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Produkte
Products

Prüfbericht - Nr.: *Test Report No.:*	**14036275 001**	**Seite 1 von 11** *Page 1 of 11*
Auftraggeber: *Client:*	**Stadlbauer Marketing + Vertrieb GmbH** **Rennbahn Allee 1** **5412 Puch/ Salzburg** **Austria**	
Gegenstand der Prüfung: *Test Item:*	**Short Range Device – Low Power Transmitter (49.86MHz)**	
Bezeichnung: *Identification:*	**900031**	**Serien-Nr.:** *Serial No.:* **Engineering sample**
Wareneingangs-Nr.: *Receipt No.:*	**A000049689-001**	**Eingangsdatum:** *Date of Receipt:* **12.04.2014**
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:*	**Global United Technology Services Co., Ltd.** 2nd Floor, Block No.2, Laodong Industrial Zone, Xixiang Road, Baoan District, Shenzhen, China	
Prüfgrundlage: *Test Specification:*	**FCC Part 15, Subpart C** **ANSI C63.4-2003**	
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:*		
25.07.2014	Benny Lau Project Manager	Benny Lau	25.07.2014	Sharon Li Section Manager	
Datum *Date*	**Name/Stellung** *Name/Position*	**Unterschrift** *Signature*	**Datum** *Date*	**Name/Stellung** *Name/Position*	**Unterschrift** *Signature*

Sonstiges / *Other Aspects:*

FCC ID: YFA90003149

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

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Appendix 1: Test Results

Appendix 2: Test Setup

Appendix 3: EUT External Photo

Appendix 4: EUT Internal Photo

Appendix 5: Technical Description, Block Diagram, Schematics, BOM, FCC label and User manual

List of Test and Measurement Instruments

Global United Technology Services Co., Ltd. (Registration number: 600491)

Radiated Emission				
Equipment	**Manufacturer**	**Type**	**Cal. Date**	**Cal. Due Date**
3m Semi- Anechoic Chamber	ZhongYu Electron	9.0(L)*6.0(W)* 6.0(H)	April. 6 2013	April. 5 2015
Control Room	ZhongYu Electron	6.2(L)*2.5(W)* 2.4(H)	N/A	N/A
ESU EMI Test Receiver	Rohde & Schwarz	ESU26	June. 27 2014	June. 27 2015
Loop Antenna	Zhinan	ZN30900A	June. 27 2014	June. 27 2015
Bi-log Hybrid Antenna	SCHWARZBECK	VULB9163	Mar. 09 2014	Mar. 08 2015
Double-ridged horn antenna	SCHWARZBECK	9120D	Mar. 09 2014	Mar. 08 2015
Horn Antenna	ETS-LINDGREN	3160-09	Mar. 09 2014	Mar. 08 2015
RF Amplifier	HP	8347A	June. 27 2014	June. 27 2015
RF Amplifier	HP	8349B	June. 27 2014	June. 27 2015
EMI Test Software	AUDIX	E3	N/A	N/A
Coaxial cable	GTS	N/A	June. 27 2014	June. 27 2015
Coaxial Cable	GTS	N/A	June. 27 2014	June. 27 2015
Thermo meter	N/A	N/A	April. 6 2013	April. 5 2015
Spectrum Analyzer	Rohde & Schwarz	FSP30	Dec 03 2012	Dec 03 2014

Bandedge Measurement				
Equipment	**Manufacturer**	**Type**	**Cal. Date**	**Cal Due Date**
Spectrum Analyzer	Rohde& Schwarz	FSP30	Dec. 02 2012	Dec. 03 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
900031	Radio Control Toy Transmitter

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	:	2 x AAA size batteries, 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 C63.4-2003.

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 63.4-2003
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	49.861	71.57	-28.43
Average	49.861	67.97	-12.03

Polarization: Horizontal

Detector function	Frequency (MHz)	Measured Field strength at 3m (dBµV/m)	Delta to Limit (dB)
Peak	49.861	57.27	-42.73
Average	49.861	52.44	-27.56

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 63.4-2009
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	:	9kHz –1000MHz

Polarization: Vertical

Frequency (MHz)	Field strength at 3m (dBµV/m)	Limit at 3m (dBµV/m)	Delta to Limit (dB)
99.528	29.17	43.5	-14.33
199.286	24.00	43.5	-19.50
*249.425	26.04	46.0	-19.96

Polarization: Horizontal

Frequency (MHz)	Field strength at 3m (dBµV/m)	Limit at 3m (dBµV/m)	Delta to Limit (dB)
99.528	30.22	43.5	-13.28
149.486	21.63	43.5	-21.87
199.286	25.82	43.5	-17.68
*249.425	26.29	46.0	-19.71

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 below 30MHz.

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) and 15.215

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 41.68 dB and 41.94 dB below the carrier respectively.

For test results refer to Appendix 1.

Limit **Subclause 15.235(b) and 15.215**

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.

15.215 (c) - Intentional radiators operating under the alternative provisions to the general emission limits, as contained in 15.217 through 15.257 and in Subpart E of this part, must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated