

Products

 Prüfbericht - Nr.:
 14025986 001
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Auftraggeber: Stadlbauer Marketing + Vertrieb GmbH

Client: Rennbahn Allee1

5412 Puch, Salzburg Austria

Gegenstand der Prüfung: Low Power Transmitter (27.145MHz)

Test Item:

Bezeichnung: 900005 Serien-Nr.: Engineering sample

Identification: Serial No.:

Wareneingangs-Nr.: 00101228049-001 Eingangsdatum: 28.12.2010

Receipt No.: Date of Receipt:

Prüfort: TÜV Rheinland Hong Kong Ltd.

Testing Location: 8/F., Niche Centre, 14 Wang Tai Road, Kowloon Bay, Kowloon, Hong Kong

Hong Kong Productivity Council

HKPC Building, 78 Tat Chee Avenue, Kowloon, Hong Kong

Prüfgrundlage: FCC Part 15, Subpart C

Test Specification:

Prüfergebnis: Der Prüfgegenstand entspricht oben genannter Prüfgrundlage(n).

Test Result: The test item passed the test specification(s).

Prüflaboratorium: TÜV Rheinland Hong Kong Ltd.

Testing Laboratory: 9th Floor, Emperor International Square, 7 Wang Tai Road, Kowloon Bay.

Kowloon, Hong Kong

geprüft / tested by: kontrolliert / reviewed by:

Tony Yeung Sharon Li
22.03.2011 Engineer 22.03.2011 Assistant Manager

22.03.2011 Engineer

Datum Name/Stellung Unterschrift Date Name/Position Signature

22.03.2011 Assistant Manager Unterschrift Datum Name/Stellung Unterschrift Name/Position Signature

Date Name/Position Signature

Sonstiges / Other Aspects:

FCCID: YFA900005

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

Dieser Prüfbericht bezieht sich nur auf das o.g. Prüfmuster 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 sample. 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 safety mark on this or similar products.



# **Test Summary**

**Radiated Emission of Carrier Frequency** 

Result: Pass

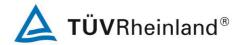
**Spurious Radiated Emissions** 

Result: Pass

**Bandwidth Measurement** 

Result: Pass

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# **List of Test and Measurement Instruments**

	Equipment used	Manufacturer	Model	S/N	Due Date
			No.		
$\boxtimes$	Semi-anechoic Chamber	Frankonia	Nil	Nil	27-Apr-11
$\boxtimes$	Test Receiver	R&S	ESU26	100050	25-May-11
$\boxtimes$	Bi-conical Antenna	R&S	HK116	100242	13-Apr-12
$\boxtimes$	Log Periodic Antenna	R&S	HL223	841516/020	13-Apr-12
	Coaxial cable 50ohm	Rosenberger	RTK081- 05S-05S- 10m	LA2-001-10M / 001	08 Dec 11
$\boxtimes$	Microwave amplifer 0.5- 26.5GHz, 25dB gain	HP	83017A	3950M00241	03-Oct-11
$\boxtimes$	High Pass Filter (cutoff freq. =1000MHz)	Trilithic	23042	9829213	30-Oct-11
$\boxtimes$	Horn Antenna	EMCO	3115	9002-3351	16-Apr-12
$\boxtimes$	Spectrum Analyser	R&S	FSP 30	100416	17-Sep-12
$\boxtimes$	Active Loop Antenna	EMCO	6502	9107-2651	06-Feb-11
$\boxtimes$	Test Receiver	R&S	ESCS 30	100201	11 Jan 12
	Artificial Mains Network	R&S	ESH3-Z5	100230	11 Jan 11

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# **General Product Information**

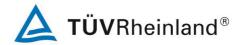
### **Product Function and Intended Use**

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, right movement and Turbo speed button of the associated receiver.

# **Ratings and System Details**

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

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# **Independent Operation Modes**

The basic operation modes are:

- transmitting control signal for the RC toy car.

For further information refer to User Manual

### **Submitted Documents**

The submitted documents are listed as follow:

- Circuit diagram
- Block diagram
- User manual
- Label artwork
- Bill(s) of material

# Related Submittal(s) Grants

This is a single application for certification of the transmitter.

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# **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

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# **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.

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### **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 63.4-2003

Measurement Location : Semi Anechoic Chamber

Measurement Distance: 3m

Detector Function : Peak and Average

Measurement BW : 120 kHz Supply Voltage : DC 9V

**Polarization: Vertical** 

Detector function	Frequency	Measured Field strength at 3m	Delta to Limit
	(MHz)	(dBµV/m)	(dB)
Peak	27.143	61.7	-38.3
Average	27.143	61.4	-18.6

#### **Polarization: Horizontal**

Detector function	Frequency (MHz)	Measured Field strength at 3m (dBμV/m)	Delta to Limit (dB)
Peak	27.143	60.0	-40.0
Average	27.143	59.7	-20.3

Limit Subclause 15.227(a)

Frequency within the band	Peak Emission		Average Emission	
r requericy within the band	(μV/m)	dBµV/m	(μV/m)	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 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.

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## **Spurious Radiated Emissions**

**Subclause 15.227(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 9V
Measuring Frequency Range : 30-1000MHz

### **Polarization: Vertical**

Frequency (MHz)	Field strength at 3m (dBuV/m)	Limit at 3m (dBuV/m)	Delta to Limit (dB)
54.290	22.2	40.0	-17.8
81.435	23.8	40.0	-16.2
*108.581	21.4	43.5	-22.1
*135.727	14.8	43.5	-28.7
*162.870	31.9	43.5	-11.6
190.017	17.3	43.5	-26.2
217.163	28.6	46.0	-17.4
*244.309	32.0	46.0	-14
*271.454	22.8	46.0	-23.2

### **Polarization: Horizontal**

Frequency (MHz)	Field strength at 3m (dBuV/m)	Limit at 3m (dBuV/m)	Delta to Limit (dB)
54.291	14.5	40.0	-25.5
81.438	30.8	40.0	-9.2
*108.582	25.4	43.5	-18.1
*135.727	21.8	43.5	-21.7
*162.873	31.9	43.5	-11.6
190.017	24.9	43.5	-18.6
217.165	29.1	46.0	-16.9
*244.310	31.5	46.0	-14.5
*271.455	23.5	46.0	-22.5

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 spurious emission found between lowest oscillating frequency to 30 MHz.

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Limit Subclause 15.209

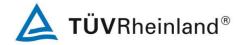
Radiated emissions, which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209.

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.

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### **Bandwidth Measurement**

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 59.29 dB and 51.14 dB below the carrier respectively.

For test results refer to Appendix 1.

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