May Cheong Toy Products Fty. Ltd.

TEST REPORT

SCOPE OF WORK
RF TESTING–81200(13092/11011)

REPORT NUMBER
SZHH01243839-001

ISSUE DATE

June 4, 2018

PAGES
14

DOCUMENT CONTROL NUMBER
FCC 15C_RX_b

May Cheong Toy Products Fty. Ltd.

Application For Certification

FCC ID: PKG81200RC49M

Product Name: 1/14 Express Lane RC

Additional names: Radio Control Vehicle Light Runners R/C, Asst. ; 1:16 Off-Road RC, Asst. ;1:16 Off-Road RC in open touch box (w/pistol grip controller) ; 1:16 Harley-Davidson R/C asst. ; Radio Control Vehicle 1:24 Formula R/C - Ferrari F138 ; Radio Control Vehicle 1:18 R/C Red Bull Racing RB9 ; Radio Control Vehicle 1:24 R/C Red Bull Racing RB9 ; 1/14 Express Lane RC ; 1:16 R/C Recon Rover ; 1:16 Off-Road R/C, Assorted

Model: 81200(13092/11011)

Additional Models: See page 5

Superregenerative Receiver

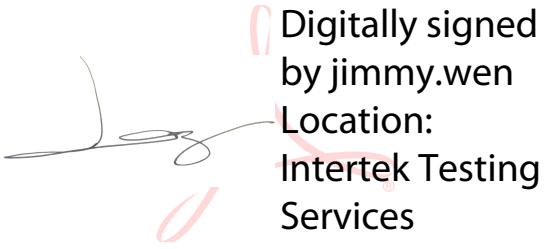
Report No.: SZHH01243839-001

We hereby certify that the sample of the above item is considered to comply with the requirements of FCC Part 15, Subpart B for Superregenerative Receiver, mention 47 CFR [10-1-17]

Prepared and Checked by:

Sign on file
Terry Tang
Senior Engineer

Approved by:



Jimmy Wen
Supervisor
Date: June 4, 2018

GENERAL INFORMATION

May Cheong Toy Products Fty. Ltd.

MODEL: 81200(13092/11011)

FCC ID: PKG81200RC49M

Grantee:	May Cheong Toy Products Fty. Ltd.
Grantee Address:	Unit 901-2, 9/F., East Ocean Centre, 98 Granville Road, Tsimshatsui East Kowloon Hong Kong
Contact Person:	Anson Wang
Tel:	(769)8775 3128ext132
Manufacturer:	May Cheong Toy Products Fty. Ltd.
Manufacturer Address:	Unit 901-2, 9/F., East Ocean Centre, 98 Granville Road, Tsimshatsui East Kowloon Hong Kong
Model:	81200(13092/11011)
Type of EUT:	Superregenerative Receiver
Description of EUT:	1/14 Express Lane RC
Serial Number:	N/A
FCC ID :	PKG81200RC49M
Date of Sample Submitted:	May 15, 2018
Date of Test:	May 18, 2018
Report No.:	SZHH01243839-001
Report Date:	June 4, 2018
Environmental Conidtions:	Temperature: +10 to 40°C Humidity: 10 to 90%

SUMMARY OF TEST RESULT

May Cheong Toy Products Fty. Ltd.

MODEL: 81200(13092/11011)

FCC ID: PKG81200RC49M

TEST SPECIFICATION	REFERENCE	RESULTS
Maximum Peak Output Power	15.247(b), (c) / RSS-210 A8.4	N/A
Hopping Channel Carrier Frequencies Separation	15.247(e) / RSS-210 A8.1	N/A
20dB Bandwidth of the Hopping Channel	15.247(a) / RSS-210 A8.1	N/A
Number of Hopping Frequencies	15.247(e) / RSS-210 A8.1	N/A
Average Time of Occupancy of Hopping Frequency	15.247(e) / RSS-210 A8.1	N/A
Anteann Conducted Spurious Emissions	15.247(d) / RSS-210 A8.5	N/A
Radiated Spurious Emissions	15.247(d) / RSS-210 A8.5	N/A
RF Exposure Compliance	15.247(i) / RSS-Gen 5.5	N/A
Transmitter Power Line Conducted Emissions	15.207 / RSS-Gen 7.2.2	N/A
Transmitter Field Strength	15.227 / RSS-310 3.8	N/A
Transmitter Field Strength	15.229 / RSS-210 A2.7	N/A
Transmitter Field Strength, Bandwidth and Timing Requirement	15.231(a) / RSS-210 A1.1.1	N/A
Transmitter Field Strength, Bandwidth and Timing Requirement	15.231(e) / RSS-210 A1.1.5	N/A
Transmitter Field Strength and Bandwidth Requirement	15.239 / RSS-210 A2.8	N/A
Transmitter Field Strength and Bandwidth Requirement	15.249 / RSS-210 A2.9	N/A
Transmitter Field Strength and Bandwidth Requirement	15.235 / RSS-310 3.9	N/A
Receiver / Digital Device Radiated Eissions	15.109 / ICES-003	Pass
Digital Device Conducted Emissions	15.107 / ICES-003	N/A

Table of Contents

1.0 General Description

1.1 Product Description

The equipment under test (EUT) is a receiver for a 1/14 Express Lane RC operating at 49.860MHz. The EUT is powered by six 1.5V AA batteries. For more detail information pls. refer to the user manual.

The model: 81200 is package numbers which include a transmitter and a receiver, the transmitter model number is 13092, receiver model number is 11011, the additional model: 81202 is same as the model: 81200 in hardware and electrical aspect. The difference in appearance and model number serves as marketing strategy.

The Additional receiver Models: 82052/82072(82067/82068/82069/82071); 82040(82041/82042); 81074/81084/81143; 81200(1012/11017); 81127; 81100(81092/81095/81096/81098) are the same as the Model: 11011 in hardware aspect (circuitry and electrical, mechanical and physical construction), the only differences are the appearance and product name and model no. for trading purpose.

Antenna Type: integral antenna

Type of modulation: Pulse modulation

For electronic filing, the brief circuit description is saved with filename: descri.pdf.

1.2 Related Submittal(s) Grants

This is an application for certification of a receiver for the 1/14 Express Lane RC, and there has a transmitter which associated with this EUT, has FCC ID: PKG13086RC49M and has been granted.

1.3 Test Methodology

Radiated emission measurements were performed according to the procedures in ANSI C63.4 (2013). Radiated Emission measurement was performed in a Semi-anechoic chamber. Preliminary scans were performed in the Semi-anechoic chamber only to determine worst case modes. . For each scan, the procedure for maximizing emissions in Appendices D and E were followed. All Radiated tests were performed at an antenna to EUT distance of 3 meters, unless stated otherwise in the **"Justification Section"** of this Application.

1.4 Test Facility

The Semi-anechoic chamber and shielding room used to collect the radiated data and conducted data are Intertek **Testing Services Shenzhen Ltd. Longhua Branch** and located at 1F/2F, Building B, QiaoAn Scientific Technology Park, Shangkeng Community, Guanhu Subdistrict, Longhua District, Shenzhen, P.R. China. This test facility and site measurement data have been fully placed on file with File Number: CN1188.

2.0 System Test Configuration

2.1 Justification.

The system was configured for testing in a typical fashion (as a customer would normally use it), and in the confines as outlined in ANSI C63.4 (2014).

The EUT was powered by six new 1.5V AA batteries during test.

For maximizing emissions below 30 MHz, the EUT was rotated through 360°, the centre of the loop antenna was placed 1 meter above the ground, and the antenna polarization was changed. For maximizing emission at and above 30 MHz, the EUT was rotated through 360°, the antenna height was varied from 1 meter to 4 meters above the ground plane, and the antenna polarization was changed. This step by step procedure for maximizing emissions led to the data report in Exhibit 3.0.

The unit was operated standalone and placed in the centre of the turntable

The equipment under test (EUT) was configured for testing in a typical fashion (as a customer would normally use it). The EUT was mounted to a plastic stand if necessary and placed on the polystyrene turntable, which enabled the Senior Engineer to maximize emissions through its placement in the three orthogonal axes.

2.2 EUT Exercising Software

There was no special software to exercise the device. Once the unit is powered up, it can transmit the RF signal continuously.

2.3 Special Accessories

There are no special accessories necessary for compliance of this product.

2.4 Equipment Modification

Any modifications installed previous to testing by May Cheong Toy Products Fty. Ltd. will be incorporated in each production model sold/leased in the United States.

No modifications were installed by Intertek Testing Services Shenzhen Ltd. Longhua Branch.

2.5 Measurement Uncertainty

When determining of the test conclusion, the Measurement Uncertainty of test has been considered.

2.6 Support Equipment List and Description
N/A.

3.0 Emission Results

Data is included of the worst case configuration (the configuration which resulted in the highest emission levels). A sample calculation, configuration photographs and data tables of the emissions are included.

3.1 Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain (if any), Average Factor (optional) from the measured reading. The basic equation with a sample calculation is as follows:

FS = RA + AF + CF - AG - AV

where FS = Field Strength in dBµV/m
RA = Receiver Amplitude (including preamplifier) in dBµV
CF = Cable Attenuation Factor in dB
AF = Antenna Factor in dB
AG = Amplifier Gain in dB
AV = Average Factor in dB

In the following table(s), the reading shown on the data table reflects the preamplifier gain. An example for the calculations in the following table is as follows:

FS = RR + LF

where FS = Field Strength in dBµV/m
RR = RA - AG - AV in dBµV
LF = CF + AF in dB

Assume a receiver reading of 52.0 dBµV is obtained. The antenna factor of 7.4 dB and cable factor of 1.6 dB are added. The amplifier gain of 29 dB and average factor of 5 dB are subtracted, giving a field strength of 27 dBµV/m. This value in dBµV/m was converted to its corresponding level in µV/m.

RA = 52.0 dBµV/m
AF = 7.4 dB
CF = 1.6 dB
AG = 29.0 dB
AV = 5.0 dB
RR = 18.0 dBµV
LF = 9.0 dB
FS = RR + LF
FS = 18 + 9 = 27 dBµV/m

Level in µV/m = Common Antilogarithm [(27 dBµV/m)/20] = 22.4 µV/m

3.2 Radiated Emission Configuration Photograph

Worst Case Radiated Emission at 50.320 MHz

For electronic filing, the worst case radiated emission configuration photographs are saved with filename: radiated photos.pdf.

3.3 Radiated Emission Data

The data on the following page lists the significant emission frequencies, the limit and the margin of compliance. Numbers with a minus sign are below the limit.

Judgment: Passed by 9.8dB

TEST PERSONNEL:

Sign on file

Terry Tang, Senior Engineer
Typed/Printed Name

May 18, 2018
Date

Applicant: May Cheong Toy Products Fty. Ltd.
Date of Test: May 18, 2018 Model: 81200(13092/11011)

Worst Case Operating Mode: Receive

Table

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-amp (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	47.980	32.4	20	11.0	23.4	40.0	-16.6
Horizontal	51.840	31.0	20	11.0	22.0	40.0	-18.0
Horizontal	52.900	31.7	20	11.0	22.7	40.0	-17.3
Vertical	49.420	37.7	20	11.0	28.7	40.0	-11.3
Vertical	50.320	39.2	20	11.0	30.2	40.0	-9.8
Vertical	50.760	37.1	20	11.0	28.1	40.0	-11.9

NOTES: 1. Quasi Peak Detector Data unless otherwise stated.

2. All measurements were made at 3 meters. Harmonic emissions not detected at the 3-meter distances were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other harmonic emissions than those reported were detected at a test distance of 0.3-meter.

3. Negative sign in the column shows value below limit.

4.0 Equipment Photographs

For electronic filing, the photographs are saved with filename: external photos.pdf and internal photos.pdf.

5.0 Product Labelling

For electronic filing, the FCC ID label artwork and the label location are saved with filename: label.pdf.

6.0 Technical Specifications

For electronic filing, the block diagram and schematic of the tested EUT are saved with filename: block.pdf and circuit.pdf respectively.

7.0 Instruction Manual

For electronic filing, a preliminary copy of the Instruction Manual is saved with filename: manual.pdf.

This manual will be provided to the end-user with each unit sold/leased in the United States.

8.0 Miscellaneous Information

This miscellaneous information includes details of the measured bandwidth, the test procedure and calculation of factors such as pulse desensitization and averaging factor.

8.1 Stabilization Waveform

Previous to the testing, the superregenerative receiver was stabilized as outlined in the test procedure. For the electronic filing, the plot saved with filename: superreg.pdf show the fundamental emission when a signal generator was used to stabilize the receiver. Please note that the antenna was placed as close as possible to the EUT for clear demonstration of the waveform and that accurate readings are not possible from this plot.

8.2 Discussion of Pulse Desensitization

This device is a superregenerative receiver. No desensitization of the measurement equipment is required as the received signals are continuously.

8.3 Calculation of Average Factor

This device is a superregenerative receiver. It is not necessary to apply average factor to the measurement result.

8.4 Emissions Test Procedures

The following is a description of the test procedure used by Intertek Testing Services in the measurements of superregenerative receivers operating under the Part 15, Subpart B rules.

The test set-up and procedures described below are designed to meet the requirements of ANSI C63.4 - 2014. Superregenerative receivers are stabilized prior to measurement by generating a signal well above the receiver threshold whose frequency is tuned until the emissions stabilize into a line spectrum. The signal is usually generated as CW with a R&S SML03 signal generator and a short whip antenna and is at a level of several hundred to several thousand mV/m. Plots of the stabilized signal will be shown. If a modulated signal is used, it will be noted.

The equipment under test (EUT) is placed on a styrene turntable which is four feet in diameter and approximately 0.8 meter in height above the ground plane. During the radiated emissions test, the turntable is rotated and any cables leaving the EUT are manipulated to find the configuration resulting in maximum emissions. The EUT is adjusted through all three orthogonal axes to obtain maximum emission levels. The antenna height and polarization are varied during the testing to search for maximum signal levels.

The frequency range scanned is from 30 MHz to 1000 MHz.

8.4 Emissions Test Procedures (cont'd)

The EUT is warmed up for 15 minutes prior to the test.

AC power to the unit is varied from 85% to 115% nominal and variation in the fundamental emission field strength is recorded. If battery powered, a new, fully charged battery is used.

Conducted measurements are made as described in ANSI C63.4 - 2014.

The IF bandwidth used for measurement of radiated signal strength was 10 kHz for emission below 30 MHz and 120 kHz for emission from 30 MHz to 1000 MHz. Where pulsed transmissions of short enough pulse duration warrant, a greater bandwidth is selected according to the recommendations of Hewlett Packard Application Note 150-2.

Transmitter measurements are normally conducted at a measurement distance of three meters. However, to assure low enough noise floor in the restricted bands, signals are acquired at a distance of one meter or less. All measurements are extrapolated to three meters using inverse scaling, but those measurements taken at a closer distance are so marked.

9.0 Equipment List

Equipment No.	Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Due Date
SZ185-01	EMI Receiver	R&S	ESCI	100547	24-Jan-18	24-Jan-19
SZ188-01	Anechoic Chamber	ETS	RFD-F/A-100	4102	16-Jan-17	16-Jan-19
SZ062-02	RF Cable	RADIALL	RG 213U	--	8-Jan-18	8-Jul-18
SZ062-05	RF Cable	RADIALL	0.04-26.5GHz	--	11-Mar-18	11-Sep-18
SZ061-06	Active Loop Antenna	Electro-Metrics	EM-6876	217	2-May-18	2-May-19
SZ061-12	BiConiLog Antenna	ETS	3142E	00166158	20-Sep-17	20-Sep-18
SZ180-01	Signal Generator	R&S	SML03	--	1-Jun-17	1-Jun-18