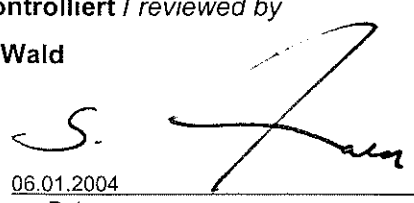


Prüfbericht - Nr.:		14004855 001		Seite 1 von 11 Page 1 of 11	
<i>Test Report No.</i>					
Auftraggeber: <i>Client:</i>		Lucky Plastic Factory Ltd. Suite 907-908 Chinachem Golden Plaza 77 Mody Road T.S.T. East, Kowloon Hong Kong			
Gegenstand der Prüfung: <i>Test item:</i>		Superregenerative Receiver			
Bezeichnung: <i>Identification:</i>		Radio Control MSX Watercraft 1074		Serien-Nr.: <i>Serial No.</i>	
Radio Control MSX Watercraft 1074		Engineering Sample			
Wareneingangs-Nr.: <i>Receipt No.:</i>		031021031		Eingangsdatum: <i>Date of receipt:</i>	
031021031		21.10.2003			
Prüfort: <i>Testing location:</i>		Refer to section 2.1			
Prüfgrundlage: <i>Test specification:</i>		FCC Part 15, Subpart B			
Prüfresultat: <i>Test Result</i>		Der vorstehend beschriebene Prüfgegenstand wurde geprüft und entspricht oben genannter Prüfgrundlage. The a. m. test item passed.			
geprüft / tested by: P.Poon		kontrolliert / reviewed by S.Wald			
06.01.2004 <i>Datum</i> <i>Date</i>  <i>Unterschrift</i> <i>Signature</i>		06.01.2004 <i>Datum</i> <i>Date</i>  <i>Unterschrift</i> <i>Signature</i>			
Sonstiges / Other Aspects: FCC ID: NEX-1074-49RX					
Abkürzungen: OK, Pass = entspricht Prüfgrundlage Fail = entspricht nicht Prüfgrundlage N/A = nicht anwendbar Abbreviations: OK, Pass = passed Fail = failed N/A = not applicable					
Dieser Prüfbericht bezieht sich nur auf den o.g. Prüfgegenstand und darf ohne Genehmigung der Prüfstelle nicht auszugsweise vervielfältigt werden. Dieser Bericht berechtigt nicht zur Verwendung eines Prüfzeichens. This test report relates to the a. m. test item. Without permission of the test center this test report is not permitted to be duplicated in extracts. This test report does not entitle to carry any test mark on this or similar products.					
<i>Authorized format 16.12.1996, R.M.</i>					

Prüfbericht - Nr.:
Test Report No.

14004855 001

Seite 2 von 11
Page 2 of 11

TEST SUMMARY

7.1.1 SPURIOUS RADIATED EMISSIONS
Result: Pass

Contents

1	GENERAL REMARKS	4
1.1	COMPLEMENTARY MATERIALS.....	4
2	TEST SITES	4
2.1	TEST FACILITIES	4
2.2	LIST OF TEST AND MEASUREMENT INSTRUMENTS	5
3	GENERAL PRODUCT INFORMATION	6
3.1	PRODUCT FUNCTION AND INTENDED USE	6
3.2	CIRCUIT DESCRIPTION.....	6
3.3	RATINGS AND SYSTEM DETAILS	6
3.4	INDEPENDENT OPERATION MODES	7
3.5	SUBMITTED DOCUMENTS	7
3.6	RELATED SUBMITTAL(S) GRANTS	7
4	TEST SET-UP AND OPERATION MODE	8
4.1	PRINCIPLE OF CONFIGURATION SELECTION	8
4.2	TEST OPERATION AND TEST SOFTWARE.....	8
4.3	SPECIAL ACCESSORIES AND AUXILIARY EQUIPMENT	8
4.4	COUNTERMEASURES TO ACHIEVE EMC COMPLIANCE.....	8
5	TEST METHODOLOGY.....	9
6	FIELD STRENGTH CALCULATION	9
7	TEST RESULTS.....	10
7.1.1	<i>Spurious Radiated Emissions</i>	<i>10</i>

1 General Remarks

1.1 Complementary Materials

All attachments are integral parts of this test report. This applies especially to the following appendix:

Appendix 1: Test Results

Appendix 2: Test Setup

Appendix 3: External Photographs of EUT

Appendix 4: Internal Photographs of EUT

Appendix 5: FCCID Label, Block Diagram, Schematics and User Manual

2 Test Sites

2.1 Test Facilities

Hong Kong Productivity Council
HKPC Building
78 Tat Chee Avenue
Kowloon
Hong Kong

2.2 List of Test and Measurement Instruments

Table 1: List of Test and Measurement Equipment

	Kind of Equipment	Manufacturer	Type	S/N
☐	Test Receiver	Rohde & Schwarz	ESH-3	890173/033
☐	L/I/S/N	Rohde & Schwarz	ESH 3-Z5	849876/026
☐	Oscilloscope	HP	54713B	US34510455
☐	Test Receiver	Rohde & Schwarz	ESVP	882402/033
☐	Absorbing Clamp	Rohde & Schwarz	MDS-21	979 3/4
☒	Test Receiver	Rohde & Schwarz	ESVS30	842807/009
☒	Biconical Antenna	Rohde & Schwarz	HK116	841489/015
☒	Log.-Periodic Antenna	Rohde & Schwarz	HL223	841516/017
☐	Universal Power Analyzer	Voltech	PM3000A	9915
☐	Reference Impedance Network	Voltech	IEC 555 Standard	9946
☐	AC Power Source	California Instr.	4500L	HK51895
☐	Trip-Loop Antenna	Chase	LLA6142	1019
☐	Double Ridge Horn Antenna	EMCO	3115	9002-3351
☐	Double Ridge Horn Antenna	EMCO	3116	9002-3347
☐	RF Comms Test Set	HP	8920B	US36492628
☐	Spectrum Analyser + Tracking Gen.	HP	8596E	3639A00758
☐	Signal Generator	Rohde & Schwarz	SMY 01	844146/024
☒	Signal Generator	Rohde & Schwarz	SMY 01	844146/023
☐	BiLog Antenna	EMCO	3143	9607-1287
☐	Isotropic Field Probe	Holladay	HI-4422	90956
☐	Power Amplifier	Kalmus	757-LC	7620-1
☐	Power Amplifier	Kalmus	122-FC	7620-2
☐	Coupling Clamp	Schaffner	CDN 126	312
☐	Couple Device Network	Fischer	CDN-M2	9604
☐	Spectrum Analyzer	Rohde & Schwarz	FSP30	1093.4495K30
☐	Temperature Chamber	Binder	MK 240	9020-0028
☐	EFT,ESD,SURGE, DIPS tester	Schaffner	Best 96	IN3796-011

3 General Product Information

3.1 Product Function and Intended Use

The equipment under test (EUT) is a RC toy boat operating at 49.860MHz. The forward, backward, left and right movement are controlled by the associated transmitter.

3.2 Circuit Description

- 1) Q1 and the associated circuit act as a RF-receiver.
- 2) IC1 and the associated circuit act as an AF amplifier.
- 3) Q2-Q13. K1-K2 and the associated circuit act as a power amplifier for DC motor.

3.3 Ratings and System Details

	Receiver
Frequency range	: 49.860MHz
Number of channels	: 1
Type of antenna	: Permanently attached receiving antenna.
Power supply	: 9.6V rechargeable battery pack.
Ports	: none
Protection Class	: III

3.4 Independent Operation Modes

The basic operation modes are:

- Power: On and Off
- Motor movement: left and right, forward and backward.

For further information refer to User Manual

3.5 Submitted Documents

The submitted documents are listed as follow:

- Circuit diagram
- Block diagram
- Rating label
- User manual

3.6 Related Submittal(s) Grants

This is a single application for certification of the receiver.

4 Test Set-up and Operation Mode

4.1 Principle of Configuration Selection

Emission: The equipment under test (EUT) was configured to measure its highest possible radiation level. The test modes were adapted accordingly in reference to the instructions for use.

4.2 Test Operation and Test Software

Test operation should refer to Section 5 and 7.

- There was no special software to exercise the device.

4.3 Special Accessories and Auxiliary Equipment

The product has been tested together with the following additional accessories:

-none

4.4 Countermeasures to achieve EMC Compliance

The test sample, which has been tested, contained the noise suppression parts as described in the Circuit Diagram or the Technical Construction File. No additional measures were employed to achieve compliance.

5 Test Methodology

Radiated Emission

The radiated emission measurements were performed according to the procedures in ANSI C63.4-2001.

The equipment under test (EUT) was placed at the middle of the 80cm height turntable, and the turntable is 3 meters far from the measuring antenna. During the testing, the EUT was operated standalone and arranged for maximum emissions. The EUT was tested in three orthogonal planes.

The investigation is performed with the EUT rotated 360° , the antenna height scanned between 1m and 4m, and the antenna rotated to repeat the measurements for both the horizontal and vertical antenna polarizations. Repeat the measurement steps until the maximum emissions were obtained.

The frequency range scanned is from the lowest radio frequency signal generated in the device which greater than 9 KHz to the tenth harmonic of the highest fundamental frequency or 40GHz, whichever is lower.

All radiated tests were performed at an antenna to EUT with 3 meters distance, unless stated otherwise in section 7.1.1 of this test report.

6 Field Strength Calculation

The field strength at 3m was established by adding the meter reading of the spectrum analyzer to the factors associated with antenna correction factor, cable loss, preamplifiers and filter attenuation.

The equation is expressed as follow:

$$FS = R + AF + CF + FA - PA$$

Where FS = Field Strength in dBuV/m at 3 meters.

R = Reading of Spectrum Analyzer in dBuV.

AF = Antenna Factor in dB/m.

CF = Cable Attenuation Factor in dB.

FA = Filter Attenuation Factor in dB.

PA = Preamplifier Factor in dB.

FA and PA are only be used for the measuring frequency above 1 GHz.

Prüfbericht - Nr.:
Test Report No.

14004855 001

Seite 10 von 11
 Page 10 of 11

7 Test Results

7.1.1 Spurious Radiated Emissions

RESULT:

Pass

Test Specification : FCC Part 15 section 15.109
 Test Method : ANSI 63.4-2001
 Measurement Location : Semi Anechoic Chamber
 Measurement Distance : 3m
 Detector Function : Quasi Peak
 Measurement BW : 100KHz
 Supply Voltage : DC 9.6V
 Measuring Frequency Range : 30-1000MHz
 :

Polarization: Vertical

Frequency	Reading	Antenna Factor	Attenuation of cable	Field strength at 3m	Limit at 3m	Delta to Limit
(MHz)	(dBuV)	(dB/m)	(dB)	(dBuV/m)	(dBuV/m)	(dB)
46.58	17.65	13.50	0.45	31.60	40.00	-8.40
49.34	14.60	12.90	0.50	28.00	40.00	-12.00
50.90	13.60	12.90	0.50	27.00	40.00	-13.00
135.20	22.00	13.30	0.90	36.20	43.50	-7.30
136.22	23.40	13.30	0.90	37.60	43.50	-5.90
136.94	23.20	13.30	0.90	37.40	43.50	-6.10
137.60	22.10	13.40	0.90	36.40	43.50	-7.10
141.32	17.70	13.60	0.90	32.20	43.50	-11.30
144.14	13.50	14.00	0.90	28.40	43.50	-15.10
181.94	12.40	15.60	1.00	29.00	43.50	-14.50
227.12	8.30	10.40	1.10	19.80	46.00	-26.20

For test results refer to Appendix 1, page 1-4

Prüfbericht - Nr.:

14004855 001

Seite 11 von 11

Test Report No.

Page 11 of 11

Polarization: Horizontal

Frequency	Reading	Antenna Factor	Attenuation of cable	Field strength at 3m	Limit at 3m	Delta to Limit
(MHz)	(dBuV)	(dB/m)	(dB)	(dBuV/m)	(dBuV/m)	(dB)
91.64	17.70	10.10	0.70	28.50	43.50	-15.00
135.20	24.90	13.30	0.90	39.10	43.50	-4.40
136.34	26.30	13.30	0.90	40.50	43.50	-3.00
136.70	26.30	13.30	0.90	40.50	43.50	-3.00
141.20	19.60	13.60	0.90	34.10	43.50	-9.40
141.62	18.30	13.60	0.90	32.80	43.50	-10.70
144.20	14.20	14.00	0.90	29.10	43.50	-14.40
180.92	14.40	15.60	1.00	31.00	43.50	-12.50
181.76	14.80	15.60	1.00	31.40	43.50	-12.10
186.38	9.40	15.80	1.00	26.20	43.50	-17.30
227.36	6.24	10.76	1.10	18.10	46.00	-27.90

For test results refer to Appendix 1, page 1-4

Limit

Subclause 15.109

The field strength of radiated emissions from unintentional radiators at a distance of 3 meters :

Frequency (MHz)	Field strength (microvolts/meter)	Field strength (dBμV/m)	Measurement distance (meters)
30-88	100	$20 \cdot \log(100) = 40.0$	3
88-216	150	$20 \cdot \log(150) = 43.5$	3
216-960	200	$20 \cdot \log(200) = 46.0$	3
Above 960	500	$20 \cdot \log(500) = 54.0$	3