



<b>Prüfbericht - Nr.:</b> Test Report No.	<b>14008250 001</b>	<b>Seite 1 von 11</b> Page 1 of 11	
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<b>Gegenstand der Prüfung:</b> Test item	<b>Superregenerative Receiver</b>		
<b>Bezeichnung:</b> Identification	<b>Refer to page 6.</b>	<b>Serien-Nr.:</b> Serial No.	<b>Engineering sample</b>
<b>Wareneingangs-Nr.:</b> Receipt No.	<b>041215010</b>	<b>Eingangsdatum:</b> Date of receipt	<b>15.12.2004</b>
<b>Prüfort:</b> Testing location	<b>TÜV Rheinland Hong Kong Ltd.</b> Unit 8, 25 <sup>th</sup> Floor, Skyline Tower, 39 Wang Kwong Road, Kowloon Bay Kowloon, Hong Kong  <b>Hong Kong Productivity Council</b> HKPC Building, 78 Tat Chee Avenue, Kowloon, Hong Kong		
<b>Prüfgrundlage:</b> Test specification	<b>FCC Part 15, Subpart B</b>		
<b>Prüfergebnis:</b> Test Result	<b>Das vorstehend beschriebene Gerät wurde geprüft und entspricht oben genannter Prüfgrundlage.</b> The above mentioned product was tested and <b>passed</b> .		
<b>geprüft / tested by:</b>		<b>kontrolliert / reviewed by:</b>	
13.01.2005	Prudence Poon	13.01.2005	Thomas Berns
<b>Datum</b> Date	<b>Name</b> Name	<b>Datum</b> Date	<b>Name</b> Name
	<b>Unterschrift</b> Signature		<b>Unterschrift</b> Signature
<b>Sonstiges:</b> <b>FCC ID NEX-9449-52</b> Other Aspects			
<b>Abkürzungen:</b>	<b>OK, Pass, P = entspricht Prüfgrundlage</b> <b>Fail, F = entspricht nicht Prüfgrundlage</b> <b>N/A = nicht anwendbar</b> <b>NT = nicht getestet</b>	<b>Abbreviations:</b>	<b>OK, Pass, P = passed</b> <b>Fail, F = failed</b> <b>N/A = not applicable</b> <b>NT = not tested</b>
<b>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.</b> This test report relates to the a. m. test sample. Without permission of the test center this test report is not permitted to be duplicate in extracts. This test report does not entitle to carry any safety mark on this or similar products.			

# Test Summary

## Spurious Radiated Emissions

*Result: Pass*

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## 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

## General Product Information

### Product Function and Intended Use

The equipment under test ( EUT ) is a RC toy car operating at 49.860 MHz. The EUT moves forward, backward, left and right according to the command of the associate transmitter.

Due to declaration from the manufacturer and our constructional checking, it is deemed that that the receiver of 9449, 9450, 9451, 9452, 9453 and 9454 are same in circuit design and PCB layout, they only differ in the plastic cosmetic design. Hence, all testing was conducted on the representative model: 9453.

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Model	Product description
<b>9449</b>	<b>GM Colorado 1:20 FF RC</b>
<b>9450</b>	<b>GM Avalanche 1:20 FF RC</b>
<b>9451</b>	<b>Jeep Rescue 1:20 FF RC</b>
<b>9452</b>	<b>Ford Explore Sport Track 1:20 FF RC</b>
<b>9453</b>	<b>Ford Bronco 1:20 FF RC</b>
<b>9454</b>	<b>Toyota Tundra 1:20 R/C</b>

### Circuit Description

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

### Ratings and System Details

	Receiver
Frequency range	: 49.860MHz
Number of channels	: 1
Type of antenna	: Integral antenna
Power supply	: Battery operated 4.5V
Ports	: none
Protection Class	: III
Equipment Class	: B

## **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

## **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 Receiver.

## **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 C63.4-2003.

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 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

### Spurious Radiated Emissions

### Section 15.109

**RESULT:**
**Pass**

Test Specification : FCC Part 15 Section 15.109  
 Test Method : ANSI 63.4-2003  
 Measurement Location : Semi Anechoic Chamber  
 Measurement Distance : 3m  
 Detector Function : Quasi Peak  
 Measurement BW : 100 kHz  
 Supply Voltage : DC 4.5V  
 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/m)	(dBuV/m)	(dB)	(dBuV/m)	(dBuV/m)	(dB)
46.52	6.56	13.50	0.46	20.52	40.00	-19.48
50.60	8.20	12.90	0.50	21.60	40.00	-18.40
91.34	5.10	10.10	0.70	15.90	43.50	-27.60
182.30	2.50	15.60	1.00	19.10	43.50	-24.40
227.42	2.20	10.80	1.10	14.10	46.00	-31.90
252.78	3.17	11.65	1.18	16.00	46.00	-30.00
317.72	0.73	13.60	1.37	15.70	46.00	-30.30
450.08	0.20	16.80	1.90	18.90	46.00	-27.10
614.84	0.70	19.40	2.10	22.20	46.00	-23.80
854.30	0.95	21.85	2.60	25.40	46.00	-20.60

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

Polarization: Horizontal

Frequency	Reading	Antenna Factor	Attenuation of cable	Field strength at 3m	Limit at 3m	Delta to Limit
(MHz)	(dBuV/m)	(dBuV/m)	(dB)	(dBuV/m)	(dBuV/m)	(dB)
34.34	0.20	16.10	0.40	16.70	40.00	-23.30
48.98	5.92	12.90	0.48	19.30	40.00	-20.70
91.10	6.80	10.10	0.70	17.60	43.50	-25.90
137.48	5.00	13.50	0.90	19.40	43.50	-24.10
188.66	1.70	15.80	1.00	18.50	43.50	-25.00
231.69	2.55	10.95	1.10	14.60	46.00	-31.40
252.78	6.57	11.65	1.18	19.40	46.00	-26.60
325.64	0.45	13.65	1.40	15.50	46.00	-30.50
372.16	0.25	14.95	1.50	16.70	46.00	-29.30
651.28	0.15	19.70	2.25	22.10	46.00	-23.90
837.36	0.20	21.4	2.6	24.20	46.00	-21.80

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

**Limit****Section 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 (dB $\mu$ V/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