

Issuing Laboratory:
Intertek Testing Services Hong Kong Limited

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TEST REPORT

Report No.: 13040262HKG-002

Spin Master Toys Far East Ltd.

Application
For
Certification

(Original Grant)

(FCC ID: PQN70156)

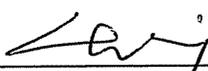
Transceiver

Prepared and Checked by:

Approved by:



Wong Kwok Yeung, Kenneth
Lead Engineer



Chow Chi Ming, Billy
Manager
Date: May 09, 2013

- The test report only allows to be revised within the retention period unless further standard or the requirement was noticed.
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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-ettsemko.com

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GENERAL INFORMATION

Spin Master Toys Far East Ltd.
BRAND NAME: N/A, MODEL: 70156

FCC ID: PQN70156

Grantee:	Spin Master Toys Far East Ltd.
Grantee Address:	Rm 1113, 11/F., Chinachem Golden Plaza, 77 Mody Road, Tsim Sha Tsui East, Kowloon, Hong Kong.
Contact Person:	Andy Wong
Tel:	86-0769-71080068 ext 1123
Fax:	86-0769-82207100
e-mail:	N/A
Manufacturer:	Spin Master Toys Far East Ltd.
Manufacturer Address:	Rm 1113A, 11/F., Chinachem Golden Plaza, 77 Mody Road, Tsim Sha Tsui East, Kowloon, Hong Kong.
Brand Name:	N/A
Model:	70156
Additional Model:	6021650, 1029127, 1029852
Type of EUT:	Transceiver
Description of EUT:	SPG SGC FieldAgnt WalkieTalkie
Serial Number:	N/A
FCC ID:	PQN70156
Date of Sample Submitted:	May 03, 2013
Date of Test:	May 03, 2013 to May 06, 2013
Report No.:	13040262HKG-002
Report Date:	May 09, 2013
Environmental Conditions:	Temperature: +10 to 40°C Humidity: 10 to 90%

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SUMMARY OF TEST RESULT

Spin Master Toys Far East Ltd.
BRAND NAME: N/A, MODEL: 70156
FCC ID: PQN70156

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, 2011 Edition

- Note:
1. The EUT uses a permanently attached antenna which, in accordance to 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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Table of Contents

1.0	<u>General Description</u>	1
1.1	Product Description	1
1.2	Related Submittal(s) Grants.....	1
1.3	Test Methodology	1
1.4	Test Facility	2
2.0	<u>System Test Configuration</u>	3
2.1	Justification	3
2.2	EUT Exercising Software.....	3
2.3	Special Accessories	3
2.4	Equipment Modification	3
2.5	Measurement Uncertainty.....	4
2.6	Support Equipment List and Description	3
3.0	<u>Emission Results</u>	5
3.1	Field Strength Calculation.....	5
3.2	Radiated Emission Configuration Photograph.....	5
3.3	Radiated Emission Data	5
4.0	<u>Equipment Photographs</u>	7
5.0	<u>Product Labelling</u>	7
6.0	<u>Technical Specifications</u>	7
7.0	<u>Instruction Manual</u>	7
8.0	<u>Miscellaneous Information</u>	7
8.1	Measured Bandwidth.....	11
8.2	Discussion of Pulse Desensitization.....	11
8.3	Calculation of Average Factor.....	8
8.4	Emissions Test Procedures.....	9
9.0	<u>Equipment List</u>	13

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1.0 General Description

1.1 Product Description

The Equipment Under Test (EUT) is a Transceiver for push-to-talk walkie talkie operating 49.860MHz which is controlled by a crystal. The EUT is power by 1 x 9.0VDC alkaline battery. The EUT has an ON/OFF switch, transmit button (PTT) and pulse generation button (code key). The communication method of the EUT is half duplex.

To transmit the signal, press and hold the transmit button. To send the pulse signal, press and hold the pulse generation button. The receiving mode will active after switching on the EUT.

The Model: 6021650, 1029127 and 1029852 are the same as the Model: 70156 in hardware aspect. The difference in item number serves as marketing strategy.

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. The receiver for this transmitter is authorized by Versification 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 EUT was powered by 1 x 9.0V alkaline battery 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 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 Ltd. will be incorporated in each production model sold/leased in the United States.

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

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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.

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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.

$$\begin{aligned} RA &= 52.0 \text{ dB}\mu\text{V/m} \\ AF &= 7.4 \text{ dB} & RR &= 18.0 \text{ dB}\mu\text{V} \\ CF &= 1.6 \text{ dB} & LF &= 9.0 \text{ dB} \\ AG &= 29.0 \text{ dB} \\ AV &= 5.0 \text{ dB} \\ FS &= RR + LF \\ FS &= 18 + 9 = 27 \text{ dB}\mu\text{V/m} \end{aligned}$$

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

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3.2 Radiated Emission Configuration Photograph

Worst Case Radiated Emission at 99.720 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 dB

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Applicant: Spin Master Toys Far East Ltd. Date of Test: May 03, 2013 to May 06, 2013
Model: 70156
Mode: Transmission

Table 1

Radiated Emissions

Polari- zation	Frequency (MHz)	Reading (dB μ V)	Pre- Amp (dB)	Antenna Factor (dB)	Average Factor (dB)	Net at 3m (dB μ V/m)	Limit at 3m (dB μ V/m)	Margin (dB)
V	49.860	70.0	16	11.0	0.0	65.0	80.0	-15.0
H	99.720	42.5	16	12.0	-	38.5	43.5	-5.0
H	149.580	40.0	16	14.0	-	38.0	43.5	-5.5
H	199.440	37.4	16	16.0	-	37.4	43.5	-6.1
H	249.200	26.4	16	20.0	-	30.4	46.0	-15.6
H	299.160	25.0	16	22.0	-	31.0	46.0	-15.0
H	349.020	22.5	16	24.0	-	30.5	46.0	-15.5
H	398.880	20.6	16	25.0	-	29.6	46.0	-16.4
H	448.740	21.1	16	26.0	-	31.1	46.0	-14.9
H	498.600	22.0	16	26.0	-	32.0	46.0	-14.0

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.

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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.

8.0 **Miscellaneous Information**

This miscellaneous information includes details of the measured bandwidth.

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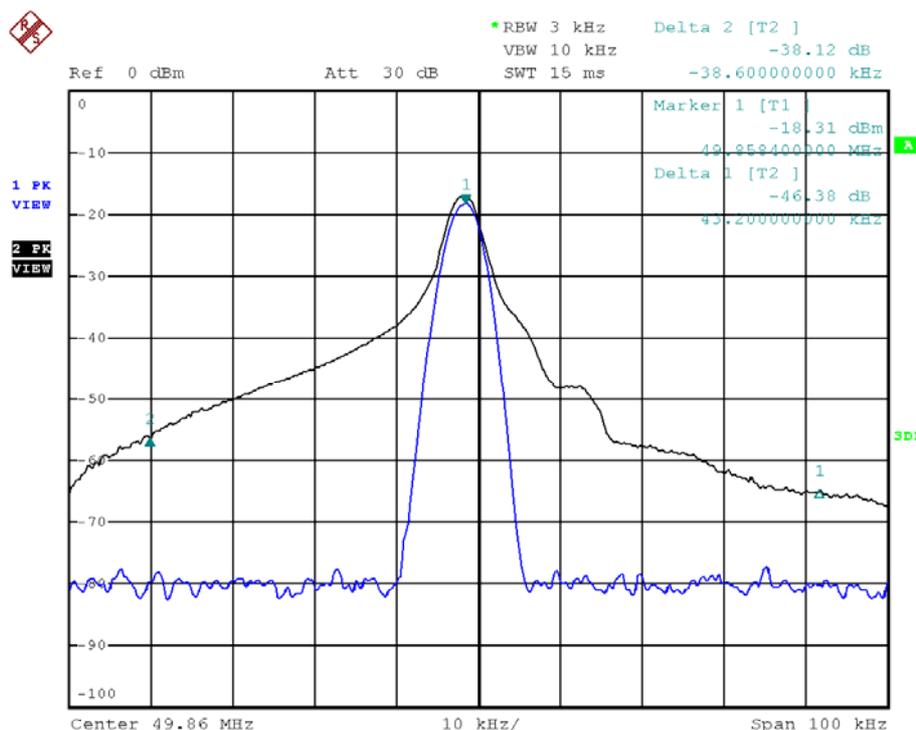
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8.1 Measured Bandwidth

The plot 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 38.1 dB below the carrier level. It meets the requirement of Section 15.235(b).

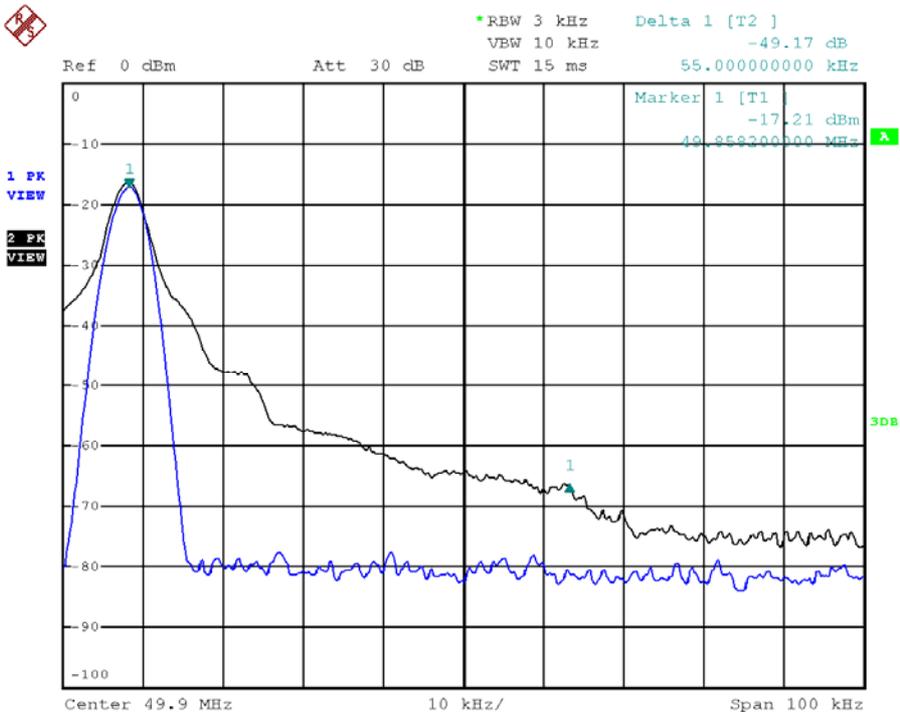
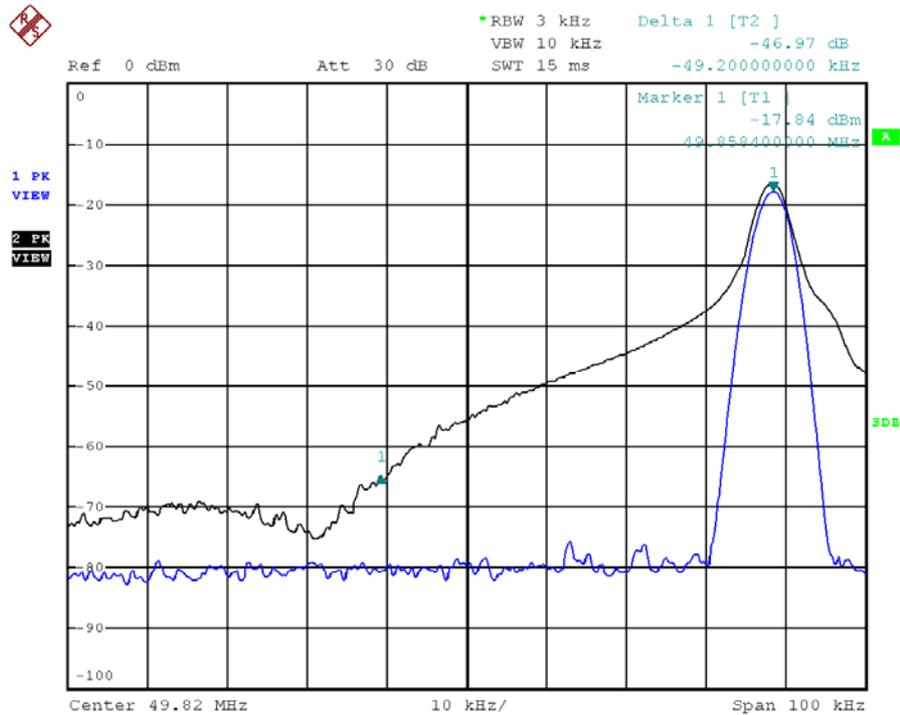


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8.2 Discussion of Pulse Desensitization

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 in the measurements of transmitters operating under Part 15, Subpart C rules.

The test set-up and procedures described below are designed to meet the requirements of ANSI C63.4 - 2009.

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 axes to obtain maximum emission levels. The antenna height and polarization are varied during the testing to search for maximum signal levels.

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 are made as described in ANSI C63.4 - 2009.

The IF bandwidth used for measurement of radiated signal strength was 10 kHz for emission below 30 MHz and 120 kHz for emission from 30 MHz to 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 8.2). 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 restricted 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, but those 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 (9kHz to 7GHz)	Spectrum Analyzer	Log Periodic Antenna
Registration No.	EW-2666	EW-2188	EW-0447
Manufacturer	ROHDESCHWARZ	AGILENTTECH	EMCO
Model No.	ESCI7	E4407B	3146
Calibration Date	May 21, 2012	November 05, 2012	February 08, 2012
Calibration Due Date	May 21, 2013	November 05, 2013	August 08, 2013

Equipment	Biconical Antenna
Registration No.	EW-2512
Manufacturer	EMCO
Model No.	3104C
Calibration Date	November 15, 2011
Calibration Due Date	May 15, 2013

2) Bandwidth Measurement

Equipment	Communication Service Monitor (Radio)	Spectrum Analyzer
Registration No.	EW-1775	EW-2329
Manufacturer	ROHDESCHWARZ	ROHDESCHWARZ
Model No.	CMS54	FSP3
Calibration Date	Nov 23, 2012	Jan 30, 2013
Calibration Due Date	Nov 22, 2013	Jan 30, 2014

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