

# FCC PART 15.227 MEASUREMENT AND TEST REPORT

For

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**FCC ID: 2AHGJJMSHY9805-27-1**

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|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|
| <b>Report Type:</b><br>Original Report                                                                                                                                                                                                                                                                                          | <b>Product Type:</b><br>RC SPEEDBOAT |
| <b>Report Number:</b> RSZ210115831-00                                                                                                                                                                                                                                                                                           |                                      |
| <b>Report Date:</b> 2021-02-05                                                                                                                                                                                                                                                                                                  |                                      |
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## GENERAL INFORMATION

### Product Description for Equipment under Test (EUT)

|                        |                                                 |
|------------------------|-------------------------------------------------|
| Product                | RC SPEEDBOAT                                    |
| Tested Model           | JMS-HY19805                                     |
| UPC Number             | 1922342700129                                   |
| Test Frequency         | 27.145MHz                                       |
| Antenna Specification* | 0dBi(provided by the applicant)                 |
| Voltage Range          | DC 1.5V*2 AA battery                            |
| Date of Test           | 2021-01-26 to 2021-02-04                        |
| Sample serial number   | RSZ210115831-RF-S1 (Assigned by BACL, Shenzhen) |
| Received date          | 2021-01-15                                      |
| Sample/EUT Status      | Good condition                                  |

### Objective

This report is 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.

### 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.

### 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.

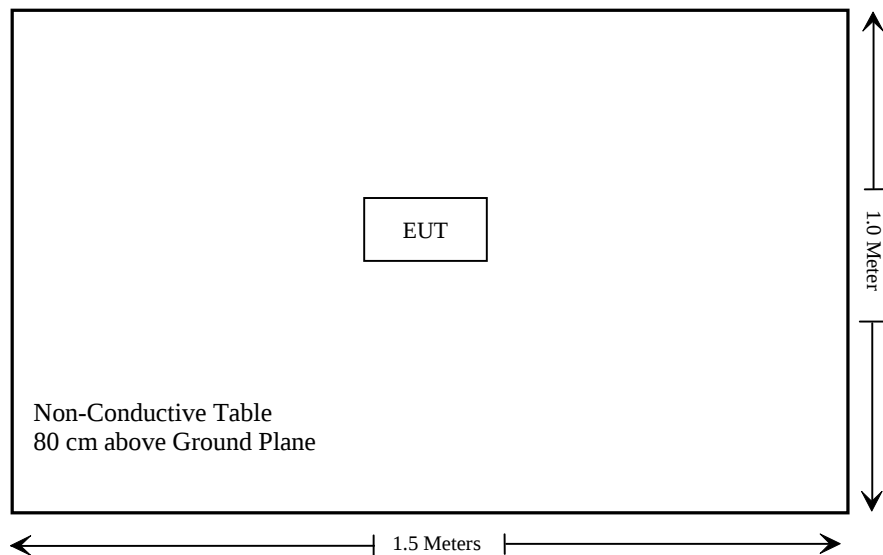
### EUT Exercise Software

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,<br>§15.227(a), §15.227(b) | Field Strength and Restricted<br>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        | 2020/08/04       | 2021/08/03           |
| Sonoma instrument | Pre-amplifier        | 310 N           | 186238        | 2020/08/04       | 2021/08/03           |
| Sunol Sciences    | Broadband Antenna    | JB1             | A040904-1     | 2020/12/22       | 2023/12/21           |
| ETS               | Passive Loop Antenna | 6512            | 29604         | 2018/07/14       | 2021/07/13           |
| Unknown           | Cable 2              | RF Cable 2      | F-03-EM197    | 2020/11/29       | 2021/11/28           |
| Unknown           | Cable                | Chamber Cable 1 | F-03-EM236    | 2020/11/29       | 2021/11/28           |
| 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).

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## **FCC§15.203 - ANTENNA REQUIREMENT**

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### **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 internal 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:** Compliant.

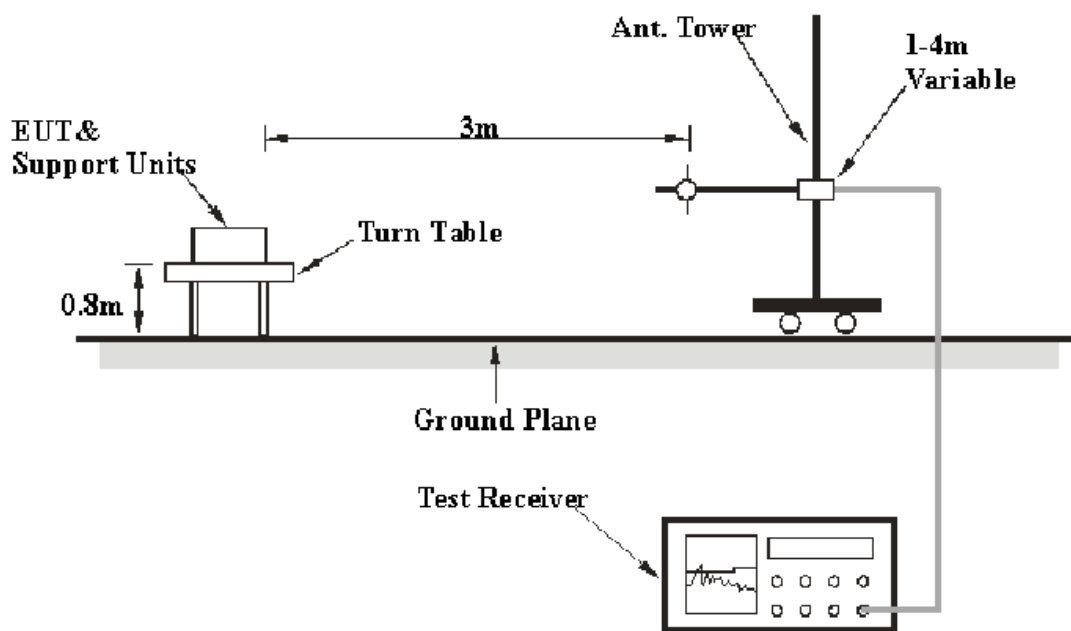
## FCC§15.205, §15.209, §15.227(a), §15.227 (b) – FIELD STRENGTH AND RESTRICTED BAND EMISSIONS

### 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.

### 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 1000MHz.

## 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:

$$\begin{aligned}\text{Corrected Amplitude} &= \text{Meter Reading} + \text{Correction Factor} \\ \text{Correction Factor} &= \text{Antenna Loss} + \text{Cable Loss} - \text{Amplifier Gain}\end{aligned}$$

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:

$$\text{Margin} = \text{Limit} - \text{Corrected Amplitude}$$

## Test Data

### Environmental Conditions

|                           |                 |
|---------------------------|-----------------|
| <b>Temperature:</b>       | 24~25 °C        |
| <b>Relative Humidity:</b> | 52~58%          |
| <b>ATM Pressure:</b>      | 101.0~101.2 kPa |

Testing was performed by Kilroy Deng on 2021-01-26 and Holland Yang on 2021-02-04.

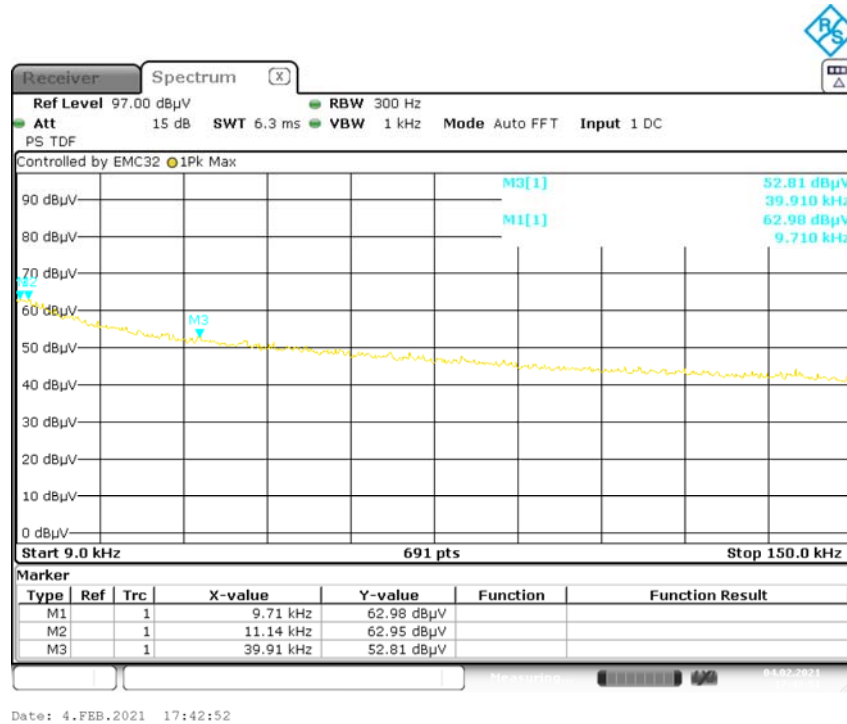
Test mode: Transmitting (Scan with X-AXIS, Y-AXIS, Z-AXIS, the worst case was Y-AXIS which was recorded)

| Frequency<br>(MHz) | Corrected<br>Amplitude<br>(dBμV/m) | PK/QP/Ave. | Turntable<br>Degree | RX<br>Antenna<br>Height<br>(m) | FCC Part<br>15.227&15.205&15.209 |                | Remark               |
|--------------------|------------------------------------|------------|---------------------|--------------------------------|----------------------------------|----------------|----------------------|
|                    |                                    |            |                     |                                | Limit<br>(dBμV/m)                | Margin<br>(dB) |                      |
| 27.127             | 68.56                              | PK         | 135                 | 1                              | 100                              | 31.44          | Fundamental          |
| 27.127             | 67.23                              | Ave.       | 135                 | 1                              | 80                               | 12.77          |                      |
| 0.00971            | 62.98                              | PK         | 135                 | 1                              | 127.86                           | 64.88          | Spurious<br>Emission |
| 0.01114            | 62.95                              | PK         | 135                 | 1                              | 126.67                           | 63.72          |                      |
| 0.03991            | 52.81                              | PK         | 135                 | 1                              | 115.58                           | 62.77          |                      |
| 0.172              | 54.62                              | PK         | 135                 | 1                              | 102.89                           | 48.27          |                      |

**Note 1:** PK detector data compliance with the average and QP detector limit for the spurious emission test.

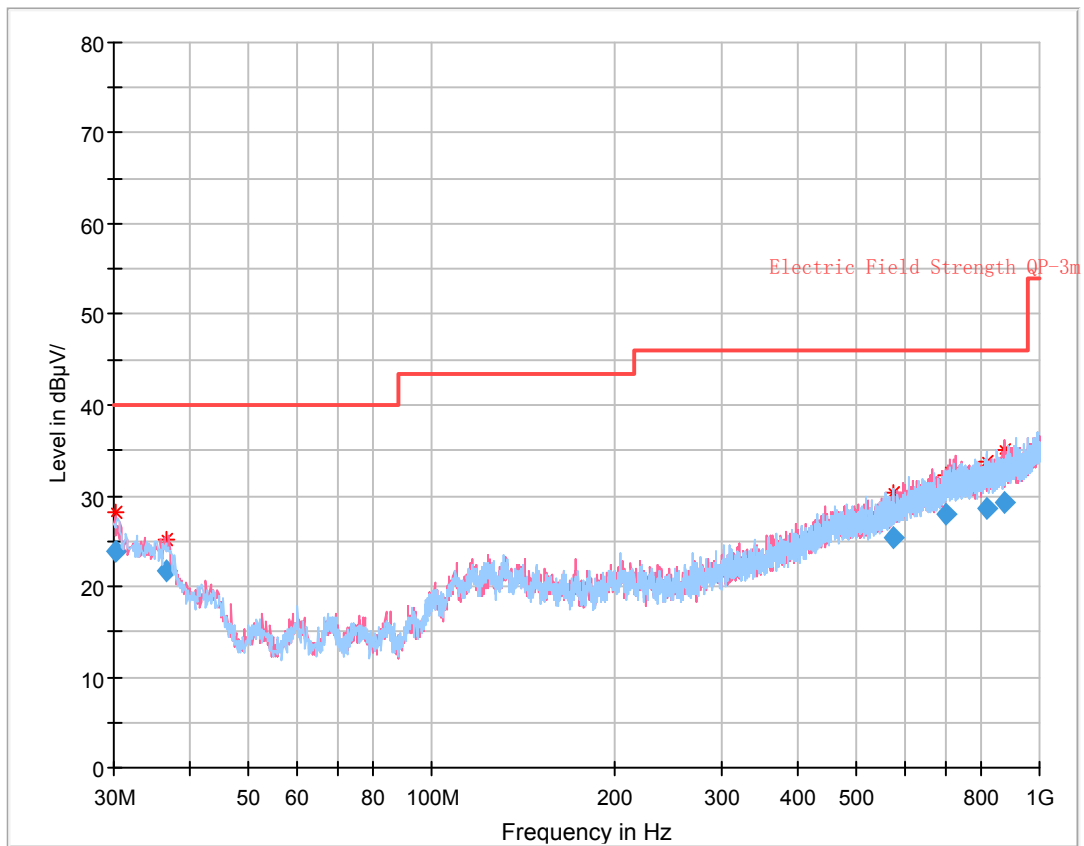
**Note 2:** The antenna factor, cable loss and preamplifier gain had been entered into the analyzer as the transducer factor.

## 9 KHz-150 KHz



## 150 KHz-30MHz



**30 MHz~1 GHz****Final Result**

| Frequency (MHz) | QuasiPeak (dB μ V/m) | Limit (dB μ V/m) | Margin (dB) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB) |
|-----------------|----------------------|------------------|-------------|-------------|-----|---------------|------------|
| 30.231105       | 23.87                | 40.00            | 16.13       | 126.0       | V   | 293.0         | 2.3        |
| 36.745250       | 21.68                | 40.00            | 18.32       | 308.0       | V   | 290.0         | -2.4       |
| 574.196000      | 25.44                | 46.00            | 20.56       | 358.0       | H   | 0.0           | 2.2        |
| 701.636500      | 27.90                | 46.00            | 18.10       | 400.0       | V   | 154.0         | 4.5        |
| 816.335750      | 28.61                | 46.00            | 17.39       | 132.0       | H   | 198.0         | 5.7        |
| 873.896000      | 29.22                | 46.00            | 16.78       | 100.0       | V   | 98.0          | 6.6        |

**Note:**

Corrected Amplitude = Corrected Factor + Reading

Corrected Factor=Antenna factor (RX) +cable loss - amplifier factor

Margin = Limit- Corr. Amplitude

**Result:** Compliance

**FCC§15.215(c) - 20dB EMISSION BANDWIDTH**

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**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 §6.4 & §6.9.

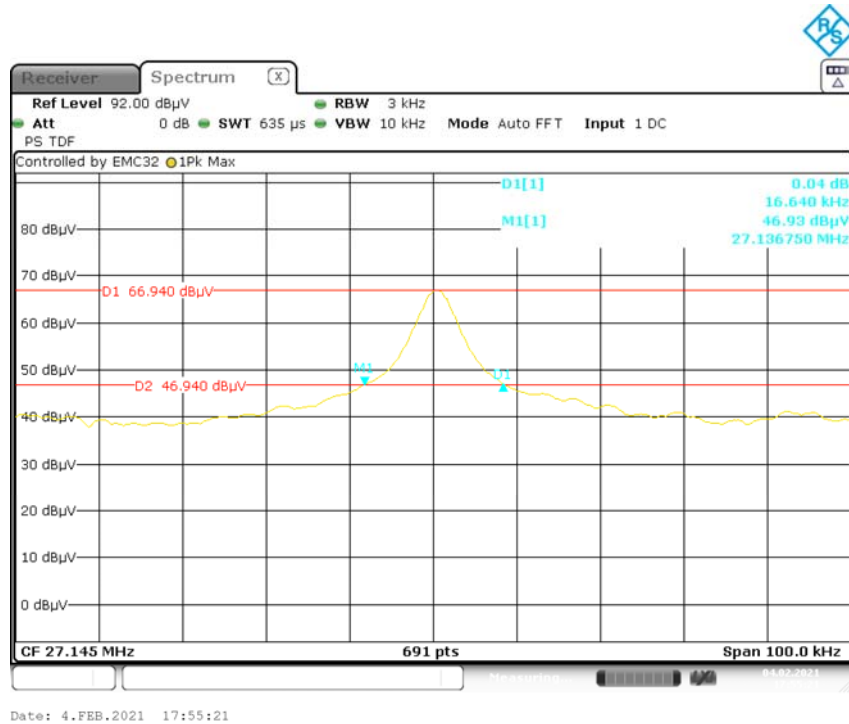
**Test Data****Environmental Conditions**

|                           |           |
|---------------------------|-----------|
| <b>Temperature:</b>       | 25 °C     |
| <b>Relative Humidity:</b> | 50 %      |
| <b>ATM Pressure:</b>      | 101.0 kPa |

*Testing was performed by Zero Yan on 2021-02-04.*

*Test Mode: Transmitting*

*Please refer to the following plots.*



| F <sub>L</sub> (MHz) | F <sub>H</sub> (MHz) | Permitted frequency range(MHz) | Result    |
|----------------------|----------------------|--------------------------------|-----------|
| 27.13675             | 27.15339             | 26.65-27.65                    | Compliant |

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