FCC PART 15.229 & 15.235
EMI MEASUREMENT AND TEST REPORT

For

Kids Station Toys International Ltd

Rm 804, 8/F, Empire Centre, 68 Mody Road, Tsim Sha Tsui East,
Kowloon, Hong Kong

FCC ID: R55KSM6016

This Report Concerns:	**Equipment Type:**
☒ Original Report	Transceiver, Dual Band Walkie Talkie

Test Engineer:	Ming Jin /
Report No.:	R0502043
Report Date:	2005-02-16
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GENERAL INFORMATION

Product Description for Equipment Under Test (EUT)

The *Kids Station Toys International Ltd.*'s product, model number: KSM6016 or the "EUT" as referred to in this report is a Transceiver, Dual Band Walkie Talkie. The EUT is measured approximately 300mm L x 180mm W x 310mm H.

** The test data gathered are from production sample, serial number:* #1 & #2*, provided by the manufacturer.*

Objective

This type approval report is prepared on behalf of *Kids Station Toys International Ltd* in accordance with Part 2, Subpart J, and Part 15, Subparts A, B and C of the Federal Communication Commissions rules.

The objective is to determine compliance with FCC rules, Part 15, sec 229 and 235 for band edge, conducted, radiated margin and frequency stability.

Related Submittal(s)/Grant(s)

No Related Submittals.

Test Methodology

All measurements contained in this report were conducted with ANSI C63.4-2003, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 9 kHz to 40 GHz. All radiated and conducted emissions measurement was performed at Bay Area Compliance Laboratory, Corp.

Test Facility

The Open Area Test site used by BACL Corp. to collect radiated and conducted emission measurement data is located in the back parking lot of the building at 230 Commercial Street, Sunnyvale, California, USA.

Test site at BACL Corp. has been fully described in reports submitted to the Federal Communication Commission (FCC) and Voluntary Control Council for Interference (VCCI). The details of these reports has been found to be in compliance with the requirements of Section 2.948 of the FCC Rules on February 11 and December 10, 1997 and Article 8 of the VCCI regulations on December 25, 1997. The facility also complies with the test methods and procedures set forth in ANSI C63.4-2003.

The Federal Communications Commission and Voluntary Control Council for Interference has the reports on file and is listed under FCC file 31040/SIT 1300F2 and VCCI Registration No.: C-1298 and R-1234. The test site has been approved by the FCC and VCCI for public use and is listed in the FCC Public Access Link (PAL) database.

Additionally, BACL is a National Institute of Standards and Technology (NIST) accredited laboratory, under the National Voluntary Laboratory Accredited Program (Lab Code 200167-0). The current scope of accreditations can be found at http://ts.nist.gov/ts/htdocs/210/214/scopes/2001670.htm

SYSTEM TEST CONFIGURATION

Justification

The EUT was configured for testing according to ANSI C63.4-2003.

Schematics and Block Diagram

Please refer to Appendix D.

Equipment Modifications

No modifications were made to the EUT.

SUMMARY OF TEST RESULTS

Results reported relate only to the product tested.

FCC RULES	DESCRIPTION OF TEST	RESULT
§ 15.203	Antenna requirement	Compliant
§15.207	Conducted Emission Test	N/A
§15.235(a) §15.235(b) §15.229(a) §15.229(c)	Radiated Emission	Compliant
§15.235(b)	Band Edge	Compliant
§ 15.229 (d)	Frequency Stability	Compliant

§15.203 - ANTENNA REQUIREMENT

Standard Applicable

According to § 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

The antenna for this device is an integral antenna that the end user cannot access.

§15.235(a), §15.235(b), §15.229(a), §15.229(c)- RADIATED EMISSIONS TEST

Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in field of EMC. The factors contributing to uncertainties are spectrum analyzer, cable loss, antenna factor calibration, antenna directivity, antenna factor variation with height, antenna phase center variation, antenna factor frequency interpolation, measurement distance variation, site imperfections, mismatch (average), and system repeatability.

Based on NIS 81, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of a radiation emissions measurement at BACL is ±4.0 dB.

EUT Setup

The radiated emission tests were performed in the open area 10-meter test site, EUT to test Antenna distance is 3-meters, using the setup accordance with the ANSI C63.4-2003. The specification used was the FCC Part 15 Subpart C limits.

Spectrum Analyzer Setup

The radiated emission tests were performed in the open area 10-meter test site, EUT to test antenna distance is 3 meters, using the setup accordance with the ANSI C63.4-2003. The specification used was the FCC Part 15 Subpart C limits.

According to FCC rules, 47 CFR 15.33, The EUT emission were investigated from 30 – 1000 MHz

Frequency Range	***RBW***	***Video B/W***
Below 30MHz	10kHz	10kHz
30 – 1000MHz	100kHz	100kHz
Above 1000MHz	1MHz	1MHz

For average measurement below 1GHz: RBW = 100KHz, VBW = 10Hz

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Cal. Date
HP	Amplifier, Pre, microwave	8449B	3147A00400	2004-03-14
HP	Amplifier, Pre	8447E	1937A01057	2004-08-04
HP	Analyzer, Spectrum	8565EC	3946A00131	2004-08-06
ETS	Antenna, Biconical	3110B	9603-2315	2004-12-14
A.R.A.	Antenna, Horn, DRG	DRG-118/A	1132	2004-09-30
A. H. Systems	Antenna, Horn, DRG	SAS-200/571	2455-261	2004-08-01
ETS	Antenna, logperiodic	3148	0004-1155	2004-10-11

* **Statement of Traceability:** BACL attests that all calibrations have been performed per the NVLAP requirements, traceable to NIST.

Test Procedure

For the radiated emissions test, the EUT, and all support equipment power cords was connected to the AC floor outlet.

Maximizing procedure was performed on the highest emissions to ensure that the EUT complied with all installation combinations.

All data was recorded in the Quasi-peak detection mode.

Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain from the Amplitude reading. The basic equation is as follows:

Corr. Ampl. = Indicated Reading + Antenna Factor + Cable Factor - Amplifier Gain

The "**Margin**" column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of -7dB means the emission is 7dB below the maximum limit for Class B. The equation for margin calculation is as follows:

Margin = Corr. Ampl. - Limit

Summary of Test Results

According to the final data in following table, the EUT complied with the FCC 15.229 and 15.235 standards, and had the worst margin of:

-2.1 dB at **40.68 MHz** in the **Vertical** polarization, FCC 15.229

-5.6 dB at **49.86 MHz** in the **Vertical** polarization, FCC 15.235

Environmental Conditions

Temperature:	21° C
Relative Humidity:	37%
ATM Pressure:	1032 mbar

Testing was performed by Ming Jin on 2005-02-07.

Radiated Emissions Test Result Data

Fundamental Frequency: 40.68MHz

INDICATED		TABLE	ANTENNA		CORRECTION FACTOR			CORRECTED AMPLITUDE	FCC 15.229		
Frequency MHz	Ampl. dBμV/m	Angle Degree	Height Meter	Polar H/ V	Antenna dB	Cable dB	Amp. dB	Corr. Ampl. dBμV/m	Limit dBμV/m	Margin dB	Comments
40.68	73.4	330	1.5	v	11.9	1.2	28.6	57.9	60	-2.1	QP
40.68	70.6	30	1.0	h	11.9	1.2	28.6	55.1	60	-4.9	QP
122.04	49.5	260	1.5	h	11.7	1.6	28.1	34.7	43.5	-8.8	Peak
122.04	47.3	270	1.5	v	11.7	1.6	28.1	32.5	43.5	-11.0	Peak
81.36	46.5	120	1.2	h	9.5	1.2	28.5	28.7	43.5	-14.8	Peak
81.36	44.1	90	1.2	v	9.5	1.2	28.5	26.3	43.5	-17.2	Peak
282.30	31.2	90	1.2	v	13.4	2.3	27.4	19.5	46	-26.5	Peak

Fundamental Frequency: 49.86MHz

INDICATED		TABLE	ANTENNA		CORRECTION FACTOR			CORRECTED AMPLITUDE	FCC 15.235		
Frequency MHz	Ampl. dBμV/m	Angle Degree	Height Meter	Polar H/ V	Antenna dB	Cable dB	Amp. dB	Corr. Ampl. dBμV/m	Limit dBμV/m	Margin dB	Comments
49.86	90.8	330	1.5	v	11.1	1.1	28.5	74.5	80	-5.6	Ave
149.58	50.4	270	1.5	v	12.6	1.7	27.9	36.7	43.5	-6.8	Peak
149.58	46.6	260	1.5	h	12.6	1.7	27.9	32.9	43.5	-10.6	Peak
99.72	49.2	90	1.2	v	10.4	1.4	28.2	32.8	43.5	-10.7	Peak
99.72	45.3	120	1.2	h	10.4	1.4	28.2	28.9	43.5	-14.6	Peak
49.86	76.2	30	1.0	h	11.1	1.1	28.5	59.9	80	-20.2	Ave
199.44	32.6	0	1.2	v	14.2	2.1	27.6	21.3	43.5	-22.2	Peak
49.86	92.7	330	1.5	v	11.1	1.1	28.5	76.3	100	-23.7	Peak
199.44	30.4	15	1.0	h	14.2	2.1	27.6	19.1	43.5	-24.4	Peak
249.30	31.2	90	1.2	v	13.8	2.2	27.3	19.9	46	-26.1	Peak
49.86	78.5	30	1.0	h	11.1	1.1	28.5	62.2	100	-37.9	Peak

§15.235 (b) – BAND EDGE

Applicable Standard

According to FCC 15.235(b), the field strength of any emissions appearing between the band edges and up to 10 kHz above and below the band edges shall be attenuated at least 26 dB below the level of the unmodulated carrier or to the general limits in §15.209, whichever permits the higher emission levels. The field strength of any emissions removed by more than 10 kHz from the band edges shall not exceed the general radiated emission limits in §15.209. All signals exceeding 20 microvolts/meter at 3 meters shall be reported in the application for certification.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Cal. Date
HP	Amplifier, Pre, microwave	8449B	3147A00400	2004-03-14
HP	Amplifier, Pre	8447E	1937A01057	2004-08-04
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A.R.A.	Antenna, Horn, DRG	DRG-118/A	1132	2004-09-30
A. H. Systems	Antenna, Horn, DRG	SAS-200/571	2455-261	2004-08-01
ETS	Antenna, logperiodic	3148	0004-1155	2004-10-11

* **Statement of Traceability:** BACL attests that all calibrations have been performed per the NVLAP requirements, traceable to NIST.

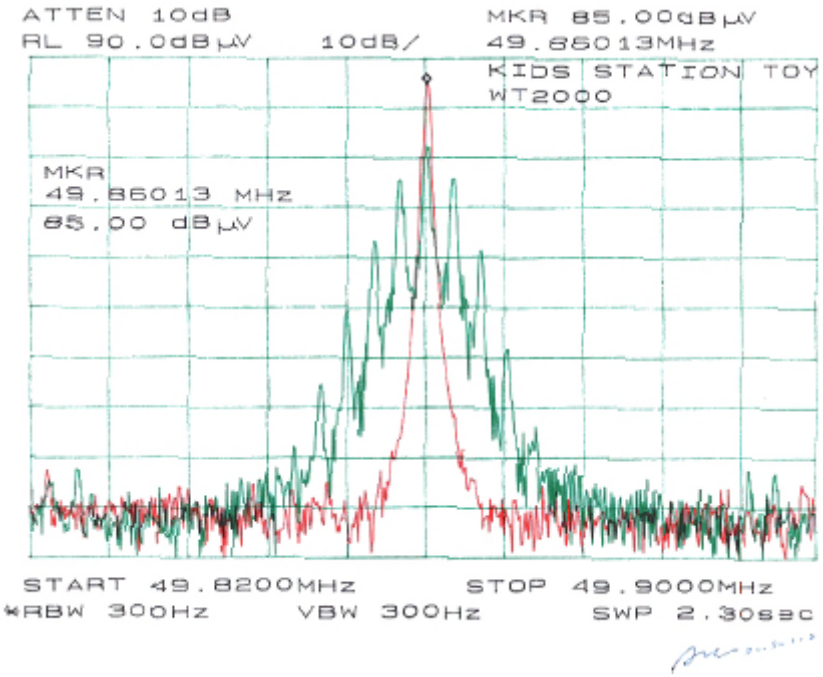
Test Result

Environmental Conditions

Temperature:	21° C
Relative Humidity:	37%
ATM Pressure:	1032 mbar

Testing was performed by Ming Jin on 2005-02-07.

The result has been complied with the 15.235(b), see the following plot:


ATTEN 10dB
RL 90.0dBµV
10dB/
MKR 85.00dBµV
49.86013MHz
KIDS STATION TOY
WT2000
MKR
49.86013 MHz
85.00 dBµV
START 49.8200MHz
STOP 49.9000MHz
*RBW 300Hz
VBW 300Hz
SWP 2.30sec

§15.229(c) – FREQUENCY STABILITY MEASUREMENT

Provision Applicable

According to FCC §2.1055(a)(1), the frequency stability shall be measure with variation of ambient temperature from –30ºC to +50ºC, and according to FCC 2.1055(d)(2), the frequency stability shall be measured with reducing primary supply voltage to the battery operating end point which is specified by the manufacturer.

According to FCC §15.229(c), the frequency tolerance of the carrier signal shall be maintained within ±0.01% of the operating frequency over a temperature variation of −20 degrees to +50 degrees C at normal supply voltage, and for a variation in the primary supply voltage from 85% to 115% of the rated supply voltage at a temperature of 20 degrees C. For battery operated equipment, the equipment tests shall be performed using a new battery.

Test Procedure

Frequency stability versus environmental temperature

The equipment under test was connected to an external DC power supply and the RF output was connected to a frequency counter via feedthrough attenuators. The EUT was placed inside the temperature chamber.

After the temperature stabilized for approximately 20 minutes, the frequency of the output signal was recorded from the counter.

Frequency Stability versus Input Voltage

At room temperature (25±5°C), an external variable DC power supply was connected to the EUT. The frequency of the transmitter was measured for 115%, 100% and 85% of the nominal operating input voltage.

Test Equipment

Manufacturer	Description	Model	Serial Number	Cal. Date
Tenny	Temperature Chamber	Versa Tenn	24581	2004-04-23
HP	DC Power supply	6236B	2212-19	N/A
HP	Counter	5342A	1000971	2004-09-07

* **Statement of Traceability:** BACL attests that all calibrations have been performed per the NVLAP requirements, traceable to NIST.

Test Results

Reference Frequency: 40.68 MHz, Limit: 0.01%			
Environment Temperature (°C)	Power Supplied (Vdc)	Frequency Measure with Time Elapsed	
		MCF (MHz)	%
50	9	40.67978	-0.0006
40	9	40.67986	-0.0003
30	9	40.67993	-0.0002
20	9	40.68022	0.0005
10	9	40.68041	0.0010
0	9	40.68065	0.0010
-10	9	40.68073	0.0020
-20	9	40.68085	0.0020

Frequency Stability Versus Input Voltage

Reference Frequency: 40.68 MHz, Limit: 0.01%		
Power Supplied (Vdc)	Frequency Measure with Time Elapsed	
	Frequency (MHz)	Error %
7.65	40.68031	0.001

End Point = 7.65 V

Conclusion: The EUT complied with the applicable Frequency Stability Limits.