Produkte
Products

Prüfbericht - Nr.: *Test Report No.:*	**14039636 001**	**Seite 1 von 10** *Page 1 of 10*

Auftraggeber: *Client:*	**Guangdong Songyang Plastic Toys Co., Ltd** **HuaiNan a section 324 National Highway** **Lianxia Town** **Chenghai, Shantou** **P.R.China**
Gegenstand der Prüfung: *Test Item:*	**Short Range Device - Radio Control Toy Transmitter (2.4GHz)**
Bezeichnung: *Identification:*	**Please refer to "Models" on page 3**
Serien-Nr.: *Serial No.:*	**Engineering sample**
Wareneingangs-Nr.: *Receipt No.:*	**A000194859-001**
Eingangsdatum: *Date of Receipt:*	**06.05.2015**
Zustand des Prüfgegenstandes bei Anlieferung: *Condition of test item at delivery:*	Test sample received 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 **Global United Technology Services Co., Ltd.** 2nd Floor, Block No.2, Laodong Industrial Zone, Xixiang Road, Baoan District, Shenzhen, China
Prüfgrundlage: *Test Specification:*	**FCC Part 15 Subpart C** **ANSI C63.4-2009**
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*
08.06.2015	Joey Leung Project Engineer	

kontrolliert/ *reviewed by:*

Datum *Date*	**Name/Stellung** *Name/Position*	**Unterschrift** *Signature*
08.06.2015	Sharon Li Department Manager	

Sonstiges: **FCCID: 2AEXV13809671876**
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	2405 - 2475 MHz
Type of modulation	GFSK
Number of channels	27
Type of antenna	Wire Antenna
Power level	fix
Connection to public utility power line	No
Nominal voltage	6.0 V

Product function and intended use

The equipment under test (EUT) is a radio control toy transmitter operating at 2.4GHz. It is powered by batteries only.

FCCID: 2AEXV13809671876

Models	Product description
X1, X1A, X1B, X1C, X1D, X2, X2A, X2B, X2C, X2D, X3, X3A, X3B, X3C, X3D, X4, X4A, X4B, X4C, X4D, X5, X5A, X5B, X5C, X5D, X6, X6A, X6B, X6C, X6D, X7, X7A, X7B, X7C, X7D, X8, X8A, X8B, X8C, X8D, X9, X9A, X9B, X9C, X9D, X10, X10A, X10B, X10C, X10D, X11, X11A, X11B, X11C, X11D, X12, X12A, X12B, X12C, X12D, X13, X13A, X13B, X13C, X13D, X14, X14A, X14B, X14C, X14D, X15, X15A, X15B, X15C, X15D, X16, X16A, X16B, X16C, X16D, X17, X17A, X17B, X17C, X17D, X18, X18A, X18B, X18C, X18D, X19, X19A, X19B, X19C, X19D, X20, X20A, X20B, X20C, X20D, X21, X21A, X21B, X21C, X21D, X22, X22A, X22B, X22C, X22D, X23, X23A, X23B, X23C, X23D, X24, X24A, X24B, X24C, X24D, X25, X25A, X25B, X25C, X25D, X26, X26A, X26B, X26C, X26D, X27, X27A, X27B, X27C, X27D, X28, X28A, X28B, X28C, X28D, X29, X29A, X29B, X29C, X29D, X30, X30A, X30B, X30C, X30D, X31, X31A, X31B, X31C, X31D, X32, X32A, X32B, X32C, X32D, X33, X33A, X33B, X33C, X33D, X34, X34A, X34B, X34C, X34D, X35, X35A, X35B, X35C, X35D, X36, X36A, X36B, X36C, X36D, X37, X37A, X37B, X37C, X37D, X38, X38A, X38B, X38C, X38D	Radio Controlled Toy

Submitted documents

Circuit Diagram
Block Diagram
Bill of material
User manual
Rating Label

Special accessories and auxiliary equipment

The product has been tested together with the following additional accessory:

Nil

Independent Operation Modes

The basic operation mode is transmitting control signal for the RC toy quadcopter.

For further information refer to User Manual

Related Submittal(s) Grants

This is a single application for certification of the transmitter.

List of Test and Measurement Instruments

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

Equipment	Manufacturer	Type	S/N	Cal. interval	Last cal.
3m Semi- Anechoic Chamber	ZhongYu Electron	9.0(L)*6.0(W)* 6.0(H)	---	2 year	27 Mar 2015
Control Room	ZhongYu Electron	6.2(L)*2.5(W)* 2.4(H)	---	1 year	N/A
ESU EMI Test Receiver	R&S	ESU26	---	1 year	27 Jun 2014
Loop Antenna	Zhinan	ZN30900A	---	1 year	27 Jun 2014
Bi-log Hybrid Antenna	SCHWARZBECK	VULB9163	---	1 year	08 Mar 2015
Double-ridged horn antenna	SCHWARZBECK	9120D	---	1 year	08 Mar 2015
RF Amplifier	HP	8347A	---	1 year	27 Jun 2014
RF Amplifier	HP	8349B	---	1 year	27 Jun 2014
EMI Test Software	AUDIX	E3	---	1 year	N/A
Coaxial cable	GTS	N/A	---	1 year	27 Jun 2014
Coaxial Cable	GTS	N/A	---	1 year	27 Jun 2014
Thermo meter	N/A	N/A	---	1 year	27 Jun 2014
Spectrum Analyzer	Rohde & Schwarz	FSP30	100007	1 year	12 Jan 2015

Results FCC Part 15 – Subpart C

Subclause 15.207 – Disturbance Voltage on AC Mains	**N/A**
There is no AC power input or output ports on the EUT.	

Subclause 15.205 – Restricted bands – Spurious Emissions – Band edge	**Pass**
Test Specification : ANSI C63.4 – 2009 Mode of operation : Tx mode Port of testing : Enclosure Detector : Peak RBW/VBW : 100 kHz / 300 kHz for f < 1 GHz 1 MHz / 3 MHz for f > 1 GHz Supply voltage : 6.0VDC, 4 x 1.5V AA size new battery Temperature : 23ºC Humidity : 50%	
Requirement:	Radiated emissions which fall in the restricted bands, as defined in 15.205 (a), must also comply with the radiated emission limits specified in 15.209(a).
Results:	Pass

Tx frequency 2405MHz — Vertical Polarization

Freq MHz	**Level dBuV/m**	**Limit/ Detector dBuV/m**
2400.000	48.97	74.0 / P
2400.000	34.36	54.0 / A

Tx frequency 2405MHz — Horizontal Polarization

Freq MHz	**Level dBuV/m**	**Limit/ Detector dBuV/m**
2400.000	49.23	74.0 / P
2400.000	34.24	54.0 / A

Tx frequency 2475MHz — Vertical Polarization

Freq MHz	**Level dBuV/m**	**Limit/ Detector dBuV/m**
2483.500	45.76	74.0 / P
2483.500	28.49	54.0 / A

Tx frequency 2475MHz — Horizontal Polarization

Freq MHz	**Level dBuV/m**	**Limit/ Detector dBuV/m**
2483.500	47.07	74.0 / P
2483.500	28.06	54.0 / A

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

Test Specification : ANSI C63.4 – 2009
Mode of operation : Tx mode
Port of testing : Enclosure
RBW/VBW : 100 kHz / 300 kHz
Supply voltage : 6.0VDC, 4 x 1.5V AA size new battery
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 2-3.

Frequency (MHz)	**20 dB left (MHz)**	**Limit (MHz)**	**20 dB right (MHz)**	**Limit (MHz)**
2405	2404.500	> 2400	2407.160	< 2483.5
2445	2444.500	> 2400	2447.120	< 2483.5
2475	2473.460	> 2400	2475.770	< 2483.5

Subclause 15.249 (a) – Field Strength of Fundamental and Harmonics	**Pass**

Test Specification : ANSI C63.4 – 2009
Mode of operation : Tx mode
Port of testing : Enclosure
RBW/VBW : 100 kHz / 300 kHz for f < 1 GHz
1 MHz / 3 MHz for f > 1 GHz
Supply voltage : 6.0VDC, 4 x 1.5V AA size new battery
Temperature : 23ºC
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 2405MHz Vertical Polarization

Freq MHz	**Level dBuV/m**	**Limit/ Detector dBuV/m**
2405.500	85.81	114.0 / P
2405.500	65.50	94.0 / A

Fundamental Frequency 2405MHz Horizontal Polarization

Freq MHz	**Level dBuV/m**	**Limit/ Detector dBuV/m**
2405.500	85.34	114.0 / P
2405.500	64.25	94.0 / A

Harmonics 2405MHz Vertical Polarization

Freq MHz	**Level dBuV/m**	**Limit/ Detector dBuV/m**
4810.500	55.59	74.0 / P

4810.500	37.61	54.0 / A
7215.000	49.22	74.0 / P
7215.000	36.17	54.0 / A
Harmonics 2405MHz	Horizontal Polarization	
Freq MHz	**Level dBuV/m**	**Limit/ Detector dBuV/m**
4810.500	53.03	74.0 / P
4810.500	36.87	54.0 / A
Fundamental Frequency 2445MHz	Vertical Polarization	
Freq MHz	**Level dBuV/m**	**Limit/ Detector dBuV/m**
2445.400	84.77	114.0 / P
2445.400	64.09	94.0 / A
Fundamental Frequency 2445MHz	Horizontal Polarization	
Freq MHz	**Level dBuV/m**	**Limit/ Detector dBuV/m**
2445.400	83.62	114.0 / P
2445.400	63.34	94.0 / A
Harmonics 2445MHz	Vertical Polarization	
Freq MHz	**Level dBuV/m**	**Limit/ Detector dBuV/m**
4890.200	52.30	74.0 / P
4890.200	38.39	54.0 / A
7335.000	49.61	74.0 / P
7335.000	36.63	54.0 / A
Harmonics 2445MHz	Horizontal Polarization	
Freq MHz	**Level dBuV/m**	**Limit/ Detector dBuV/m**
4890.200	50.86	74.0 / P
4890.200	38.36	54.0 / A
Fundamental Frequency 2475MHz	Vertical Polarization	
Freq MHz	**Level dBuV/m**	**Limit/ Detector dBuV/m**
2475.100	84.52	114.0 / P
2475.100	64.07	94.0 / A
Fundamental Frequency 2475MHz	Horizontal Polarization	
Freq MHz	**Level dBuV/m**	**Limit/ Detector dBuV/m**
2475.100	83.05	114.0 / P
2475.100	63.07	94.0 / A
Harmonics 2475MHz	Vertical Polarization	
Freq MHz	**Level dBuV/m**	**Limit/ Detector dBuV/m**
4950.800	53.08	74.0 / P
4950.800	37.69	54.0 / A
Harmonics 2475MHz	Horizontal Polarization	

Freq MHz	Level dBuV/m	Limit/ Detector dBuV/m
4950.800	51.52	74.0 / P
4950.800	36.46	54.0 / A

Subclause 15.249 (d) – Emissions radiated outside of the specified frequency bands **Pass**

Test Specification : ANSI C63.4 - 2009
Mode of operation : Tx mode
Port of testing : Enclosure
Detector : Peak
Frequency range : 9kHz – 25GHz
RBW/VBW : 100 kHz / 300 kHz for f < 1 GHz
1 MHz / 3 MHz for f > 1 GHz
Supply voltage : 6.0VDC, 4 x 1.5V AA size new battery
Temperature : 23ºC
Humidity : 50%

Requirement: Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50dB below the level of the fundamental or to the general radiated emission limits in Section 15.209, whichever is the lesser attenuation.

Results: All three transmit frequency modes comply with the field strength within the restricted bands. There is no spurious found below 30MHz.

Tx frequency 2405MHz Vertical Polarization

Freq MHz	Level dBuV/m	Limit/ Detector dBuV/m
No peak found	---	74.0 / P
No peak found	---	54.0 / A

Tx frequency 2405MHz Horizontal Polarization

Freq MHz	Level dBuV/m	Limit/ Detector dBuV/m
No peak found	---	74.0 / P
No peak found	---	54.0 / A

Tx frequency 2445MHz Vertical Polarization

Freq MHz	Level dBuV/m	Limit/ Detector dBuV/m
No peak found	---	74.0 / P
No peak found	---	54.0 / A

Tx frequency 2445MHz Horizontal Polarization

Freq MHz	Level dBuV/m	Limit/ Detector dBuV/m
No peak found	---	74.0 / P
No peak found	---	54.0 / A

Tx frequency 2475MHz Vertical Polarization

Freq MHz	Level dBuV/m	Limit/ Detector dBuV/m
No peak found	---	74.0 / P
No peak found	---	54.0 / A

Tx frequency 2475MHz	Horizontal Polarization	
Freq MHz	**Level dBuV/m**	**Limit/ Detector dBuV/m**
No peak found	---	74.0 / P
No peak found	---	54.0 / A