Produkte
Products

Prüfbericht - Nr.: *Test Report No.:*	**14044892 001**	**Seite 1 von 12** *Page 1 of 12*

Auftraggeber: *Client:*	**Dickie Toys Hong Kong Ltd.** 19/F., Prudential Tower The Gateway, Harbour City 21 Canton Road, Tsimshatsui Kowloon, Hong Kong
Gegenstand der Prüfung: *Test Item:*	**Short Range Device - Radio Control Toy Transmitter (49.860MHz)**
Bezeichnung: *Identification:*	**49028**
Serien-Nr.: *Serial No.:*	**Engineering sample**
Wareneingangs-Nr.: *Receipt No.:*	**A000383151-001**
Eingangsdatum: *Date of Receipt:*	**24.06.2016**
Zustand des Prüfgegenstandes bei Anlieferung: *Condition of test item at delivery:*	Test sample is not damaged and suitable for testing.
Prüfort: *Testing Location:*	**TÜV Rheinland Hong Kong Ltd.** 8/F, First Group Centre, 14 Wang Tai Road, Kowloon Bay, Kowloon, Hong Kong **Hong Kong Productivity Council** HKPC Building, 78 Tat Chee Avenue, Kowloon, Hong Kong
Prüfgrundlage: *Test Specification:*	**FCC Part 15 Subpart C** **ANSI C63.10-2013**
Prüfergebnis: *Test Results:*	**Das vorstehend beschriebene Gerät wurde geprüft und entspricht oben genannter Prüfgrundlage.** The above mentioned product was tested and **passed**.
Prüflaboratorium: *Testing Laboratory:*	**TÜV Rheinland Hong Kong Ltd.** 8 - 10/F., Goldin Financial Global Square, 7 Wang Tai Road, Kowloon Bay, Kowloon, Hong Kong

geprüft/ *tested by:*

Datum / Date	Name/Stellung / Name/Position	Unterschrift / Signature
28.07.2016	Joey Leung Project Manager	Joey Leung

kontrolliert/ *reviewed by:*

Datum / Date	Name/Stellung / Name/Position	Unterschrift / Signature
28.07.2016	Benny Lau Senior Project Manager	Benny Lau

Sonstiges: **FCC ID: NLB49028TX**
Other Aspects

Abkürzungen:				*Abbreviations:*			
	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*

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Product information

Manufacturers declarations

	Transmitter
Operating frequency range	49.860 MHz
Type of modulation	ASK
Number of channels	1
Type of antenna	Integral Antenna
Power level	fix
Connection to public utility power line	No
Nominal voltage	V_{nor}: 9.0Vdc (6F22 size battery)

Product function and intended use

The equipment under test (EUT) is a transmitter operating at 49.860MHz. It is powered by 9.0V 6F22 size battery only.

FCC ID: NLB49028TX

Models	Product description
49028	Radio Control Toy Transmitter

Submitted documents

Circuit Diagram
Block Diagram
Bill of material
User manual
Rating Label

Independent Operation Modes

The basic operation mode is transmitting mode .

For further information refer to User Manual

Related Submittal(s) Grants

This is a single application for certification of the transmitter. The FCC ID of the corresponding receiver is NLB201119886RX.

Remark

The test results in this test report are only relevant to the tested sample and does not involve any assessment in the production

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.

- No testing software is provided by the applicant.

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 of the transmitter part were performed according to the procedures in ANSI C63.10-2013. The radiated emission measurements of the receiver part were performed according to the procedures in ANSI C63.4-2014.

For measurement below 1GHz, the equipment under test (EUT) was placed at the middle of the 80 cm height turntable. For measurement above 1GHz, the EUT was placed at the middle of the 1.5 m height turntable and RF absorbing material was placed on ground plane between turntable and 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:

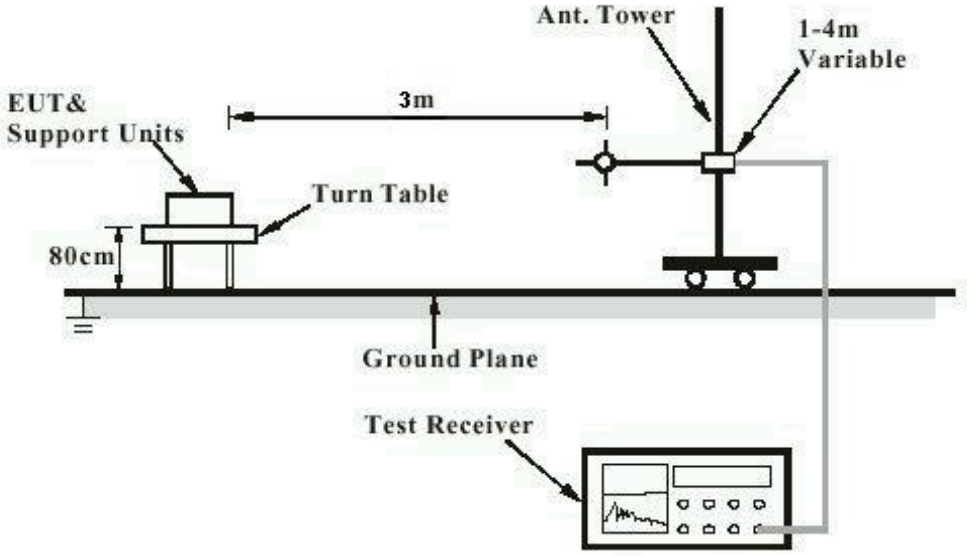
FS = R + AF + CF + FA – PA

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.

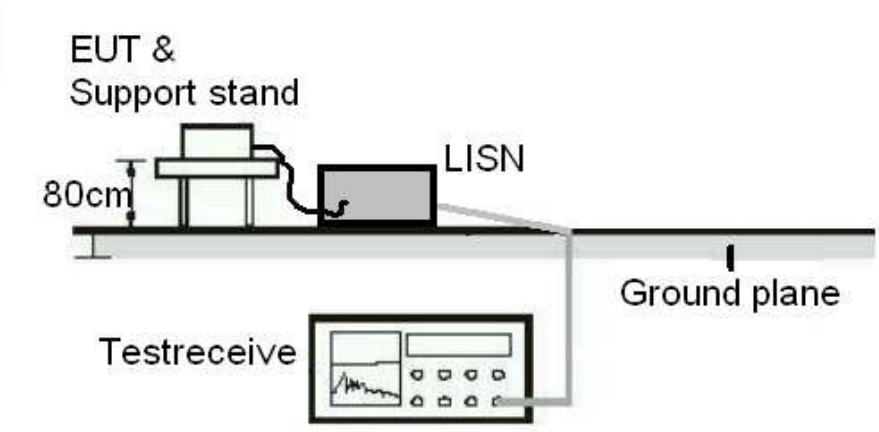
Test Setup Diagram

Diagram of Measurement Configuration for Radiation Test



Note: Measurements above 1 GHz are done with a table height of 1.5m. In addition, there is RF absorbing material on the floor of the test site for above 1GHz measurement.

Diagram of Measurement Equipment Configuration for Mains Conduction Measurement (if applicable)



List of Test and Measurement Instruments

Hong Kong Productivity Council (FCC Registration number: 90656)

Radiated Emission

Equipment	Manufacturer	Type	S/N	Last Cal. Date	Due Date
Semi anechoic Chamber	Frankonia	Nil	Nil	14 Apr 2015	25 Apr 2017
Test Receiver	R & S	ESU40	100190	07 Dec 2015	07 Dec 2016
Bi conical Antenna	R & S	HK116	100241	01 Sep 2015	01 Sep 2017
Log Periodic Antenna	R & S	HL223	841516/017	01 Sep 2015	01 Sep 2017
Coaxial cable	Harbour	LL335	N/A	10 Jun 2016	10 Jun 2018
Microwave amplifer 0.5 26.5GHz, 25dB gain	HP	83017A	3950M00241	18 Jul 2016	18 Jul 2018
High Pass Filter (cutoff freq. =1000MHz)	Trilithic	23042	9829213	28 Oct 2015	28 Oct 2017
Horn Antenna	EMCO	3115	9002 3347	26 Aug 2015	26 Aug 2017

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Radio Frequency Test

Equipment	Manufacturer	Type	S/N	Last Cal. Date	Cal. Due Date
Spectrum Analyzer	Rohde & Schwarz	FSP30	100610	20 Jan 2016	19 Jan 2017

Measurement Uncertainty

The estimated combined standard uncertainty for power-line conducted emissions measurements is ±3.43dB.

The estimated combined standard uncertainty for radiated emissions measurements is ±4.68dB (30MHz to 200MHz) and ±5.73dB (200MHz to 1000MHz) and ±5.57dB (above 1GHz).

The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor of k=2, which for the level of confidence is approximately 95%.

Results FCC Part 15 – Subpart C

FCC 15.203 – Antenna Requirement 1		Pass
FCC Requirement:	No antenna other than that furnished by the responsible party shall be used with the device	
Results:	Antenna type:	Fixed Integral wire antenna
Verdict:	Pass	

FCC 15.204 – Antenna Requirement 2		Pass
FCC Requirement:	An intentional radiator may be operated only with the antenna with which it is authorized. If an antenna is marketed with the intentional radiator, it shall be of a type which is authorized with the intentional radiator.	
Results:	Only one integral antenna can be used.	
Verdict:	N/A	

FCC 15.207 – Conducted Emission on AC Mains	N/A
There is no AC power input or output ports on the EUT.	

FCC 15.235(a) – Radiated Emission (Fundamental) **Pass**

Test Specification : ANSI C63.10-2013
Mode of operation : Tx mode
Port of testing : Enclosure
RBW/VBW : 120kHz
Supply voltage : 9.0VDC
Temperature : 23ºC
Humidity : 50%

Requirement: The field strength of emissions from intentional radiators operated within frequency bands shall comply with the following limit.

Results: Pass

Fundamental Frequency — Vertical Polarization

Freq MHz	Level dBuV/m	Limit/ Detector dBuV/m
49.859	72.5	100 / PK
49.859	65.3	80 / AV

Fundamental Frequency — Horizontal Polarization

Freq MHz	Level dBuV/m	Limit/ Detector dBuV/m
49.859	53.9	100 / PK
49.859	46.6	80 / AV

FCC 15.235(b) – Out Of Band Radiated Emissions **Pass**

Test Specification : ANSI C63.10-2013
Mode of operation : Tx mode
Port of testing : Enclosure
Detector : Peak / Average
RBW/VBW : 120 kHz for f < 1 GHz
1 MHz / 3 MHz for f > 1 GHz
Supply voltage : 9.0VDC
Frequency range : 9kHz to tenth harmonic
Temperature : 23ºC
Humidity : 50%

Requirement: The field strength of any emissions which appear outside the assigned bands shall not exceed the general radiated limits shown in §15.209.

Results: Pass

Vertical Polarization

Freq MHz	Level dBuV/m	Limit/ Detector dBuV/m
No peak found	---	74 / PK
No peak found	---	54 / AV

Horizontal Polarization

Freq MHz	Level dBuV/m	Limit/ Detector dBuV/m
No peak found	---	74 / PK
No peak found	---	54 / AV

FCC 15.235(b) – Band-edge Emissions **Pass**

Test Specification : ANSI C63.10-2013
Mode of operation : Tx mode
Port of testing : Enclosure
Detector : Peak
RBW/VBW : 3kHz / 10kHz
Supply voltage : 9.0VDC
Frequency range : 49.82MHz – 49.90MHz
Temperature : 23ºC
Humidity : 50%

Requirement: The field strength of any emissions appearing between the band edges and up to 10kHz above and below the band edges is at least 26dB below the carrier. The field strength of any emissions removed by more than 10 kHz from the band edges shall not exceed the general radiated emission limits in 15.209.

Results: Pass

Freq MHz	Attenuation dB	Limit dB	Level dBuV/m	Limit dBuV/m
49.82	35.23	> 26	37.27	40.0
49.90	35.18	> 26	37.32	40.0

FCC 15.215 (c) – 20 dB Bandwidth **Pass**

Test Specification : ANSI C63.10 – 2013
Mode of operation : Tx mode
Port of testing : Enclosure
RBW/VBW : 10kHz / 30kHz
Supply voltage : 9.0VDC
Temperature : 23ºC
Humidity : 50%

Requirement: The intentional radiators must be designed to ensure that the 20dB bandwidth of the emission, is contained within the frequency band designated in the rule section under which the equipment is operated.

Results: For test protocols refer to Appendix 1, page 2.

Frequency (MHz)	20 dB left (MHz)	Limit (MHz)	20 dB right (MHz)	Limit (MHz)
49.86	49.83376	> 49.82	49.88560	< 49.90