Produkte
Products

Prüfbericht - Nr.: *Test Report No.:*	**14032333 002**		**Seite 1 von 11** *Page 1 of 11*
Auftraggeber: *Client:*	**Stadlbauer Marketing + Vertrieb Ges.M.B.H.** **Rennbahnallee 1** **5412 Puch, Salzburg** **Austria**		
Gegenstand der Prüfung: *Test Item:*	**Short Range Device – Low Power Transmitter (49.86MHz)**		
Bezeichnung: *Identification:*	**900030**	**Serien-Nr.:** *Serial No.:*	**Engineering sample**
Wareneingangs-Nr.: *Receipt No.:*	**00131223071-002**	**Eingangsdatum:** *Date of Receipt:*	**23.12.2013**
Zustand des Prüfgegenstandes bei Anlieferung: *Condition of test item at delivery:*	Test sample(s) received is/are sufficient for testing and not damaged.		
Prüfort: *Testing Location:*	**Hong Kong Productivity Council** HKPC Building, 78 Tat Chee Avenue, Kowloon, Hong Kong		
Prüfgrundlage: *Test Specification:*	**FCC Part 15, Subpart C** **ANSI C63.4-2009**		
Prüfergebnis: *Test Result:*	**Der Prüfgegenstand entspricht oben genannter Prüfgrundlage(n).** *The test item passed the test specification(s).*		
Prüflaboratorium: *Testing Laboratory:*	**TÜV Rheinland Hong Kong Ltd.** 8 - 10/F., Goldin Financial Global Square, 7 Wang Tai Road, Kowloon Bay, Kowloon, Hong Kong		

geprüft / *tested by:*			**kontrolliert** / *reviewed by:*		
02.04.2014	Hugo Wan Senior Project Manager		02.04.2014	Sharon Li Section Manager	
Datum *Date*	**Name/Stellung** *Name/Position*	**Unterschrift** *Signature*	**Datum** *Date*	**Name/Stellung** *Name/Position*	**Unterschrift** *Signature*

Sonstiges / *Other Aspects:*

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Abkürzungen:				***Abbreviations:***			
	P(ass)	=	***entspricht Prüfgrundlage***		***P(ass)***	=	***passed***
	F(ail)	=	***entspricht nicht Prüfgrundlage***		***F(ail)***	=	***failed***
	N/A	=	***nicht anwendbar***		***N/A***	=	***not applicable***
	N/T	=	***nicht getestet***		***N/T***	=	***not tested***

Test Summary

Radiated Emission of Carrier Frequency

Result: Pass

Spurious Radiated Emissions

Result: Pass

Bandwidth Measurement

Result: Pass

Contents

List of Test and Measurement Instruments

Hong Kong Productivity Council (FCC Registration number: 90656)

Radiated Emission

Equipment	Manufacturer	Type	S/N	Cal Due Date
Semi-anechoic Chamber	Frankonia	Nil	Nil	12 Apr 2014
EMI Test Receiver	Rohde & Schwarz	ESU40	100190	19 Feb 2014
Biconical Antenna	Rohde & Schwarz	HK116	100241	11 Jun 2015
Log-Periodic Antenna	Rohde & Schwarz	HL223	841516/017	10 Jun 2015
Horn Antenna	EMCO	3115	9002-3347	11 Jun 2015
Coaxial Cable 50ohm	Rosenberger	RTK081-05S-05S-10m	LA2-001-10M / 001	15 Nov 2015
Active Loop Antenna	EMCO	6502	9107-2651	21 Jun 2014

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Radio Frequency Test

Equipment	Manufacturer	Type	S/N	Cal Due Date
Spectrum Analyzer	Rohde & Schwarz	FSP30	100007	03 Dec 2014

General Product Information

Product Function and Intended Use

The equipment under test (EUT) is a transmitter for a RC toy car operating at 49.86MHz. The EUT has 2 control rods to command forward, backward, left and right movement of the associated receiver.

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Model	Product description
900030	Radio Control Toy Transmitter

According to client declaration, the transmitter of model mentioned in above table are totally identical to previous tested transmitter of model 900022 in test report 14032333 001 except the change of battery compartment from LR6 (AA) type battery to LR03 (AAA) type battery and model number.

Ratings and System Details

		Transmitter
Frequency range	:	49.86MHz
Number of channels	:	1
Type of antenna	:	External Telescopic Antenna
Antenne length	:	36 cm
Power supply	:	Battery operated 3.0 V
Ports	:	none
Protection Class	:	III

Independent Operation Modes

The basic operation modes are:

- Remote Control: On and Off

For further information refer to User Manual

Submitted Documents

The submitted documents are listed as follow:

- Circuit diagram
- Block diagram
- User manual
- Bill of materials
- 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

- none

Test Methodology

Radiated Emission

The radiated emission measurements were performed according to the procedures in ANSI C63.4-2009.

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 particular parts 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 15.235(a)

RESULT: **Pass**

Test Specification	:	FCC Part 15 Subclause 15.235(a)
Test Method	:	ANSI 63.4-2009
Measurement Location	:	Semi Anechoic Chamber
Measurement Distance	:	3m
Detector Function	:	Peak and Average
Measurement BW	:	120 kHz
Supply Voltage	:	DC 3.0 V

Polarization: Vertical

Detector function	Frequency (MHz)	Measured Field strength at 3m (dBµV/m)	Delta to Limit (dB)
Peak	49.860	72.6	-27.4
Average	49.860	66.8	-13.2

Polarization: Horizontal

Detector function	Frequency (MHz)	Measured Field strength at 3m (dBµV/m)	Delta to Limit (dB)
Peak	49.861	58.7	-41.3
Average	49.861	52.9	-27.1

Limit **Subclause 15.235(a)**

Frequency within the band	Peak Emission		Average Emission	
	(µV/m)	dBµV/m	(µV/m)	dBµV/m
49.82-49.90 MHz	100,000	100.0	10,000	80.0

According to section 15.35(b), when average radiated emission measurements are specified in this part, including average emission measurements below 1000 MHz, there also is a limit on the peak level of the radio frequency emissions. Unless otherwise specified, the limit on peak radio frequency emissions is 20 dB above the maximum permitted average emission limit applicable to the equipment under test.

Spurious Radiated Emissions — Subclause 15.235(b)

RESULT: **Pass**

Test Specification	:	FCC Part 15 Subclause 15.209
Test Method	:	ANSI 63.4-2003
Measurement Location	:	Semi Anechoic Chamber
Measurement Distance	:	3m
Detector Function	:	Quasi Peak
Measurement BW	:	120 kHz
Supply Voltage	:	DC 3.0 V
Measuring Frequency Range	:	30-1000MHz

Polarization: Vertical

Frequency (MHz)	Field strength at 3m (dBµV/m)	Limit at 3m (dBµV/m)	Delta to Limit (dB)
39.840	26.9	40.0	-13.1
99.721	26.2	43.5	-17.3
149.583	30.3	43.5	-13.2
199.444	29.1	43.5	-14.4
448.748	34.7	46.0	-11.3
548.471	38.7	46.0	-7.3
648.193	33.0	46.0	-13.0

Polarization: Horizontal

Frequency (MHz)	Field strength at 3m (dBµV/m)	Limit at 3m (dBµV/m)	Delta to Limit (dB)
149.583	28.2	43.5	-15.3
448.749	34.8	46.0	-11.2

Remark: (1) ' * ' indicates the frequency of the emissions fall into the restricted band as defined in Section 15.205(a). They comply with the radiated emission limits specified in Section 15.209.
(2) There is no other spurious emission found from 30MHz to 1000MHz.

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 (µV/m)	Field strength (dBµV/m)	Measurement distance (m)
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 15.235(b)

RESULT: **Pass**

Test Specification	:	FCC Part 15 section 235(b)
Port of Testing	:	Antenna port
Detector Function	:	Peak
Supply Voltage	:	DC 3.0 V

The field strength of any emissions appearing between the band edges and up to 10kHz above and below the band edges is at least 26dB below the carrier. At the lower edge 49.81MHz and upper edge 49.91 MHz are 26.31 dB and 26.22 dB below the carrier respectively.

For test results refer to Appendix 1.

Limit **Subclause 15.235(b)**

The field strength of any emissions appearing between the band edges and up to 10KHz above and below the band edges shall be attenuated at least 26dB below the level of the unmodulated carrier or to the general limits in Section 15.209, whichever permits the higher emission levels.