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TEST REPORT

Report No.: 14040547HKG-001

Spin Master Toys Far East Ltd.

Application
For
Certification
(Original Grant)
(FCC ID: PQN7015649)

Transceiver

Prepared and Checked by:

A handwritten signature in black ink, appearing to be 'Wong Kwok Yeung'.

Wong Kwok Yeung, Kenneth
Lead Engineer

Approved by:

A handwritten signature in black ink, appearing to be 'Chan Chi Hung'.

Chan Chi Hung, Terry
Supervisor
Date: April 24, 2014

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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:	86-769-81080068-1123
Fax:	N/A
e-mail:	N/A
Manufacturer:	GuangZhou PanYu Fantasia Creation Toys Co., Ltd.
Manufacturer Address:	1-3/F, Block 3, Standard Industrial Park, Tai Shi Industrial Park, DongYong, NanSha Guangzhou.
Brand Name:	SPG
Model:	70156 Additional Model: 1030112, 6021650
Type of EUT:	Transceiver
Description of EUT:	SPG SGC FieldAgnt WalkieTalkie NBL5pkM02
Serial Number:	N/A
FCC ID:	PQN7015649
Date of Sample Submitted:	April 09, 2014
Date of Test:	April 09, 2014 to April 23, 2014
Report No.:	14040547HKG-001
Report Date:	April 24, 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 and Bandwidth Requirement	15.235	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 with section 15.203, is considered sufficient to comply with the provisions 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 transceiver for a toy Push-to-Talk (PTT) type Walkie-Talkie operating at 49.860MHz governed by a crystal. The EUT is powered by a 9V battery. After switched ON the EUT, the user can transmit voice to other transceiver by pressing the PTT button and speaking to the loudspeaker, while release the PTT button to listen voice of other transceiver from the loudspeaker. The loudspeaker also acts as microphone.

Also there is a Morse Code button on the (EUT), the user can transmit the Morse Code to other transceiver by pressing the PTT button and the Morse Code button at the same time.

The Model: 1030112 and 6021650 are the same as the Model: 70156 in hardware aspect. The models are difference in item number only.

Antenna Type: External, 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 portion. The receiver for this device is authorized by Verification procedure.

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.



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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.

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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 1 x 9V Alkaline 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.

Uncertainty and Compliance - Unless the standard specifically states that measured values are to be extended by the measurement uncertainty in determining compliance, all compliance determinations are based on the actual measured value.

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 dB μ V/m
- RA = Receiver Amplitude (including preamplifier) in dB μ V
- 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 dB μ V/m
- RR = RA - AG - AV in dB μ V
- LF = CF + AF in dB

Assume a receiver reading of 52.0 dB μ V 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 dB μ V/m. This value in dB μ V/m was converted to its corresponding level in μ V/m.

RA = 52.0 dB μ V/m	
AF = 7.4 dB	RR = 18.0 dB μ V
CF = 1.6 dB	LF = 9.0 dB
AG = 29.0 dB	
AV = 5.0 dB	
FS = RR + LF	
FS = 18 + 9 = 27 dB μ V/m	

$$\text{Level in } \mu\text{V/m} = \text{Common Antilogarithm} [(27 \text{ dB}\mu\text{V/m})/20] = 22.4 \mu\text{V/m}$$



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3.2 Radiated Emission Configuration Photograph

The worst case in radiated emission was found at 99.718 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 5.0 dB



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Applicant: Spin Master Toys Far East Ltd.
Model: 70156
Worst-Case Operating Mode: Transmitting

Date of Test: April 23, 2014

Table 1

**Radiated Emissions
Pursuant to FCC Part 15 Section 15.235 Requirement**

Polarization	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	68.8	16	11.0	0.0	63.8	80.0	-16.2
H	99.718	42.5	16	12.0	-	38.5	43.5	-5.0
H	149.577	31.8	16	14.0	-	29.8	43.5	-13.7
H	199.436	37.7	16	16.0	-	37.7	43.5	-5.8
H	249.295	25.8	16	20.0	-	29.8	46.0	-16.2
H	299.154	25.1	16	22.0	-	31.1	46.0	-14.9
H	349.013	22.0	16	24.0	-	30.0	46.0	-16.0
H	398.872	22.3	16	25.0	-	31.3	46.0	-14.7
H	448.731	19.7	16	26.0	-	29.7	46.0	-16.3
H	498.590	19.9	16	26.0	-	29.9	46.0	-16.1

- 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. Horn antenna is used for the emission over 1000MHz.

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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

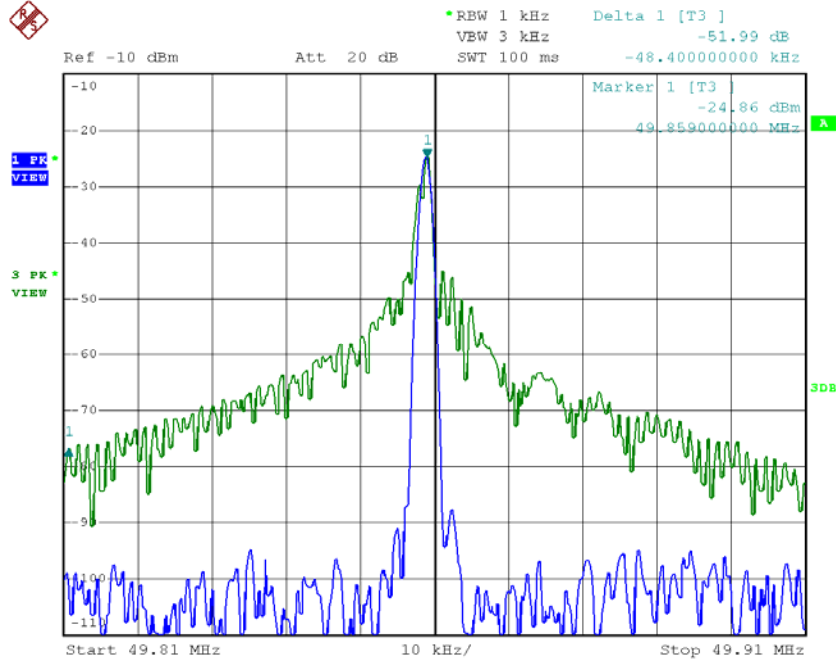
The plots which shows the fundamental emission is confined in the specified band. The field strength of any emission appearing between the band edges and up to 10kHz above and below the band edges (49.81 and 49.91 MHz) is at least 26 dB below the carrier level. And at 49.81 & 49.91 MHz, there are at least 52.0 dB below the carrier level. It meets requirement of Section 15.235(b).

For the below plot1 shows the fundamental emission when modulated with 1 kHz and 100 dB SPL, 10 cm from the Microphone of EUT and unmodulated, which is shown on below plot1.

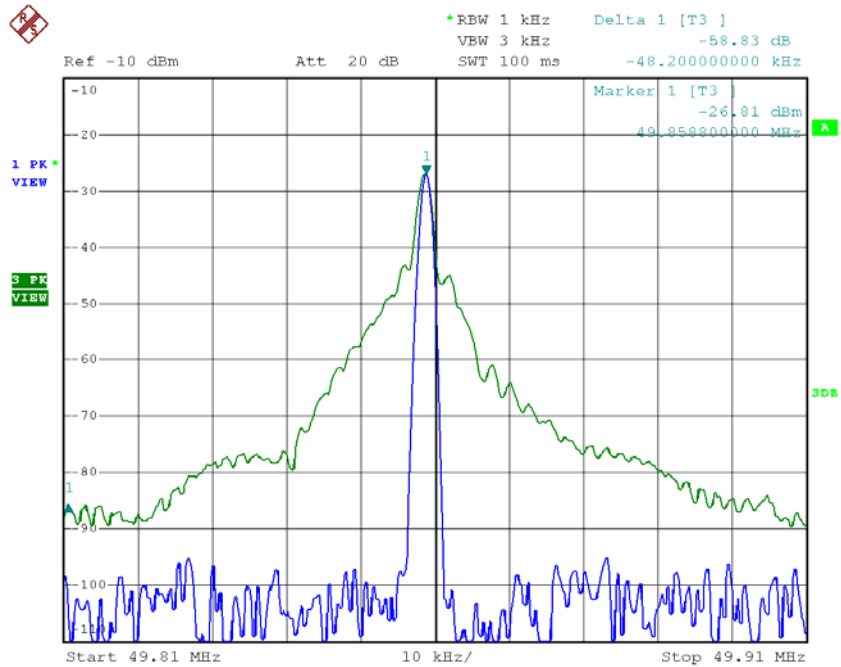
For the below plot 2 shows the emission is modulated by Morse code key.

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Plot 1



Plot 2



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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.



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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 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	Biconical Antenna
Registration No.	EW-2666	EW-2466	EW-0571
Manufacturer	R&S	R&S	EMCO
Model No.	ESC17	FSP30	3104C
Calibration Date	Jun. 20, 2013	Aug. 04, 2013	Nov. 01, 2013
Calibration Due Date	Jun. 20, 2014	Aug. 04, 2014	May 01, 2015

Equipment	Log Periodic Antenna
Registration No.	EW-0572
Manufacturer	EMCO
Model No.	3146
Calibration Date	Jun. 26, 2013
Calibration Due Date	Dec. 26, 2014

2) Bandedge Measurement

Equipment	Spectrum Analyzer
Registration No.	EW-2249
Manufacturer	R&S
Model No.	FSP30
Calibration Date	Oct. 28, 2013
Calibration Due Date	Oct. 28, 2014

End Of Report