TEST REPORT

Report No.: HK11090669-1

Spin Master Toys Far East Limited

Application
For
Certification

(Original Grant)

(FCC ID: PQN44422RX49MHz)

Superregenerative Receiver

Prepared and Checked by:

Signed On File
Wong Cheuk Ho, Herbert
Engineer

Approved by:

Digitally signed by Terry Chan
Location: Intertek Testing Services Hong Kong Ltd.

Chan Chi Hung, Terry
Assistant Supervisor
Date: October 13, 2011

Intertek Testing Services Hong Kong Ltd.
2/F., Garment Centre, 576 Castle Peak Road, Kowloon, Hong Kong.
Tel: (852) 2173 8888 Fax: (852) 2785 5487 Website: www.hk.intertek-etlsemko.com

GENERAL INFORMATION

Spin Master Toys Far East Limited
BRAND NAME: Spin Master Ltd., MODEL: 44422

FCC ID: PQN44422RX49MHz

Grantee:	Spin Master Toys Far East Limited
Grantee Address:	Room 1113, 11/F., Chinachem Golden Plaza, 77 Mody Road, Tsim Sha Tsui East, Kowloon, Hong Kong.
Contact Person:	Allen Yang
Tel:	N/A
Fax:	N/A
e-mail:	alleny/georgew@spinmaster.com
Manufacturer:	First Union Toys Co., Ltd
Manufacturer Address:	Gong Lian Industrial Estate, Wan Jiang, Dong Guan City, China.
Brand Name:	Spin Master Ltd.
Model:	44422
Additional Model:	1021361/6016876, 1023913/6018296, 1023915/6018296, 1023996/6018354, 1023999/6018357, 1024001/6018360
Type of EUT:	Superregenerative Receiver
Description of EUT:	NASCAR 1/24TH RF (44422), AHN RDC NASCAR 1:24th RF Ast GTL 4pk M01 (1021361/6016876), AHN RDC NASCAR1:24thScl Ast GTL 2pk M01A (1023913/6018296), AHN RDC NASCAR1:24thScl Ast GTL 2pk M01B (1023915/6018296), AHN RDC NASCAR1:24DaleJRsRFAst GTL4pkM01 (1023996/6018354), AHN RDC NASCAR1:24th Jimmy RF GTL 4pkSLD, (1023999/6018357), AHN RDC NASCAR1:24th Tony RF GTL 4pkSLD (1024001/6018360)
Serial Number:	N/A
FCC ID:	PQN44422RX49MHz
Date of Sample Submitted:	September 19, 2011
Date of Test:	September 21, 2011
Report No.:	HK11090669-1
Report Date:	October 13, 2011
Environmental Conditions:	Temperature: +10 to 40°C Humidity: 10 to 90%

SUMMARY OF TEST RESULT

Spin Master Toys Far East Limited
BRAND NAME: Spin Master Ltd., MODEL: 44422

FCC ID: PQN44422RX49MHz

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 Radiated Eissions	15.109 / ICES-003	Pass
Digital Device Conducted Emissions	15.107 / ICES-003	N/A

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.

Table of Contents

1.0 General Description

1.1 Product Description

The Equipment Under Test (EUT) is a super-regenerative receiver of an RC Car operating at 49.860 MHz. The EUT is powered by a 6.0 V DC source (4 x 1.5V "AA" size batteries). The EUT has an ON/OFF switch.

After switching ON the EUT and the transmitter of the RC Car, the EUT can be controlled to move forward, backward, left and right by the transmitter.

The Model: 1021361/6016876, 1023913/6018296, 1023915/6018296, 1023996/6018354, 1023999/6018357 and 1024001/6018360 are the same as the Model: 44422 in hardware aspect. The difference in model number and item name only.

Antenna Type : Internal, Integral

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

1.2 Related Submittal(s) Grants

The Certification procedure of transmitter for this receiver (with FCC ID: PQN44422TX49MHz) is being processed as the same time of this application.

1.3 Test Methodology

Radiated emission measurements were performed according to the procedures in ANSI C63.4 (2003). All radiated measurements were performed in an Open Area Test Site. Preliminary scans were performed in the Open Area Test Site 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 open area test site and conducted measurement facility used to collect the radiated data is located at Garment Centre, 576 Castle Peak Road, Kowloon, Hong Kong. This test facility and site measurement data have been placed on file with the FCC.

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 (2003).

The EUT was powered by 4 x new 1.5V "AA" size batteries during test.

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 receives 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 Spin Master Toys Far East Limited will be incorporated in each production model sold/leased in the United States.

No modifications were installed by Intertek Testing Services Hong Kong Ltd.

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
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

3.2 Radiated Emission Configuration Photograph

Worst Case Radiated Emission at 50.507 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 2.9 dB

Applicant: Spin Master Toys Far East Limited Date of Test: September 21, 2011
Model: 44422
Mode: Receiving
Sample: 1/2

Table 1

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)
V	49.277	40.2	16	11.0	35.2	40.0	-4.8
V	50.507	42.1	16	11.0	37.1	40.0	-2.9
V	51.349	40.1	16	11.0	35.1	40.0	-4.9
V	53.277	39.3	16	11.0	34.3	40.0	-5.7
V	54.348	38.7	16	11.0	33.7	40.0	-6.3
V	99.348	36.8	16	12.0	32.8	43.5	-10.7
V	101.829	36.7	16	13.0	33.7	43.5	-9.8
V	103.749	36.1	16	13.0	33.1	43.5	-10.4
H	149.129	34.8	16	14.0	32.8	43.5	-10.7
H	151.189	33.1	16	15.0	32.1	43.5	-11.4

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 emissions over 1000MHz.

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.

8.0 Miscellaneous Information

This miscellaneous information includes details of the stabilizing process (including a plot of the stabilized waveform) and the test procedure.

8.1 Stabilization Waveform

Previous to the testing, the superregenerative receiver was stabilized as outlined in the test procedure. The plot saved on the filename : superreg.pdf shows 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 Pulse Desensitivity

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 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 C63.4 - 2003. 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 transmitting equipment under test (EUT) is placed on a wooden turntable which is four feet in diameter and approximately one 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 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.

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 C63.4 - 2003.

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 1 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.

9.0 **Equipment List**

1) Radiated Emissions Test

Equipment	EMI Test Receiver	Log Periodic Antenna	Biconical Antenna	Signal Generator
Registration No.	EW-2500	EW-0446	EW-0954	EW-0423
Manufacturer	R&S	EMCO	EMCO	IFR
Model No.	ESCI	3146	3104C	2023B
Calibration Date	Jan. 25, 2011	Apr. 26, 2010	Apr. 14, 2010	Apr. 28, 2011
Calibration Due Date	Jan. 25, 2012	Oct. 26, 2011	Oct. 14, 2011	Apr. 28, 2012

Equipment	14m Double Shield RF Cable (20MHz - 6GHz)	Spectrum Analyzer 40GHz
Registration No.	EW-2528	EW-2253
Manufacturer	RADIALL	ROHDESCHWARZ
Model No.	nm / br5d / sma 14m	FSP40
Calibration Date	Dec. 14, 2010	Nov. 23, 2010
Calibration Due Date	Dec. 14, 2011	Nov. 23, 2011

2) Bandedge Measurement

Equipment	Spectrum Analyzer
Registration No.	EW-2249
Manufacturer	R&S
Model No.	FSP30
Calibration Date	Oct. 22, 2010
Calibration Due Date	Oct. 22, 2011