received AC120V/60Hz power from a LISN, if any.
5. The EUT received DC 3V power from PC which received AC120V/60Hz power from a LISN.

6. The test program was started. Emissions were measured on each current carrying line of the EUT using a spectrum Analyzer / Receiver connected to the LISN powering the EUT. The LISN has two monitoring points: Line 1 (Hot Side) and Line 2 (Neutral Side). Two scans were taken: one with Line 1 connected to Analyzer / Receiver and Line 2 connected to a 50 ohm load; the second scan had Line 1 connected to a 50 ohm load and Line 2 connected to the Analyzer / Receiver.
7. Analyzer / Receiver scanned from 150 kHz to 30MHz for emissions in each of the test modes.
8. During the above scans, the emissions were maximized by cable manipulation.
9. The test mode(s) were scanned during the preliminary test.

Then, the EUT configuration and cable configuration of the above highest emission level were recorded for reference of final testing.

12.4. FINAL PROCEDURE OF LINE CONDUCTED EMISSION TEST

1. EUT and support equipment was set up on the test bench as per step 2 of the preliminary test.
2. A scan was taken on both power lines, Line 1 and Line 2, recording at least the six highest emissions. Emission frequency and amplitude were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit. If EUT emission level was less –2dB to the A.V. limit in Peak mode, then the emission signal was re-checked using Q.P and Average detector.
3. The test data of the worst case condition(s) was reported on the Summary Data page.

12.5. TEST RESULT OF LINE CONDUCTED EMISSION TEST

N/A

Note: The conducted emission tests at AC port are not required for devices which only employ battery power for operation.

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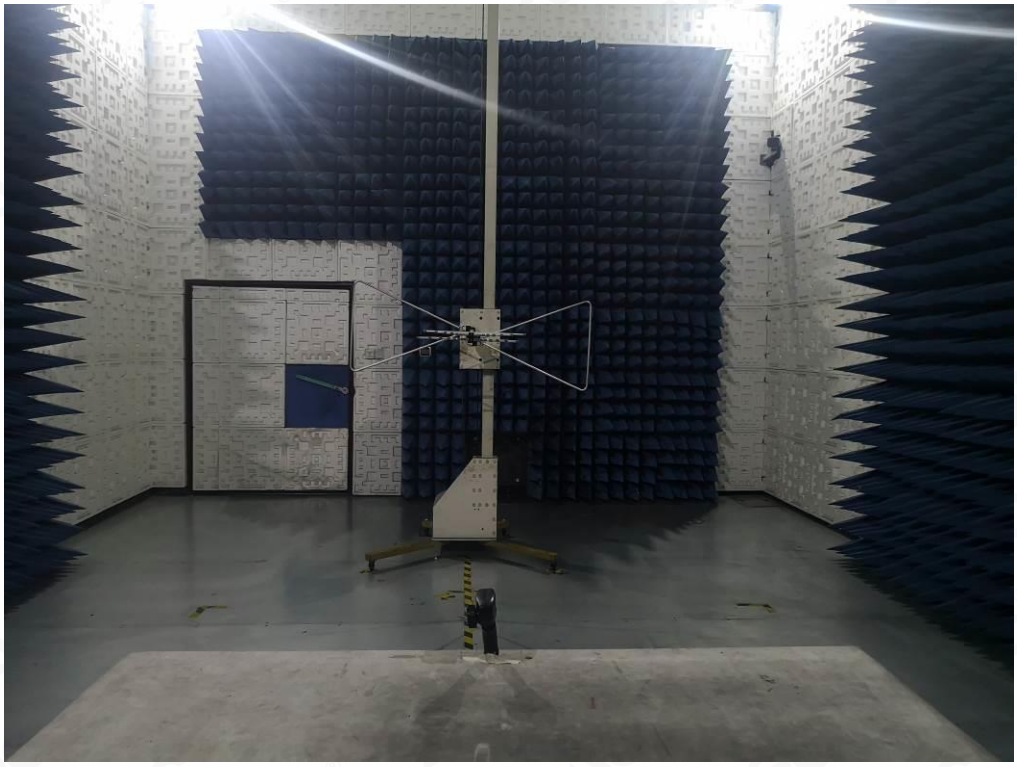
APPENDIX A: PHOTOGRAPHS OF TEST SETUP

FCC RADIATED EMISSION TEST SETUP BELOW 1GHZ



FCC RADIATED EMISSION TEST SETUP ABOVE 1GHZ

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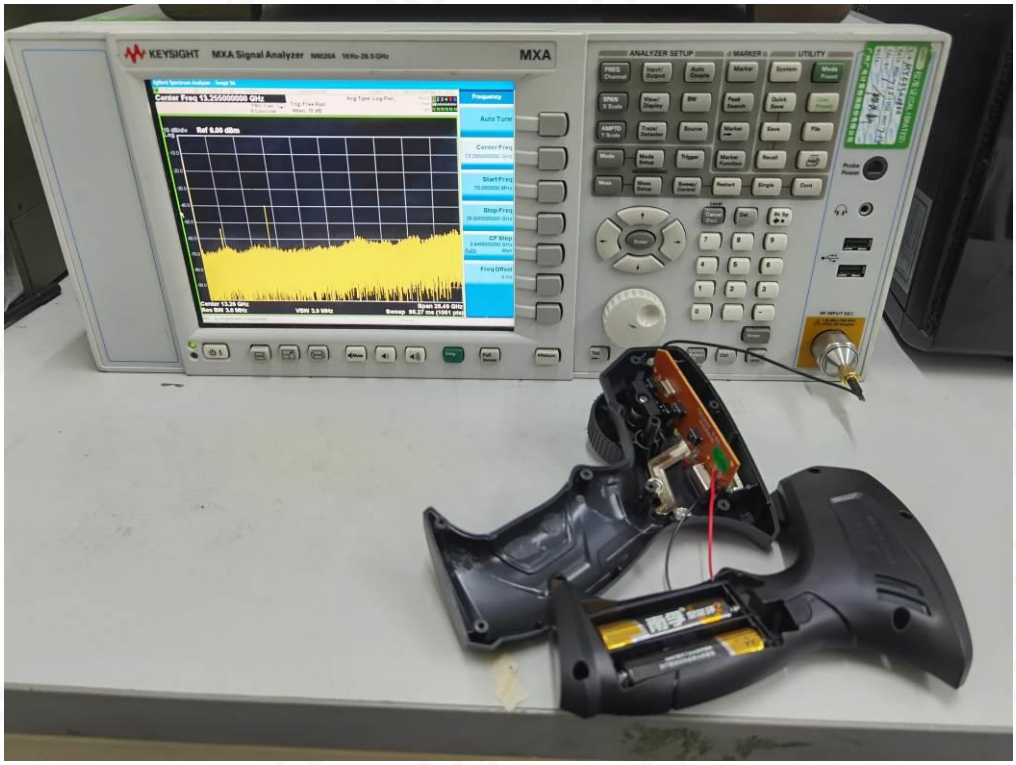
CONDUCTED TEST SETUP



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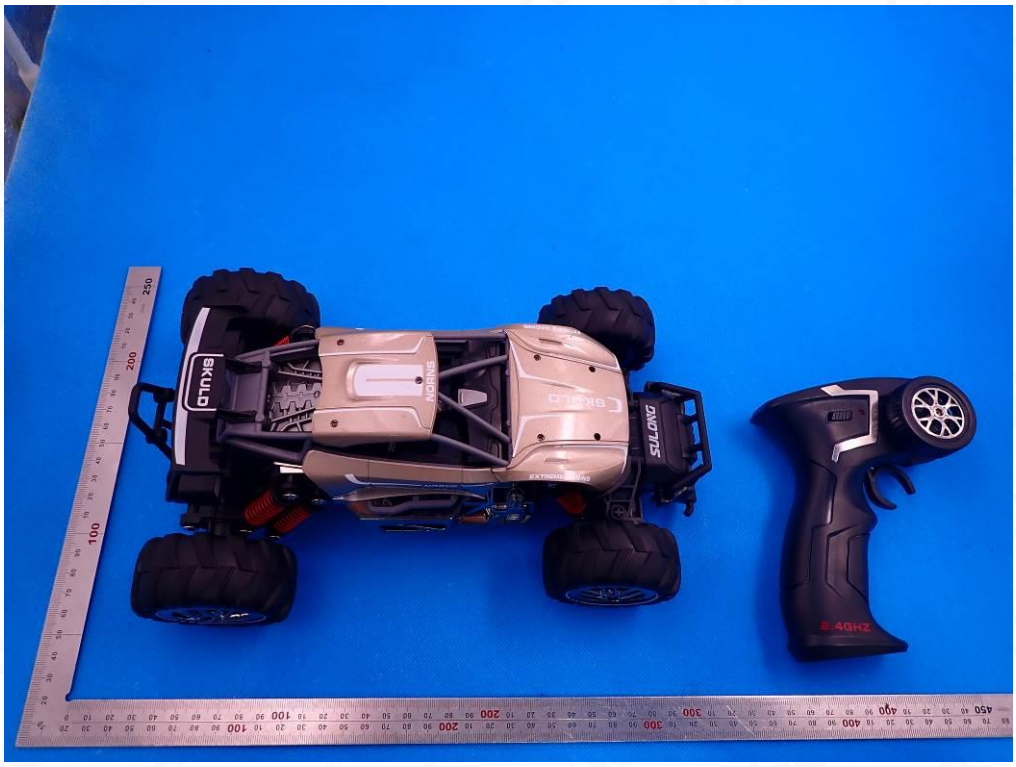
Attestation of Global Compliance(Shenzhen)Co., Ltd
Attestation of Global Compliance(Shenzhen)Std & Tech Co., Ltd
Tel: +86-755 2523 4088 E-mail: agc@agc-cert.com Web: http://cn.agc-cert.com/

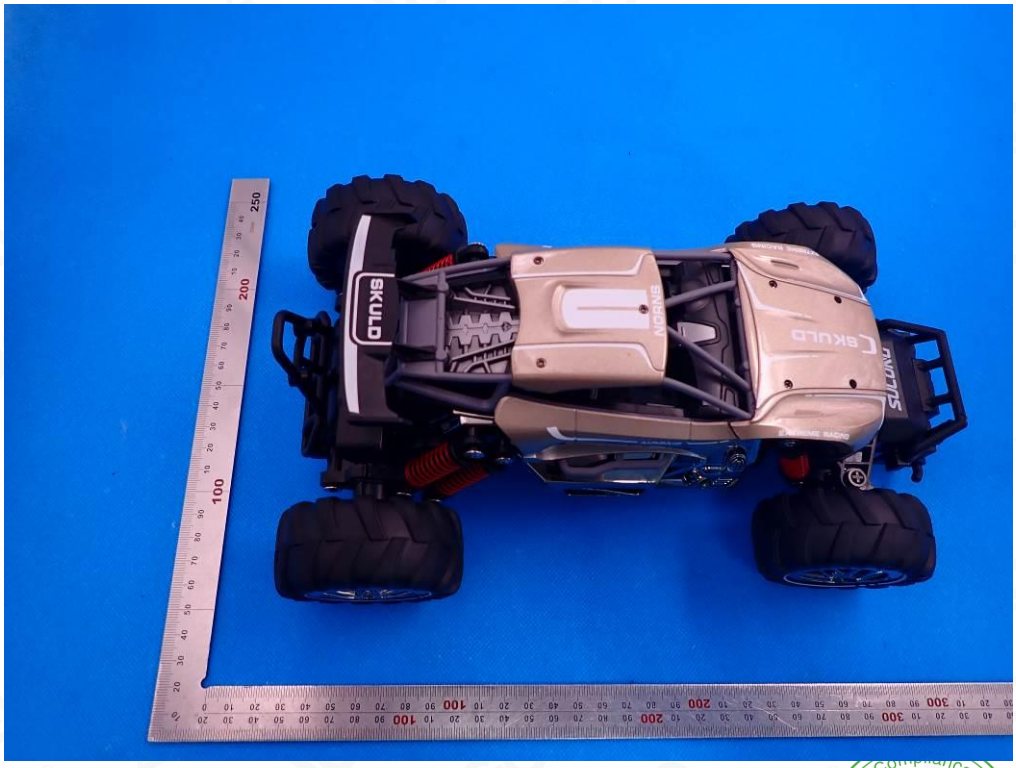
APPENDIX B: PHOTOGRAPHS OF THE EUT

ALL VIEW OF EUT



Receiver

OUTSIDE VIEW-1 OF EUT



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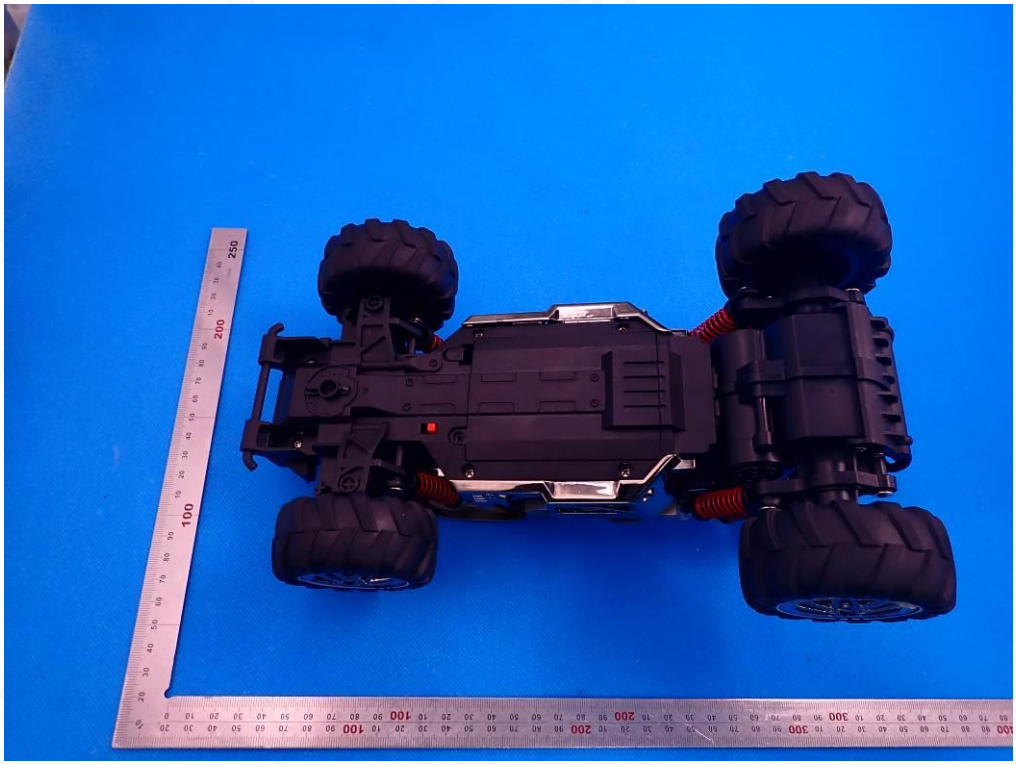
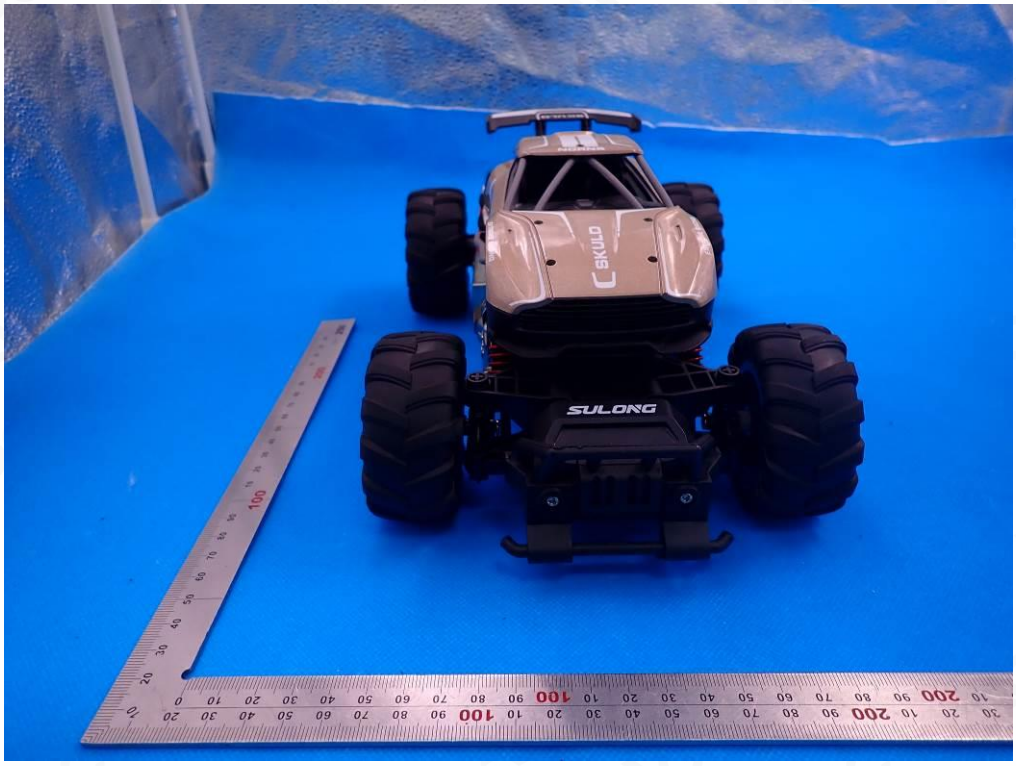
OUTSIDE VIEW-2 OF EUT



OUTSIDE VIEW-3 OF EUT



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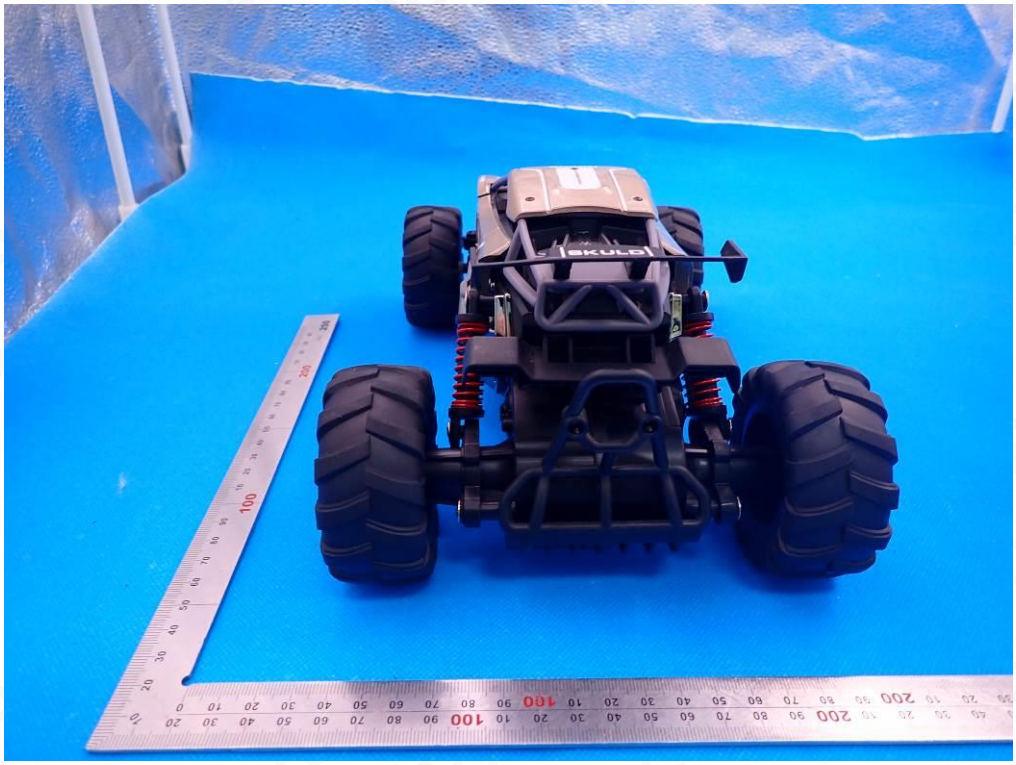
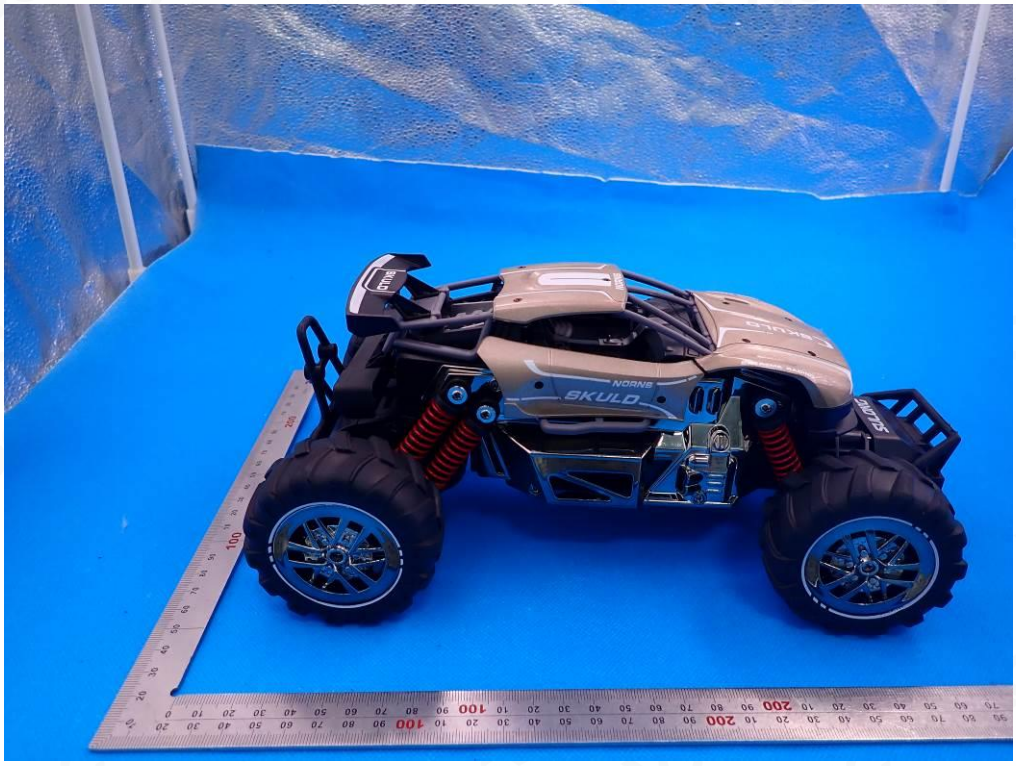
OUTSIDE VIEW-4 OF EUT



OUTSIDE VIEW-5 OF EUT



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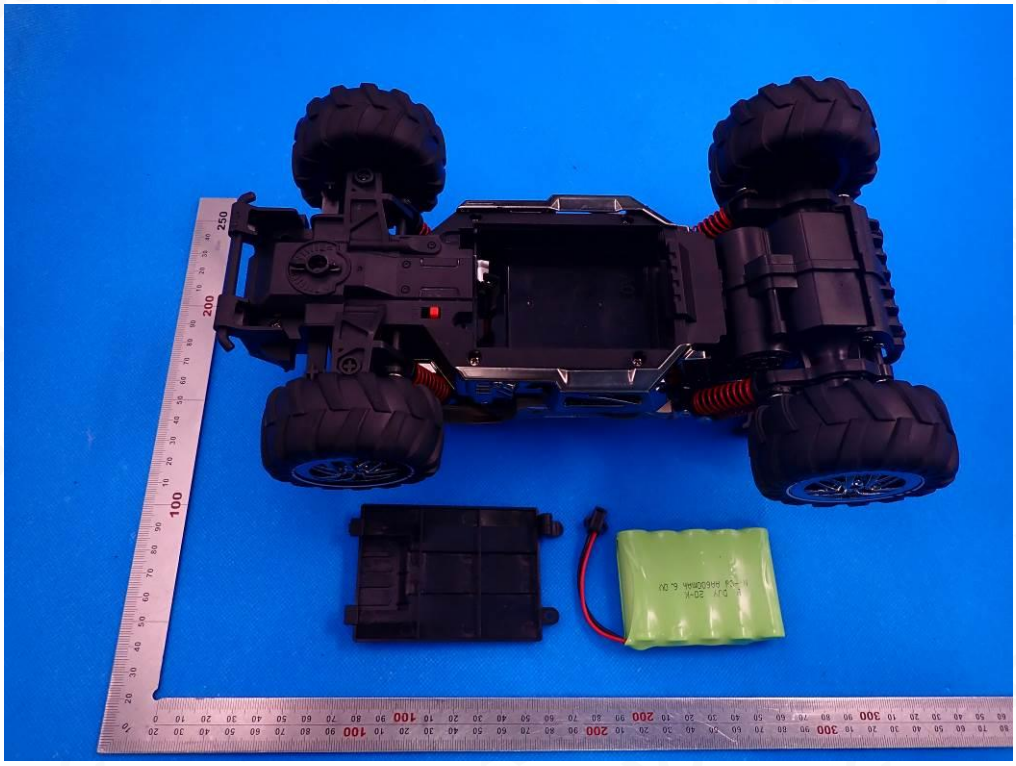
OUTSIDE VIEW-6 OF EUT

OPEN VIEW-1 OF EUT



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