TÜVRheinland®

Produkte
Products

Prüfbericht - Nr.: *Test Report No.:*	**14032932 001**	**Seite 1 von 9** *Page 1 of 9*

Auftraggeber: *Client:*	**GUANGDONG SYMA MODEL AIRCRAFT INDUSTRIAL CO., LTD** **NO.2 WEST XINGYE ROAD** **LAIMEI INDUSTRIAL AREA, CHENGHAI** **SHANTOU, GUANGDONG** **CHINA**
Gegenstand der Prüfung: *Test Item:*	**Short Range Device - Radio Control Toy Transmitter (2.4GHz)**
Bezeichnung: *Identification:*	**Please refer to "Models" on page 5**
Serien-Nr.: *Serial No.:*	**Engineering sample**
Wareneingangs-Nr.: *Receipt No.:*	**00130531064-001** **00130531064-002** **00130531064-003**
Eingangsdatum: *Date of Receipt:*	**31.05.2013**
Zustand des Prüfgegenstandes bei Anlieferung: *Condition of test item at delivery:*	Test sample(s) is/are not damaged and suitable for testing.
Prüfort: *Testing Location:*	**Shenzhen Emtek Co., Ltd.** Bldg. 69, Majialong Industry Zone, Nanshan District, ShenZhen, Guangdong, 518052 P.R. China
Prüfgrundlage: *Test Specification:*	**FCC Part 15 Subpart C** **ANSI C63.4-2003**
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:*

03.06.2013	Joey Leung Test Engineer	
Datum *Date*	**Name/Stellung** *Name/Position*	**Unterschrift** *Signature*

kontrolliert/ *reviewed by:*

03.06.2013	Sharon Li Section Manager	
Datum *Date*	**Name/Stellung** *Name/Position*	**Unterschrift** *Signature*

Sonstiges: **FCCID: QV7-GC887552-4**
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*

Table of Content

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Product information

Manufacturers declarations

	Transmitter
Operating frequency range	2405 - 2475 MHz
Type of modulation	GFSK
Number of channels	71
Type of antenna	Integral
Power level	fix
Connection to public utility power line	No
Nominal voltage	V_{nor}: 6.0 V

Product function and intended use

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

FCCID: QV7-GC887552-4

Models	Product description
S31, S32, S33, S34, S35, S36, S37, S38, S39, S40, S41, S42, S43, S44, S45, S46, S47, S48, S49, S50, S51, S52, S53, S54, S55, S56, S57, S58, S59, S60	Radio Control Toy Helicopter

Submitted documents

Circuit Diagram
Block Diagram
Bill of material
User manual
Rating Label

List of Test and Measurement Instruments

Shenzhen EMTEK Co., Ltd. (Registration number: 709623)

Equipment	Manufacturer	Type	S/N	Due Date
EMI Test Receiver	Rohde & Schwarz	ESU	1302.6005.26	29 May 2014
Pre-Amplifier	HP	8447D	2944A07999	29 May 2014
Bilog Antenna	Schwarzbeck	VULB9163	142	11 May 2014
Loop Antenna	Schwarzbeck	FMZB 1519	012	11 May 2014
Horn Antenna	Schwarzbeck	BBHA 9170	BBHA9170399	11 May 2014
Horn Antenna	Schwarzbeck	BBHA 9120	D143	11 May 2014
Cable	Schwarzbeck	AK9513	ACRX1	11 May 2014
Cable	Rosenberger	N/A	FP2RX2	29 May 2014
Cable	Schwarzbeck	AK9513	CRPX1	29 May 2014
Cable	Schwarzbeck	AK9513	CRRX2	29 May 2014
Pre-Amplifier	A.H.	PAM-0126	1415261	29 May 2014
Spectrum Analyzer	Rohde & Schwarz	FSP30	100007	16 Sep 2013

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 – Band edge compliance of radiated emissions	**Pass**
Test Specification : ANSI C63.4 – 2003 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, 4x1.5V AA size new battery Temperature : 23ºC Humidity : 50%	
Requirement:	Radiated emissions which fall in the restricted bans, as defined in 15.205 (a), must also comply with the radiated emission limits specified in 15.209(a).
Results:	For test protocols refer to Appendix 1, page 4-7.

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 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

Subclause 15.215 (c) – 20 dB Bandwidth	**Pass**
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.
Test Specification : ANSI C63.4 – 2003 Mode of operation : Tx mode Port of testing : Enclosure RBW/VBW : 100 kHz / 300 kHz Supply voltage : 6.0VDC, 4x1.5V AA size new battery Temperature : 23ºC Humidity : 50%	
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	2404.45	> 2400	2405.76	< 2483.5
2445	2444.42	> 2400	2446.14	< 2483.5
2475	2474.41	> 2400	2476.23	< 2483.5

Subclause 15.249 (a) – Radiated Emission (Fundamental and Harmonics)	**Pass**
Test Specification : ANSI C63.4 – 2003 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, 4x1.5V 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**
2405.667	84.50	114.0 / P
2405.667	60.20	94.0 / A

Fundamental Frequency 2405MHz Horizontal Polarization

Freq MHz	**Level dBuV/m**	**Limit/ Detector dBuV/m**
2405.667	66.89	114.0 / P
2405.667	59.49	94.0 / A

Harmonics 2405MHz	Vertical Polarization	
Freq MHz	**Level dBuV/m**	**Limit/ Detector dBuV/m**
4810.103	46.68	74.0 / P
4810.103	29.31	54.0 / A
Harmonics 2405MHz	Horizontal Polarization	
Freq MHz	**Level dBuV/m**	**Limit/ Detector dBuV/m**
No peak found	---	74.0 / P
No peak found	---	54.0 / A
Fundamental Frequency 2445MHz	Vertical Polarization	
Freq MHz	**Level dBuV/m**	**Limit/ Detector dBuV/m**
2445.910	81.00	114.0 / P
2445.910	58.62	94.0 / A
Fundamental Frequency 2445MHz	Horizontal Polarization	
Freq MHz	**Level dBuV/m**	**Limit/ Detector dBuV/m**
2445.910	79.97	114.0 / P
2445.910	59.61	94.0 / A
Harmonics 2445MHz	Vertical Polarization	
Freq MHz	**Level dBuV/m**	**Limit/ Detector dBuV/m**
No peak found	---	74.0 / P
No peak found	---	54.0 / A
Harmonics 2445MHz	Horizontal Polarization	
Freq MHz	**Level dBuV/m**	**Limit/ Detector dBuV/m**
No peak found	---	74.0 / P
No peak found	---	54.0 / A
Fundamental Frequency 2475MHz	Vertical Polarization	
Freq MHz	**Level dBuV/m**	**Limit/ Detector dBuV/m**
2475.154	80.82	114.0 / P
2475.154	71.53	94.0 / A
Fundamental Frequency 2475MHz	Horizontal Polarization	
Freq MHz	**Level dBuV/m**	**Limit/ Detector dBuV/m**
2475.154	67.83	114.0 / P
2475.154	57.52	94.0 / A
Harmonics 2475MHz	Vertical Polarization	
Freq MHz	**Level dBuV/m**	**Limit/ Detector dBuV/m**
4950.320	47.83	74.0 / P
4950.320	29.75	54.0 / A

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

Subclause 15.249 (d) – Spurious Radiated Emissions **Pass**

Test Specification : ANSI C63.4 - 2003
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, 4x1.5V 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**
3751.603	43.69	74.0 / P
3751.603	27.78	54.0 / A
8001.603	52.20	74.0 / P
8001.603	34.89	54.0 / A
9908.654	57.12	74.0 / P
9908.654	40.34	54.0 / A

Tx frequency 2405MHz	Horizontal Polarization	
Freq MHz	**Level dBuV/m**	**Limit/ Detector dBuV/m**
5086.538	45.88	74.0 / P
5086.538	29.09	54.0 / A
7320.513	51.00	74.0 / P
7320.513	33.45	54.0 / A
8001.603	51.50	74.0 / P
8001.603	34.08	54.0 / A
9826.923	56.11	74.0 / P
9826.923	39.67	54.0 / A

Tx frequency 2445MHz	Vertical Polarization	
Freq MHz	**Level dBuV/m**	**Limit/ Detector dBuV/m**
5086.538	46.30	74.0 / P
5086.538	29.40	54.0 / A

7129.808	50.63	74.0 / P
7129.808	33.11	54.0 / A
9200.321	54.27	74.0 / P
9200.321	37.27	54.0 / A
Tx frequency 2445MHz	Horizontal Polarization	
Freq MHz	**Level dBuV/m**	**Limit/ Detector dBuV/m**
3806.090	43.11	74.0 / P
3806.090	26.42	54.0 / A
4487.179	43.75	74.0 / P
4487.179	26.32	54.0 / A
7075.321	50.91	74.0 / P
7075.321	34.61	54.0 / A
9908.654	56.64	74.0 / P
9908.654	38.94	54.0 / A
Tx frequency 2475MHz	Vertical Polarization	
Freq MHz	**Level dBuV/m**	**Limit/ Detector dBuV/m**
7375.000	51.33	74.0 / P
7375.000	33.61	54.0 / A
7838.141	52.31	74.0 / P
7838.141	35.90	54.0 / A
9963.141	58.44	74.0 / P
9963.141	41.52	54.0 / A
Tx frequency 2475MHz	Horizontal Polarization	
Freq MHz	**Level dBuV/m**	**Limit/ Detector dBuV/m**
3806.090	42.54	74.0 / P
3806.090	24.82	54.0 / A
5958.333	46.65	74.0 / P
5958.333	29.37	54.0 / A
7293.269	50.86	74.0 / P
7293.269	32.91	54.0 / A