

**Date:** 2000-01-13  
**No.:** HM102051

## **TEST REPORT**

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**APPLICANT:** (CODE : SAK001)  
LIFE-LIKE PRODUCTS INC.  
1600 UNION AVENUE, BALTIMORE, MD 21211, U.S.A.

**DATE OF SAMPLES RECEIVED:** 1999.12.11

**DATE OF TESTING:** 1999.12.23.

**DESCRIPTION OF SAMPLE(S):**

A sample of product said to be:

Product: R/C FOR TRAINS  
Manufacturer: SANDA KAN INDUSTRIAL LTD.  
Model Number: 1302  
Brand Name: LIFE-LIKE  
Rating: 120.0Va.c.  
Origin: CHINA

**INVESTIGATIONS REQUESTED:**

Measurement to the relevant clauses of F.C.C. Rules and Regulations Part 15 Subpart B - Unintentional Radiator.

**RESULT/ REMARK:** Please see attached sheet(s).

**CONCLUSION:**

From the measurement data obtained, the tested sample was considered to have COMPLIED with the clause 15.109(a) & ANSI C63.4:1992 section 12.1.1.1-2 of Federal Communications Commission Rules and Regulations Part 15.

**TEST EQUIPMENT AUDIT:** Please see Appendix A

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Law Man Kit  
Testing Engineer

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Kitty Choy  
Verify by

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Patrick Wong  
Patrick Wong  
for Managing Director

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TEST SUMMARY

\*\*\*UNINTENTIONAL RADIATOR\*\*\*

- (A) Measurement of Radiated Emissions ..... Satisfactory
- (B) Line Conducted Voltage Test ..... Satisfactory

TEST DATA

Please refer to the attached result sheets.

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\*\*\*UNINTENTIONAL RADIATOR\*\*\*

\*\* RECEIVER SECTION \*\*

**(A) Measurement of Radiated Interference**

TEST REFERENCE : FCC Rules Part 15 Subpart B section 15.107(a)  
 TEST CONDITION : Normal  
 TEST DATE : 1999.12.23

Freq. to which tuned MHz	Freq. of the emission MHz	Polarization H-V	Meter reading (at 3m)	Antenna factor dB	Field Strength (at 3m)		FCC Limit µV/m
					dB(µV)	µV/m	
49.8	49.8	V	19.1	+ 15.0	34.1	50.7	100
	99.7		< 1.0	+ 12.2	< 13.2	< 4.6	150
	149.5		< 1.0	+ 9.8	< 10.8	< 3.5	150
	199.3		< 1.0	+ 11.5	< 12.5	< 4.2	150
	249.2		< 1.0	+ 15.9	< 16.9	< 7.0	200
	299.0		< 1.0	+ 17.0	< 18.0	< 7.9	200
	348.8		< 1.0	+ 17.2	< 18.2	< 8.1	200
	398.6		< 1.0	+ 18.8	< 19.8	< 9.8	200
	448.5		< 1.0	+ 19.7	< 20.7	< 10.8	200
	498.3		< 1.0	+ 20.6	< 21.6	< 12.0	200
	543.1		< 1.0	+ 22.2	< 23.2	< 14.5	200
	598.0		< 1.0	+ 23.4	< 24.4	< 16.6	200
	647.8		< 1.0	+ 23.5	< 24.5	< 16.8	200
	697.4		< 1.0	+ 25.0	< 26.0	< 20.0	200
	747.5		< 1.0	+ 26.3	< 27.2	< 22.9	200
	797.3		< 1.0	+ 27.2	< 28.2	< 25.7	200
	847.1		< 1.0	+ 26.6	< 28.2	< 25.7	200
	896.9		< 1.0	+ 27.1	< 28.2	< 25.7	200
	946.8		< 1.0	+ 28.0	< 28.8	< 27.5	200
	996.6		< 1.0	+ 28.5	< 29.5	< 29.9	500

=====SUMMARY=====

All data is within limits

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Broad-band Antennas were used and both polarizations of emissions were measured

Polarizations at highest reading indicated as:

H -- Horizontal                  V -- Vertical

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**NOTES FOR THE RADIATION MEASUREMENT**

- (1) Test site facility:  
Open field test site located at Taipo (Hong Kong) with a metal ground plane on filed with the FCC pursuant to section 2.948 of the FCC Rules.
- (2) Distance between the EUT and measuring antenna:  
3 meters.
- (3) Measuring instrumentation's:  
CISPR Quasi-peak type field strength meter (25 MHz - 1000 MHz.). 6 dB bandwidth set at 120 KHz. Also, peak level of the fundamental emissions was measured in order to determine compliance with the 20dB peak to average limit specified in Section 15.35(b) of the FCC new Rules.
- (4) Measuring antenna:  
Broad band antenna for the frequency range 25-1000 MHz, connected with 10 meters coaxial cable. Cable loss of the coaxial cable included in the Antenna Factor for measurement data. The antenna are capable of measuring both horizontal and vertical polarizations.
- (5) Frequency range scanned:  
The frequency range from 25 MHz to 1000 MHz had been searched. Readings of the highest emissions relating to the limit were reported as above.
- (6) Arrangement of EUT:  
During the test, the sample was operated at rated supply voltage and arranged for maximum emissions.
- (7) Measuring Procedure:  
In accordance with the relevant clauses of the FCC Rules Part 15 section 15.109(a) and ANSI C63.4:1992 section 12.1.1.1-2.  
For superregenerative receivers, an independent signal generator had been used to radiated an unmodulated wave (cw) signal to the receiver at its operating frequency in order to "cohere" or resolve the individual components of the characteristic broadband emission from such a receiver. The level of such signal may need to be adjusted in order to accomplish this.
- (8) Measuring Uncertainty:  
The calculated uncertainty for measurement performed at 3M test distance are:-  
30MHz to 300MHz = ± 3.7dB, 300MHz to 1000MHz = + 3.0dB/-2.7dB.

Remark: Purpose of this test is to provide the Applicant with the necessary test data of their device for the submission to FCC with application for Equipment Authorization under FCC's Equipment Authorization Program. This test itself is not an Approval Test.

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\*\*\* RECEIVER \*\*\*

## (2) Measurement of Line-Conducted Voltage onto AC Power Line

TEST REFERENCE : FCC Rules Part 15 Subpart B Section 15.107(a)  
(Class B)

TEST CONDITION : Normal

TEST DATE : 1999.12.23

### (1) Between "Live" and "Ground"

Frequency Range of Emission	Maximum Measured Radio Noise		FCC Limit (Class B)	
	MHz	dB(μV)	μV	
0.45 - 0.8		24.54	16.87	250.00
0.8 - 1.6		22.06	12.68	250.00
1.6 - 3.0		19.59	9.54	250.00
3.0 - 5.0		19.44	9.38	250.00
5.0 - 7.0		18.82	8.73	250.00
7.0 - 9.0		19.77	9.74	250.00
9.0 - 11.0		22.48	13.30	250.00
11.0 - 13.0		23.96	15.78	250.00
13.0 - 15.0		26.70	21.63	250.00
15.0 - 17.0		31.87	39.22	250.00
17.0 - 19.0		0.00	1.00	250.00
19.0 - 21.0	<	36.54	67.14	250.00
21.0 - 23.0		0.00	1.00	250.00
23.0 - 25.0		39.96	99.54	250.00
25.0 - 27.0	<	29.86	31.12	250.00
27.0 - 30.0		0.00	1.00	250.00

- End -

===== SUMMARY =====

All data is within limits

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### (2) Measurement of Line-Conducted Voltage onto AC Power Line

TEST REFERENCE : FCC Rules Part 15 Subpart B Section 15.107(a)  
(Class B)  
TEST CONDITION : Normal  
TEST DATE : 1999.12.23

#### (1) Between "Neutral" and "Ground"

Frequency Range of Emission	Maximum Measured Radio Noise		FCC Limit (Class B)
MHz	dB( $\mu$ V)	$\mu$ V	$\mu$ V
0.45 - 0.8	35.18	57.41	250.00
0.8 - 1.6	<	22.06	250.00
1.6 - 3.0	<	19.59	250.00
3.0 - 5.0	<	19.44	250.00
5.0 - 7.0	<	18.82	250.00
7.0 - 9.0	<	19.77	250.00
9.0 - 11.0	<	22.48	250.00
11.0 - 13.0	<	23.96	250.00
13.0 - 15.0	<	26.70	250.00
15.0 - 17.0	<	31.87	250.00
17.0 - 19.0		0.00	250.00
19.0 - 21.0		36.54	250.00
21.0 - 23.0		0.00	250.00
23.0 - 25.0	<	39.96	250.00
25.0 - 27.0		29.86	250.00
27.0 - 30.0		0.00	250.00

- End -

===== SUMMARY =====  
All data is within limits  
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### **NOTES FOR THE CONDUCTED POWER-LINE MEASUREMENT**

- (1) LISN (Line Impedance Stabilization Network) used :  
50  $\mu$ H LISN in accordance with Section of ANSI C63.4:1992.
- (2) Measurement Instrumentations:  
CISPR quasi-peak type radio noise meter (9 KHz - 30 MHz), 6 dB bandwidth set at 9 KHz for measurement between 150 KHz & 30MHz.
- (3) Frequency range scanned :  
The frequency range from 450 KHz to 30 MHz had been searched. Reading of the highest emissions relating to the limit were reported as above.
- (4) Configuration of EUT  
Connection of equipment and operation conditions were same as those in the Radiation measurement.
- (5) Measurement procedure :  
In accordance with the relevant sections of ANSI C63.4:1992 "FCC Methods of measurement of Radio Noise Emissions from Computing Devices".
- (6) Measuring Uncertainty:  
The calculated uncertainty for conducted power-line measurement is  $= \pm 2.3$ dB.

Remark: Purpose of this test is to provide the Applicant with the necessary test data of their device for the submission to FCC with application for Equipment Authorization under FCC's Equipment Authorization Program. This test itself is not an Approval Test.

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