

Prüfbericht - Nr.: 14016796 001		Seite 1 von 12 Page 1 of 12	
<i>Test Report No.:</i>			
Auftraggeber: <i>Client:</i>	Zaptoys International Ltd. Unit 1105, 11/F, Tower II South Seas Centre T.S.T. East, Kowloon Hong Kong		
Gegenstand der Prüfung: <i>Test Item:</i>	Low Power Transmitter (27.145MHz)		
Bezeichnung: <i>Identification:</i>	5001	Serien-Nr.: <i>Serial No.:</i>	Engineering sample
Wareneingangs-Nr.: <i>Receipt No.:</i>	070723011-1	Eingangsdatum: <i>Date of Receipt:</i>	23.07.2007
Prüfört: <i>Testing Location:</i>	TÜV Rheinland Hong Kong Ltd. 9th Floor, Oriental News Building, 7 Wang Tai Road, Kowloon Bay, Kowloon, Hong Kong Hong Kong Productivity Council HKPC Building, 78 Tat Chee Avenue, Kowloon, Hong Kong		
Prüfgrundlage: <i>Test Specification:</i>	FCC Part 15, Subpart C ANSI C63.4-2003		
Prüfergebnis: <i>Test Result:</i>	Der Prüfgegenstand entspricht oben genannter Prüfgrundlage(n). <i>The test item passed the test specification(s).</i>		
Prüflaboratorium: <i>Testing Laboratory:</i>	TÜV Rheinland Hong Kong Ltd. 9th Floor, Oriental News Building, 7 Wang Tai Road, Kowloon Bay, Kowloon, Hong Kong		
geprüft / tested by:		kontrolliert / reviewed by:	
25.9.2007	Lam Kong Project Engineer	25.9.2007	Derek Leung Project Manager
Datum <i>Date</i>	Name/Stellung <i>Name/Position</i>	Datum <i>Date</i>	Name/Stellung <i>Name/Position</i>
	 Unterschrift <i>Signature</i>		 Unterschrift <i>Signature</i>
Sonstiges / Other Aspects:			
FCCID: NEX-5001-27TX			
Abkürzungen: P(ass) = entspricht Prüfgrundlage F(ail) = entspricht nicht Prüfgrundlage N/A = nicht anwendbar N/T = nicht getestet		Abbreviations: P(ass) = passed F(ail) = failed N/A = not applicable N/T = 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. <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

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List of Test and Measurement Instruments

Hong Kong Productivity Council (Registration number: 90656)

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	9002-3347
Spectrum Analyzer	Rohde & Schwarz	FSP30	1093.4495K30

General Product Information

Product Function and Intended Use

The equipment under test (EUT) is a transmitter for a RC toy plane operating at 27.145 MHz. The EUT has one push button and one control wheel for commanding the left and the right propellers movement of the associated receiver.

Circuit Description

IC1 and the associated circuit act as AF-modulator. Q1 and the associated circuit act as a RF-Transmitter. Q3 , XTAL and the associated circuit act as an oscillator.

Ratings and System Details

FCCID	:	NEX-5001-27TX
Frequency range	:	27.145MHz
Number of RF channels	:	1
Type of antenna	:	Integral
Power supply	:	DC 9V, 6 x AA size batteries

Independent Operation Modes

The basic operation modes are:

- Remote Control: On and Off
- Charging function for RC Plane

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.

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 high 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.

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, 6 x AA size batteries
 Mode of operation : RC control

Polarization: Vertical

Detector function	Frequency (MHz)	Measured Field strength at 3m (dBµV/m)	Delta to Limit (dB)
Peak	27.145	72.9	-27.1
Average	27.145	58.2	-21.8

Polarization: Horizontal

Detector function	Frequency (MHz)	Measured Field strength at 3m (dBµV/m)	Delta to Limit (dB)
Peak	27.145	59.2	-40.8
Average	27.145	49.1	-30.9

Limit
Subclause 15.227(a)

Frequency within the band	Peak Emission		Average Emission	
	(µV/m)	dBµV/m	(µV/m)	dBµV/m
27.96-27.28 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, 6 x AA size batteries
 Measuring Frequency Range : 25 -1000MHz
 Mode of operation : RC control and audio transfer

Polarization: Vertical

Frequency (MHz)	Field strength at 3m (dBuV/m)	Limit at 3m (dBuV/m)	Delta to Limit (dB)
54.290	16.3	40.0	-23.7
81.435	12.6	40.0	-27.4
*108.580	17.7	43.5	-25.8
*135.725	21.5	43.5	-22.0
*162.870	20.3	43.5	-23.2
190.015	12.5	43.5	-31.0
217.160	14.5	46.0	-31.5
*244.305	10.3	46.0	-35.7
*271.450	14.6	46.0	-31.4
298.595	13.6	46.0	-32.4

Polarization: Horizontal

Frequency (MHz)	Field strength at 3m (dBuV/m)	Limit at 3m (dBuV/m)	Delta to Limit (dB)
54.290	9.6	40.0	-30.4
81.435	10.5	40.0	-29.5
*108.580	16.8	43.5	-26.7
*135.725	19.2	43.5	-24.3
*162.870	21.6	43.5	-21.9
190.015	12.2	43.5	-31.3
217.160	14.9	46.0	-31.1
*244.305	10.5	46.0	-35.5
*271.450	11.7	46.0	-34.3
298.595	13.3	46.0	-32.7

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 other spurious emission found from 25MHz 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 ($\mu\text{V/m}$)	Field strength (dB$\mu\text{V/m}$)	Measurement distance (m)
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
960-2500	500	$20 \cdot \log(500) = 54.0$	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

Port of Testing : By coupling device
Detector Function : Peak
Supply Voltage : DC 9V, 6 x AA size batteries

The field strength of any emissions appearing at the lower edge 26.96 MHz and upper edge 27.28 MHz are 43.94 dB and 40.47 dB below the carrier respectively.

For test results refer to Appendix 1.