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Produkte
Products

Prüfbericht - Nr.: *Test Report No.:*	**14041620 001**	**Seite 1 von 12** *Page 1 of 12*
Auftraggeber: *Client:*	**Shantou City Chenghai Zone Newqida Toys Factory Co., Ltd.** **Yuting Road, Chenghua, Chenghai Zone** **Shantou City, Guangdong** **China**	
Gegenstand der Prüfung: *Test Item:*	**Short Range Device – Low Power Transmitter (49.86MHz)**	
Bezeichnung: *Identification:*	**Please refer to multiple model list on page 5**	**Serien-Nr.:** *Serial No.:* **Engineering sample**
Wareneingangs-Nr.: *Receipt No.:*	**A000263266-001**	**Eingangsdatum:** *Date of Receipt:* **07.10.2015**
Zustand des Prüfgegenstandes bei Anlieferung: *Condition of test item at delivery:*	Test sample(s) received is/are sufficient for testing and not damaged.	
Prüfort: *Testing Location:*	**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 Result:*	**Der Prüfgegenstand entspricht oben genannter Prüfgrundlage(n).** *The test item passed the test specification(s).*	
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:*			**kontrolliert** / *reviewed by:*		
06.11.2015	Hugo Wan Senior Project Manager		06.11.2015	Benny Lau Senior Project Manager	
Datum *Date*	**Name/Stellung** *Name/Position*	**Unterschrift** *Signature*	**Datum** *Date*	**Name/Stellung** *Name/Position*	**Unterschrift** *Signature*

Sonstiges / *Other Aspects:*

FCC ID: T9TNQD757-49MHZ

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*

Test Summary

Radiated Emission of Carrier Frequency

Result: Pass

Spurious Radiated Emissions

Result: Pass

Bandwidth Measurement

Result: Pass

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Appendix 1: Test Results

Appendix 2: Test Setup

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Appendix 4: EUT Internal Photo

Appendix 5: FCCID Label, Block Diagram, Schematics and User manual

Appendix 6: Safety Human Exposure – Radio Frequency Exposure Compliance

List of Test and Measurement Instruments

Hong Kong Productivity Council (Registration number: 90656)

Radiated Emission

Equipment	Manufacturer	Type	S/N	Cal. Date	Cal. Due Date
Semi-anechoic Chamber	Frankonia	Nil	Nil	14 Apr 2015	14 Apr 2016
Cable	Hubersuhner	SUCOFLEX 104	72799 /6	31 Mar 2014	31 Mar 2016
Test Receiver	R & S	ESU26	100050	12 Feb 2015	12 Feb 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 2014	10 Jun 2016
Microwave amplifer 0.5-26.5GHz, 25dB gain	HP	83017A	3950M00241	17 Jul 2014	17 Jul 2016
High Pass Filter (cutoff freq. =1000MHz)	Trilithic	23042	9829213	28 Oct 2013	28 Oct 2015
Horn Antenna	EMCO	3115	9002-3347	26 Aug 2015	26 Aug 2017
Spectrum Analyzer	Rohde & Schwarz	FSP3	100561	29 May 2015	29 May 2017

General Product Information

Product Function and Intended Use

The equipment under test (EUT) is a transmitter for a RC toy car operating at 49.86MHz. The EUT has 1 control button and 1 control wheel to command forward, backward, left and right movement of the associated receiver.

The client declared that the EUT consists of 40 models as listed in below table. All of them are totally identical including schematics, PCB layouts, electronic component used except the model number and packaging only.

Due to the equivalence of EUT, model 757-9023 was provided by client for performing test.

FCC ID: T9TNQD757-49MHZ

Model
757-9023, 757-9024, 757-9025, 757-915, 757-915[2.4G], 757-912, 757-913, 757-904, 757-906, 757-4WD01, 77-4WD02, 757-4WD03, 757-4WD05, 757-4WD07, 757-931, 757-932, 757-933, 757-4WD11, 757-4WD12, 757-4WD24, 757-4WD80, 757-032C, 757-035C, 757-036C, 757-2045, 757-2047, 757-056, 757T-2041, 757T-2042, 757T-2043, M001, M002, M003, M004, M005, M006, M007, M008, M009, M010

Ratings and System Details

		Transmitter
Frequency range	:	49.86MHz
Number of channels	:	1
Type of antenna	:	External Telescopic Antenna
Antenna length	:	44 cm
Power supply	:	6LR61 Battery operated 9.0 V
Ports	:	none
Protection Class	:	III

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
- Bill of materials
- 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.

- Press the control button to start transmission.

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 C63.10-2013.

For emission measurement at or below 1GHz, the equipment under test (EUT) was placed at the middle of the 80 cm height turntable. For emission testing above 1GHz, the EUT was placed at the middle of 1.5m height turntable. In above two measurement, 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 15.235(a)

RESULT: **Pass**

Test Specification	:	FCC Part 15 Subclause 15.235(a)
Test Method	:	ANSI 63.10-2013
Measurement Location	:	Semi Anechoic Chamber
Measurement Distance	:	3m
Detector Function	:	Peak and Average
Measurement BW	:	120 kHz
Supply Voltage	:	DC 9.0 V

Polarization: Vertical

Detector function	Frequency (MHz)	Measured Field strength at 3m (dBµV/m)	Delta to Limit (dB)
Peak	49.860	71.3	-28.7
Average	49.860	67.0	-13.0

Polarization: Horizontal

Detector function	Frequency (MHz)	Measured Field strength at 3m (dBµV/m)	Delta to Limit (dB)
Peak	49.860	55.5	-44.5
Average	49.860	51.3	-28.7

Limit **Subclause 15.235(a)**

Frequency within the band	Peak Emission		Average Emission	
	(µV/m)	dBµV/m	(µV/m)	dBµV/m
49.82-49.90 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 15.235(b)

RESULT: **Pass**

Test Specification	:	FCC Part 15 Subclause 15.209
Test Method	:	ANSI 63.10-2013
Measurement Location	:	Semi Anechoic Chamber
Measurement Distance	:	3m
Detector Function	:	Quasi Peak
Measurement BW	:	120 kHz
Supply Voltage	:	DC 9.0 V
Measuring Frequency Range	:	30-1000MHz

Polarization: Vertical

Frequency (MHz)	Field strength at 3m (dBµV/m)	Limit at 3m (dBµV/m)	Delta to Limit (dB)
99.720	28.5	43.5	-15.0
149.580	20.5	43.5	-23.0
199.443	20.1	43.5	-23.4
249.302	26.0	46.0	-20.0
299.163	22.6	46.0	-23.4
349.022	26.9	46.0	-19.1
398.884	22.5	46.0	-23.5
448.745	21.0	46.0	-25.0
498.605	21.7	46.0	-24.3

Polarization: Horizontal

Frequency (MHz)	Field strength at 3m (dBµV/m)	Limit at 3m (dBµV/m)	Delta to Limit (dB)
99.721	20.3	43.5	-23.2
149.581	17.2	43.5	-26.3
199.442	16.4	43.5	-27.1
249.302	17.7	46.0	-28.3
299.163	14.6	46.0	-31.4
349.023	19.0	46.0	-27.0
398.884	18.0	46.0	-28.0
448.744	18.5	46.0	-27.5
498.605	19.6	46.0	-26.4

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 30MHz to 1000MHz.

Limit **Subclause 15.235(b)**

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.

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*log(100) = 40.0	3

88-216	150	20*log(150) = 43.5	3
216-960	200	20*log(200) = 46.0	3
960-2500	500	20*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 — Subclause 15.235(b)

RESULT: **Pass**

Test Specification	:	FCC Part 15 section 235(b)
Port of Testing	:	Antenna port
Detector Function	:	Peak
Supply Voltage	:	DC 9.0 V

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. At the lower edge 49.81MHz and upper edge 49.91 MHz are 29.69 dB and 28.78 dB below the carrier respectively.

For test results refer to Appendix 1.

Limit **Subclause 15.235(b)**

The field strength of any emissions appearing between the band edges and up to 10kHz above and below the band edges shall be attenuated at least 26dB below the level of the unmodulated carrier or to the general limits in Section 15.209, whichever permits the higher emission levels.