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TEST REPORT

Report No.: 18061026HKG-004R1

Kidztech Toys Manufacturing Ltd

Application For Certification
(Original Grant)

FCC ID: OTM-8502118-49MRX

Superregenerative Receiver

This report supersedes previous report with report number 18061026HKG-004 dated July 06, 2018.
Please refer TY-S18-0261 Letter issued on August 17, 2018 for amendment/ supersede notification.

Prepared and Checked by:	**Approved by:**
Signed On File Tam Chu Kwong, Bismarck Assistant Engineer	Digitally signed by Kenneth Wong Location: Intertek Testing Services Hong Kong Ltd. Wong Kwok Yeung, Kenneth Senior Lead Engineer Date: August 17, 2018

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GENERAL INFORMATION

Grantee:	Kidztech Toys Manufacturing Ltd
Grantee Address:	Room 1201, 12/F., Inter-Continental Plaza, 94 Granville Road, Tsim Sha Tsui East, Kowloon, Hong Kong.
Contact Person:	Eric Ho
Tel:	(852) 2721 8868
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e-mail:	N/A
Manufacturer:	Kidztech Intelligent Technology Co., Ltd.
Manufacturer Address:	No. 9, Zhen Dao Gou Dong Industrial Avenue, Yong Xin Industrial Estate, Lian Shang Town, Chenghai District, Shantou City, 515833, Guangdong, China
Brand Name:	Kidztech Toys
Model:	85021
Additional Model:	85051, 85071, 85091, 85101, 85111, 85121, 85131, 85181, 85221, 85231, 85241, 85281, 85291, 85301, 85311, 85331, 85341, 85351, 85361, 85391, 85411, 85421, 85431, 85511, 85022, 85052, 85072, 85092, 85102, 85112, 85122, 85132, 85182, 85222, 85232, 85242, 85282, 85292, 85302, 85312, 85332, 85342, 85352, 85362, 85392, 85412, 85422, 85432, 85512, AD15452, 85126, 85286, 5F62D85, 5F62D86, 5F62DB7
Type of EUT:	Superregenerative Receiver
Description of EUT:	1/16 RC Cars
Serial Number:	N/A
FCC ID:	OTM-8502118-49MRX
Date of Sample Submitted:	June 25, 2018
Date of Test:	June 25, 2018 to June 28, 2018
Report No.:	18061026HKG-004R1
Report Date:	August 17, 2018
Environmental Conditions:	Temperature: +10 to 40°C Humidity: 10 to 90%

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SUMMARY OF TEST RESULT

Test Specification	Reference	Results
Transmitter Field Strength and Bandwidth Requirement	15.239	Pass
Receiver / Digital Device Radiated Emissions	15.109	Pass

The equipment under test is found to be complying with the following standards:
FCC Part 15, October 1, 2017 Edition

Note: 1. The EUT uses a permanently attached antenna which, in accordance to section 15.203, is considered sufficient to comply with the pervisions of this section.
2. Pursuant to FCC part 15 Section 15.215(c), the 20 dB bandwidth of the emission was contained within the frequency band designated (mentioned as above) which the EUT operated. The effects, if any, from frequency sweeping, frequency hopping, other modulation techniques and frequency stability over excepted variations in temperature and supply voltage were considered.

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1.0 GENERAL DESCRIPTION

1.1 Product Description

The Equipment Under Test (EUT) is portable car unit for Remote controlled car set which operates at 49.860MHz. The EUT is powered by 5 x 1.5V AA batteries.

After switch on the EUT, the car will be moved forward or backward, turned left or right based on the joystick control in the controller.

The Model: 85051, 85071, 85091, 85101, 85111, 85121, 85131, 85181, 85221, 85231, 85241, 85281, 85291, 85301, 85311, 85331, 85341, 85351, 85361, 85391, 85411, 85421, 85431, 85511, 85022, 85052, 85072, 85092, 85102, 85112, 85122, 85132, 85182, 85222, 85232, 85242, 85282, 85292, 85302, 85312, 85332, 85342, 85352, 85362, 85392, 85412, 85422, 85432, 85512, AD15452, 85126, 85286, 5F62D85, 5F62D86 and 5F62DB7 are the same as the Model: 85021 in hardware aspect. The difference in model number serves as marketing strategy. The models are different in non-conductive outer casing of corresponding receiver only.

Antenna Type: Internal, Integral

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

1.2 Related Submittal(s) Grants

This is a single application for certification of a receiver.

The Certification procedure of transmitter for this receiver (with FCC ID: OTM-8502118-49MTX) is being processed as the same time of this application.

1.3 Test Methodology

Radiated emission measurement was performed according to the procedures in ANSI C63.10 (2013). All radiated measurements were performed in an 3m Chamber. Preliminary scans were performed in the 3m Chamber only to determine worst case modes. 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 3m Chamber facility used to collect the radiated data is located at Workshop No. 3, G/F., World-Wide Industrial Centre, 43-47 Shan Mei Street, Fo Tan, Sha Tin, N.T., Hong Kong. This test facility and site measurement data have been placed on file with the FCC.

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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 C63.10 (2013).

The device was powered by new DC 7.5V (5 x 1.5V AA batteries).

For maximizing emissions, 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 reported in Exhibit 3.0.

The unit was operated standalone and placed in the center 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 wooden turntable, which enabled the 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 transmits the RF signal continuously.

2.3 Special Accessories

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

2.4 Measurement Uncertainty

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

2.5 Support Equipment List and Description

N/A.

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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
FS = RR + LF
FS = 18 + 9 = 27 dBµV/m

RR = 18.0 dBµV
LF = 9.0 dB

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

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3.2 Radiated Emission Configuration Photograph

The worst case in radiated emission was found at 49.500 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 13.2 dB

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RADIATED EMISSIONS

Model: 85021
Date of Test: June 28, 2018
Worst-Case Operating Mode: Receiver

Table 1
Pursuant to FCC Part 15 Section 15.109 Requirement

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-amp (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Limit at 3m (dBµV/m)	Margin (dB)
H	49.000	30.3	16	11.0	25.3	40.0	-14.7
V	49.500	31.8	16	11.0	26.8	40.0	-13.2
V	***50.460***	***31.0***	***16***	***11.0***	***26.0***	***40.0***	***-14.0***
H	51.000	30.7	16	11.0	25.7	40.0	-14.3
H	51.870	30.4	16	11.0	25.4	40.0	-14.6
H	98.000	28.7	16	12.0	24.7	43.5	-18.8
H	***147.000***	***25.6***	***16***	***14.0***	***23.6***	***43.5***	***-19.9***
H	***196.000***	***23.1***	***16***	***16.0***	***23.1***	***43.5***	***-20.4***

NOTES:
1. 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. Horn antenna is used for the emission over 1000MHz.
5. Emission (the row indicated by ***bold italic***) within the restricted band meets the requirement of FCC Part 15 Section 15.205.
6. Measurement Uncertainty is ±5.3dB at a level of confidence of 95%.

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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 electronics 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.

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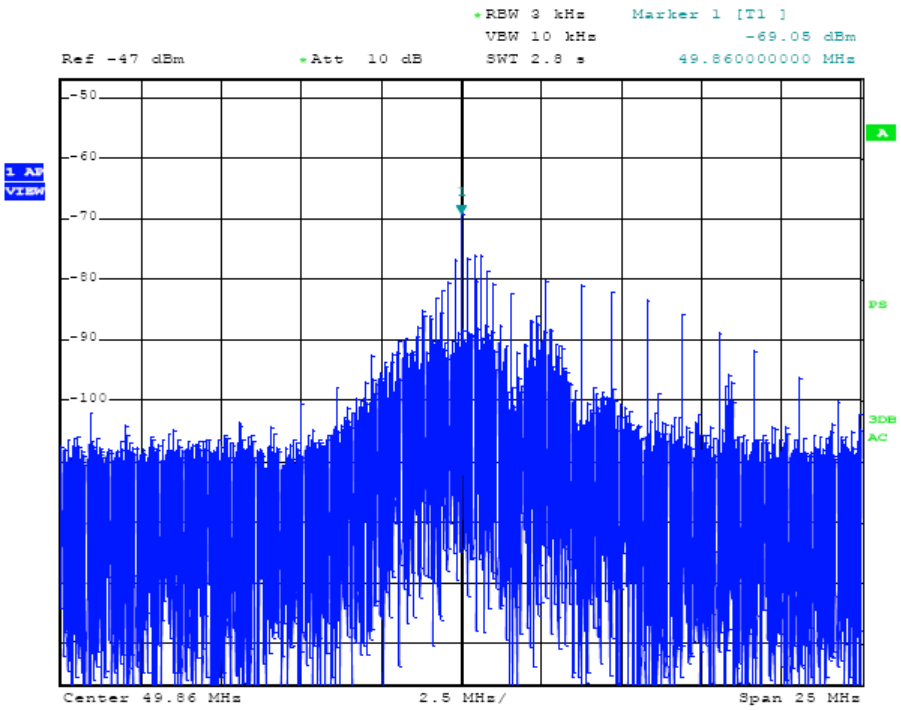
8.0 MISCELLANEOUS INFORMATION

The miscellaneous information includes details of the test procedure and measured bandwidth / calculation of factor such as pulse desensitization and averaging factor (calculation and timing diagram).

8.1 Stabilization Waveform

Previous to the testing, the superregenerative receiver was stabilized as outlined in the test procedure. The plot shows the fundamental emission when a signal generator was used to stabilize the receiver. Please not 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.

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8.4 Emissions Test Procedures

The following is a description of the test procedure used by Intertek Testing Services Hong Kong Ltd. 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 C63.10 (2013). A typical or an unmodulated CW signal at the operating frequency of the EUT has been supplied to the EUT for all measurements. Such a signal is supplied by a signal generator and an antenna in close proximity to the EUT. The signal level is sufficient to stabilize the local oscillator of the EUT.

The equipment under test (EUT) is placed on a wooden turntable which is four feet in diameter and approximately one meter in height above the groundplane. 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 antenna height and polarization are also varied during the testing to search for maximum signal levels. The height of the antenna is varied from one to four meters.

Detector function for radiated emissions is in peak mode. Average readings, when required, are taken by measuring the duty cycle of the equipment under test and subtracting the corresponding amount in dB from the measured peak readings.

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

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8.4 Emissions Test Procedures (cont'd)

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. Above 1000 MHz, a resolution bandwidth of 1 MHz is used.

Measurements are normally conducted at a measurement distance of three meters. All measurements are extrapolated to three meters using inverse scaling, unless otherwise reported. Measurements taken at a closer distance are so marked.

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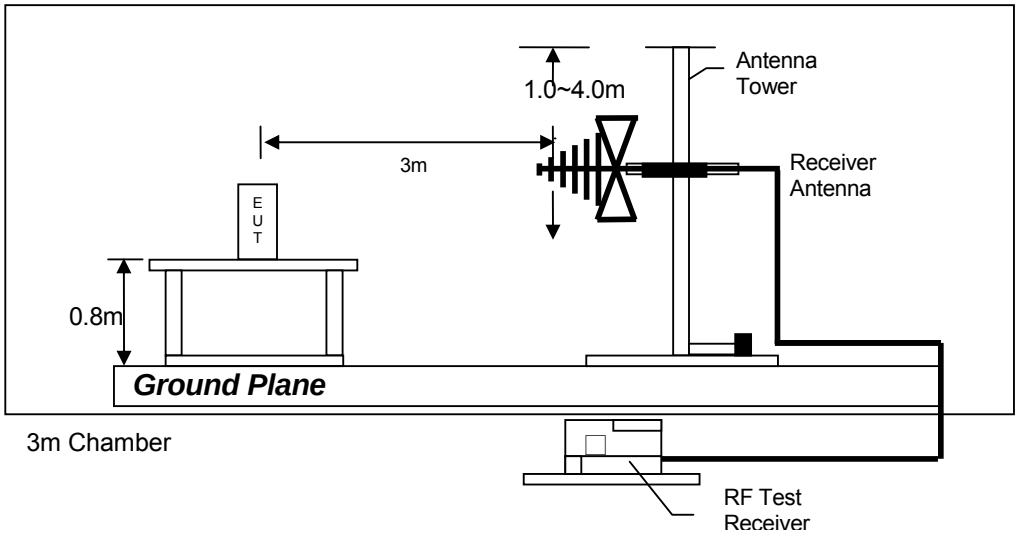
8.4.1 Radiated Emission Test Setup

The figure below shows the test setup, which is utilized to make these measurements.



Test setup of radiated emissions up to 1GHz

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9.0 EQUIPMENT LIST

1) Radiated Emissions Test

Equipment	Spectrum Analyzer	EMI Test Receiver	Log Periodic Antenna
Registration No.	EW-3281	EW-3156	EW-1042
Manufacturer	ROHDESCHWARZ	R&S	EMCO
Model No.	FSV40	ESR26	3148
Calibration Date	January 02, 2018	November 10, 2017	June 19, 2017
Calibration Due Date	January 02, 2019	November 10, 2018	December 19, 2018

Equipment	Loop Antenna (1000Hz to 30MHz)	Biconical Antenna	14m Double Shield RF Cable
Registration No.	EW-3318	EW-0954	EW-2505
Manufacturer	EMCO	EMCO	RADIALL
Model No.	6905	3104C	nm / br5d / sma 14m
Calibration Date	August 31, 2017	February 27, 2018	October 30, 2017
Calibration Due Date	August 31, 2018	August 27, 2019	October 30, 2018

Equipment	RF Pre-amplifier 3 pcs (9kHz to 40GHz)	Communication Service Monitor (Radio)
Registration No.	EW-3006	EW-1775
Manufacturer	SCHWARZBECK	R&S
Model No.	BBV 9718 BBV9744 BBV 9721	CMS54
Calibration Date	January 30, 2018	December 27, 2017
Calibration Due Date	January 30, 2019	December27, 2018

2) Waveform Measurement

Equipment	Communication Service Monitor (Radio)	Spectrum Analyzer
Registration No.	EW-1775	EW-2329
Manufacturer	R&S	R&S
Model No.	CMS54	FSP3
Calibration Date	December 27, 2017	September 28, 2017
Calibration Due Date	December27, 2018	September 28, 2018

END OF TEST REPORT