TEST REPORT

Report No.: HK11090666-1

Spin Master Toys Far East Limited

Application
For
Certification
(Original Grant)

(FCC ID: PQN44422TX27MHZ)

Transmitter

Prepared and Checked by:

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Date: October 13, 2011

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GENERAL INFORMATION

Spin Master Toys Far East Limited
BRAND NAME: Spin Master Ltd, MODEL: 44422
FCC ID: PQN44422TX27MHZ

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.
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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:	Transmitter
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:	PQN44422TX27MHZ
Date of Sample Submitted:	September 19, 2011
Date of Test:	September 21, 2011
Report No.:	HK11090666-1
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: PQN44422TX27MHZ

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
Antenna 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	Pass
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 Emissions	15.109 / ICES-003	N/A
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.

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1.0 General Description

1.1 Product Description

The Equipment Under Test (EUT) is a transmitter of an RC Car operating at 27.145 MHz as dictated by a crystal. The EUT is powered by a 4.5 V DC source (3 x 1.5V "AA" size batteries). The EUT has a left / right control lever, a forward / backward control lever and a power ON/OFF switch.

After switching ON the EUT and the receiver of the RC Car, activating the control levers on the EUT can control the receiver moving forward, backward, left and right.

The Model: 1021361/6016876, 1023913/6018296, 1023915/6018296, 1023996/6018354, 1023999/6018357 and 1024001/6018360 are the same as the Model: 44422 in hardware and software aspect. The models are different in Model Number and Item Name only.

Antenna Type : External, Integral

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

1.2 Related Submittal(s) Grants

The receiver portion for this transceiver is exempted from the Part 15 technical rules per 15.101(b).

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 device was powered by 3 X new 1.5V “AA” size 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 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

The worst case in radiated emission was found at 27.145 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 3.2 dB margin.

Applicant: Spin Master Toys Far East Limited Date of Test: September 21, 2011
Model: 44422
Worst-Case Operating Mode: Transmitting
Sample: 1/2

Table 1

Radiated Emissions
Pursuant to FCC Part 15 Section 227 Emissions 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	27.145	77.4	16	15.4	0.0	76.8	80.0	-3.2
V	54.290	39.1	16	11.0	-	34.1	40.0	-5.9
V	81.435	43.8	16	7.0	-	34.8	40.0	-5.2
H	108.580	36.7	16	14.0	-	34.7	43.5	-8.8
H	135.725	37.1	16	14.0	-	35.1	43.5	-8.4
H	162.870	34.8	16	16.0	-	34.8	43.5	-8.7
H	190.015	34.1	16	16.0	-	34.1	43.5	-9.4
H	217.160	33.9	16	17.0	-	34.9	46.0	-11.1
H	244.305	31.3	16	20.0	-	35.3	46.0	-10.7
H	271.450	28.4	16	22.0	-	34.4	46.0	-11.6

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. Loop antenna is used for the emissions below 30 MHz.

5. 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

The miscellaneous information includes details of the test procedure and measured bandwidth.

8.1 Measured Bandwidth

The plot saved in bw.pdf which shows the fundamental emission is confined in the specified band. And it also shows that the emission is at least 44.78 dB below the carrier level at the band edge (26.96 and 27.28 MHz). It meets the requirement of Section 15.227 (b).

Pursuant to FCC Part 15 Section 15.215(c), the 20dB bandwidth of the emission was contained within the frequency band designed (mentioned as above) which the EUT operated. The effects, if any, from frequency sweeping, frequency hopping, other modulation techniques and frequency stability over expected variations in temperature and supply voltage were considered.

8.2 Discussion Pulse Desensitivity

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

8.3 Calculation of Average Factor

The average factor is not applicable for this device as the transmitted signal is a continuously signal.

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 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.

9.0 **Equipment List**

1) Radiated Emissions Test

Equipment	EMI Test Receiver	Spectrum Analyzer 40GHz	Biconical Antenna
Registration No.	EW-2500	EW-2253	EW-0954
Manufacturer	ROHDESCHWARZ	ROHDESCHWARZ	EMCO
Model No.	ESCI	FSP40	3104C
Calibration Date	Jan 25, 2011	Nov 23, 2010	Apr 14, 2010
Calibration Due Date	Jan 25, 2012	Nov 23, 2011	Oct 14, 2011

Equipment	Log Periodic Antenna	14m Double Shield RF Cable (20MHz - 6GHz)
Registration No.	EW-0446	EW-2528
Manufacturer	EMCO	RADIALL
Model No.	3146	nm / br5d / sma 14m
Calibration Date	Apr 26, 2010	Dec 14, 2010
Calibration Due Date	Oct 26, 2011	Dec 14, 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