

Produkte
Products

Prüfbericht - Nr.: 14041619 001		Seite 1 von 12	
<i>Test Report No.:</i>		<i>Page 1 of 12</i>	
Auftraggeber: <i>Client:</i>	Shantou City Chenghai Zone Newqida Toys Factory Co., Ltd. Yuting Road, Chenghua, Chenghai Zone Shantou City, Guangdong China		
Gegenstand der Prüfung: <i>Test Item:</i>	Short Range Device – Low Power Transmitter (27.145MHz)		
Bezeichnung: <i>Identification:</i>	Please refer to multiple model list on page 5	Serien-Nr.: <i>Serial No.:</i>	Engineering sample
Wareneingangs-Nr.: <i>Receipt No.:</i>	A000263266-002	Eingangsdatum: <i>Date of Receipt:</i>	07.10.2015
Zustand des Prüfgegenstandes bei Anlieferung: <i>Condition of test item at delivery:</i>	Test samples received are sufficient for testing and not damaged.		
Prüfört: <i>Testing Location:</i>	Global United Technology Services Co., Ltd. 2nd Floor, Block No.2, Laodong Industrial Zone, Xixiang Road, Baoan District, Shenzhen, China		
Prüfgrundlage: <i>Test Specification:</i>	FCC Part 15, Subpart C ANSI C63.10-2013		
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:	
06.11.2015	Hugo Wan Senior Project Manager	06.11.2015	Sharon Li Department Manager
Datum <i>Date</i>	Name/Stellung <i>Name/Position</i>	Unterschrift <i>Signature</i>	Unterschrift <i>Signature</i>
Sonstiges / Other Aspects:			
FCC ID: T9TNQD757-27MHZ			
Abkürzungen:		Abbreviations:	
P(ass) = entspricht Prüfgrundlage		P(ass) = passed	
F(all) = entspricht nicht Prüfgrundlage		F(all) = failed	
N/A = nicht anwendbar		N/A = not applicable	
N/T = nicht getestet		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>			

Test Summary

Radiated Emission of Carrier Frequency

Result: Pass

Spurious Radiated Emissions

Result: Pass

Bandwidth Measurement

Result: Pass

Contents

List of Test and Measurement Instruments.....	4
General Product Information	5
Product Function and Intended Use.....	5
Ratings and System Details.....	5
Independent Operation Modes.....	6
Submitted Documents	6
Related Submittal(s) Grants	6
Test Set-up and Operation Mode.....	7
Principle of Configuration Selection	7
Test Operation and Test Software	7
Special Accessories and Auxiliary Equipment.....	7
Countermeasures to achieve EMC Compliance.....	7
Test Methodology	8
Radiated Emission.....	8
Field Strength Calculation	8
Test Results	9
Radiated Emission of Carrier Frequency Subclause 15.227(a).....	9
Spurious Radiated Emissions Subclause 15.227(b)	10
Bandwidth Measurement Subclause 15.215(c)	12
Appendix 1 Test Protocol	
Appendix 2 Test Setup	
Appendix 3 EUT External Photo	
Appendix 4 EUT Internal Photo	
Appendix 5 FCCID Label, Block Diagram, Schematics, BOM and User manual	
Appendix 6 Safety Human Exposure – Radio Frequency Exposure Compliance	

List of Test and Measurement Instruments

Global United Technology Services Co., Ltd. (Registration number: 600491)

Radiated Emission

Equipment	Manufacturer	Type	S/N	Cal. Date	Cal. Due Date
3m Semi- Anechoic Chamber	ZhongYu Electron	9.0(L)*6.0(W)*6.0(H)	--	5 Apr 2015	4 Apr 2017
Control Room	ZhongYu Electron	6.2(L)*2.5(W)*2.4(H)	--	N/A	N/A
ESU EMI Test Receiver	R&S	ESU26	--	8 Jun 2015	7 Jun 2016
Bi-log Hybrid Antenna	SCHWARZBECK	VULB9163	--	8 Mar 2015	8 Mar 2016
Double-ridged horn antenna	SCHWARZBECK	9120D	--	8 Mar 2015	8 Mar 2016
Horn Antenna	ETS-LINDGREN	3160-09	--	8 Mar 2015	8 Mar 2016
RF Amplifier	HP	8347A	--	8 Jun 2015	7 Jun 2016
RF Amplifier	HP	8349B	--	8 Jun 2015	7 Jun 2016
EMI Test Software	AUDIX	E3	--	N/A	N/A
Coaxial cable	GTS	N/A	--	8 Jun 2015	7 Jun 2016
Coaxial Cable	GTS	N/A	--	8 Jun 2015	7 Jun 2016
Thermo meter	N/A	N/A	--	8 Jun 2015	7 Jun 2016
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 27.145MHz. The EUT has 1 control button and 1 control wheel to command the 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: T9TNQD757-27MHZ

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	: 27.145MHz
Number of channels	: 1
Type of antenna	: External Telescopic Antenna
Power supply	: 6LR61 battery, 9.0V DC
Ports	: none
Protection Class	: III

www.tuv.com

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.

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 15.227(a)

RESULT:
Pass

Test Specification : FCC Part 15 Subclause 15.227(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 : 9.0V DC

Polarization: Vertical

Detector function	Frequency (MHz)	Measured Field strength at 3m (dB μ V/m)	Delta to Limit (dB)
Peak	27.145	79.12	-20.88
Average	27.145	74.10	-5.90

Polarization: Horizontal

Detector function	Frequency (MHz)	Measured Field strength at 3m (dB μ V/m)	Delta to Limit (dB)
Peak	27.145	69.36	-30.64
Average	27.145	64.40	-15.60

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 63.10-2013
 Measurement Location : Semi Anechoic Chamber
 Measurement Distance : 3m
 Detector Function : Quasi Peak
 Measurement BW : 120 kHz
 Supply Voltage : 9.0V DC
 Measuring Frequency Range : 25-1000MHz

Polarization: Vertical

Frequency (MHz)	Field strength at 3m (dBuV/m)	Limit at 3m (dBuV/m)	Delta to Limit (dB)
54.295	25.84	40.0	-14.16
81.395	24.64	40.0	-15.36
*108.533	21.67	43.5	-21.83
*135.921	24.63	43.5	-18.87
*162.850	24.17	43.5	-19.33
190.140	21.07	43.5	-22.43
217.144	26.70	46.0	-19.30
*244.350	26.28	46.0	-19.72
*271.940	25.62	46.0	-20.38

Polarization: Horizontal

Frequency (MHz)	Field strength at 3m (dBuV/m)	Limit at 3m (dBuV/m)	Delta to Limit (dB)
54.295	15.20	40.0	-24.80
*135.921	15.68	43.5	-27.82
*162.850	16.48	43.5	-27.02
190.140	17.33	43.5	-26.17
217.144	18.52	46.0	-27.48
*244.350	20.26	46.0	-25.74

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 15.227(b)

The field strength of any emissions which appear outside of this band shall not exceed the general radiated emission limits in §15.209.

According to clause 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

www.tuv.com

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**Subclause 15.215(c)**

Port of Testing : Antenna port
Detector Function : Peak
Supply Voltage : 9.0V DC

The field strength of any emissions appearing at the lower edge 26.96 MHz and upper edge 27.28 MHz are 67.06 dB and 41.59 dB below the carrier respectively.

For test results refer to Appendix 1.

Limit**Subclause 15.215(c)**

Intentional radiators operating under the alternative provisions to the general emission limits, as contained in Section 15.217 through 15.257 and in Subpart E of this part, must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated.