

Produkte
Products

Prüfbericht - Nr.: 14048987 001		Seite 1 von 12	
<i>Test Report No.:</i>		<i>Page 1 of 12</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 - Remote Controlled Toy Transmitter (27.145MHz)	
Bezeichnung: <i>Identification:</i>	27203	Serien-Nr.: <i>Serial No.:</i>	Engineering sample
Wareneingangs-Nr.: <i>Receipt No.:</i>	A000532746-010	Eingangsdatum: <i>Date of Receipt:</i>	19.04.2017
Zustand des Prüfgegenstandes bei Anlieferung: <i>Condition of test item at delivery:</i>		Test sample is not damaged and suitable for testing.	
Prüfört: <i>Testing Location:</i>		TÜV Rheinland Hong Kong Ltd. 3-4, 11/F., Fou Wah Industrial Building, 10-16 Pun Shan Street, Tsuen Wan, N.T., 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 C63.10-2013	
Prüfergebnis: <i>Test Results:</i>		Das vorstehend beschriebene Gerät wurde geprüft und entspricht oben genannter Prüfgrundlage. The above mentioned product was tested and passed .	
Prüflaboratorium: <i>Testing Laboratory:</i>		TÜV Rheinland Hong Kong Ltd. 3-4, 11/F., Fou Wah Industrial Building, 10-16 Pun Shan Street, Tsuen Wan, N.T., Hong Kong	
geprüft/ tested by:		kontrolliert/ reviewed by:	
10.05.2017	David Cheng Test Engineer	10.05.2017	Joey Leung Project Manager
<i>Datum</i> <i>Date</i>	<i>Name/Stellung</i> <i>Name/Position</i>	<i>Datum</i> <i>Date</i>	<i>Name/Stellung</i> <i>Name/Position</i>
	<i>Unterschrift</i> <i>Signature</i>		<i>Unterschrift</i> <i>Signature</i>
Sonstiges: Other Aspects		FCC ID: NLB27203TX	
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	
<p>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.</p> <p><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></p>			



Table of Content

	Page
Cover Page	1
Table of Content	2
Product information.....	4
Manufacturers declarations	4
Product function and intended use	4
Submitted documents.....	4
Independent Operation Modes	4
Related Submittal(s) Grants	4
Remark	4
Test Set-up and Operation Mode.....	5
Principle of Configuration Selection	5
Test Operation and Test Software.....	5
Special Accessories and Auxiliary Equipment.....	5
Countermeasures to achieve EMC Compliance.....	5
Test Methodology	6
Radiated Emission	6
Field Strength Calculation.....	6
Test Setup Diagram	7
List of Test and Measurement Instruments.....	8
Measurement Uncertainty	9
Results FCC Part 15 – Subpart C	10
FCC 15.203 – Antenna Requirement 1	Pass..... 10
FCC 15.204 – Antenna Requirement 2.....	Pass..... 10
FCC 15.207 – Conducted Emission on AC Mains	N/A..... 10
FCC 15.215 (c) – 20 dB Bandwidth	Pass..... 10
FCC 15.227(a) – Radiated Emission (Fundamental)	Pass..... 11
FCC 15.227(b) – Out Of Band Radiated Emissions.....	Pass..... 11
FCC 15.227(b) – Band-edge Emissions.....	Pass..... 12
Appendix 1 – Test Results.....	2 pages
Appendix 2 – Test Setup Photos.....	3 pages

Appendix 3 – EUT External Photos.....	4 pages
Appendix 4 – EUT Internal Photos.....	3 pages
Appendix 5 – RF Exposure Information.....	2 pages

Product information

Manufacturers declarations

	Transmitter
Operating frequency range	27.145 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

Product function and intended use

The equipment under test (EUT) is a transmitter operating at 27.145MHz. It is powered by 9.0VDC battery.

FCC ID: NLB27203TX

Models	Product description
27203	Radio Control Toy Transmitter

Submitted documents

Circuit Diagram
Block Diagram
Technical Description
User manual
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.

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.

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:

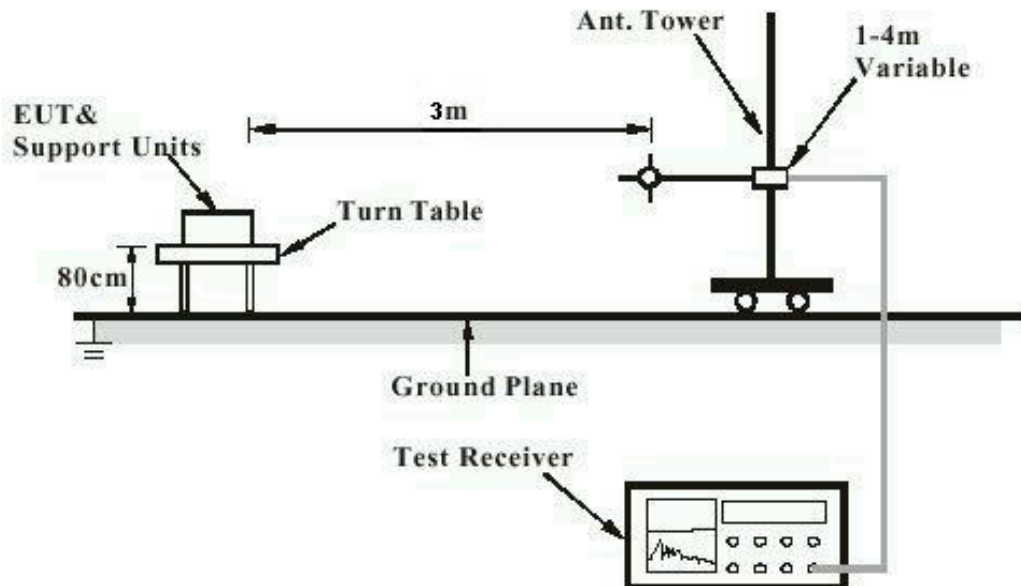
$$FS = R + AF + CF + FA - PA$$

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.

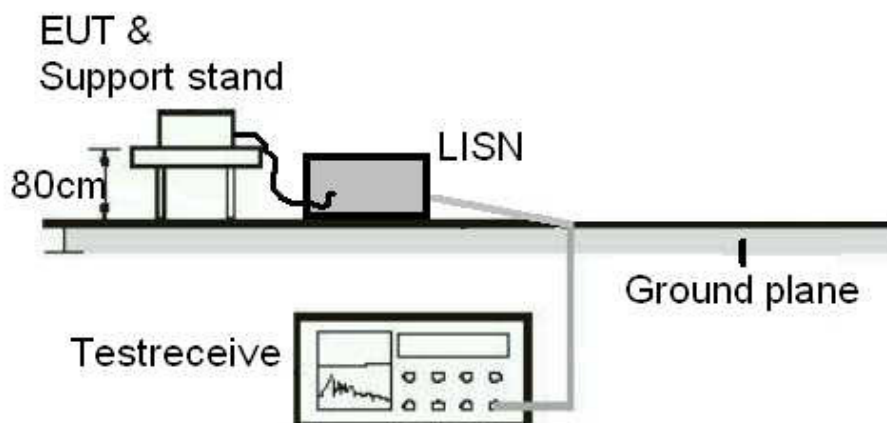
Test Setup Diagram

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	Cal. Date	Due Date
Semi-anechoic Chamber	Frankonia	Nil	25 Apr 2017	25 Apr 2018
Test Receiver	R & S	ESU26	15 Jun 2016	15 Jun 2017
Bi-conical Antenna	R & S	HK116	01 Sep 2015	01 Sep 2017
Log Periodic Antenna	R & S	HL223	01 Sep 2015	01 Sep 2017
Coaxial cable	Harbour	LL335	10 Jun 2016	10 Jun 2018
Microwave amplifier 0.5-26.5GHz, 25dB gain	HP	83017A	18 Jul 2016	18 Jul 2018
High Pass Filter (cutoff freq. =1000MHz)	Trilithic	23042	28 Oct 2015	28 Oct 2017
Horn Antenna	EMCO	3115	26 Aug 2015	26 Aug 2017
Active Loop Antenna	EMCO	6502	27 Oct 2016	27 Oct 2017

TÜV Rheinland Hong Kong Ltd

Radio Test

Equipment	Manufacturer	Type	Cal. Date	Due Date
Spectrum Analyzer	R & S	FSP30	16 Oct 2016	15 Oct 2017

Measurement Uncertainty

The estimated combined standard uncertainty for power-line conducted emissions measurements is $\pm 2.42\text{dB}$.

The estimated combined standard uncertainty for radiated emissions measurements is $\pm 4.81\text{dB}$ (9kHz to 30MHz) and $\pm 4.62\text{dB}$ (30MHz to 200MHz) and $\pm 5.67\text{dB}$ (200MHz to 1000MHz) and is $\pm 5.07\text{dB}$ (1GHz to 8.2GHz) and $\pm 4.58\text{dB}$ (8.2GHz to 12.4GHz) and $\pm 4.78\text{dB}$ (12.4GHz to 18GHz)

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:	a) Antenna type: Fixed Integral antenna b) Manufacturer and model no: N/A c) Peak Gain: N/A	
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 15.215 (c) – 20 dB Bandwidth			Pass	
Test Specification : ANSI C63.10 – 2013 Mode of operation : Tx mode Port of testing : Enclosure Supply voltage : 9.0VDC Temperature : 23°C 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 2-3.		
Frequency (MHz)	20 dB left (MHz)	Limit (MHz)	20 dB right (MHz)	Limit (MHz)
27.145	27.141	>26.96	27.149	<27.28

FCC 15.227(a) – Radiated Emission (Fundamental)			Pass
Test Specification : ANSI C63.10-2013 Mode of operation : Tx mode Port of testing : Enclosure Meas. Distance : 3m Supply voltage : 9.0VDC Temperature : 23°C Humidity : 50%			
Requirement: The field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following limit.			
Results: Pass			
Fundamental Frequency		Vertical Polarization	
Freq MHz	Level dBuV/m	Limit/ Detector dBuV/m	
27.145	57.9	100 / PK	
27.145	53.5	80 / AV	
Fundamental Frequency		Horizontal Polarization	
Freq MHz	Level dBuV/m	Limit/ Detector dBuV/m	
27.145	40.5	100 / PK	
27.145	35.9	80 / AV	

FCC 15.227(b) – Out Of Band Radiated Emissions		Pass
Test Specification : ANSI C63.10-2013 Mode of operation : Tx mode Port of testing : Enclosure Meas. Distance : 3m Supply voltage : 9.0VDC Frequency range : 9kHz to 1GHz Temperature : 23°C 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
30.000	11.5	40.0 / QP
200.000	8.5	43.5 / QP
400.000	15.6	46.0 / QP
Horizontal Polarization		

Freq MHz	Level dBuV/m	Limit/ Detector dBuV/m
30.000	11.6	40.0 / QP
200.000	8.1	43.5 / QP
400.000	15.3	46.0 / QP

FCC 15.227(b) – Band-edge Emissions		Pass
Test Specification : ANSI C63.10-2013 Mode of operation : Tx mode Port of testing : Enclosure Meas. Distance : 3m Supply voltage : 9.0VDC Temperature : 23°C 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
26.960	30.79	49.5 / QP
27.280	31.96	49.5 / QP
Horizontal Polarization		
Freq MHz	Level dBuV/m	Limit/ Detector dBuV/m
26.960	13.39	49.5 / QP
27.280	14.56	49.5 / QP