

Prüfbericht - Nr.: 14031747 001			Seite 1 von 9 Page 1 of 9		
<i>Test Report No.:</i>					
Auftraggeber: <i>Client:</i>		Geobra Brandstaetter GmbH & Co.KG Brandstaetterstr. 2-10 90513 Zirndorf Germany			
Gegenstand der Prüfung: <i>Test Item:</i>		Short Range Device - Radio Control Toys Transceiver (2.4GHz)			
Bezeichnung: <i>Identification:</i>	5536	Serien-Nr.: <i>Serial No.:</i>	Engineering sample		
Wareneingangs-Nr.: <i>Receipt No.:</i>	00121224006-001	Eingangsdatum: <i>Date of Receipt:</i>	24.12.2012		
Zustand des Prüfgegenstandes bei Anlieferung: <i>Condition of test item at delivery:</i>		Test sample(s) is/are not damaged and suitable for testing.			
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 C63.4-2009 CISPR 22:2003			
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:		
28.02.2013 Joey Leung Test Engineer 			28.02.2013 Sharon Li Section 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: N2T30808383			
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		
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. <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>					

Table of Content

	Page
Cover Page	1
Table of Content	2
Product information.....	3
Manufacturers declarations	3
Product function and intended use	3
Submitted documents.....	3
List of Test and Measurement Instruments.....	4
Results FCC Part 15 – Subpart C	5
Subclause 15.207 – Disturbance Voltage on AC Mains.....	N/A..... 5
Subclause 15.205 – Band edge compliance of radiated emissions	Pass..... 5
Subclause 15.215 (c) – 20 dB Bandwidth.....	Pass..... 5
Subclause 15.249 (a) – Radiated Emission (Fundamental and Harmonics).....	Pass..... 6
Subclause 15.249 (d) – Spurious Radiated Emissions	Pass..... 8
 Appendix 1 – Test Results.....	 7 pages
Appendix 2 – Test Setup Photos.....	2 pages
Appendix 3 – Photo documentation.....	8 pages
Appendix 4 – Product documentation.....	17 pages

Product information

Manufacturers declarations

	Transceiver
Operating frequency range	2403 - 2475 MHz
Type of modulation	GFSK modulation
Number of channels	16
Type of antenna	Integral
Power level	fix
Connection to public utility power line	No
Nominal voltage	V _{nom} : 9.0 V

Product function and intended use

The equipment under test (EUT) is a radio control toy transceiver operating at 2.4GHz. During pairing, EUT operates as transceiver. After pairing EUT operates as a transmitter only. The EUT is powered by batteries only.

Submitted documents

Circuit Diagram
Block Diagram
Bill of material
User manual
Label Artwork

Special accessories and auxiliary equipment

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

Nil

List of Test and Measurement Instruments

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

Equipment	Manufacturer	Type	Due Date
3m Semi- Anechoic Chamber	ZhongYu Electron	9.0(L)*6.0(W)* 6.0(H)	Mar. 29 2013
Control Room	ZhongYu Electron	6.2(L)*2.5(W)* 2.4(H)	N/A
ESU EMI Test Receiver	R&S	ESU26	Jul. 06 2013
Loop Antenna	Zhinan	ZN30900A	Jul. 25 2013
Bi-log Hybrid Antenna	SCHWARZBECK	VULB9163	Mar. 09 2013
Double-ridged horn antenna	SCHWARZBECK	9120D	Mar. 09 2013
Horn Antenna	ETS-LINDGREN	3160	Mar. 09 2013
RF Amplifier	HP	8347A	Jul. 06 2013
RF Amplifier	HP	8349B	Jul. 06 2013
EMI Test Software	AUDIX	E3	N/A
Coaxial cable	GTS	N/A	Jul. 06 2013
Coaxial Cable	GTS	N/A	Jul. 06 2013
Thermo meter	N/A	N/A	Jul. 05 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 : 9.0VDC, 6F22 size new battery 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	: There is no peak found in the restricted bands. For test protocols refer to Appendix 1, page 4-7.

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 for f < 1 GHz 1 MHz / 3 MHz for f > 1 GHz			
Supply voltage	: 9.0VDC, 6F22 size new battery			
Temperature	: 23°C			
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)
2403	2402.550	> 2400	2404.690	< 2483.5
2440	2439.550	> 2400	2441.330	< 2483.5
2475	2474.550	> 2400	2476.630	< 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 : 9.0VDC, 6F22 size new battery 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 : PASS		
Fundamental Frequency 2403MHz Vertical Polarization		
Freq MHz	Level dBuV/m	Limit/ Detector dBuV/m
2403.000	92.70	114.0 / P
2403.000	62.65	94.0 / A
Fundamental Frequency 2403MHz Horizontal Polarization		
Freq MHz	Level dBuV/m	Limit/ Detector dBuV/m
2403.000	92.84	114.0 / P
2403.000	62.52	94.0 / A
Harmonics 2403MHz Vertical Polarization		
Freq MHz	Level dBuV/m	Limit/ Detector dBuV/m
4806.000	44.20	74.0 / P
4806.000	27.47	54.0 / A
7209.000	51.91	74.0 / P
7209.000	32.49	54.0 / A
9612.000	54.25	74.0 / P
9612.000	34.95	54.0 / A
Harmonics 2403MHz Horizontal Polarization		
Freq MHz	Level dBuV/m	Limit/ Detector dBuV/m
4806.000	45.10	74.0 / P
4806.000	29.86	54.0 / A
7209.000	52.25	74.0 / P
7209.000	35.02	54.0 / A
9612.000	36.67	74.0 / P
9612.000	54.77	54.0 / A
Fundamental Frequency 2440MHz Vertical Polarization		
Freq MHz	Level dBuV/m	Limit/ Detector dBuV/m
2440.000	92.60	114.0 / P
2440.000	62.05	94.0 / A

Fundamental Frequency 2440MHz			Horizontal Polarization		
Freq MHz	Level dBuV/m	Limit/ Detector dBuV/m	Freq MHz	Level dBuV/m	Limit/ Detector dBuV/m
2440.000	93.24	114.0 / P	2440.000	62.76	94.0 / A
2440.000	62.76	94.0 / A			
Harmonics 2440MHz			Vertical Polarization		
Freq MHz	Level dBuV/m	Limit/ Detector dBuV/m	Freq MHz	Level dBuV/m	Limit/ Detector dBuV/m
4880.000	44.43	74.0 / P	4880.000	33.43	54.0 / A
4880.000	33.43	54.0 / A	7320.000	50.36	74.0 / P
7320.000	50.36	74.0 / P	7320.000	34.46	54.0 / A
7320.000	34.46	54.0 / A	9760.000	52.52	74.0 / P
9760.000	52.52	74.0 / P	9760.000	35.02	54.0 / A
9760.000	35.02	54.0 / A			
Harmonics 2440MHz			Horizontal Polarization		
Freq MHz	Level dBuV/m	Limit/ Detector dBuV/m	Freq MHz	Level dBuV/m	Limit/ Detector dBuV/m
4880.000	46.08	74.0 / P	4880.000	33.47	54.0 / A
4880.000	33.47	54.0 / A	7320.000	51.36	74.0 / P
7320.000	51.36	74.0 / P	7320.000	33.82	54.0 / A
7320.000	33.82	54.0 / A	9760.000	53.89	74.0 / P
9760.000	53.89	74.0 / P	9760.000	33.94	54.0 / A
9760.000	33.94	54.0 / A			
Fundamental Frequency 2475MHz			Vertical Polarization		
Freq MHz	Level dBuV/m	Limit/ Detector dBuV/m	Freq MHz	Level dBuV/m	Limit/ Detector dBuV/m
2475.000	88.09	114.0 / P	2475.000	57.86	94.0 / A
2475.000	57.86	94.0 / A			
Fundamental Frequency 2475MHz			Horizontal Polarization		
Freq MHz	Level dBuV/m	Limit/ Detector dBuV/m	Freq MHz	Level dBuV/m	Limit/ Detector dBuV/m
2475.000	93.85	114.0 / P	2475.000	63.32	94.0 / A
2475.000	63.32	94.0 / A			
Harmonics 2475MHz			Vertical Polarization		
Freq MHz	Level dBuV/m	Limit/ Detector dBuV/m	Freq MHz	Level dBuV/m	Limit/ Detector dBuV/m
4950.000	46.07	74.0 / P	4950.000	33.59	54.0 / A
4950.000	33.59	54.0 / A	7425.000	52.02	74.0 / P
7425.000	52.02	74.0 / P	7425.000	34.71	54.0 / A
7425.000	34.71	54.0 / A	9900.000	53.00	74.0 / P
9900.000	53.00	74.0 / P	9900.000	35.05	54.0 / A
9900.000	35.05	54.0 / A			
Harmonics 2475MHz			Horizontal Polarization		
Freq MHz	Level dBuV/m	Limit/ Detector dBuV/m	Freq MHz	Level dBuV/m	Limit/ Detector dBuV/m
4950.000	45.91	74.0 / P	4950.000	33.45	54.0 / A
4950.000	33.45	54.0 / A			

7425.000	51.60	74.0 / P
7425.000	34.49	54.0 / A
9900.000	52.72	74.0 / P
9900.000	33.02	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 : 9.0VDC, 6F22 size new battery 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 : All three transmit frequency modes comply with the field strength within the restricted bands. There is no spurious found below 30MHz.		
Tx frequency 2403MHz 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 2403MHz 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 2440MHz 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 2440MHz 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
343.180	31.90	46.0 / QP
No peak found	---	74.0 / P
No peak found	---	54.0 / A