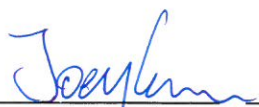
Produkte
Products

Prüfbericht - Nr.: *Test Report No.:*	**14041372 001**	**Seite 1 von 11** *Page 1 of 11*
Auftraggeber: *Client:*	**Chenghai Udirc Toys Co.,Ltd** **Dengfeng Industrial Zone** **Chenghai District, Shantou** **Guangdong** **China**	
Gegenstand der Prüfung: *Test Item:*	**Short Range Device - Radio Control Toy Quadcopter (2.4GHz)**	
Bezeichnung: *Identification:*	**Please refer to "Models" on page 3**	**Serien-Nr.:** *Serial No.:* **Engineering sample**
Wareneingangs-Nr.: *Receipt No.:*	**A000242056 (004-006)** **A000252999 (005-007)**	**Eingangsdatum:** *Date of Receipt:* **15.08.2015** **10.09.2015**
Zustand des Prüfgegenstandes bei Anlieferung: *Condition of test item at delivery:*	Test samples received are 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:*			**kontrolliert/** *reviewed by:*		
18.09.2015	Joey Leung Project Engineer		18.09.2015	Sharon Li Department Manager	
Datum *Date*	**Name/Stellung** *Name/Position*	**Unterschrift** *Signature*	**Datum** *Date*	**Name/Stellung** *Name/Position*	**Unterschrift** *Signature*

Sonstiges: **FCCID: ZKWFPV15082801**
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*	

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.

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.

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Product information

Manufacturers declarations

	Transmitter
Operating frequency range	2448 - 2472 MHz
Type of modulation	GFSK
Number of channels	4
Type of antenna	Wire Antenna
Power level	fix
Connection to public utility power line	No
Nominal voltage	7.4 V

Product function and intended use

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

FCCID: ZKWFPV15082801

Models	Product description
U842-1, U842, U842Wifi, U842-2, U842 FPV, U818A, U818A-1, U818A HD, U818AW, U818A WIFI, U818A FPV, U818A-2, U816A, U27, U27-1, U845, U845Wifi, U845A, U845 FPV, U845-1, U846, U839, U39, U841, U841-1, U841W, U829A, U829A FPV, U829AWiFi, U829A-1, U830, U830A, U843, U820, U12, U12A, U13, U13A, U36, U37, U38, U39, U40, U41, U42, U43, U44, U45, U46, U47, U48, U49, U50, U51, U52, U53, U54, U55, U56, U57, U58, U59, U60, U28, U28W, U28-1, U29, U29W, U30, U30-1, U30W, U30F, U30-2, U31, U31-1, U31W, U31F, U31-2, U32, U33, U34, U34-1, U34W, U34F, U34-2, U35, U35-1, U35W, U35F, U35-2	Radio Controlled Quadcopter

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:

- Camera with TF card slot provided by client. The FCC ID of that camera is ZKWFPV15082803.

Independent Operation Modes

The basic operation mode are
- Transmitting current status to the associate controller;
- Receiving control signal from the associate controller.

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	05 Apr 2015
Control Room	ZhongYu Electron	6.2(L)*2.5(W)* 2.4(H)	---	N/A	N/A
ESU EMI Test Receiver	R&S	ESU26	---	1 year	08 Jun 2015
Loop Antenna	Zhinan	ZN30900A	---	1 year	08 Jun 2015
Bi-log Hybrid Antenna	SCHWARZBECK	VULB9163	---	1 year	09 Mar 2015
Double-ridged horn antenna	SCHWARZBECK	9120D	---	1 year	09 Mar 2015
RF Amplifier	HP	8347A	---	1 year	08 Jun 2015
RF Amplifier	HP	8349B	---	1 year	08 Jun 2015
EMI Test Software	AUDIX	E3	---	1 year	N/A
Coaxial cable	GTS	N/A	---	1 year	08 Jun 2015
Coaxial Cable	GTS	N/A	---	1 year	08 Jun 2015
Thermo meter	N/A	N/A	---	1 year	08 Jun 2015
Spectrum Analyzer	Rohde & Schwarz	FSP30	100007	1 year	12 Jan 2015

Results FCC Part 15 – Subpart C

Subclause 15.203 – Antenna Information	**Pass**
Requirement:	No antenna other than that furnished by the responsible party shall be used with the device
Results:	Permanent attached antenna
Verdict:	Pass

Subclause 15.204 – Antenna Information	**Pass**
Requirement:	Provide information for every antenna proposed for the use with the EUT
Results:	a) Antenna type: Wired antenna b) Manufacturer and model no: N.A. c) Gain with reference to an isotropic radiator: 0 dBi
Verdict:	Pass

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

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 : Internal battery has been activated 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)**
2448	2446.620	> 2400	2448.900	< 2483.5
2456	2454.660	> 2400	2456.920	< 2483.5
2472	2470.570	> 2400	2472.960	< 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 : Internal battery has been activated
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: Both quadcopter and camera are test mode enabled and transmit at all combination of channels simultaneously during testing. Only worst case results are recorded in below table.

PASS

Fundamental Frequency 2448MHz Vertical Polarization

Freq MHz	**Level dBuV/m**	**Limit/ Detector dBuV/m**
2448.025	70.03	114.0 / P
2448.025	46.97	94.0 / A

Fundamental Frequency 2448MHz Horizontal Polarization

Freq MHz	**Level dBuV/m**	**Limit/ Detector dBuV/m**
2448.000	74.93	114.0 / P
2448.000	48.88	94.0 / A

Harmonics 2448MHz Vertical Polarization

Freq MHz	**Level dBuV/m**	**Limit/ Detector dBuV/m**
4895.100	62.36	74.0 / P
4895.100	42.76	54.0 / A
7341.000	53.84	74.0 / P
7341.000	41.11	54.0 / A

Harmonics 2448MHz Horizontal Polarization

Freq MHz	**Level dBuV/m**	**Limit/ Detector dBuV/m**
4895.104	59.50	74.0 / P
4895.104	41.90	54.0 / A
7341.000	50.56	74.0 / P
7341.000	39.83	54.0 / A

Fundamental Frequency 2456MHz Vertical Polarization

Freq MHz	**Level dBuV/m**	**Limit/ Detector dBuV/m**
2456.020	70.96	114.0 / P
2456.020	46.94	94.0 / A

Fundamental Frequency 2456MHz	Horizontal Polarization	
Freq MHz	**Level dBuV/m**	**Limit/ Detector dBuV/m**
2456.030	74.58	114.0 / P
2456.030	48.57	94.0 / A
Harmonics 2456MHz	Vertical Polarization	
Freq MHz	**Level dBuV/m**	**Limit/ Detector dBuV/m**
4911.025	59.54	74.0 / P
4911.025	41.97	54.0 / A
7358.000	55.09	74.0 / P
7358.000	40.42	54.0 / A
Harmonics 2456MHz	Horizontal Polarization	
Freq MHz	**Level dBuV/m**	**Limit/ Detector dBuV/m**
4911.025	61.71	74.0 / P
4911.025	42.13	54.0 / A
7358.000	54.31	74.0 / P
7358.000	40.63	54.0 / A
Fundamental Frequency 2472MHz	Vertical Polarization	
Freq MHz	**Level dBuV/m**	**Limit/ Detector dBuV/m**
2472.050	71.86	114.0 / P
2472.050	47.91	94.0 / A
Fundamental Frequency 2472MHz	Horizontal Polarization	
Freq MHz	**Level dBuV/m**	**Limit/ Detector dBuV/m**
2471.620	75.65	114.0 / P
2471.620	48.70	94.0 / A
Harmonics 2472MHz	Vertical Polarization	
Freq MHz	**Level dBuV/m**	**Limit/ Detector dBuV/m**
4943.050	59.86	74.0 / P
4943.050	43.33	54.0 / A
7409.000	54.25	74.0 / P
7409.000	41.73	54.0 / A
Harmonics 2472MHz	Horizontal Polarization	
Freq MHz	**Level dBuV/m**	**Limit/ Detector dBuV/m**
4943.075	61.64	74.0 / P
4943.075	42.11	54.0 / A
7409.000	52.96	74.0 / P
7409.000	40.45	54.0 / A

Subclause 15.249 (d) – 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 : Internal battery has been activated
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: Both quadcopter and camera are test mode enabled and transmit at all combination of channels simultaneously during testing. Only worst case results are recorded in below table.

PASS

Tx frequency 2448MHz Vertical Polarization

Freq MHz	**Level dBuV/m**	**Limit/ Detector dBuV/m**
2400.000	33.55	74.0 / P
2400.000	22.55	54.0 / A

Tx frequency 2448MHz Horizontal Polarization

Freq MHz	**Level dBuV/m**	**Limit/ Detector dBuV/m**
2400.000	32.80	74.0 / P
2400.000	21.80	54.0 / A

Tx frequency 2472MHz Vertical Polarization

Freq MHz	**Level dBuV/m**	**Limit/ Detector dBuV/m**
2483.500	33.86	74.0 / P
2483.500	22.95	54.0 / A

Tx frequency 2472MHz Horizontal Polarization

Freq MHz	**Level dBuV/m**	**Limit/ Detector dBuV/m**
2483.500	33.61	74.0 / P
2483.500	22.69	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
RBW/VBW : 100 kHz / 300 kHz for f < 1 GHz
1 MHz / 3 MHz for f > 1 GHz
Supply voltage : Internal battery has been activated
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: Both quadcopter and camera are test mode enabled and transmit at all combination of channels simultaneously during testing. Only worst case results are recorded in below table.

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

Tx frequency 2448MHz Vertical Polarization

Freq MHz	Level dBuV/m	Limit/ Detector dBuV/m
143.830	20.44	43.5 / QP
180.017	30.34	43.5 / QP
239.987	29.12	46.0 / QP

Tx frequency 2448MHz Horizontal Polarization

Freq MHz	Level dBuV/m	Limit/ Detector dBuV/m
180.017	27.29	43.5 / QP
239.987	36.82	46.0 / QP
252.063	25.88	46.0 / QP

Tx frequency 2456MHz Vertical Polarization

Freq MHz	Level dBuV/m	Limit/ Detector dBuV/m
180.017	29.21	43.5 / QP
239.987	29.41	46.0 / QP
552.883	29.27	46.0 / QP

Tx frequency 2456MHz Horizontal Polarization

Freq MHz	Level dBuV/m	Limit/ Detector dBuV/m
180.017	30.98	43.5 / QP
191.745	26.67	43.5 / QP
239.987	36.85	46.0 / QP

Tx frequency 2472MHz	Vertical Polarization	
Freq MHz	**Level dBuV/m**	**Limit/ Detector dBuV/m**
180.017	29.14	43.5 / QP
239.987	30.07	46.0 / QP
552.883	28.81	46.0 / QP
Tx frequency 2472MHz	Horizontal Polarization	
Freq MHz	**Level dBuV/m**	**Limit/ Detector dBuV/m**
180.017	29.89	43.5 / QP
239.987	37.20	46.0 / QP
576.644	25.62	46.0 / QP