

Produkte
 Products


Prüfbericht - Nr.: 14041370 001		Seite 1 von 12 Page 1 of 12	
<i>Test Report No.:</i>			
Auftraggeber: <i>Client:</i>	Chenghai Udirc Toys Co.,Ltd Dengfeng Industrial Zone Chenghai District, Shantou Guangdong China		
Gegenstand der Prüfung: <i>Test Item:</i>	Short Range Device - Radio Control Camera (2.4GHz)		
Bezeichnung: <i>Identification:</i>	Please refer to "Models" on page 3	Serien-Nr.: <i>Serial No.:</i>	Engineering sample
Wareneingangs-Nr.: <i>Receipt No.:</i>	A000242056 (010-012) A000252999 (008-010)	Eingangsdatum: <i>Date of Receipt:</i>	15.08.2015 10.09.2015
Zustand des Prüfgegenstandes bei Anlieferung: <i>Condition of test item at delivery:</i>	Test samples received are not damaged and suitable for testing.		
Prüfört: <i>Testing Location:</i>	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: <i>Test Specification:</i>	FCC Part 15 Subpart B FCC Part 15 Subpart C ANSI C63.4-2009		
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. 8 - 10/F., Goldin Financial Global Square, 7 Wang Tai Road, Kowloon Bay, Kowloon, Hong Kong		
geprüft/ tested by:	kontrolliert/ reviewed by:		
22.09.2015	Joey Leung Project Engineer		22.09.2015
			Sharon Li Department Manager
Datum <i>Date</i>	Name/Stellung <i>Name/Position</i>	Unterschrift <i>Signature</i>	Datum <i>Date</i>
			Name/Stellung <i>Name/Position</i>
			Unterschrift <i>Signature</i>
Sonstiges: Other Aspects	FCCID: ZKWFPV15082803		
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>			

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Product information

Manufacturers declarations

	Transmitter
Operating frequency range	2421 - 2446 MHz
Type of modulation	GFSK
Number of channels	3
Type of antenna	Integral Antenna
Power level	fix
Connection to public utility power line	No
Nominal voltage	3.7 V

Product function and intended use

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

FCCID: ZKWFPV15082803

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 Camera

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:

- Remote controlled quadcopter provided by client. The FCC ID of that quadcopter is ZKWFPV15082801.

Independent Operation Modes

The basic operation modes are

- receiving control signal from associate LCD display;
- transmitting a real time image to the associate LCD display;
- transferring data to TF card.

For further information refer to User Manual

Related Submittal(s) Grants

This is a single application for certification of the transmitter.

Remarks

Pre-scan has been conducted to determine the worst-case mode from all possible combinations of available channels. Simultaneous transmission was investigated, no additional spurious emission was found from 9kHz to 25GHz.

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 B

Subclause 15.107 – Conducted Emission on AC Mains	N/A
There is no AC power input or output ports on the EUT.	

Subclause 15.109 – Radiated Emissions	Pass	
Test Specification : ANSI C63.4 - 2009 Mode of operation : Data transfer mode (RF disabled) Port of testing : Enclosure Frequency range : 30MHz – 1GHz Detector : Peak RBW/VBW : 120 kHz for f < 1 GHz Supply voltage : 3.7VDC, Powered by external source Temperature : 24°C Humidity : 50%		
Requirement: 15.109(a)		
Results: Pass		
Vertical Polarization		
Freq MHz	Level dBuV/m	Limit/ Detector dBuV/m
No peak found	---	43.5 / QP
Horizontal Polarization		
Freq MHz	Level dBuV/m	Limit/ Detector dBuV/m
No peak found	---	43.5 / QP

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:	Integral antenna
	b) Manufacturer and model no:	N.A.
	c) Gain with reference to an isotropic radiator:	2 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 : 3.7VDC, Powered by external source 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)
2421	2418.320	> 2400	2423.340	< 2483.5
2424	2421.660	> 2400	2426.520	< 2483.5
2446	2444.120	> 2400	2448.860	< 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 : 3.7VDC, Powered by external source 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:	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 2421MHz		Vertical Polarization
Freq MHz	Level dBuV/m	Limit/ Detector dBuV/m
2420.470	72.50	114.0 / P
2420.470	48.77	94.0 / A
Fundamental Frequency 2421MHz		Horizontal Polarization
Freq MHz	Level dBuV/m	Limit/ Detector dBuV/m
2420.440	81.91	114.0 / P
2420.440	56.37	94.0 / A
Harmonics 2421MHz		Vertical Polarization
Freq MHz	Level dBuV/m	Limit/ Detector dBuV/m
4895.040	62.43	74.0 / P
4895.040	39.83	54.0 / A
7341.000	53.75	74.0 / P
7341.000	40.02	54.0 / A
Harmonics 2421MHz		Horizontal Polarization
Freq MHz	Level dBuV/m	Limit/ Detector dBuV/m
4895.050	60.21	74.0 / P
4895.050	41.61	54.0 / A
7341.000	53.91	74.0 / P
7341.000	40.18	54.0 / A
Fundamental Frequency 2424MHz		Vertical Polarization
Freq MHz	Level dBuV/m	Limit/ Detector dBuV/m
2423.060	74.89	114.0 / P
2423.060	48.57	94.0 / A

Fundamental Frequency 2424MHz		Horizontal Polarization	
Freq MHz	Level dBuV/m	Limit/ Detector dBuV/m	
2422.990	81.85	114.0 / P	
2422.990	57.63	94.0 / A	
Harmonics 2424MHz		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 2424MHz		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 2446MHz		Vertical Polarization	
Freq MHz	Level dBuV/m	Limit/ Detector dBuV/m	
2445.560	72.63	114.0 / P	
2445.560	48.84	94.0 / A	
Fundamental Frequency 2446MHz		Horizontal Polarization	
Freq MHz	Level dBuV/m	Limit/ Detector dBuV/m	
2445.500	82.73	114.0 / P	
2445.500	57.11	94.0 / A	
Harmonics 2446MHz		Vertical Polarization	
Freq MHz	Level dBuV/m	Limit/ Detector dBuV/m	
4895.025	61.65	4943.560	
4895.025	43.05	4943.560	
7341.000	52.15	7409.000	
7341.000	40.42	7409.000	
Harmonics 2446MHz		Horizontal Polarization	
Freq MHz	Level dBuV/m	Limit/ Detector dBuV/m	
4895.235	59.57	74.0 / P	
4895.235	39.98	54.0 / A	
7341.000	53.64	74.0 / P	
7341.000	39.91	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 : 3.7VDC, Powered by external source Temperature : 23°C 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 2421MHz		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 2421MHz		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 2446MHz		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 2446MHz		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 : 3.7VDC, Powered by external source Temperature : 23°C 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 three transmit frequency modes comply with the field strength within the restricted bands. There is no spurious found below 30MHz.	
Tx frequency 2421MHz 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 2421MHz Horizontal Polarization		
Freq MHz	Level dBuV/m	Limit/ Detector dBuV/m
180.017	30.98	43.5 / QP
191.745	26.67	46.0 / QP
239.987	36.85	46.0 / QP
Tx frequency 2424MHz 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 2424MHz 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

Tx frequency 2446MHz			Vertical Polarization		
Freq MHz	Level dBuV/m	Limit/ Detector dBuV/m			
180.017	30.53	43.5 / QP			
239.987	31.33	46.0 / QP			
552.883	28.28	46.0 / QP			
Tx frequency 2446MHz			Horizontal Polarization		
Freq MHz	Level dBuV/m	Limit/ Detector dBuV/m			
180.017	31.01	43.5 / QP			
191.745	27.40	46.0 / QP			
239.987	36.46	46.0 / QP			