TESTING LABORATORY
CERTIFICATE # 4821.01

FCC PART 15.235

TEST REPORT

For

Zeeva International Limited

Suite 1007B,10th Floor, Exchange Tower, 33 Wang Chiu Road, Kowloon Bay, HongKong, China

FCC ID: 2ADM5-ET-0122-49

Report Type:	**Product Type:**
Original Report	RC SHOOTING ROBOT (49MHz)

Report Number:	RSZ200723833-00
Report Date:	2020-07-31
Reviewed By:	Jimmy Xiao RF Engineer
Test Laboratory:	Bay Area Compliance Laboratories Corp. (Shenzhen) 6/F., West Wing, Third Phase of Wanli Industrial Building, Shihua Road, Futian Free Trade Zone, Shenzhen, Guangdong, China Tel: +86-755-33320018 Fax: +86-755-33320008 www.baclcorp.com.cn

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GENERAL INFORMATION

Product Description for Equipment Under Test (EUT)

Product	RC SHOOTING ROBOT(49MHz)
Model	ET-0122-2CH
UPC Number	192234058954
SKU Number	3330529
Frequency Range	49.86MHz
Antenna Specification	0dBi
Voltage Range	DC 1.5V*2 AAA batteries
Date of Test	2020/07/29
Sample serial number	RSZ200723833-RF-S1 (Assigned by BACL, Shenzhen)
Received date	2020/07/23
Sample/EUT Status	Good condition

Objective

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

The objective is to determine compliance with FCC rules, section 15.203, 15.205, 15.209, 15.215 and 15.235 rules.

Related Submittal(s)/Grant(s)

No related submittal(s).

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 4.75 dB for 30MHz-1GHz, and 4.88 dB for above 1GHz, 1.6dB 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., West Wing, Third Phase of Wanli Industrial Building, Shihua Road, Futian Free Trade Zone, Shenzhen, Guangdong, China.

The test site has been approved by the FCC under the KDB 974614 D01 and is listed in the FCC Public Access Link (PAL) database, FCC Registration No. : 342867, the FCC Designation No. : CN1221.

The test site has been registered with ISED Canada under ISED Canada Registration Number 3062B.

SYSTEM TEST CONFIGURATION

Justification

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

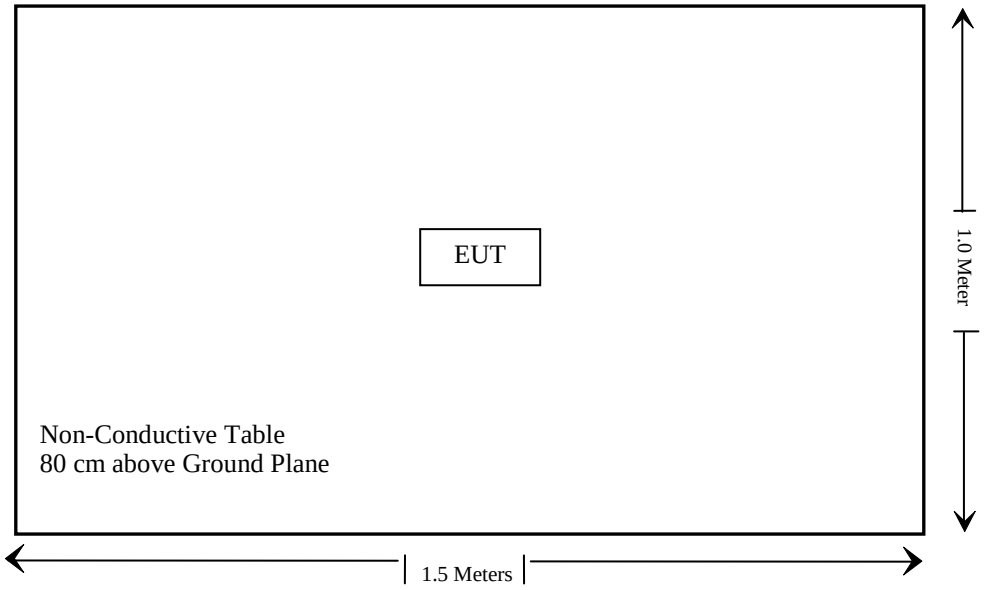
Special Accessories

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.

TEST EQUIPMENT LIST

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	EMI Test Receiver	ESR3	102455	2020/7/9	2021/7/8
Sonoma instrument	Pre-amplifier	310 N	186238	2020/4/20	2021/4/20
Sunol Sciences	Broadband Antenna	JB1	A040904-1	2017/12/22	2020/12/21
Unknown	Cable 2	RF Cable 2	F-03-EM197	2019/11/29	2020/11/28
Unknown	Cable	Chamber Cable 1	F-03-EM236	2019/11/29	2020/11/28
Rohde & Schwarz	Auto test software	EMC 32	V9.10	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).

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 an integral antenna arrangement, which was permanently attached and the antenna gain is 0dBi, fulfill the requirement of this section. Please refer to EUT photos.

Result: Compliance.

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.

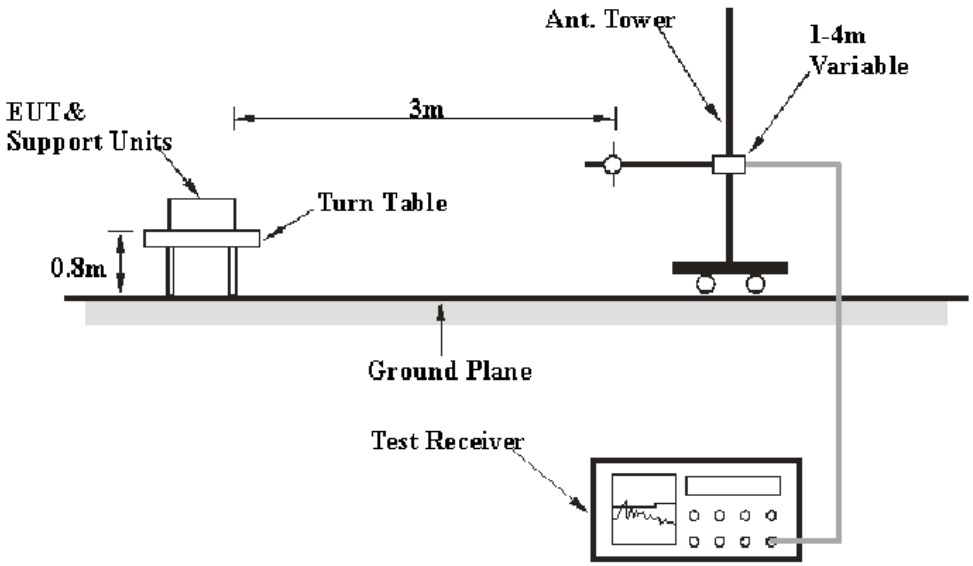
FCC 15.235(b)

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.

EUT Setup



The radiated emission tests were performed in the 3 meters, using the setup accordance with the 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 Procedure

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

All radiated emission data was recorded in the Quasi-peak detection mode from 30MHz to 1GHz, Peak and average detection mode for fundamental test.

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.

Test Data

Environmental Conditions

Temperature:	23 ℃
Relative Humidity:	58 %
ATM Pressure:	101.0 kPa

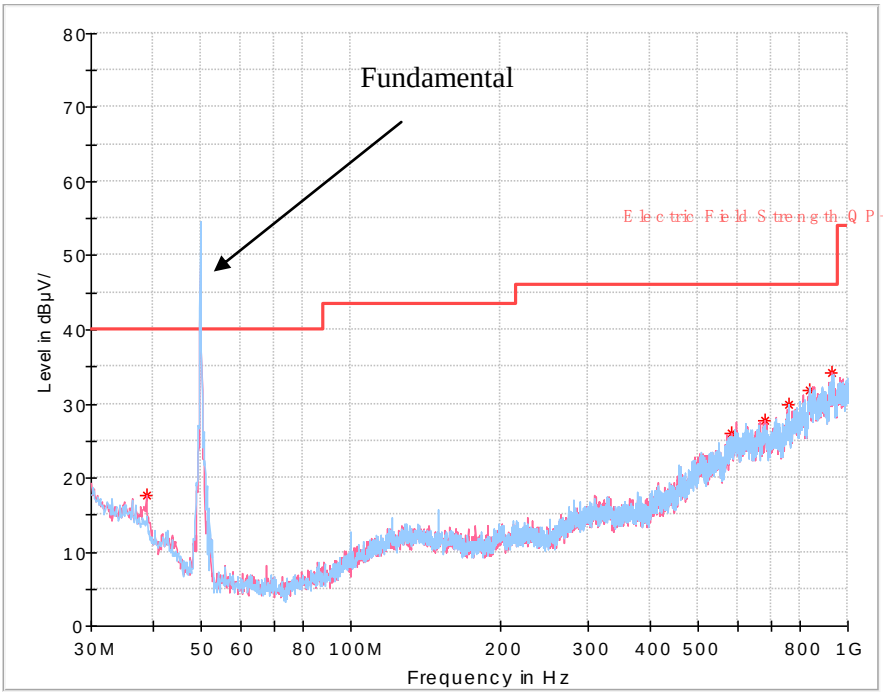
The testing was performed by Harris He on 2020-07-29.

Test Mode: Transmitting (*Scan with X-AXIS, Y-AXIS, Z-AXIS, the worst case is Y-AXIS which was recorded*)

Frequency (MHz)	Corrected Amplitude (dBμV/m)	PK/QP/Ave.	Turntable Degree	Rx Antenna Height (m)	Rx Antenna Polar (H / V)	Corrected Factor (dB)	FCC Part 15.235(a) Limit (dBμV/m)	FCC Part 15.235(a) Margin (dB)	Remark
49.86	54.18	PK	324	1.6	H	-19.6	100	45.82	Fundamental
49.86	49.81	Ave.	324	1.6	H	-19.6	80	30.19	
49.86	52.35	PK	107	1.3	V	-19.6	100	47.65	
49.86	48.12	Ave.	107	1.3	V	-19.6	80	31.88	

Spurious Emission:

30 MHz~1 GHz



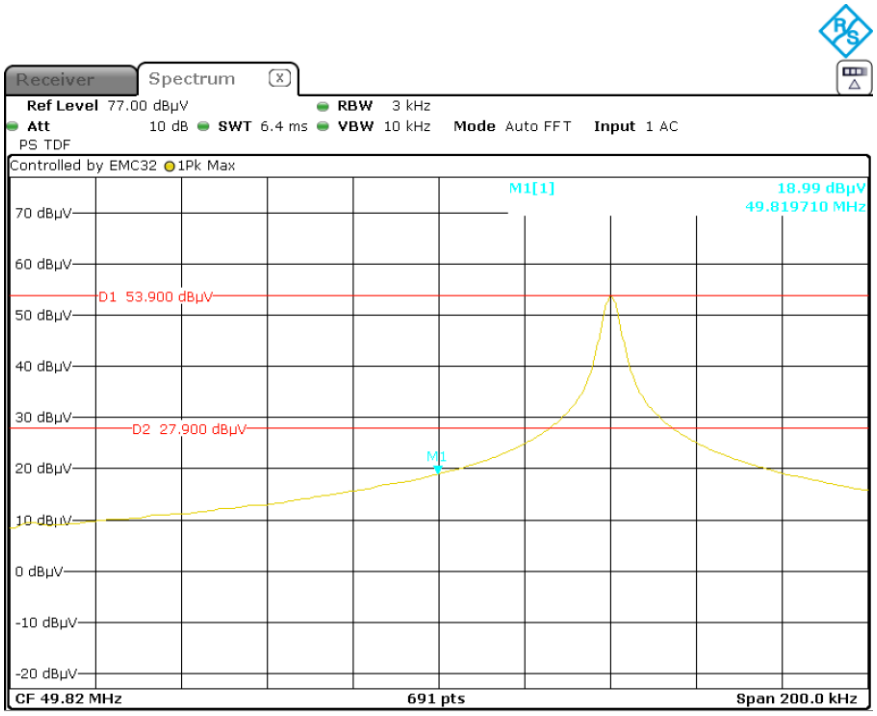
Frequency (MHz)	Corrected Amplitude (dBµV/m)	Antenna height (cm)	Antenna Polarity	Turntable position (degree)	Correction Factor (dB/m)	Limit (dBµV/m)	Margin (dB)
38.730000	17.56	300.0	V	223.0	-13.0	40.00	22.44
581.687500	26.02	200.0	V	295.0	-2.5	46.00	19.98
679.900000	27.72	100.0	V	87.0	-1.4	46.00	18.28
759.197500	29.97	400.0	H	334.0	0.0	46.00	16.03
834.857500	31.81	200.0	H	137.0	2.7	46.00	14.19
930.645000	34.24	200.0	V	274.0	4.7	46.00	11.76

Note:
Corrected Amplitude = Corrected Factor + Reading
Corrected Factor=Antenna factor（RX）+cable loss － amplifier factor
Margin = Limit- Corr. Amplitude

Result: Compliance

Band Edge:

26 dB Band Edge-Left



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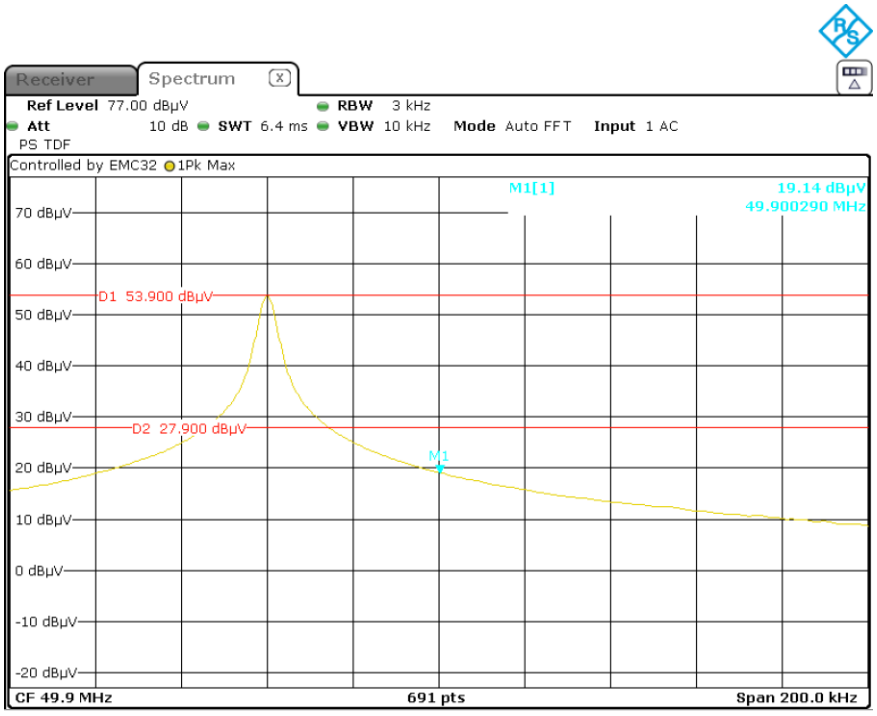
26 dB Band Edge-Right



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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

Per ANSI C63.10-2013 §6.5 & §6.9.

Test Data

Environmental Conditions

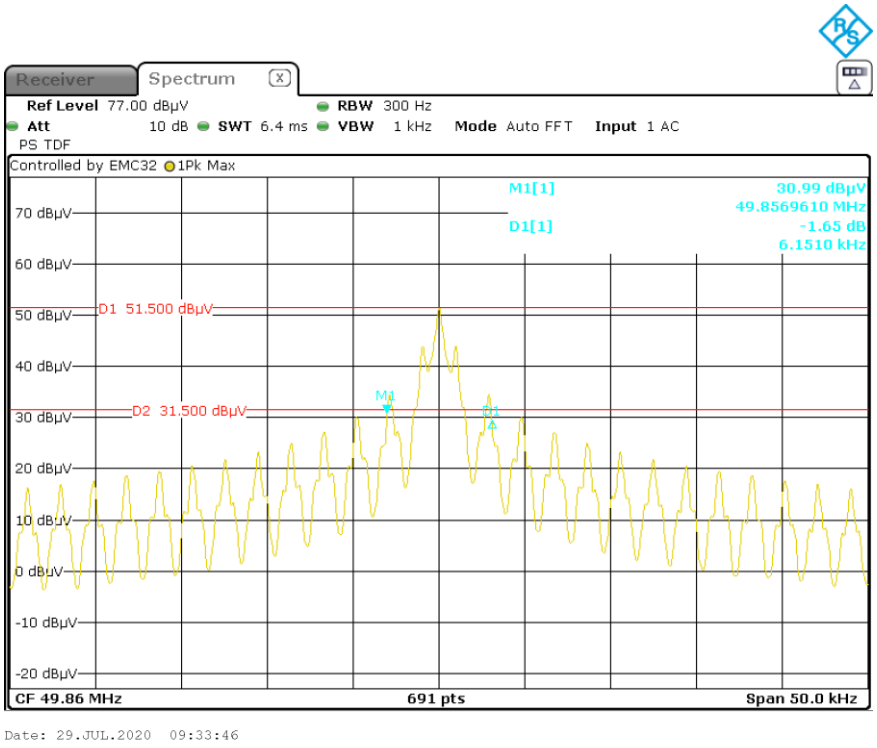
Temperature:	23 ℃
Relative Humidity:	58 %
ATM Pressure:	101.0 kPa

The testing was performed by Zero Yan on 2020-07-29.

Test Mode: Transmitting

Please refer to following plot and table.

20 dB Emission Bandwidth



F_L (MHz)	F_H (MHz)	Permitted frequency range (MHz)	Result
49.856961	49.863112	49.82-49.90	Compliant

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