Prüfbericht - Nr.: Test Report No.	**14006777 002**	**Seite 1 von 13** Page 1 of 13
Auftraggeber: Applicant	**Lucky Plastic Factory Ltd.** **Suite 907-908, Chinachem Golden Plaza** **77 Mody Road** **T.S.T. East, Kowloon** **Hong Kong**	
Gegenstand der Prüfung: Test item	**Low Power Transmitter- R/C Victory Vegas**	
Bezeichnung: Identification	**9401**	**Serien-Nr.:** Serial No. **Engineering sample**
Wareneingangs-Nr.: Receipt No.	**040913006**	**Eingangsdatum:** Date of receipt **13.09.2004**
Prüfort: Testing location	**TÜV Rheinland Hong Kong Ltd.** Unit 8, 25th Floor, Skyline Tower, 39 Wang Kwong Road, Kowloon Bay Kowloon, Hong Kong **Hong Kong Productivity Council** HKPC Building, 78 Tat Chee Avenue, Kowloon, Hong Kong	
Prüfgrundlage: Test specification	**FCC Part 15, Subpart C**	
Prüfergebnis: Test Result	**Das vorstehend beschriebene Gerät wurde geprüft und entspricht oben genannter Prüfgrundlage.** The above mentioned product was tested and **passed**.	

geprüft / tested by:			**kontrolliert** / reviewed by:		
06.10.2004	Prudence Poon		06.10.2004	Thomas Berns	
Datum Date	**Name** Name	**Unterschrift** Signature	**Datum** Date	**Name** Name	**Unterschrift** Signature

Sonstiges: **FCCID: NEX-9401**
Other Aspects

Abkürzungen:			Abbreviations:		
	OK, Pass, P	= entspricht Prüfgrundlage		OK, Pass, P	= passed
	Fail, F	= entspricht nicht Prüfgrundlage		Fail, F	= failed
	N/A	= nicht anwendbar		N/A	= not applicable
	NT	= nicht getestet		NT	= not tested

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Test Summary

Radiated Emission of Carrier Frequency

Result: Pass

Spurious Radiated Emissions

Result: Pass

Bandwidth Measurement

Result: Pass

Contents

General Remarks

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: EUT External Photo
Appendix 4: EUT Internal Photo
Appendix 5: FCCID Label, Block Diagram, Schematics and User manual.

List of Test and Measurement Instruments

Kind of Equipment	Manufacturer	Type	S/N
Test Receiver	Rohde & Schwarz	ESVS30	842807/009
Biconical Antenna	Rohde & Schwarz	HK116	841489/015
Log.-Periodic Antenna	Rohde & Schwarz	HL223	841516/017
Double Ridge Horn Antenna	EMCO	3115	9002-3351
Double Ridge Horn Antenna	EMCO	3115	9002-3347
Signal Generator	Rohde & Schwarz	SMY 01	844146/024
Signal Generator	Rohde & Schwarz	SMY 01	844146/023
Spectrum Analyzer	Rohde & Schwarz	FSP30	1093.4495K30

General Product Information

Product Function and Intended Use

The equipment under test (EUT) is a transmitter for a RC toy car operating at 27.145 MHz. The EUT has two control rods for commanding the forward, backward, left and right movement of the associated receiver.

Circuit Description

IC1, Q2, Q5, Q6 and the associated circuit act as AF-Modulator. Q1 and the associated circuit act as a RF-transmitter. Q3 together with 27.145 MHz crystal oscillator drive the base of Q1. The matching network at output of Q1 is to limit the harmonic content and provide the proper coupling to antenna output.

Ratings and System Details

		Transmitter
Frequency range	:	27.145MHz
Number of channels	:	1
Type of antenna	:	Integral antenna
Power supply	:	Battery operated 9V
Ports	:	none
Protection Class	:	III

Independent Operation Modes

The basic operation modes are:

Remote Control:
-On and Off
-Forward, backward, left and right controlling rod.

For further information refer to User Manual

Submitted Documents

The submitted documents are listed as follow:

- Circuit diagram
- Block diagram
- User manual
- Label artwork

Related Submittal(s) Grants

This is a single application for certification of the transmitter.

Test Set-up and Operation Mode

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.

Test Operation and Test Software

Test operation should refer to test methodology.

- There was no special software to exercise the device.

Special Accessories and Auxiliary Equipment

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

- none

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.

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 80 cm 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.

All radiated tests were performed at an antenna to EUT with 3 meters distance, unless stated otherwise in section 7.1.1 and 7.1.2 of this test report.

Field Strength Calculation

The field strength at 3 m 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.
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.

Test Results

Radiated Emission of Carrier Frequency — Subclause 15.227(a)

RESULT: **Pass**

Test Specification	:	FCC Part 15 Subclause 15.227(a)
Test Method	:	ANSI 63.4-2001
Measurement Location	:	Semi Anechoic Chamber
Measurement Distance	:	3m
Detector Function	:	Peak and Average
Measurement BW	:	100 kHz
Supply Voltage	:	DC 9V

Polarization: Vertical

Detector function	Frequency (MHz)	Reading (dBuV)	Antenna Factor (dBuV/m)	Attenuation of cable (dB)	Measured Field strength at 3m (dBuV/m)	Delta to Limit (dB)
Peak	27.145	39.53	18.8	0.37	58.7	-41.30
Average	27.145	33.93	18.8	0.37	53.1	-26.90

Polarization: Horizontal

Detector function	Frequency (MHz)	Reading (dBuV)	Antenna Factor (dBuV/m)	Attenuation of cable (dB)	Measured Field strength at 3m (dBuV/m)	Delta to Limit (dB)
Peak	27.145	18.03	18.8	0.37	37.2	-62.8
Average	27.145	10.63	18.8	0.37	29.8	-50.2

For test results refer to Appendix 1, page 1-2

Limit **Subclause 15.227(a)**

Frequency within the band	Peak Emission		Average Emission	
	(microvolt/meter)	dBµV/m	(microvolt/meter)	dBµV/m
26.96-27.28 MHz	100,000	100.0	10,000	80.0

According to section 15.35(b), When average radiated emission measurements are specified, including emission measurement below 1000MHz, there also is limit on the radio frequency emissions, as measured using instrumentation with a peak detector function, corresponding to 20dB above the maximum permitted average limit for the frequency being investigated.

Spurious Radiated Emissions

Subclause 15.227(b)

RESULT: **Pass**

Test Specification	:	FCC Part 15 Subclause 15.209
Test Method	:	ANSI 63.4-2001
Measurement Location	:	Semi Anechoic Chamber
Measurement Distance	:	3m
Detector Function	:	Quasi Peak
Measurement BW	:	100 kHz
Supply Voltage	:	DC 9V
Measuring Frequency Range	:	30-1000MHz

Polarization: Vertical

Frequency (MHz)	Reading (dBuV/m)	Antenna Factor (dBuV/m)	Attenuation of cable (dB)	Field strength at 3m (dBuV/m)	Limit at 3m (dBuV/m)	Delta to Limit (dB)
54.29	22.40	11.95	0.55	34.90	40.00	-5.10
81.44	19.20	9.70	0.60	29.50	40.00	-10.50
108.58	15.10	11.60	0.80	27.50	43.50	-16.00
135.72	16.00	13.30	0.90	30.20	43.50	-13.30
162.87	8.70	14.70	0.90	24.30	43.50	-19.20
190.01	19.30	16.00	1.00	36.30	43.50	-7.20
217.16	27.30	10.40	1.10	38.80	46.00	-7.20
271.45	18.30	12.20	1.30	31.80	46.00	-14.20
325.74	14.15	13.75	1.40	29.30	46.00	-16.70

Polarization: Horizontal

Frequency (MHz)	Reading (dBuV/m)	Antenna Factor (dBuV/m)	Attenuation of cable (dB)	Field strength at 3m (dBuV/m)	Limit at 3m (dBuV/m)	Delta to Limit (dB)
54.29	14.30	11.95	0.55	26.80	40.00	-13.20
81.44	13.80	9.70	0.60	24.10	40.00	-15.90
108.58	11.90	11.60	0.80	24.30	43.50	-19.20
135.72	10.80	13.30	0.90	25.00	43.50	-18.50
162.87	8.70	14.70	0.90	24.30	43.50	-19.20
190.01	12.10	16.00	1.00	29.10	43.50	-14.40
217.16	13.70	10.40	1.10	25.20	46.00	-20.80
271.45	14.00	12.20	1.30	27.50	46.00	-18.50
325.74	13.95	13.75	1.40	29.10	46.00	-16.90

Limit **Subclause 15.209**

Radiated emissions, which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209.

Limit for Radiated Emission under Section 15.209:

Frequency (MHz)	Field strength (microvolt/meter)	Field strength (dBμV/m)	Measurement distance (meters)
30-88	100	20*log(100) = 40.0	3
88-216	150	20*log(150) = 43.5	3
216-960	200	20*log(200) = 46.0	3
960-2500	500	20*log(500) = 54.0	3

The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector and above 1000 MHz are based on the measurements employing an average detector.

Bandwidth Measurement — Subclause 15.227(b)

RESULT: **Pass**

Test Specification	:	FCC Part 15 section 227(b)
Port of Testing	:	Antenna port
Detector Function	:	Peak
Supply Voltage	:	DC 9V

The field strength of any emissions appearing at the lower edge 26.96 MHz and upper edge 27.28 MHz are 54.45 dB and 51.27 dB below the carrier respectively.

For test results refer to Appendix 1.

Limit **Subclause 15.227(b)**

The field strength of any emission which appears outside of this band shall not exceed the general radiated emission limits in Section 15.209.