ACCREDITED
TESTING LABORATORY
CERTIFICATE # 4821.01

BACL
Bay Area Compliance Labs Corp.

FCC PART 15.227

MEASUREMENT AND TEST REPORT

For

JM Manufacturing (HK) Ltd.

Unit G, 4/F Kaiser Estate, Phase 2, No. 47-53 Man Yue Street, Hung Hom, Kowloon, Hong Kong

FCC ID:2AHGJJMSDB2113-27-1

Report Type:	**Product Type:**
Original Report	RC Sleek Speedboat 27MHz remote controller

Report Number:	RSZ191212836-00
Report Date:	2019-12-27
Reviewed By:	Krieron Luo 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 Sleek Speedboat 27MHz remote controller
Tested Model	JMS-DB2113
UPC Number	192234046951
Voltage Range	DC 1.5V*2 from battery
Date of Test	2019-12-20 to 2019-12-24
Sample serial number	RSZ191212836-RF-S1 (Assigned by BACL, Shenzhen)
Received date	2019-12-12
Sample/EUT Status	Good condition

Objective

This report is prepared on behalf of *JM Manufacturing (HK) Ltd.* in accordance with Part 2-Subpart J, and Part 15-Subparts A and C of the Federal Communication Commission's rules.

The objective is to determine the compliance of EUT with FCC rules, section 15.203, 15.205, 15.209, 15.215 and 15.227.

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 mode.

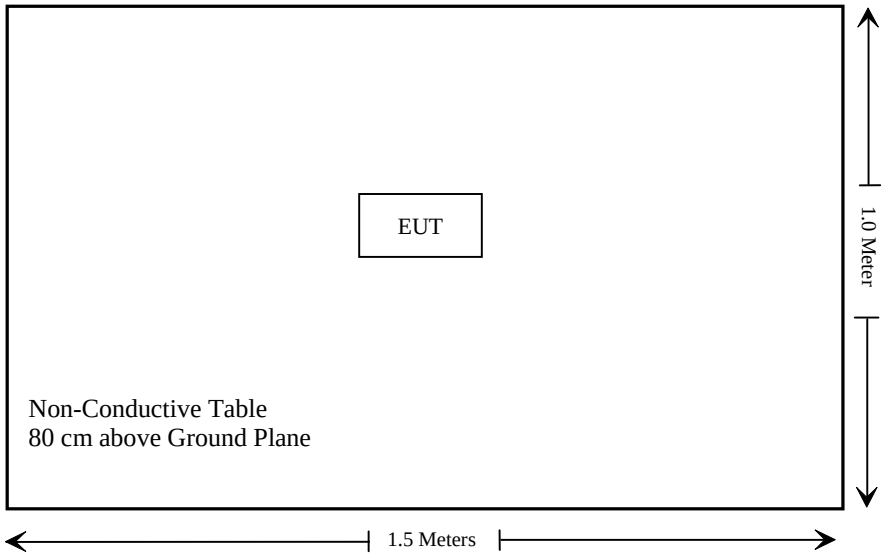
EUT Exercise Software

No exercise software was used.

Equipment Modifications

No modifications.

Block Diagram of Test Setup



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
§15.203	Antenna requirement	Compliance
§15.207	Conducted Emissions	Not Applicable
§15.205, §15.209, §15.227(a), §15.227(b)	Field Strength and Restricted Band Emissions	Compliance
§15.215(c)	20dB Emission 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	2019/7/9	2020/7/8
Sonoma instrument	Pre-amplifier	310 N	186238	2019/4/20	2020/4/20
Sunol Sciences	Broadband Antenna	JB1	A040904-1	2017/12/22	2020/12/21
ETS	Passive Loop Antenna	6512	29604	2018/7/14	2021/7/13
/	Cable 2	RF Cable 2	/	2019/11/29	2020/11/28
/	Cable	Chamber Cable 1	/	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 0.4dBi; fulfill the requirement of this section. Please refer to EUT photos.

Result: Compliant.

FCC§15.205, §15.209, §15.227(a), §15.227 (b) – FIELD STRENGTH AND RESTRICTED BAND EMISSIONS

Applicable Standard

According to FCC §15.227 (a), the field strength if any emission within this band shall not exceed 10,000 microvolts/meter at 3 meters.

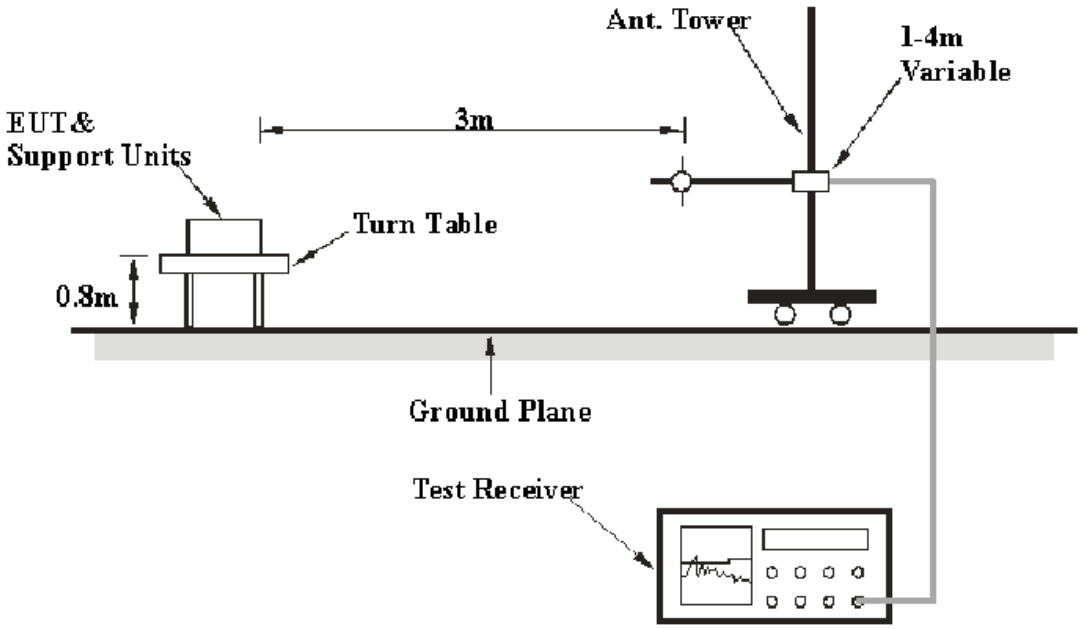
(b) The field strength of any emissions which appear outside of this band shall not exceed the general radiated emission limits in §15.209.

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 16-4-4, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of a radiation emissions measurement at Bay Area Compliance Laboratories Corp. (Shenzhen) is 4.0 dB.(k=2, 95% level of confidence), and the uncertainty will not be taken into consideration for all 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 C63.10-2013. The specification used was the FCC Part 15.205 and 15.209 and 15.227 limits.

EMI Test Receiver Setup

The system was investigated from 9 kHz to 1000 MHz.

Corrected Amplitude & Margin Calculation

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

Corrected Amplitude = Meter Reading + Correction Factor
Correction Factor = Antenna Loss + 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 7dB means the emission is 7dB below the limit. The equation for margin calculation is as follows:

Margin = Limit – Corrected Amplitude

Test Data

Environmental Conditions

Temperature:	23~24 ℃
Relative Humidity:	55~56 %
ATM Pressure:	101.5 kPa

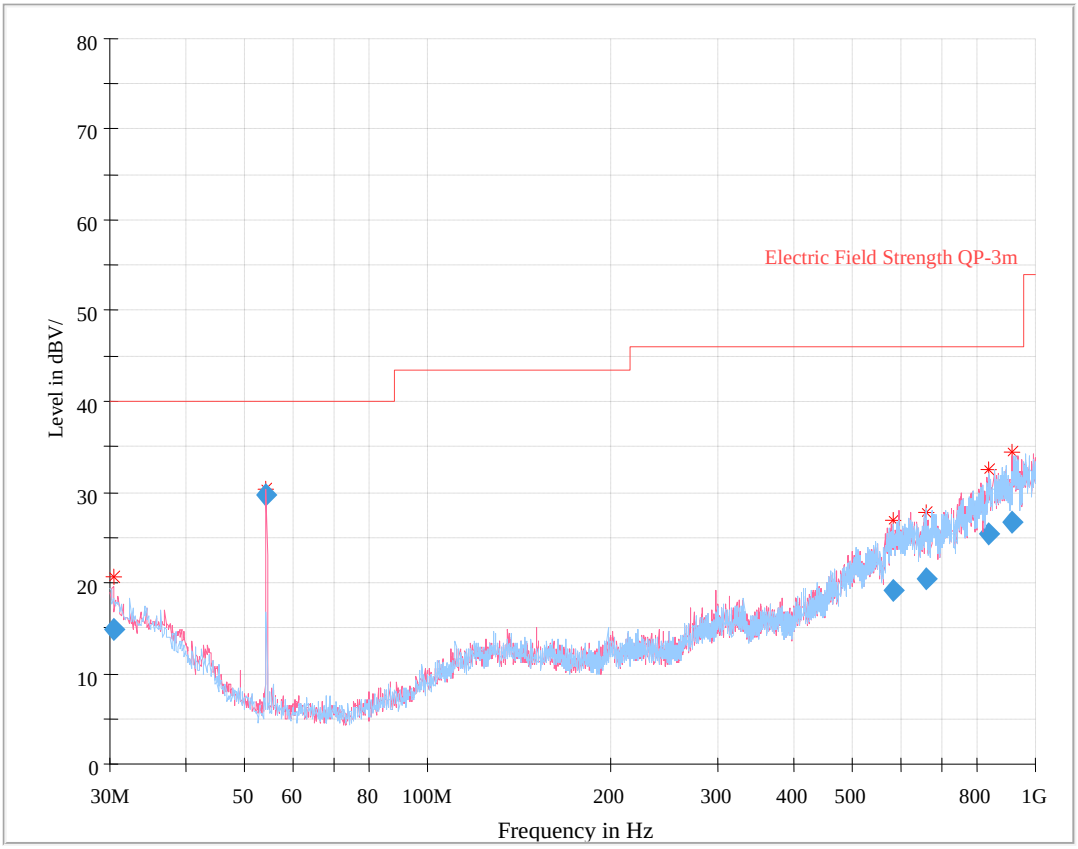
Testing was performed by Zero Yan from 2019-12-20 and 2019-12-24.

Test mode: Transmitting

Frequency (MHz)	Corrected Amplitude (dBμV/m)	Detector (PK/QP/AV)	Turntable Degree	Rx Antenna Height (m)	Rx Antenna Polar	Corrected Factor (dB)	FCC Part 15.227&15.205&15.209 Limit (dBμV/m)	FCC Part 15.227&15.205&15.209 Margin (dB)	Remark
27.145	69.58	PK	118	1	H	30.3	100	30.42	Fundamental
27.145	65.42	Ave.	118	1	H	30.3	80	14.58	
0.0091	59.01	PK	118	1	H	87.8	128.42	69.41	Spurious emission
0.172	60.89	PK	118	1	H	62.2	102.89	42.00	
16.933	56.45	PK	118	1	H	32.2	69.54	13.09	

Note: PK detector data compliance with average detector limit.

30 MHz~1 GHz

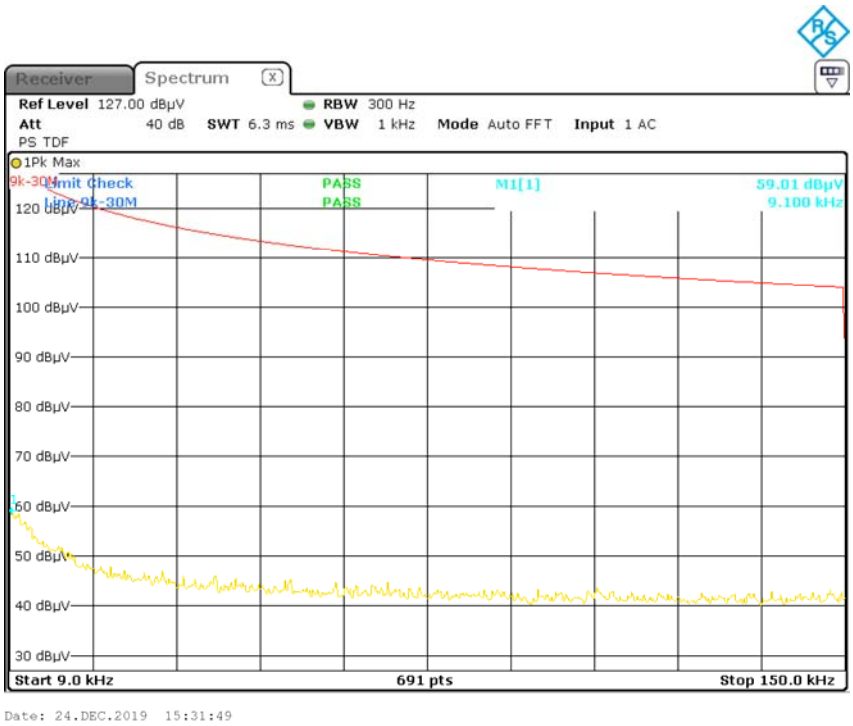


Frequency (MHz)	Corrected Amplitude (dBµV/m)	Antenna height (cm)	Antenna Polarity	Turntable position (degree)	Correction Factor (dB/m)	Limit (dBµV/m)	Margin (dB)
30.411253	14.75	137.0	V	94.0	-7.9	40.00	25.25
54.301375	29.58	102.0	V	250.0	-19.9	40.00	10.42
582.345250	19.24	133.0	H	165.0	-2.5	46.00	26.76
662.400125	20.42	228.0	H	13.0	-1.6	46.00	25.58
835.450625	25.32	219.0	H	114.0	2.7	46.00	20.68
918.022000	26.60	335.0	V	26.0	4.5	46.00	19.40

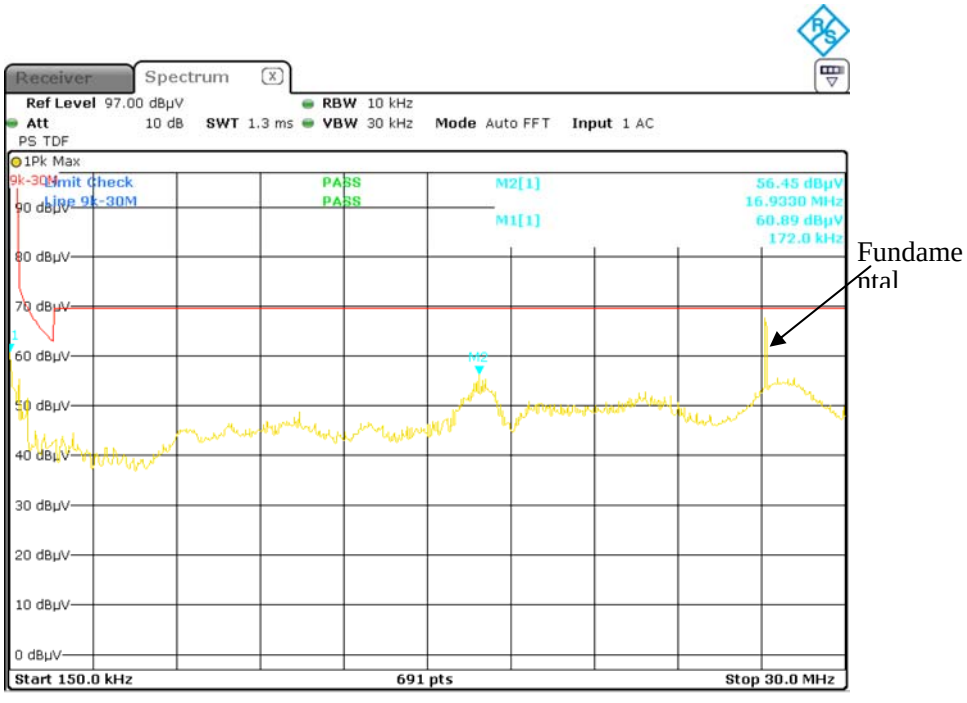
Note:
Corrected Amplitude = Corrected Factor + Reading
Corrected Factor=Antenna factor（RX）+cable loss － amplifier factor
Margin = Limit- Corr. Amplitude

Result: Compliance

9 KHz-150 KHz



150 KHz-30MHz



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 indicated 20dB bandwidth.

4. Repeat above procedures until all frequencies measured were complete.

Test Data

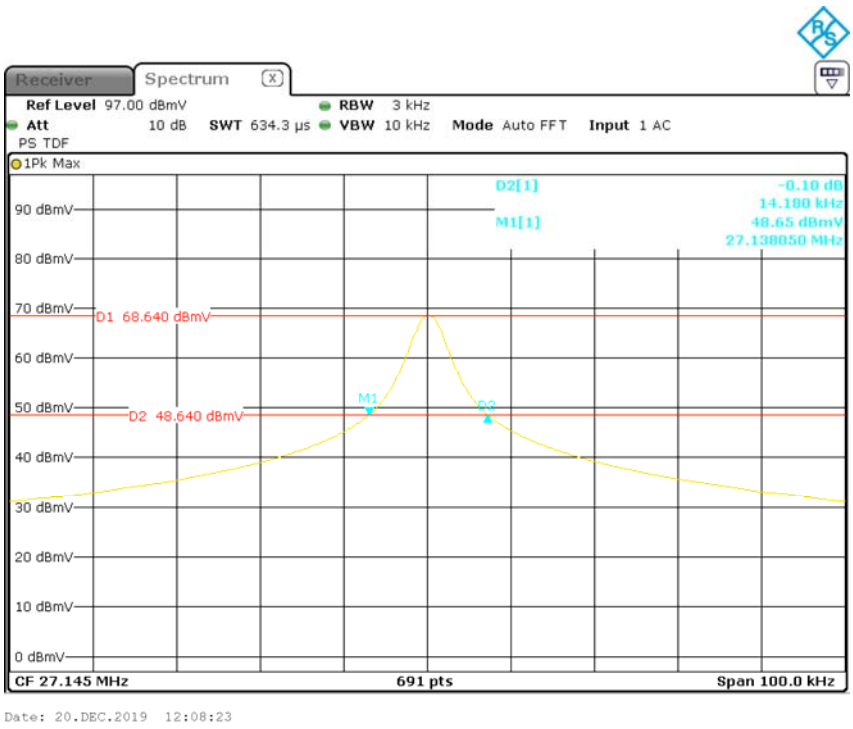
Environmental Conditions

Temperature:	23℃
Relative Humidity:	56 %
ATM Pressure:	101.0 kPa

Testing was performed by Zero Yan on 2019-12-20.

Test Mode: Transmitting

Please refer to the following plots.



Fl(MHz)	Fh (MHz)	Permitted frequency range(MHz)	Result
27.138050	27.152230	26.96-27.28	Compliant

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