

Produkte
Products



| | | | |
|--|---|--|--|
| Prüfbericht - Nr.: 14041371 001 | | Seite 1 von 12 | |
| <i>Test Report No.:</i> | | <i>Page 1 of 12</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 LCD Display (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 (007-009) A000252999 (002-004) | 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 <i>Datum</i> <small>Date</small> | Joey Leung Project Engineer <i>Name/Stellung</i> <small>Name/Position</small> |  <i>Unterschrift</i> <small>Signature</small> | 22.09.2015 <i>Datum</i> <small>Date</small> |
| | | | Benny Lau Senior Project Manager <i>Name/Stellung</i> <small>Name/Position</small> |
| | | |  <i>Unterschrift</i> <small>Signature</small> |
| Sonstiges: <i>Other Aspects</i> | FCCID: ZKWFPV15082804 | | |
| 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> | | | |

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 |
| Special accessories and auxiliary equipment | 3 |
| Independent Operation Modes | 4 |
| Related Submittal(s) Grants..... | 4 |
| List of Test and Measurement Instruments | 5 |
| Results FCC Part 15 – Subpart B | 6 |
| Subclause 15.107 – Conducted Emission on AC Mains.....N/A | 6 |
| Subclause 15.109 – Radiated Emissions | Pass 6 |
| Results FCC Part 15 – Subpart C | 7 |
| Subclause 15.203 – Antenna Information | Pass 7 |
| Subclause 15.204 – Antenna Information | Pass 7 |
| Subclause 15.207 – Disturbance Voltage on AC Mains.....N/A | 7 |
| Subclause 15.215 (c) – 20 dB Bandwidth..... | Pass 7 |
| Subclause 15.249 (a) – Field Strength of Fundamental and Harmonics..... | Pass 8 |
| Subclause 15.249(d) – Spurious Emissions – Band edge..... | Pass 10 |
| Subclause 15.249 (d) – Emissions radiated outside of the specified frequency bands . | Pass 11 |
| Appendix 1 – Test Results..... | 3 pages |
| Appendix 2 – Test Setup Photos..... | 3 pages |
| Appendix 3 – Photo documentation..... | 6 pages |
| Appendix 4 – Product documentation..... | 24 pages |
| Appendix 5 – RF Exposure Information..... | 2 pages |

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 LCD display operating at 2.4GHz. It is powered by battery only.

FCCID: ZKWFPV15082804

| 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 LCD Display |

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 controller provided by client. The FCC ID of that remote controller is ZKWFPV15082802.

Independent Operation Modes

The basic operation modes are

- transmitting control signal for the RC camera;
- display a real time image captured from the associate camera;
- reading data from 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 : Video playing 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 |
| 143.830 | 28.78 | 43.5 / QP |
| 216.024 | 33.31 | 46.0 / QP |
| 239.987 | 34.60 | 46.0 / QP |
| 263.819 | 35.20 | 46.0 / QP |
| Horizontal Polarization | | |
| Freq MHz | Level dBuV/m | Limit/ Detector dBuV/m |
| 192.419 | 29.02 | 43.5 / QP |
| 200.688 | 34.61 | 43.5 / QP |
| 216.024 | 33.45 | 46.0 / QP |
| 235.816 | 36.90 | 46.0 / QP |
| 239.987 | 36.70 | 46.0 / QP |
| 263.819 | 33.50 | 46.0 / 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 | 2418.460 | > 2400 | 2423.480 | < 2483.5 |
| 2424 | 2421.480 | > 2400 | 2426.480 | < 2483.5 |
| 2446 | 2443.960 | > 2400 | 2448.960 | < 2483.5 |

| Fundamental Frequency 2424MHz | | Horizontal Polarization | |
|-------------------------------|--------------|-------------------------|--|
| Freq MHz | Level dBuV/m | Limit/ Detector dBuV/m | |
| 2423.080 | 82.57 | 114.0 / P | |
| 2423.080 | 57.27 | 94.0 / A | |
| Harmonics 2424MHz | | Vertical Polarization | |
| Freq MHz | Level dBuV/m | Limit/ Detector dBuV/m | |
| 4895.320 | 59.73 | 74.0 / P | |
| 4895.320 | 41.73 | 54.0 / A | |
| 7341.000 | 53.20 | 74.0 / P | |
| 7341.000 | 40.47 | 54.0 / A | |
| Harmonics 2424MHz | | Horizontal Polarization | |
| Freq MHz | Level dBuV/m | Limit/ Detector dBuV/m | |
| 4895.320 | 61.52 | 74.0 / P | |
| 4895.320 | 42.52 | 54.0 / A | |
| 7341.000 | 53.31 | 74.0 / P | |
| 7341.000 | 41.58 | 54.0 / A | |
| Fundamental Frequency 2446MHz | | Vertical Polarization | |
| Freq MHz | Level dBuV/m | Limit/ Detector dBuV/m | |
| 2445.420 | 72.73 | 114.0 / P | |
| 2445.420 | 48.86 | 94.0 / A | |
| Fundamental Frequency 2446MHz | | Horizontal Polarization | |
| Freq MHz | Level dBuV/m | Limit/ Detector dBuV/m | |
| 2445.540 | 82.68 | 114.0 / P | |
| 2445.540 | 57.46 | 94.0 / A | |
| Harmonics 2446MHz | | Vertical Polarization | |
| Freq MHz | Level dBuV/m | Limit/ Detector dBuV/m | |
| 4943.560 | 59.95 | 4943.560 | |
| 4943.560 | 42.68 | 4943.560 | |
| 7409.000 | 53.08 | 7409.000 | |
| 7409.000 | 39.56 | 7409.000 | |
| Harmonics 2446MHz | | Horizontal Polarization | |
| Freq MHz | Level dBuV/m | Limit/ Detector dBuV/m | |
| 4943.560 | 61.62 | 74.0 / P | |
| 4943.560 | 41.73 | 54.0 / A | |
| 7409.000 | 52.10 | 74.0 / P | |
| 7409.000 | 39.58 | 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 transmitter and LCD display 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 | 35.15 | 74.0 / P |
| 2400.000 | 22.10 | 54.0 / A |
| Tx frequency 2421MHz Horizontal Polarization | | |
| Freq MHz | Level dBuV/m | Limit/ Detector dBuV/m |
| 2400.000 | 34.67 | 74.0 / P |
| 2400.000 | 23.69 | 54.0 / A |
| Tx frequency 2446MHz Vertical Polarization | | |
| Freq MHz | Level dBuV/m | Limit/ Detector dBuV/m |
| 2483.500 | 33.70 | 74.0 / P |
| 2483.500 | 22.71 | 54.0 / A |
| Tx frequency 2446MHz Horizontal Polarization | | |
| Freq MHz | Level dBuV/m | Limit/ Detector dBuV/m |
| 2483.500 | 33.89 | 74.0 / P |
| 2483.500 | 21.89 | 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 transmitter and LCD display 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 |
| 152.130 | 30.81 | 43.5 / QP |
| 239.987 | 36.67 | 46.0 / QP |
| 263.819 | 37.30 | 46.0 / QP |
| Tx frequency 2421MHz Horizontal Polarization | | |
| Freq MHz | Level dBuV/m | Limit/ Detector dBuV/m |
| 143.830 | 34.40 | 43.5 / QP |
| 247.682 | 36.69 | 46.0 / QP |
| 272.278 | 36.63 | 46.0 / QP |
| Tx frequency 2424MHz Vertical Polarization | | |
| Freq MHz | Level dBuV/m | Limit/ Detector dBuV/m |
| 135.982 | 34.21 | 43.5 / QP |
| 223.733 | 34.67 | 46.0 / QP |
| 239.987 | 34.60 | 46.0 / QP |
| Tx frequency 2424MHz Horizontal Polarization | | |
| Freq MHz | Level dBuV/m | Limit/ Detector dBuV/m |
| 135.982 | 35.44 | 43.5 / QP |
| 223.733 | 36.43 | 46.0 / QP |
| 247.682 | 34.84 | 46.0 / QP |

| Tx frequency 2446MHz | | Vertical Polarization | |
|----------------------|-------------------------|-----------------------------------|--|
| Freq MHz | Level dBuV/m | Limit/ Detector dBuV/m | |
| 135.982 | 33.45 | 43.5 / QP | |
| 223.733 | 34.02 | 46.0 / QP | |
| 272.278 | 33.49 | 46.0 / QP | |
| Tx frequency 2446MHz | | Horizontal Polarization | |
| Freq MHz | Level dBuV/m | Limit/ Detector dBuV/m | |
| 135.982 | 34.05 | 43.5 / QP | |
| 223.733 | 36.94 | 46.0 / QP | |
| 248.552 | 35.90 | 46.0 / QP | |