

Produkte
Products

Prüfbericht - Nr.: 14026475 001

Test Report No.:

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Auftraggeber: CHAODA PLASTIC TOYS FACTORY
Client: FENGXIANG INDUSTRIAL ZONE
 CHENGHAI DISTRICT
 SHANTOU
 CHINA

Gegenstand der Prüfung: Low Power Transmitter (49.86MHz)

Test Item:

Bezeichnung: A68690 **Serien-Nr.:** Engineering sample
Identification: Please see "Models" on page 5 for details **Serial No.:**

Wareneingangs-Nr.: 00110401155-001 **Eingangsdatum:** 01.04.2011
Receipt No.: **Date of Receipt:**

Prüfort: TÜV Rheinland Hong Kong Ltd.
Testing Location: 8/F, Niche Centre, 14 Wang Tai Road, Kowloon Bay, Kowloon, Hong Kong
 Hong Kong Productivity Council
 HKPC Building, 78 Tat Chee Avenue, Kowloon, Hong Kong

Prüfgrundlage: FCC Part 15, Subpart C
Test Specification:

Prüfergebnis: Der Prüfgegenstand entspricht oben genannter Prüfgrundlage(n).
Test Result: The test item passed the test specification(s).

Prüflaboratorium: TÜV Rheinland Hong Kong Ltd.
Testing Laboratory: 9th Floor, Emperor International Square, 7 Wang Tai Road, Kowloon Bay, Kowloon, Hong Kong

geprüft / tested by:

kontrolliert / reviewed by:

17.05.2011 Mika Chan
 Datum Name/Stellung
 Date Name/Position



Unterschrift
 Signature

17.05.2011

Sharon Li
 Assistant Manager


 Unterschrift
 Signature

Sonstiges / Other Aspects:

FCCID: ZJI69485668688

Abkürzungen: P(pass) = entspricht Prüfgrundlage
 F(fail) = entspricht nicht Prüfgrundlage
 N/A = nicht anwendbar
 N/T = nicht getestet

Abbreviations: P(pass) = passed
 F(fail) = 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 auszugswise vervielfältigt werden. Dieser Bericht berechtigt nicht zur Verwendung eines Prüfzeichens.
 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.

Test Summary

Radiated Emission of Carrier Frequency

Result: Pass

Spurious Radiated Emissions

Result: Pass

Bandwidth Measurement

Result: Pass

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List of Test and Measurement Instruments

Hong Kong Productivity Council (Registration number: 90656)

| | Equipment used | Manufacturer | Model No. | S/N | Due Date |
|-------------------------------------|--|--------------|--------------------|-------------------|-----------|
| <input checked="" type="checkbox"/> | Semi-anechoic Chamber | Frankonia | Nil | Nil | 27-Apr-11 |
| <input checked="" type="checkbox"/> | Test Receiver | R & S | ESU8 | 100141 | 25-May-11 |
| <input checked="" type="checkbox"/> | Bi-conical Antenna | R & S | HK116 | 100242 | 13-Apr-12 |
| <input checked="" type="checkbox"/> | Log Periodic Antenna | R & S | HL223 | 841516/020 | 13-Apr-12 |
| <input checked="" type="checkbox"/> | Coaxial cable 50ohm | Rosenberger | RTK081-05S-05S-10m | LA2-001-10M / 002 | 08-Dec-11 |
| <input checked="" type="checkbox"/> | Microwave amplifier 0.5-26.5GHz, 25dB gain | HP | 83017A | 3950M00241 | 03-Oct-11 |
| <input checked="" type="checkbox"/> | High Pass Filter (cutoff freq. =1000MHz) | Trilithic | 23042 | 9829213 | 30-Oct-11 |
| <input checked="" type="checkbox"/> | Horn Antenna | EMCO | 3115 | 9002-3351 | 16-Apr-12 |
| <input checked="" type="checkbox"/> | FSP 30 Spectrum Analyser | R & S | FSP 30 | 100286 | 17-Sep-12 |
| <input checked="" type="checkbox"/> | Active Loop Antenna | EMCO | 6502 | 9107-2651 | 19-Apr-12 |

General Product Information

Product Function and Intended Use

The equipment under test (EUT) is a transmitter for a RC toy helicopter operating at 49.86 MHz. The EUT has two control rods for commanding the Forward, backward, ascend, descend, left and right movement of the associated receiver.

FCCID: ZJI69485668688

| Models | Product description |
|---|-------------------------------|
| A68688 , A68690 , A68685, A68686, A68687, A68688, A68689, A68690, A68691, 366, 368, 389, 370, 85501, 85502, 85503, 85504, 85505, 68781, 68782, 68783, 68784 | Radio Control Toy Transmitter |

Ratings and System Details

| | |
|--------------------|----------------------------------|
| | Transmitter |
| Frequency range | : 49.86MHz |
| Number of channels | : 1 |
| Type of antenna | : External telescopic antenna |
| Power supply | : 8 x AA size batteries, 12.0VDC |
| Ports | : none |
| Protection Class | : III |

Independent Operation Modes

The basic operation modes are:

- Remote Control: On and Off

For further information refer to User Manual

Submitted Documents

The submitted documents are listed as follow:

- Circuit diagram
- Block diagram
- User manual
- Label artwork

Related Submittal(s) Grants

This is a single application for certification of the transmitter.

Test Set-up and Operation Mode

Principle of Configuration Selection

Emission: The equipment under test (EUT) was configured to measure its highest possible radiation level. The test modes were adapted accordingly in reference to the instructions for use.

Test Operation and Test Software

Test operation should refer to test methodology.

- There was no special software to exercise the device.

Special Accessories and Auxiliary Equipment

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

- none

Countermeasures to achieve EMC Compliance

- none

Test Methodology

Radiated Emission

The radiated emission measurements were performed according to the procedures in ANSI C63.4-2003.

The equipment under test (EUT) was placed at the middle of the 80 cm height turntable, and the turntable is 3 meters far from the measuring antenna. During the testing, the EUT was operated standalone and arranged for maximum emissions. The EUT was tested in three orthogonal planes.

The investigation is performed with the EUT rotated 360 °, the antenna height scanned between 1m and 4m, and the antenna rotated to repeat the measurements for both the horizontal and vertical antenna polarizations. Repeat the measurement steps until the maximum emissions were obtained.

All radiated tests were performed at an antenna to EUT with 3 meters distance, unless stated otherwise in particular parts of this test report.

Field Strength Calculation

The field strength at 3 m was established by adding the meter reading of the spectrum analyzer to the factors associated with antenna correction factor, cable loss, preamplifiers and filter attenuation.

The equation is expressed as follow:

$$FS = R + AF + CF + FA - PA$$

Where FS = Field Strength in dBuV/m at 3 meters.

R = Reading of Spectrum Analyzer in dBuV.

AF = Antenna Factor in dB.

CF = Cable Attenuation Factor in dB.

FA = Filter Attenuation Factor in dB.

PA = Preamplifier Factor in dB.

FA and PA are only be used for the measuring frequency above 1 GHz.

Test Results

Radiated Emission of Carrier Frequency

Subclause 15.235(a)

RESULT:

Pass

| | | |
|----------------------|---|---------------------------------|
| Test Specification | : | FCC Part 15 Subclause 15.235(a) |
| Test Method | : | ANSI 63.4-2003 |
| Measurement Location | : | Semi Anechoic Chamber |
| Measurement Distance | : | 3m |
| Detector Function | : | Peak and Average |
| Measurement BW | : | 120 kHz |
| Supply Voltage | : | 8 x AA size batteries, DC 12.0V |

Polarization: Vertical

| Detector function | Frequency (MHz) | Measured Field strength at 3m (dB μ V/m) | Delta to Limit (dB) |
|-------------------|--------------------|--|------------------------|
| Peak | 49.860 | 67.7 | -32.3 |
| Average | 49.860 | 63.0 | -17.0 |

Polarization: Horizontal

| Detector function | Frequency (MHz) | Measured Field strength at 3m (dB μ V/m) | Delta to Limit (dB) |
|-------------------|--------------------|--|------------------------|
| Peak | 49.860 | 49.7 | -50.3 |
| Average | 49.860 | 45.5 | -34.5 |

| Limit | Subclause 15.235(a) | | | |
|---------------------------|---------------------|--------------|------------------|--------------|
| Frequency within the band | Peak Emission | | Average Emission | |
| | (μ V/m) | dB μ V/m | (μ V/m) | dB μ V/m |
| 49.82-49.90 MHz | 100,000 | 100.0 | 10,000 | 80.0 |

According to section 15.35(b), when average radiated emission measurements are specified in this part, including average emission measurements below 1000 MHz, there also is a limit on the peak level of the radio frequency emissions. Unless otherwise specified, the limit on peak radio frequency emissions is 20 dB above the maximum permitted average emission limit applicable to the equipment under test.

Spurious Radiated Emissions**Subclause 15.235(b)****RESULT:****Pass**

| | | |
|---------------------------|---|---------------------------------|
| Test Specification | : | FCC Part 15 Subclause 15.209 |
| Test Method | : | ANSI 63.4-2003 |
| Measurement Location | : | Semi Anechoic Chamber |
| Measurement Distance | : | 3m |
| Detector Function | : | Quasi Peak |
| Measurement BW | : | 120 kHz |
| Supply Voltage | : | 8 x AA size batteries, DC 12.0V |
| Measuring Frequency Range | : | 30-1000MHz |

Polarization: Vertical

| Frequency (MHz) | Field strength at 3m (dBuV/m) | Limit at 3m (dBuV/m) | Delta to Limit (dB) |
|-----------------|-------------------------------|----------------------|---------------------|
| 99.721 | 36.3 | 43.5 | -7.2 |
| 149.581 | 34.7 | 43.5 | -8.8 |
| 199.442 | 23.2 | 43.5 | -20.3 |
| *249.303 | 25.4 | 46.0 | -20.6 |
| 299.163 | 26.6 | 46.0 | -19.4 |
| 349.023 | 19.2 | 46.0 | -26.8 |
| 398.885 | 16.7 | 46.0 | -29.3 |
| 448.745 | 17.4 | 46.0 | -28.6 |
| 498.605 | 17.4 | 46.0 | -28.6 |

Polarization: Horizontal

| Frequency (MHz) | Field strength at 3m (dBuV/m) | Limit at 3m (dBuV/m) | Delta to Limit (dB) |
|-----------------|-------------------------------|----------------------|---------------------|
| 99.721 | 30.0 | 43.5 | -13.5 |
| 149.582 | 37.8 | 43.5 | -5.7 |
| 199.443 | 28.5 | 43.5 | -15.0 |
| *249.303 | 19.3 | 46.0 | -26.7 |
| 299.164 | 24.1 | 46.0 | -21.9 |
| 349.024 | 18.3 | 46.0 | -27.7 |
| 398.885 | 18.4 | 46.0 | -27.6 |
| 448.746 | 17.4 | 46.0 | -28.6 |
| 498.607 | 17.4 | 46.0 | -28.6 |

Remark: (1) '*' indicates the frequency of the emissions fall into the restricted band as defined in Section 15.205(a). They comply with the radiated emission limits specified in Section 15.209.
 (2) There is no other spurious emission found from 30MHz to 1000MHz.

Limit**Subclause 15.209**

Radiated emissions, which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209.

Limit for Radiated Emission under Section 15.209:

| Frequency (MHz) | Field strength (μV/m) | Field strength (dBμV/m) | Measurement distance (m) |
|-----------------|-----------------------|-----------------------------|--------------------------|
| 30-88 | 100 | $20 \cdot \log(100) = 40.0$ | 3 |
| 88-216 | 150 | $20 \cdot \log(150) = 43.5$ | 3 |
| 216-960 | 200 | $20 \cdot \log(200) = 46.0$ | 3 |
| 960-2500 | 500 | $20 \cdot \log(500) = 54.0$ | 3 |

The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector and above 1000 MHz are based on the measurements employing an average detector.

Bandwidth Measurement**Subclause 15.235(b)****RESULT:****Pass**

Test Specification : FCC Part 15 section 235(b)
Port of Testing : Antenna port
Detector Function : Peak
Supply Voltage : DC 12V

The field strength of any emissions appearing between the band edges and up to 10KHz above and below the band edges is at least 26dB below the carrier. At the lower edge 49.81MHz and upper edge 49.91 MHz are 30.32 dB and 30.60 dB below the carrier respectively.

For test results refer to Appendix 1.

Limit**Subclause 15.235(b)**

The field strength of any emissions appearing between the band edges and up to 10KHz above and below the band edges shall be attenuated at least 26dB below the level of the unmodulated carrier or to the general limits in Section 15.209, whichever permits the higher emission levels.