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TEST REPORT

Report No.: 18061026HKG-001R1

Kidztech Toys Manufacturing Ltd

Application For Certification
(Original Grant)

FCC ID: OTM-8502118-49MTX

Transmitter

This report supersedes previous report with report number 18061026HKG-001 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	Digitally signed by Kenneth Wong Location: Intertek Testing Services Hong Kong Ltd.
Tam Chu Kwong, Bismarck	Wong Kwok Yeung, Kenneth
Assistant Engineer	Senior Lead Engineer
	Date: August 17, 2018

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TEST REPORT

GENERAL INFORMATION

Grantee:	Kidztech Toys Manufacturing Ltd
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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:	Transmitter
Description of EUT:	1/16 RC Cars
Serial Number:	N/A
FCC ID:	OTM-8502118-49MTX
Date of Sample Submitted:	June 15, 2018
Date of Test:	June 15, 2018 to June 28, 2018
Report No.:	18061026HKG-001R1
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	15.235	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 controller for Remote controlled car set which operates at 49.859MHz. The EUT is power by 1 x 9V battery.

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 transmitter.

The Certification procedure of receiver for this transmitter (with FCC ID: OTM-8502118-49MRX) 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 9.0V (1 x 9.0V battery).

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 49.859 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 8.6 dB

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RADIATED EMISSIONS

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

Table 1
Pursuant to FCC Part 15 Section 15.235 Requirement

Polari-zation	Frequency (MHz)	Reading (dBµV)	Pre-Amp (dB)	Antenna Factor (dB)	Average Factor (dB)	Net at 3m (dBµV/m)	Limit at 3m (dBµV/m)	Margin (dB)
V	49.859	76.4	16	11.0	0.0	71.4	80.0	-8.6
H	99.718	22.8	16	12.0	-	18.8	43.5	-24.7
V	149.577	15.5	16	14.0	-	13.5	43.5	-30.0
V	199.436	17.0	16	16.0	-	17.0	43.5	-26.5
H	***249.295***	***15.8***	***16***	***20.0***	***-***	***19.8***	***46.0***	***-26.2***
H	299.154	12.3	16	22.0	-	18.3	46.0	-27.7
V	349.013	10.7	16	24.0	-	18.7	46.0	-27.3
H	398.872	12.9	16	25.0	-	21.9	46.0	-24.1
H	448.731	11.0	16	26.0	-	21.0	46.0	-25.0
H	498.590	14.2	16	26.0	-	24.2	46.0	-21.8

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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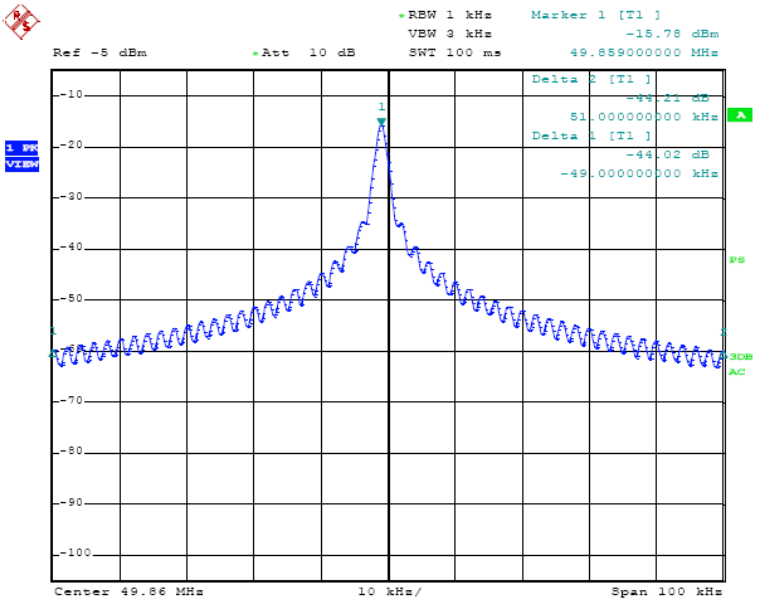
8.0 MISCELLANEOUS INFORMATION

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 Measured Bandwidth

The plot shows the fundamental emission is confined in the specified band. The field strength of any emission appearing between the band edges and up to 10kHz above and below the band edges (49.81 and 49.91 MHz) is at least 26 dB below the carrier level. And at 49.81 & 49.91 MHz, there are at least 44 dB below the carrier level. It meets requirement of Section 15.235(b).



8.2 Discussion of Pulse Desensitization

Pulse desensitivity is not applicable for this device. Since the transmitter transmits the RF signal continuously.

8.3 Calculation of Average Factor

It is not necessary to apply average factor as the measured (peak) data has been complied with average limit of the radiated emission.

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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 transmitter operating under the Part 15, Subpart C rules.

The transmitting equipment under test (EUT) is placed on a wooden turntable which is four feet in diameter and approximately 0.8m in height above the ground plane for emission measurement at or below 1GHz and 1.5m in height above the ground plane for emission measurement above 1GHz. 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 axis to obtain maximum emission levels. 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. A detailed description for the calculation of the average factor can be found in Exhibit 8.3.

The frequency range scanned is from the lowest radio frequency signal generated in the device which is greater than 9 kHz to the tenth harmonic of the highest fundamental frequency or 40 GHz, whichever is lower.

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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 were made as described in ANSI C63.10 (2013).

The IF bandwidth used for measurement of radiated signal strength was 100 kHz or greater when frequency is below 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. A discussion of whether pulse desensitivity is applicable to this unit is included in this report (See Exhibit 8.1). Above 1000 MHz, a resolution bandwidth of 3 MHz is used.

Transmitter measurements are normally conducted at a measurement distance of three meters. However, to assure low enough noise floor in the forbidden bands and above 1 GHz, signals are acquired at a distance of one meter or less. 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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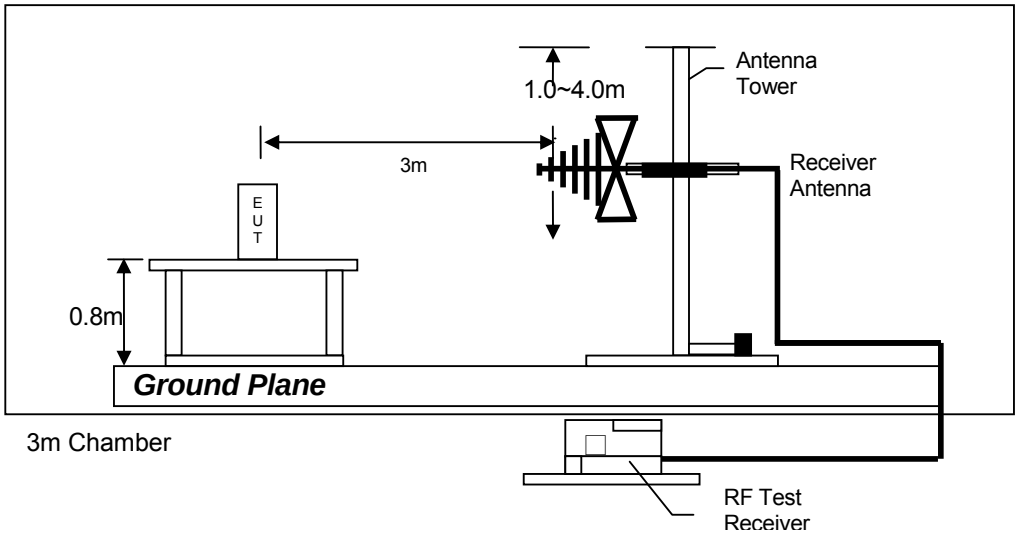
8.4.1 Radiated Emission Test Setup

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)
Registration No.	EW-3006
Manufacturer	SCHWARZBECK
Model No.	BBV 9718 BBV9744 BBV 9721
Calibration Date	January 30, 2018
Calibration Due Date	January 30, 2019

2) Bandedge Measurement

Equipment	RF Cable 30cm (1-26)GHz	Spectrum Analyzer
Registration No.	EW-2268	EW-2329
Manufacturer	RADIALL	R&S
Model No.	SMA(M)/SHF5M/SMA(M)30cm	FSP3
Calibration Date	Aug. 23, 2017	September 28, 2017
Calibration Due Date	Aug. 23, 2018	September 28, 2018

END OF TEST REPORT