FCC PART 15.235

TEST REPORT

For

Toy Century Company Limited

Unit 214, 2th Floor, New East Ocean Centre, No. 9 Science Museum Road, Tsim Sha Tsui East, Kowloon, Hong Kong

FCC ID: SSYRC49MHZT

Report Type:	**Product Type:**
Original Report	Radio Control ATV

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Report Number:	RSZ160614830-00
Report Date:	2016-06-23
Reviewed By:	Rocky Kang RF Engineer
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Note: This test report is prepared for the customer shown above and for the equipment described herein. It may not be duplicated or used in part without prior written consent from Bay Area Compliance Laboratories Corp.

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GENERAL INFORMATION

Product Description for Equipment Under Test (EUT)

The *Toy Century Company Limited'* s product, model number: *80280SF (FCC ID: SSYRC49MHZT)* or the "EUT" in this report is a transmitter of the *Radio Control ATV,* which measures approximately: 33.1 cm (L) x 9.3 cm (W) x 3.2 cm (H), rated input voltage: DC 9 V battery.

** All measurement and test data in this report was gathered from production sample serial number: 160601 (Assigned by BACL, Shenzhen). The EUT supplied by the applicant was received on 2016-06-14.*

Objective

This Type approval report is prepared on behalf of *Toy Century Company Limited* in accordance with Part 2, Subpart J, and Part 15, Subparts A, B and C of the Federal Communication Commissions rules.

The objective is to determine compliance with FCC rules, section 15.203, 15.205, 15.209 and 15.235 rules.

Related Submittal(s)/Grant(s)

FCC Part 15B CRR submissions with FCC ID: SSYRC49MHZR

Test Methodology

All measurements contained in this report were conducted with ANSI C63.10-2013, American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices.

All emissions measurement was performed at Bay Area Compliance Laboratories Corp. (Shenzhen). The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

Measurement uncertainty with radiated emission is 5.81 dB for 30MHz-1GHz, and 4.88 dB for above 1GHz, 1.95dB for conducted measurement.

Test Facility

The test site used by Bay Area Compliance Laboratories Corp. (Shenzhen) to collect test data is located on the 6/F, the 3rd Phase of WanLi Industrial Building, ShiHua Road, FuTian Free Trade Zone Shenzhen, Guangdong, China.

Test site at Bay Area Compliance Laboratories Corp. (Shenzhen) has been fully described in reports submitted to the Federal Communication Commission (FCC). The details of these reports have been found to be in compliance with the requirements of Section 2.948 of the FCC Rules on October 31, 2013. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.10-2013.

The Federal Communications Commission has the reports on file and is listed under FCC Registration No.: 382179. The test site has been approved by the FCC for public use and is listed in the FCC Public Access Link (PAL) database.

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SYSTEM TEST CONFIGURATION

Justification

The system was configured for testing in a typical fashion (as normally used by a typical user).

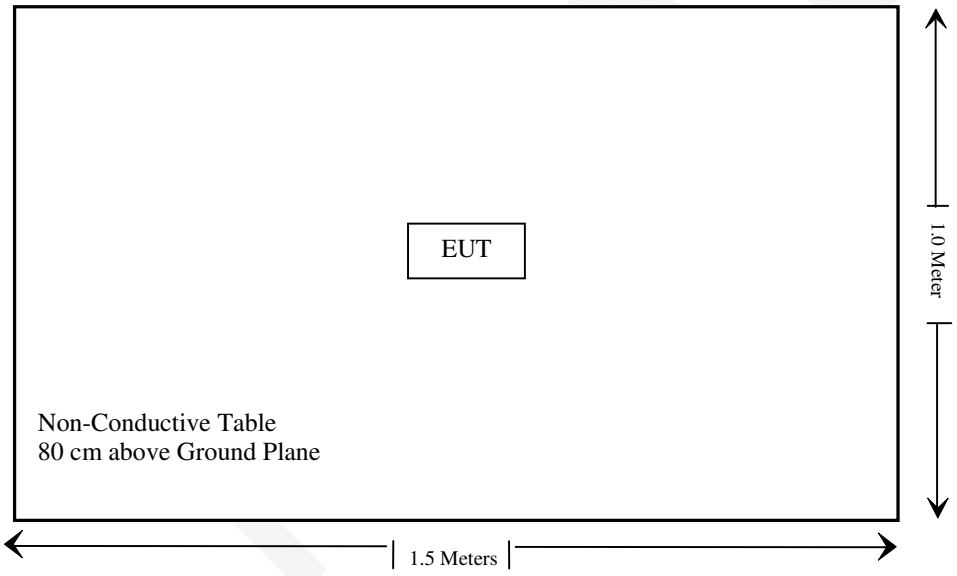
Special Accessories

No special accessories was used

Equipment Modifications

No modification was made to the EUT.

Block Diagram of Test Setup



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
§15.203	Antenna requirement	Compliance
§15.207(a)	AC Line Conducted Emissions	Not Applicable
§15.235(a)& 15.235(b)&15.209	Radiated Emissions and Band Edges	Compliance
§15.215	20 dB bandwidth	Compliance

Not Applicable: The EUT is powered by battery.

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FCC §15.203 - ANTENNA REQUIREMENT

Applicable Standard

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 or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section.

Antenna Connector Construction

The EUT has a helical antenna arrangement, which was permanently attached and the antenna gain is 0 dBi; fulfill the requirement of this section. Please refer to EUT photos.

Result: Compliance.

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FCC §15.235(a) & 15.235 (b)&15.209 - RADIATED EMISSIONS AND BAND EDGES

Applicable Standard

FCC 15.235(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.

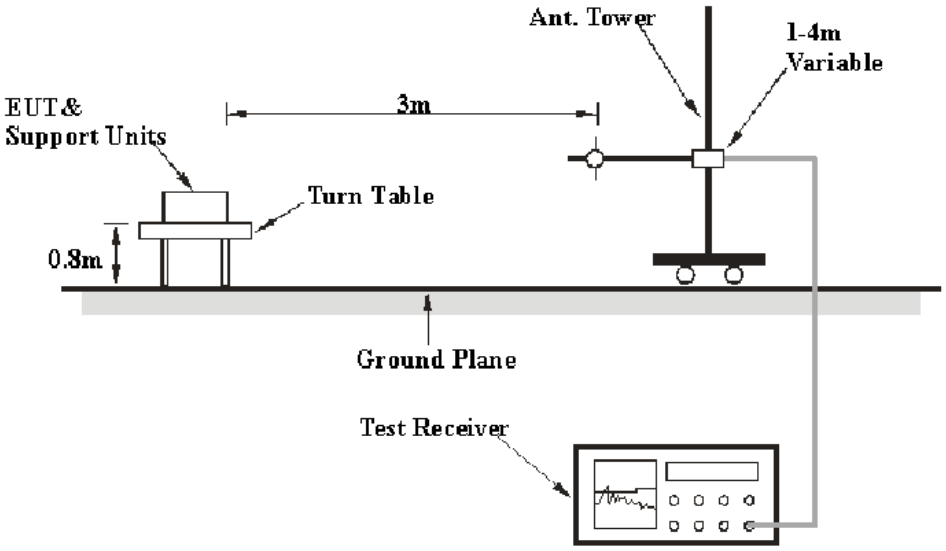
FCC 15.235(b)
The field strength of any emissions appearing between the band edges and up to 10 kHz above and below the band edges shall be attenuated at least 26 dB below the level of the unmodulated carrier or to the general limits in §15.209, whichever permits the higher emission levels. The field strength of any emissions removed by more than 10 kHz from the band edges shall not exceed the general radiated emission limits in §15.209. All signals exceeding 20 microvolts/meter at 3 meters shall be reported in the application for certification.

Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in field of EMC. The factors contributing to uncertainties are spectrum analyzer, cable loss, antenna factor calibration, antenna directivity, antenna factor variation with height, antenna phase center variation, antenna factor frequency interpolation, measurement distance variation, site imperfections, mismatch (average), and system repeatability.

Based on CISPR 16-4-2:2011, the expended combined standard uncertainty of radiation emissions at Bay Area Compliance Laboratories Corp. (Shenzhen) is 5.81 dB for 30MHz-1GHz.and 4.88 dB for above 1GHz, and it will not be taken into consideration for the test data recorded in the report.

EUT Setup



The radiated emission tests were performed in the 3 meters, using the setup accordance with the ANSI ANSI C63.10-2013. The specification used was the FCC Part 15.235(a) & 15.235 (b) &15.209 limits.

EMI Test Receiver Setup

The system was investigated from 30 MHz to 1000 MHz.

During the radiated emission test, the EMI test receiver was set with the following configurations:

Frequency Range	RBW	Video B/W	IF B/W	Detector
30MHz – 1000 MHz	100 kHz	300 kHz	120 kHz	QP

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
HP	Amplifier	8447E	1937A01046	2016-05-06	2017-05-06
Rohde & Schwarz	EMI Test Receiver	ESCI	101120	2015-11-03	2016-11-03
Sunol Sciences	Bi-log Antenna	JB1	A040904-2	2014-12-07	2017-12-06
R&S	Auto test Software	Auto test Software	V6.30	NCR	NCR

*** Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Shenzhen) attests that all calibrations have been performed in accordance to requirements that traceable to National Primary Standards and International System of Units (SI).

Test Procedure

Maximizing procedure was performed on the highest emissions to ensure that the EUT complied with all installation combinations.

All final data was recorded in the Quasi-peak detection mode from 30MHz to 1GHz, Peak detection mode above 1 GHz.

Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Factor and Cable Loss, and subtracting the Amplifier Gain from the Meter reading. The basic equation is as follows:

Corrected Amplitude = Meter Reading + Antenna Factor + Cable Loss - Amplifier Gain

The "**Margin**" column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of 7 dB means the emission is 7 dB below the maximum limit. The equation for margin calculation is as follows:

Margin = Limit - Corrected Amplitude

Test Results Summary

According to the data in the following table, the EUT complied with the FCC Part 15.235(a) & 15.235 (b) &15.209, with the worst margin reading of:

8.70 dB at **99.73 MHz** in the **Horizontal** polarization

Test Data

Environmental Conditions

Temperature:	23 ℃
Relative Humidity:	50 %
ATM Pressure:	100.1 kPa

The testing was performed by Sonia Zhou on 2016-06-18.

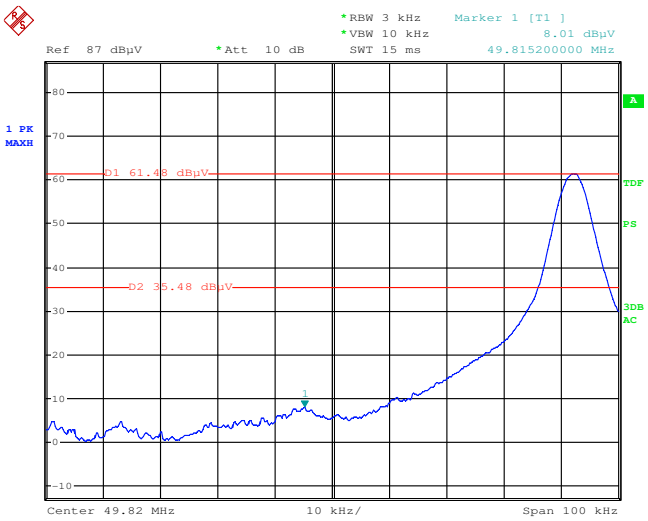
Test Mode: Transmitting

Frequency (MHz)	Receiver		Turntable Degree	Rx Antenna		Corrected Factor (dB)	Corrected Amplitude (dBμV/m)	FCC Part 15.235(a) & 15.235 (b) &15.209		Remark
	Reading (dBμV)	Detector (PK/QP/Ave.)		Height (m)	Polar (H / V)			Limit (dBμV/m)	Margin (dB)	
49.865	66.06	PK	342	1.1	H	-13.4	52.66	100	47.34	Fundamental
49.865	65.68	Ave.	327	1.1	H	-13.4	52.28	80	27.72	
49.865	78.68	PK	69	1.0	V	-13.4	65.28	100	34.72	
49.865	78.54	Ave.	72	1.0	V	-13.4	65.14	80	14.86	
99.73	46.40	QP	78	1.1	H	-11.6	34.80	43.5	8.70	Spurious emission

Note:
Corrected Amplitude = Corrected Factor + Reading
Corrected Factor=Antenna factor（RX）+cable loss － amplifier factor
Margin = Limit- Corr. Amplitude
All signals exceeding 20 microvolts/meter at 3 meters have been recorded.

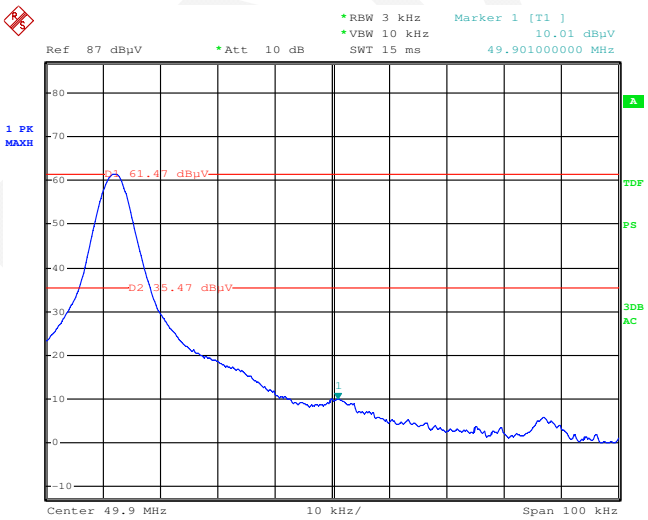
Result: Compliance

Band Edges



EUT

Date: 18.JUN.2016 13:02:06



EUT

Date: 18.JUN.2016 13:03:52

FCC§15.215(c) - 20dB EMISSION BANDWIDTH

Applicable Standard

Intentional radiators operating under the alternative provisions to the general emission limits, as contained in § 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.

Test Procedure

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT without connection to measurement instrument. Turn on the EUT and connect it to measurement instrument. Then set it to any one convenient frequency within its operating range. Set a reference level on the measuring instrument equal to the highest peak value.
3. Measure the frequency difference of two frequencies that were attenuated 20 dB from the reference level. Record the frequency difference as the emission bandwidth.
4. Repeat above procedures until all frequencies measured were complete.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCI	101120	2015-11-03	2016-11-03

*** Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Shenzhen) attests that all calibrations have been performed in accordance to requirements, traceable to traceable to National Primary Standards and International System of Units (SI).

Test Data

Environmental Conditions

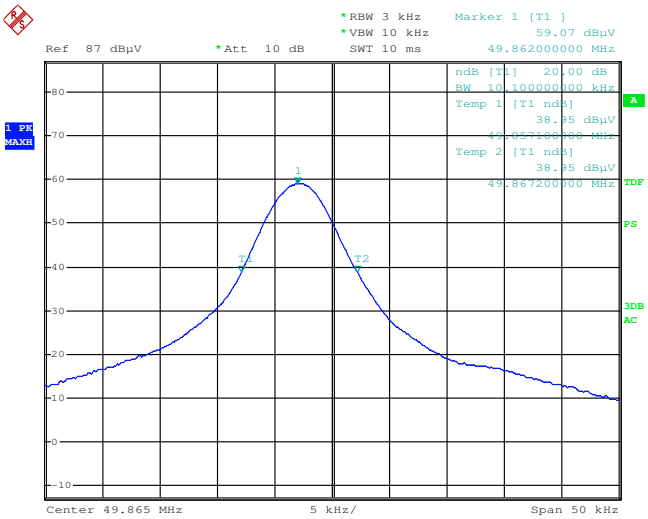
Temperature:	20 ℃
Relative Humidity:	50 %
ATM Pressure:	101.0 kPa

The testing was performed by Sonia Zhou on 2016-06-21.

Test Mode: Transmitting

Please refer to following plot.

20 dB Emission Bandwidth



EUT

Date: 21.JUN.2016 17:54:19

Fl(MHz)	Fh(MHz)	Permitted frequency range(MHz)	Result
49.8571000	49.8672000	49.82-49.90MHz	Compliant

******* END OF REPORT *******