



Produkte
Products

Prüfbericht - Nr.: 14034249 001		Seite 1 von 11	
<i>Test Report No.:</i>		<i>Page 1 of 11</i>	
Auftraggeber: <i>Client:</i>	Dickie Toys Hong Kong Ltd. 19/F., Prudential Tower, The Gateway, Harbour City, 21 Canton Road, Tsimshatsui, Kowloon, Hong Kong		
Gegenstand der Prüfung: <i>Test Item:</i>	Short Range Device - Low Power Transmitter (27.145MHz)		
Bezeichnung: <i>Identification:</i>	20 308 9549	Serien-Nr.: <i>Serial No.:</i>	Engineering sample
Wareneingangs-Nr.: <i>Receipt No.:</i>	00130928048-001	Eingangsdatum: <i>Date of Receipt:</i>	28.09.2013
Zustand des Prüfgegenstandes bei Anlieferung: <i>Condition of test item at delivery:</i>	Test sample(s) is/are not damaged and suitable for testing.		
Prüfört: <i>Testing Location:</i>	Hong Kong Productivity Council HKPC Building, 78 Tat Chee Avenue, Kowloon, Hong Kong		
Prüfgrundlage: <i>Test Specification:</i>	FCC Part 15, Subpart C		
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. 8 - 10/F., Goldin Financial Global Square, 7 Wang Tai Road, Kowloon Bay, Kowloon, Hong Kong		
geprüft / tested by:	kontrolliert / reviewed by:		
02.12.2013 <i>Date</i>	Joey Leung <i>Name/Position</i>	 <i>Unterschrift</i> <i>Signature</i>	02.12.2013 <i>Date</i>
			Mika Chan <i>Name/Position</i>
			 <i>Unterschrift</i> <i>Signature</i>
Sonstiges / Other Aspects:			
FCC ID: NLB27186TX			
Abkürzungen:	P(ass) = entspricht Prüfgrundlage	Abbreviations:	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
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>			

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Test Summary

Radiated Emission of Carrier Frequency

Result: Pass

Spurious Radiated Emissions

Result: Pass

Bandwidth Measurement

Result: Pass

List of Test and Measurement Instruments

Hong Kong Productivity Council (Registration number: 90656)

Radiated Emission

Equipment	Manufacturer	Type	S/N	Cal. due date
Semi-anechoic Chamber	Frankonia	Nil	Nil	12 Apr 2014
New Fully Anchoic Chamber	TDK	N/A	N/A	30 Apr 2014
Cable	Hubersuhner	SUCOFLEX 104	72799 /6	30 Mar 2014
Test Receiver	R & S	ESU40	100190	19 Feb 2014
Bi-conical Antenna	R & S	HK116	100241	11 Jun 2015
Coaxial cable 50ohm	Rosenberger	RTK081-05S-05S-10m	LA2-001-10M / 001	15 Nov 2015
Microwave amplifier 0.5-26.5GHz, 25dB gain	HP	83017A	3123A00437	03 Oct 2015
High Pass Filter (cutoff freq. =1000MHz)	Trilithic	23042	9829213	28 Oct 2015
Active Loop Antenna	EMCO	6502	9107-2651	12 Apr 2014
Spectrum Analyzer	Rohde & Schwarz	FSP30	100007	03 Dec 2014

General Product Information

Product Function and Intended Use

The equipment under test (EUT) is a transmitter for a RC toy car operating at 27.145MHz. The EUT has 2 control rods to command forward, backward, left and right movement of the associated receiver.

FCC ID: NLB27186TX

Models	Product description
20 308 9549	Radio Control Toy Car

Ratings and System Details

		Transmitter
Frequency range	:	27.145MHz
Number of channels	:	1
Type of antenna	:	Permanent External Antenna
Power supply	:	Battery operated 3V
Ports	:	none
Protection Class	:	III

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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 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.

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 3V

Polarization: Vertical

Detector function	Frequency (MHz)	Measured Field strength at 3m (dB μ V/m)	Delta to Limit (dB)
Peak	27.146	65.80	-34.20
Average	27.146	59.70	-20.30

Polarization: Horizontal

Detector function	Frequency (MHz)	Measured Field strength at 3m (dB μ V/m)	Delta to Limit (dB)
Peak	27.146	50.00	-50.00
Average	27.146	44.10	-35.90

Limit
Subclause 15.227(a)

Frequency within the band	Peak Emission		Average Emission	
	(μ V/m)	dB μ V/m	(μ V/m)	dB μ V/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 3V
 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	18.80	40.00	-21.20

Polarization: Horizontal

Frequency (MHz)	Field strength at 3m (dBuV/m)	Limit at 3m (dBuV/m)	Delta to Limit (dB)
No peak found	---	40.00	---

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.

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	$20 \cdot \log(100) = 40.0$	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.

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Bandwidth Measurement

Port of Testing	:	Antenna port
Detector Function	:	Peak
Supply Voltage	:	DC 3V

The field strength of any emissions appearing at the lower edge 26.96 MHz and upper edge 27.28 MHz are 49.14 dB and 45.57 dB below the carrier respectively.

For test results refer to Appendix 1.