



Produkte  
Products

<b>Prüfbericht - Nr.: 14018988 001</b> <i>Test Report No.:</i>		Seite 1 von 12 Page 1 of 12	
<b>Auftraggeber:</b> <i>Client:</i>		<b>Zaptoys International Limited</b> <b>Unit 1105, 11/F, Tower II</b> <b>South Seas Centre</b> <b>T.S.T. East, Kowloon</b> <b>Hong Kong</b>	
<b>Gegenstand der Prüfung:</b> <i>Test Item:</i>		<b>Low Power Transmitter (27.145MHz)</b>	
<b>Bezeichnung:</b> <i>Identification:</i>	<b>9605</b>	<b>Serien-Nr.:</b> <i>Serial No.:</i>	<b>Engineering sample</b>
<b>Wareneingangs-Nr.:</b> <i>Receipt No.:</i>	<b>080603001-1</b>	<b>Eingangsdatum:</b> <i>Date of Receipt:</i>	<b>03.06.2008</b>
<b>Prüfört:</b> <i>Testing Location:</i>		<b>TÜV Rheinland Hong Kong Ltd.</b> 9th Floor, Oriental News Building, 7 Wang Tai Road, Kowloon Bay, Kowloon, Hong Kong <b>Hong Kong Productivity Council</b> HKPC Building, 78 Tat Chee Avenue, Kowloon, Hong Kong	
<b>Prüfgrundlage:</b> <i>Test Specification:</i>		<b>FCC Part 15, Subpart C</b>	
<b>Prüfergebnis:</b> <i>Test Result:</i>		<b>Der Prüfgegenstand entspricht oben genannter Prüfgrundlage(n).</b> <i>The test item passed the test specification(s).</i>	
<b>Prüflaboratorium:</b> <i>Testing Laboratory:</i>		<b>TÜV Rheinland Hong Kong Ltd.</b> 9th Floor, Oriental News Building, 7 Wang Tai Road, Kowloon Bay, Kowloon, Hong Kong	
<b>geprüft / tested by:</b>		<b>kontrolliert / reviewed by:</b>	
03.06.2008	Hugo Wan Project Manager		03.06.2008
Datum <i>Date</i>	Name/Stellung <i>Name/Position</i>	Unterschrift <i>Signature</i>	Datum <i>Date</i>
03.06.2008	Thomas Berns Manager		03.06.2008
Datum <i>Date</i>	Name/Stellung <i>Name/Position</i>	Unterschrift <i>Signature</i>	Datum <i>Date</i>
<b>Sonstiges / Other Aspects:</b>			
<b>FCCID: NEX-9605-27TX</b>			
<b>Abkürzungen:</b>		<b>Abbreviations:</b>	
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
<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> <i>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.</i>			

## Test Summary

### **Radiated Emission of Carrier Frequency**

*Result: Pass*

### **Spurious Radiated Emissions**

*Result: Pass*

### **Bandwidth Measurement**

*Result: Pass*

## Contents

<b>List of Test and Measurement Instruments.....</b>	<b>4</b>
<b>General Product Information .....</b>	<b>5</b>
Product Function and Intended Use.....	5
Ratings and System Details.....	5
Independent Operation Modes.....	6
Submitted Documents .....	6
Related Submittal(s) Grants .....	6
<b>Test Set-up and Operation Mode.....</b>	<b>7</b>
Principle of Configuration Selection .....	7
Test Operation and Test Software .....	7
Special Accessories and Auxiliary Equipment .....	7
Countermeasures to achieve EMC Compliance.....	7
<b>Test Methodology .....</b>	<b>8</b>
Radiated Emission.....	8
Field Strength Calculation .....	8
<b>Test Results .....</b>	<b>9</b>
Radiated Emission of Carrier Frequency   Subclause 15.227(a) .....	9
Spurious Radiated Emissions   Subclause 15.227(b).....	10
Bandwidth Measurement.....	12
<b>Appendix 1 Test Protocol</b>	
<b>Appendix 2 Test Setup</b>	
<b>Appendix 3 EUT External Photo</b>	
<b>Appendix 4 EUT Internal Photo</b>	
<b>Appendix 5 FCCID Label, Block Diagram, Schematics and User manual</b>	

## List of Test and Measurement Instruments

### Hong Kong Productivity Council (Registration number: 90656)

Kind of Equipment	Manufacturer	Type	S/N	Cal Due Date
Semi-anechoic Chamber	Frankonia	Nil	Nil	28 Mar 08
Test Receiver	Rohde & Schwarz	ESU26	100050	06 Aug 08
Biconical Antenna	Rohde & Schwarz	HK116	841489/016	08 Mar 09
Log.-Periodic Antenna	Rohde & Schwarz	HL223	841516/020	28 Feb 09
Horn Antenna	EMCO	3115	9002-3347	02 Feb 08
Loop Antenna	EMCO	6502	9107-2651	20 Dec 09
Coaxial Cable 50ohm	Rosenberger	RTK081-05S-05S-10m	LA2-001-10M / 002	15 May 08

## 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 one control button for commanding the forward, backward movement of the associated receiver. In addition, there is an internal motion sensor for left and right signal transmission.

#### FCCID: NEX-9605-27TX

Model	Product description
9605	Radio Control Toy Transmitter

### Ratings and System Details

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

[www.tuv.com](http://www.tuv.com)

## **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
- 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 15.227(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 (MHz)	Measured Field strength at 3m (dBμV/m)	Delta to Limit (dB)
Peak	27.146	73.3	-26.7
Average	27.146	67.6	-12.4

**Polarization: Horizontal**

Detector function	Frequency (MHz)	Measured Field strength at 3m (dBμV/m)	Delta to Limit (dB)
Peak	27.146	56.9	-43.1
Average	27.146	51.2	-28.8

**Limit**
**Subclause 15.227(a)**

Frequency within the band	Peak Emission		Average Emission	
	(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.

## 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)
54.292	25.9	40.0	-14.1
81.438	15.7	40.0	-24.3
*108.584	14.8	43.5	-28.7
*135.731	12.4	43.5	-31.1
*162.877	15.2	43.5	-28.3
190.023	19.1	43.5	-24.4
217.170	20.2	46.0	-25.8
*244.316	16.2	46.0	-29.8
*271.462	16.6	46.0	-29.4

### Polarization: Horizontal

Frequency (MHz)	Field strength at 3m (dBuV/m)	Limit at 3m (dBuV/m)	Delta to Limit (dB)
54.292	10.5	40.0	-29.5
81.438	9.3	40.0	-30.7
*108.584	9.0	43.5	-34.5
*135.731	10.1	43.5	-33.4
*162.877	12.8	43.5	-30.7
190.023	13.3	43.5	-30.2
217.170	12.1	46.0	-33.9
*244.316	10.4	46.0	-35.6
*271.462	11.3	46.0	-34.7

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.

[www.tuv.com](http://www.tuv.com)

**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 ( $\mu\text{V/m}$ )	Field strength (dB $\mu\text{V/m}$ )	Measurement distance (m)
30-88	100	$20 \cdot \log(100) = 40.00$	3
88-216	150	$20 \cdot \log(150) = 43.52$	3
216-960	200	$20 \cdot \log(200) = 46.02$	3
960-2500	500	$20 \cdot \log(500) = 53.98$	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.

[www.tuv.com](http://www.tuv.com)

## 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 47.20 dB and 45.98 dB below the carrier respectively.

For test results refer to Appendix 1.