

Prüfbericht - Nr.: 14029548 001		Seite 1 von 8	
<i>Test Report No.:</i>		<i>Page 1 of 8</i>	
Auftraggeber: <i>Client:</i>	Mun Ah Plastic Electronic Toys Co., Ltd. 21/F, Block 2 Kingsway Industrial Building 173-175 Wo Yi Hop Road Kwai Chung, N.T., Hong Kong		
Gegenstand der Prüfung: <i>Test Item:</i>	Short Range Device - Radio Control Transmitter (2.4GHz)		
Bezeichnung: <i>Identification:</i>	CTX-2710	Serien-Nr.: <i>Serial No.:</i>	Engineering sample
Wareneingangs-Nr.: <i>Receipt No.:</i>	00120419207-001	Eingangsdatum: <i>Date of Receipt:</i>	19.04.2012
Zustand des Prüfgegenstandes bei Anlieferung: <i>Condition of test item at delivery:</i>	Test samples received are sufficient for testing and not damaged.		
Prüfört: <i>Testing Location:</i>	TÜV Rheinland Hong Kong Ltd. 8/F., First Group Centre, 14 Wang Tai Road, Kowloon Bay, Kowloon, Hong Kong Hong Kong Productivity Council HKPC Building, 78 Tat Chee Avenue, Kowloon, Hong Kong		
Prüfgrundlage: <i>Test Specification:</i>	FCC Part 15 Subpart C ANSI C63.4-2003 CISPR 22:1997		
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:		
17.05.2012	Joey Leung Test Engineer	17.05.2012	Sharon Li Section Manager
<i>Datum</i> <i>Date</i>	<i>Name/Stellung</i> <i>Name/Position</i>	<i>Unterschrift</i> <i>Signature</i>	<i>Datum</i> <i>Date</i>
			<i>Name/Stellung</i> <i>Name/Position</i>
			<i>Unterschrift</i> <i>Signature</i>
Sonstiges: Other Aspects	FCCID: YDTMTM27HP		
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.....	11 pages
Appendix 2 – Test Setup Photos.....	2 pages
Appendix 3 – Photo documentation.....	9 pages
Appendix 4 – Product documentation.....	11 pages

Product information

Manufacturers declarations

	Transceiver
Operating frequency range	2406 - 2477 MHz
Type of modulation	FHSS modulation
Number of channels	72
Type of antenna	Permanent External Antenna
Power level	fix
Connection to public utility power line	No
Nominal voltage	V_{nor} : 6.0 V

Product function and intended use

This is a sophisticated hobby product and not a toy. It must be operated with caution and common sense. User also requires some basic mechanical abilities. Fail to operate this product in a safe and responsible manner could result in injury or do damage to the product or other properties. This product is not intended for use by children without direct adult supervision.

Submitted documents

- Circuit Diagram
- Block Diagram
- Bill of material
- User manual
- Rating Label

List of Test and Measurement Instruments

Hong Kong Productivity Council (Registration number: 90656)

Equipment	Manufacturer	Type	S/N	Due Date
Semi-anechoic Chamber	Frankonia	Nil	Nil	12-Apr-13
Test Receiver	R & S	ESU40	100190	26-May-12
Bi-conical Antenna	R & S	HK116	100241	05-May-13
Log Periodic Antenna	R & S	HL223	841516/020	06-May-13
Coaxial cable 50ohm	Rosenberger	RTK081-05S-05S-10m	LA2-001-10M / 001	15-Nov-13
Microwave amplifier 0.5-26.5GHz, 25dB gain	HP	83017A	3950M00241	03-Oct-13
High Pass Filter (cutoff freq. =1000MHz)	Trilithic	23042	9829213	30-Oct-13
Horn Antenna	EMCO	3115	9002-3351	11-May-13
FSP 30 Spectrum Analyser	R & S	FSP 30	100286	17-Sep-12
Active Loop Antenna	EMCO	6502	9107-2651	19-Apr-13

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 : DC 6.0V Temperature : 23°C 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:	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 : DC 6.0V Temperature : 23°C Humidity : 50%				
Results:	For test protocols refer to Appendix 1, page 1-3.			
Frequency (MHz)	20 dB left (MHz)	Limit (MHz)	20 dB right (MHz)	Limit (MHz)
2406	2405.26	> 2400	2406.86	< 2483.5
2441	2443.22	> 2400	2444.87	< 2483.5
2477	2476.26	> 2400	2477.77	< 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 : DC 6.0V 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 2406MHz		Vertical Polarization
Freq MHz	Level dBuV/m	Limit/ Detector dBuV/m
2406.154	111.11	114.0 / P
2405.971	68.53	94.0 / A
Fundamental Frequency 2406MHz		Horizontal Polarization
Freq MHz	Level dBuV/m	Limit/ Detector dBuV/m
2406.212	111.03	114.0 / P
2405.971	68.41	94.0 / A
Harmonics 2406MHz		Vertical Polarization
Freq MHz	Level dBuV/m	Limit/ Detector dBuV/m
4811.619	51.35	74.0 / P
4811.859	35.82	54.0 / A
7217.692	52.88	74.0 / P
7217.869	37.57	54.0 / A
9623.317	60.78	74.0 / P
9623.862	42.92	54.0 / A
Harmonics 2406MHz		Horizontal Polarization
Freq MHz	Level dBuV/m	Limit/ Detector dBuV/m
4811.619	51.35	74.0 / P
4811.859	35.82	54.0 / A
7217.644	52.12	74.0 / P
7217.869	37.37	54.0 / A
9623.349	62.99	74.0 / P
9623.830	43.85	54.0 / A
Fundamental Frequency 2441MHz		Vertical Polarization
Freq MHz	Level dBuV/m	Limit/ Detector dBuV/m
2444.080	110.16	114.0 / P
2444.016	68.29	94.0 / A

Fundamental Frequency 2441MHz		Horizontal Polarization	
Freq MHz	Level dBuV/m	Limit/ Detector dBuV/m	
2443.856	110.16	114.0 / P	
2444.032	68.25	94.0 / A	
Harmonics 2441MHz		Vertical Polarization	
Freq MHz	Level dBuV/m	Limit/ Detector dBuV/m	
4888.413	54.77	74.0 / P	
4887.917	37.01	54.0 / A	
7332.282	52.61	74.0 / P	
7331.881	37.74	54.0 / A	
9777.010	58.60	74.0 / P	
9777.010	41.54	54.0 / A	
Harmonics 2441MHz		Horizontal Polarization	
Freq MHz	Level dBuV/m	Limit/ Detector dBuV/m	
4888.333	59.75	74.0 / P	
4887.901	39.23	54.0 / A	
Fundamental Frequency 2477MHz		Vertical Polarization	
Freq MHz	Level dBuV/m	Limit/ Detector dBuV/m	
2477.061	108.92	114.0 / P	
2476.965	67.96	94.0 / A	
Fundamental Frequency 2477MHz		Horizontal Polarization	
Freq MHz	Level dBuV/m	Limit/ Detector dBuV/m	
2476.869	108.89	114.0 / P	
2476.772	67.89	94.0 / A	
Harmonics 2477MHz		Vertical Polarization	
Freq MHz	Level dBuV/m	Limit/ Detector dBuV/m	
4953.702	57.16	74.0 / P	
4953.990	38.56	54.0 / A	
7430.924	53.18	74.0 / P	
7430.908	38.32	54.0 / A	
9908.131	59.72	74.0 / P	
9908.035	42.54	54.0 / A	
Harmonics 2477MHz		Horizontal Polarization	
Freq MHz	Level dBuV/m	Limit/ Detector dBuV/m	
4953.676	57.13	74.0 / P	
4953.049	38.19	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 : DC 6.0V 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 2406MHz		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 2406MHz		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 2441MHz		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 2441MHz		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 2477MHz		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 2477MHz		Horizontal Polarization
Freq MHz	Level dBuV/m	Limit/ Detector dBuV/m
no peak found	---	74.0 / P
no peak found	---	54.0 / A