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HOKLAS 005 TEST

TEST REPORT

Report No.: 14070167HKG-005

Spin Master Toys Far East Ltd.

Application
For
Certification
(Original Grant)
(FCC ID: PQN7260113M56)

Transmitter

Prepared and Checked by:

Wong Kwok Yeung, Kenneth
Lead Engineer

Approved by:

Chan Chi Hung, Terry
Supervisor
Date: July 29, 2014

GENERAL INFORMATION

Grantee:	Spin Master Toys Far East Ltd.
Grantee Address:	Room 1113, 11/F., Chinachem Golden Plaza, 77 Mody Road, Tsim Sha Tsui East, Kowloon, Hong Kong.
Contact Person:	Andy Wong
Tel:	(852) 23013822
Fax:	(852) 23011820
e-mail:	andyw@spinmaster.com
Manufacturer:	Pacific Industries (Zhong Shan) Ltd.
Manufacturer Address:	Xincun Factory Area,Baishawan Industrial Park,Eastern District, Zhong Shan,Guangdong,China
Brand Name:	Spin Master Toys
Model:	72601
Additional Model:	1033217, 1032294
Phantom No.:	20066840/20068303/20067002/20067391
Type of EUT:	Transmitter
Description of EUT:	GAB Pop Star Gabby TRUX (Date Code: 40603APA)
Serial Number:	N/A
FCC ID:	PQN7260113M56
Date of Sample Submitted:	July 04, 2014
Date of Test:	July 04, 2014 to July 20, 2014
Report No.:	14070167HKG-005
Report Date:	July 29, 2014
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 Frequency Stability	15.225	Pass
Radiated Emission in Restricted Bands	15.205	Pass

The equipment under test is found to be complying with the following standards:
FCC Part 15, October 1, 2012 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 a transmitter for a Doll (RFID toy reader) operating at 13.56 MHz which is controlled by a crystal. The EUT is powered by 4 x AA size batteries. This product consists of a doll (RFID toy reader) and 14pcs of interactive accessories (passive tags). The EUT have an ON/OFF switch, a head button, a lip button, two LCD displays and two touch buttons (on the eyeglasses). After switch on the EUT, it can give you a response (i.e. dancing or singing) when you place the passive tags on the lip or you can play different modes by pressing different buttons. The EUT can also connect with iPad via 18kHz audio tone for game playing.

The Model: 1033217 and 1032294 are the same as the Model: 72601 in hardware aspect. The models are different in package 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.

1.3 Test Methodology

Radiated emission measurements was performed according to the procedures in ANSI C63.4 (2009). 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 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 C63.4 (2009).

The device was powered by new 4 x 1.5V AA batteries.

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 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.

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2.5 Support Equipment List and Description

14pcs of passive tags are shown as below;

1) Phone
2) Award
3) Cupcake
4) Mirror
5) Powder Puff
6) Camera
7) Music Book
8) Guitar
9) Dog
10) Lipstick
11) Drink
12) Perfume
13) Eye Shadow
14) Mic

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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
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

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3.2 Radiated Emission Configuration Photograph

The worst case in radiated emission was found at 81.372 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 11.3 dB

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Applicant: Spin Master Toys Far East Ltd. Date of Test: July 20, 2014
Model: 72601
Worst-Case Operating Mode: Transmitting

Table 1

Radiated Emissions
Pursuant to FCC Part 15 Section 15.225 Requirement

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-amp (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Distance Factor (-dB)	Calculated at 30m (dBµV/m)	Limit at 30m (dBµV/m)	Margin (dB)
V	13.562	41.5	0	10.8	52.3	40.0	12.3	84.0	-71.7
V	27.124	17.3	0	9.5	26.8	40.0	-13.2	29.5	-42.7

Polari-zation	Frequency (MHz)	Reading (dBµV)	Pre-Amp (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Limit at 3m (dBµV/m)	Margin (dB)
V	40.686	34.3	16	10.0	28.3	40.0	-11.7
V	54.248	32.2	16	11.0	27.2	40.0	-12.8
V	67.810	36.3	16	8.0	28.3	40.0	-11.7
V	81.372	37.7	16	7.0	28.7	40.0	-11.3
V	94.934	34.4	16	11.0	29.4	43.5	-14.1
V	***108.496***	***30.6***	***16***	***14.0***	***28.6***	***43.5***	***-14.9***
V	122.058	31.8	16	14.0	29.8	43.5	-13.7
V	***135.620***	***31.4***	***16***	***14.0***	***29.4***	***43.5***	***-14.1***

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 30MHz.

5. Emission (the row indicated by ***bold italic***) within the restricted band meets the requirement of FCC Part 15 Section 15.205 / RSS-210 Section 2.2.

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3.4 Frequency Tolerance

Data Table
Frequency tolerance of Transmitter
(Temperature Variation: -20°C to +50°C)

Operating frequency		13.562498MHz		
Test Voltage (V)	Temperature (°C)	Measured frequency (MHz)	Frequency error (%)	Limit (%)
6.0	+ 50	13.562752	+0.00187	±0.01
	+ 40	13.562604	+0.00078	±0.01
	+ 30	13.562552	+0.00039	±0.01
	+ 20	13.562498	0	±0.01
	+ 10	13.562425	-0.00053	±0.01
	0	13.562329	-0.00124	±0.01
	- 10	13.562215	-0.00208	±0.01
	- 20	13.562018	-0.00353	±0.01

We found that the EUT met the requirement of FCC Part 15 Section 15.225(e).

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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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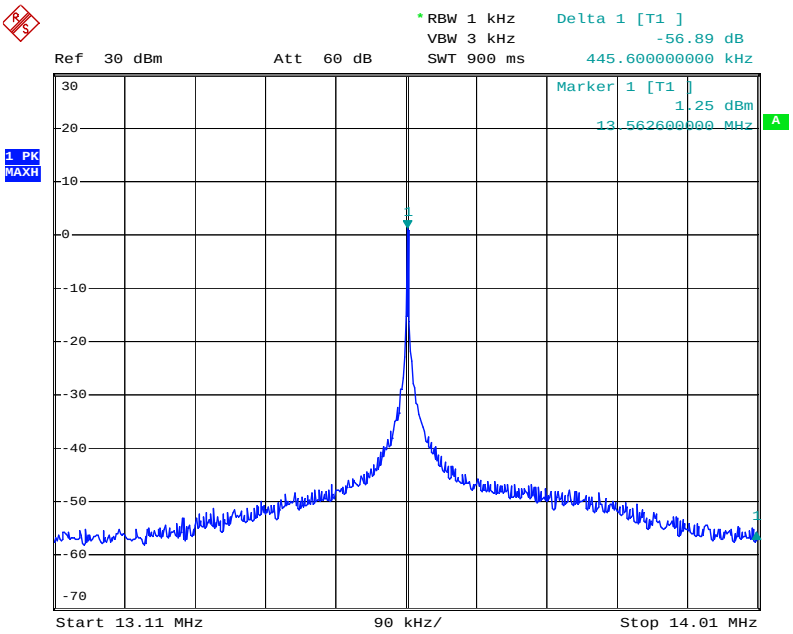
8.0 Miscellaneous Information

The miscellaneous information includes details of the test procedure.

8.1 Measured Bandwidth

The below plot shows the fundamental emission is confined in the specified band. The emission of the fundamental is 12.3dBµV/m and it is below the limit of 50.5 dBµV/m in the range of (13.410-13.553MHz) and (13.567-13.710MHz) and the limit of 40.5 dBµV/m in the frequency range of (13.110-13.410MHz) and (13.710-14.010MHz). In the frequency range from 13.110-14.010MHz, we cannot find any emission higher than the fundamental emission. Therefore they meet the requirement of Section 15.225(a), (b), (c), & (d).



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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

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 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.

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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 C63.4 (2009).

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.

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9.0 **Equipment List**

1) Radiated Emissions Test

Equipment	EMI Test Receiver	Spectrum Analyzer	Log Periodic Antenna
Registration No.	EW-2666	EW-2466	EW-0572
Manufacturer	R&S	R&S	EMCO
Model No.	ESCI7	FSP30	3146
Calibration Date	Jun. 20, 2013	Aug. 04, 2013	Jun. 26, 2013
Calibration Due Date	Sep. 20, 2014	Aug. 14, 2014	Dec. 26, 2014

Equipment	Biconical Antenna	Active Loop H-field (9kHz to 30MHz)
Registration No.	EW-0571	EW-2313
Manufacturer	EMCO	ELECTROMETRI
Model No.	3104C	EM-6876
Calibration Date	Nov. 01, 2013	May 06, 2013
Calibration Due Date	May 01, 2015	Nov. 06, 2014

2) Bandedge Measurement

Equipment	Spectrum Analyzer
Registration No.	EW-3016
Manufacturer	R&S
Model No.	Spectrum Analyzer
Calibration Date	Feb. 13, 2014
Calibration Due Date	Feb. 13, 2015

END OF TEST REPORT

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