eurofins | Product Service

# FCC TEST REPORT

**FCC 47 CFR Part 15C**
**Industry Canada RSS-210**

**Intentional radiator operating within the bands**
**902 – 928 MHz, 2400 – 2483.5 MHz and 5725 – 5875 MHz**

| | |
|---|---|
| **Report Reference No**. ..... : | G0M-1704-6415-TFC249DXX-V02 |
| **Testing Laboratory** ..... : | Eurofins Product Service GmbH |
| Address ..... : | Storkower Str. 38c<br>15526 Reichenwalde<br>Germany |
| Accreditation ..... : | FCC Test Firm Designation Number: DE0008<br>IC Testing Laboratory site: 3470A-2 |
| **Applicant's name** ..... : | Kieback & Peter GmbH & Co. KG |
| Address ..... : | Tempelhofer Weg 50<br>12347 Berlin<br>GERMANY |
| **Test specification:** | |
| Standard..... : | 47 CFR Part 15C<br>RSS-210, Issue 9, 2016-08<br>RSS-Gen, Issue 4, 2014-11<br>ANSI C63.10, 2013 |
| Test scope…….. ..... : | complete Radio compliance test |
| **Equipment under test (EUT):** | |
| Product description | Actuator |
| Model No. | MD15-CFL-HE |
| Additional Model(s) | None |
| Brand Name(s) | None |
| Hardware version | 11651000_MD15-FTL-CFL902 |
| Firmware / Software version | Test-SW: GWC1.2.0.3_TCM300HW_TCM320HW-868MHz |
| | FCC-ID: NY3MD15CFL IC: N/A |
| **Test result** | **Passed** |

**Possible test case verdicts:**

| | |
|---|---|
| - required by standard but not appl. to test object ..... : | N/A |
| - required by standard but not tested ..... : | N/T |
| - not required by standard for the test object ..... : | N/R |
| - test object does meet the requirement ..... : | P (Pass) |
| - test object does not meet the requirement ..... : | F (Fail) |

**Testing:**

| | | |
|---|---|---|
| Test Lab Temperature ..... : | 20 – 23 °C | |
| Test Lab Humidity ..... : | 32 – 38 % | |
| Date of receipt of test item ..... : | 2017-05-05 | |
| Date (s) of performance of tests ..... : | 2017-05-06 | |
| Compiled by ..... : | Wilfried Treffke | |
| Tested by (+ signature) ..... : (Responsible for Test) | Wilfried Treffke | W. Treff |
| Approved by (+ signature) ..... : (Head of Lab) | Christian Weber | C. Weber |
| Date of issue ..... : | 2017-07-20 | |
| Total number of pages ..... : | 45 | |

**General remarks:**

**The test results presented in this report relate only to the object tested.**
**The results contained in this report reflect the results for this particular model and serial number. It is the responsibility of the manufacturer to ensure that all production models meet the intent of the requirements detailed within this report.**

This report shall not be reproduced, except in full, without the written approval of the Issuing testing laboratory.

**Additional comments:**

# Version History

| Version | Issue Date | Remarks | Revised by |
|---|---|---|---|
| 01 | 2017-05-29 | Initial Release | |
| 02 | 2017-07-08 | FCC ID added. | W. Treffke |

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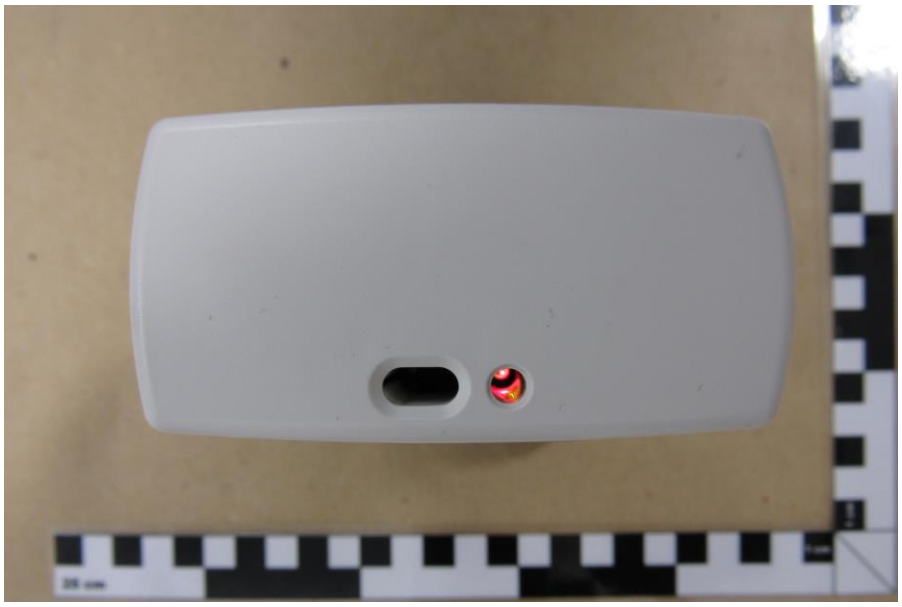
# 1 Equipment (Test item) Description:

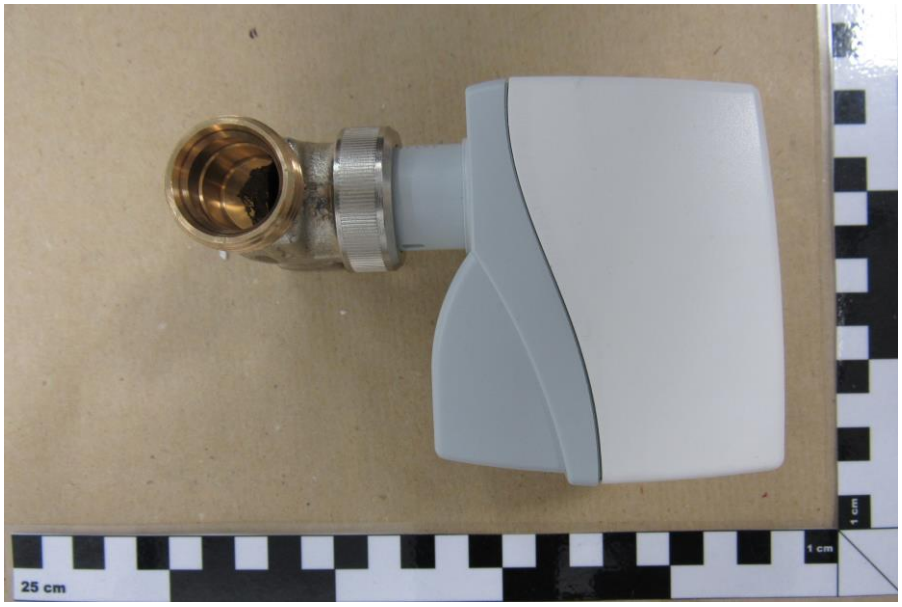
| | | |
|---|---|---|
| **Description** | Actuator | |
| **Model** | MD15-CFL-HE | |
| **Additional Model(s)** | None | |
| **Brand Name(s)** | None | |
| **Serial number** | 018F45AE | |
| **Hardware version** | 11651000_MD15-FTL-CFL902 | |
| **Software / Firmware version** | Test-SW: GWC1.2.0.3_TCM300HW_TCM320HW-868MHz | |
| **PMN** | N/A | |
| **HVIN** | N/A | |
| **FVIN** | N/A | |
| **HMN** | N/A | |
| **FCC-ID** | NY3MD15CFL | |
| **IC** | N/A | |
| **Equipment type** | End product | |
| **Radio type** | Transceiver | |
| **Radio technology** | custom | |
| **Operating frequency range** | 902.875 MHz | |
| **Assigned frequency band** | 902 - 928 MHz | |
| **Frequency range** | $F_{MID}$ | 902.875 MHz |
| **Spreading** | None | |
| **Modulations** | 2-FSK | |
| **Number of channels** | 1 | |
| **Channel spacing** | None | |
| **Number of antennas** | 1 | |
| **Antenna** | Type | integrated |
| | Model | PCB-antenna |
| | Manufacturer | Kieback & Peter |
| | Gain | -10.8 dBi |
| **Manufacturer** | Kieback & Peter GmbH & Co. KG<br>Tempelhofer Weg 50<br>12347 Berlin<br>GERMANY | |
| **Power supply** | $V_{NOM}$ | 3.6 VDC (Lithium-Battery) |
| | $V_{MIN}$ | N/A |
| | $V_{MIN}$ | N/A |

| | | |
|---|---|---|
| **AC/DC-Adaptor** | Model | N/A |
| | Vendor | N/A |
| | Input | N/A |
| | Output | N/A |

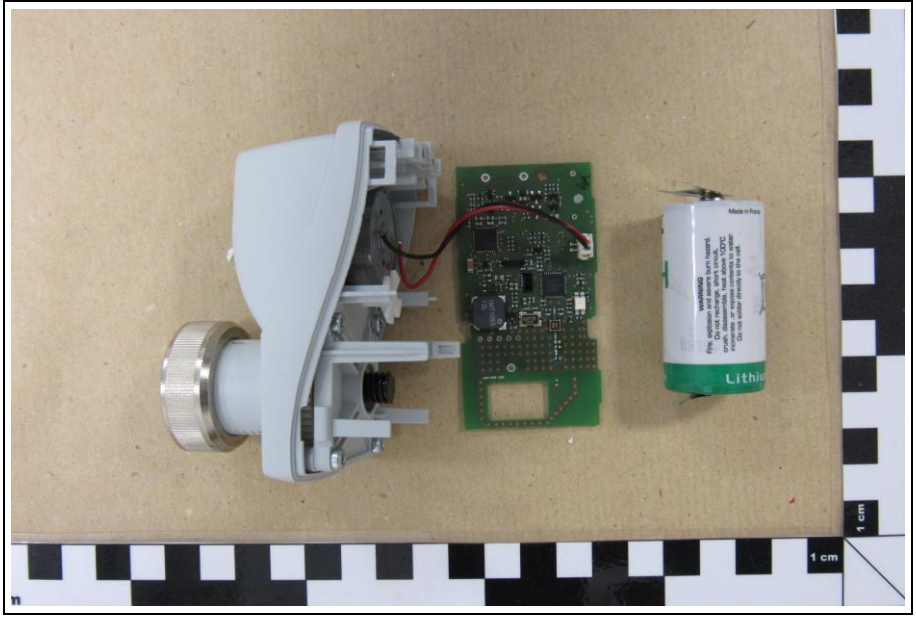
## 1.1 Photos – Equipment External

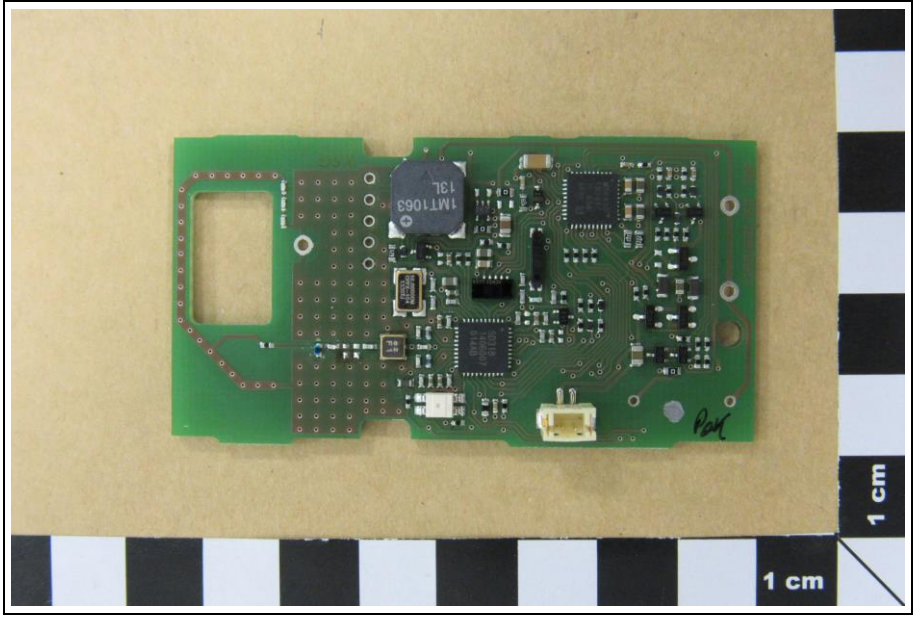
| EUT Top |
| --- |
|  |

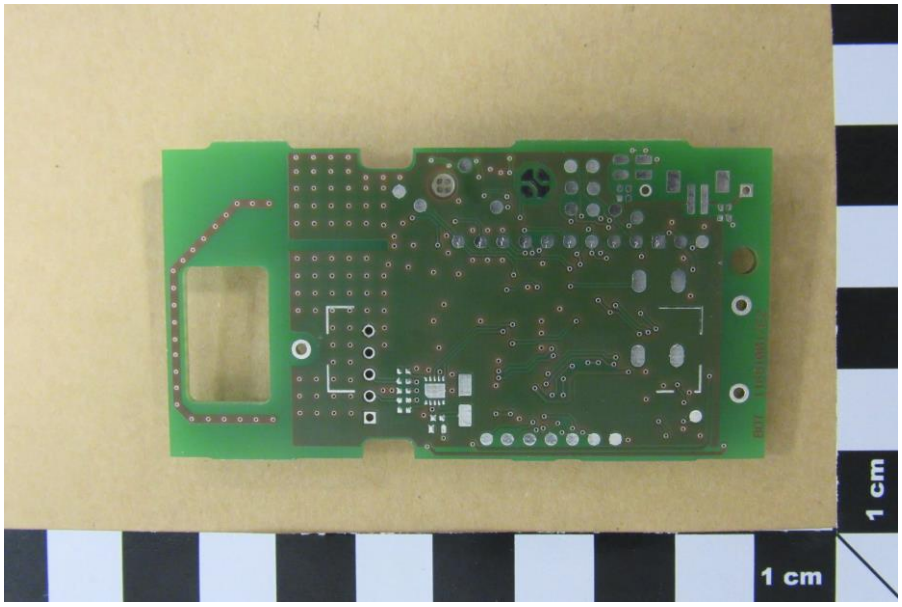
| EUT Bottom |
| --- |
| |

| EUT Side |
| --- |
|  |

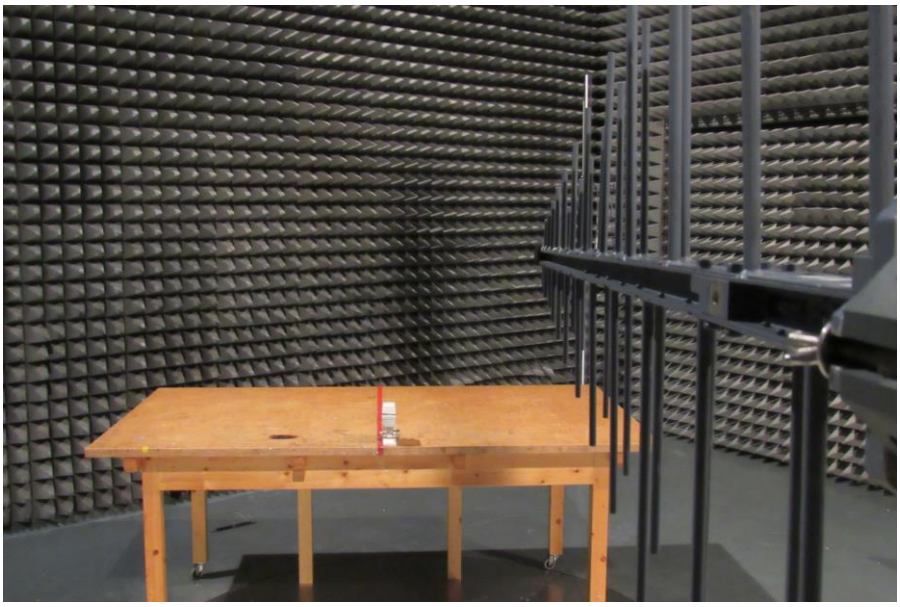
## 1.2 Photos – Equipment internal

| EUT Open |
|---|
|  |

| PCB Top |
|---|
|  |

| PCB Bottom |
| --- |
|   |

## 1.3 Photos – Test setup

| Setup radiated |
| --- |
|  |

## 1.4 Supporting Equipment Used During Testing

| Product Type* | Device | Manufacturer | Model No. | Comments |
|---|---|---|---|---|
| None | | | | |

***Note:** Use the following abbreviations:

AE : Auxiliary/Associated Equipment, or

SIM : Simulator (Not Subjected to Test)

CABL : Connecting cables

## 1.5 Test Modes

| Mode # | Description | |
|---|---|---|
| Transmit | General conditions: | EUT powered by fully battery |
| | Radio conditions: | Mode = standalone transmit<br>Modulation = 2-FSK<br>Power level = Maximum |
| Receive | General conditions: | EUT powered by fully battery |
| | Radio conditions: | Mode = standalone receive<br>Modulation = 2-FSK |

### 1.6 Test Equipment Used During Testing

| Measurement Software | | | |
|---|---|---|---|
| Description | Manufacturer | Name | Version |
| EMC Test Software | Dare Instruments | Radimation | 2014.2.5 |

| Occupied Bandwidth | | | | | |
|---|---|---|---|---|---|
| Description | Manufacturer | Model | Identifier | Cal. Date | Cal. Due |
| Spectrum analyzer | R&S | FSU 26 | EF01003 | 2017-04 | 2018-04 |

| Field strength emissions | | | | | |
|---|---|---|---|---|---|
| Description | Manufacturer | Model | Identifier | Cal. Date | Cal. Due |
| Semi-anechoic chamber | Frankonia | AC 1 | EF00062 | - | - |
| MXE EMI Receiver | Keysight Technologies | N9038A-526/WXP | EF01070 | 2016-08 | 2017-08 |
| Biconical Antenna | R&S | HK 116 | EF00012 | 2016-05 | 2019-05 |
| LPD Antenna | R&S | HL 223 | EF00187 | 2016-05 | 2019-05 |
| Horn antenna | Schwarzbeck | BBHA 9120D | EF00019 | 2016-09 | 2018-09 |

## 1.7 Sample emission level calculation

The following is a description of terms and a sample calculation, as appears in the radiated emissions data table. The numbers used in the calculation are for example only. There is no direct correlation to the specific data taken for the product described in this document:

Reading:

This is the reading obtained on the spectrum analyzer in dBµV. Any external preamplifiers used are taken into account through internal analyzer settings.

A.F.:

This is the antenna factor for the receiving antenna. It is a conversion factor, which converts electric fields strengths to voltages, which can be measured directly on the spectrum analyzer. It is treated as a loss in dB. Cable losses have been included with the A.F. to simplify the calculations. The antenna factor is used in calculations as follows:

Reading on Analyzer (dBµV) + A.F. (dB) = Net field strength (dBµV/m)

Net:

This is the net field strength measurement (as shown above).

Limit:

This is the FCC Class B radiated emission limit (in units of dBµV/m). The FCC limits are given in units of µV/m. The following formula is used to convert the units of µV/m to dBµV/m:

Limit (dBµV/m) = 20*log (µV/m)

Margin:

This is the margin of compliance below the FCC limit. The units are given in dB. A negative margin indicates the emission was below the limit. A positive margin indicates that the emission exceeds the limit.

Example only:

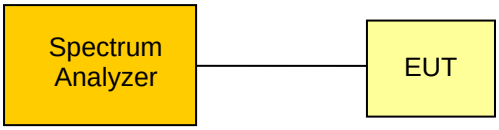
| Reading | + | AF | = | Net Reading | : | Net reading - FCC limit = Margin |
|---|---|---|---|---|---|---|
| 21.5 dBµV | + | 26 dB | = | 47.5 dBµV/m | : | 47.5 dBµV/m - 57.0 dBµV/m = -9.5 dB |

## 2 Result Summary

| FCC 47 CFR Part 15C, IC RSS-210 | | | | |
|---|---|---|---|---|
| **Product Specific Standard Section** | **Requirement – Test** | **Reference Method** | **Result** | **Remarks** |
| RSS-Gen 6.6 | Occupied Bandwidth | RSS-Gen 6.6 | N/R | Informational only |
| FCC 15.35(c)<br>RSS-Gen 6.10 | Duty Cycle | ANSI C63.10 | N/R | Informational only |
| FCC 15.249(a),(c),(e)<br>RSS-210 B.10(a) | Fundamental field strength emissions | ANSI C63.10 | PASS | |
| FCC 15.249(a),(c),(d),(e)<br>RSS-210 B.10(b) | Emission radiated outside the specified frequency band | ANSI C63.10 | PASS | |
| RSS-Gen 7.1 | Receiver radiated spurious emissions | ANSI C63.10 | PASS | |
| FCC § 15.207<br>RSS-Gen 8.8 | AC power line conducted emissions | ANSI C63.10 | N/R | EUT exclusively battery powered |
| **Remarks:** | | | | |

# 3 Test Conditions and Results

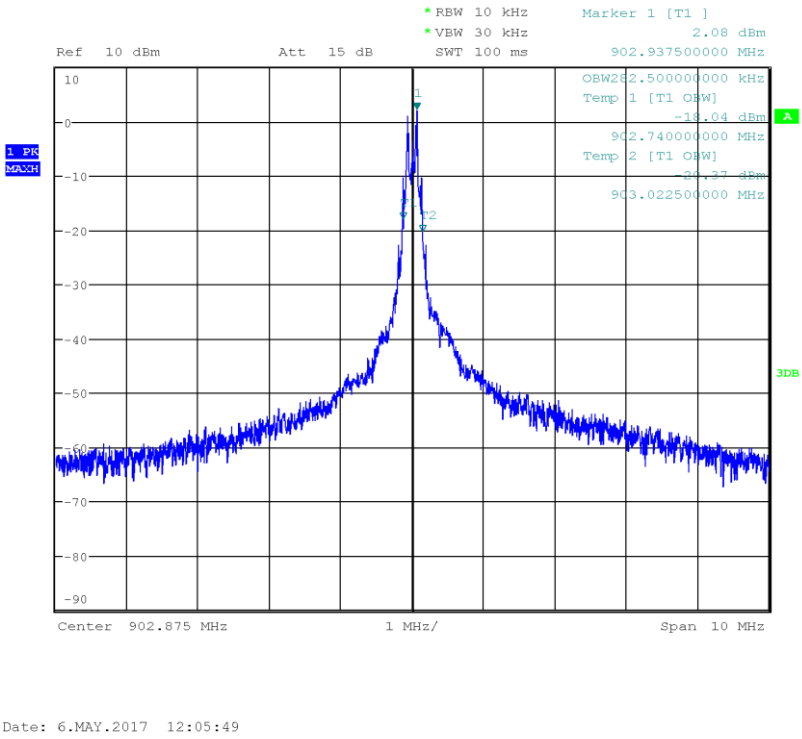
## 3.1 Test Conditions and Results – Occupied Bandwidth

| **Occupied Bandwidth acc. to IC RSS-Gen** | | **Verdict: N/R** |
|---|---|---|
| Test according to measurement reference | Reference Method | |
| | RSS-Gen 6.6 | |
| Test frequency range | Tested frequencies | |
| | $F_{MID}$ | |
| EUT test mode | Transmit | |
| **Limits** | | |
| None (Informational only) | | |
| **Test setup** | | |
|   | | |
| **Test procedure** | | |
| 1. EUT set to test mode (Communication tester is used if needed)<br>2. Span set to at least twice the emission spectrum<br>3. Resolution bandwidth set to 1 % of span<br>4. Occupied Bandwidth (99 %) measurement with spectrum analyzer built in measurement function | | |
| **Test results** | | |
| Channel | Frequency [MHz] | Occupied Bandwidth [kHz] |
| $F_{MID}$ | 902.875 | 82.5 |
| Comments: | | |

## Occupied Bandwidth – $F_{Mid}$

### Occupied Bandwidth

| | |
|---|---|
| Project Number: | G0M-1704-6415 |
| Applicant | Kieback & Peter GmbH & Co. KG |
| Model Description | Actuator |
| Model: | MD15-CFL-HE |
| Test Sample ID: | 018F45AE |
| Reference Method: | ANSI C63.10:2013, Section 6.9.3 |
| Operational Mode: | 2-FSK, Channel: 902.875 MHz |
| Operating Conditions: | Tnom/Vnom |
| Operator: | W. Treffke |
| Test Site: | Eurofins Product Service GmbH |
| Test Date: | 2017-05-06 |
| Occupied Bandwidth [MHz]: | 0.280 |



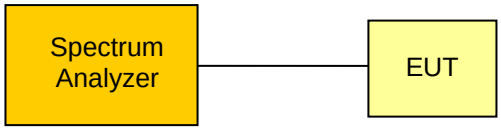
### 3.2 Test Conditions and Results – Duty Cycle

| **Duty cycle acc. to FCC 47 CFR 15.35(c) / ISED RSS-Gen 6.10** | **Verdict: N/R** |
|---|---|
| Test according referenced standards | Reference Method |
| | FCC 15.35(c) / ISED RSS-Gen 6.10 |
| Test according to measurement reference | Reference Method |
| | non specific |
| Test frequency range | Tested frequencies |
| | $F_{MID}$ |
| EUT test mode | Transmit |

**Limits**

None (only for peak to average correction, 20dB max)

**Test setup**




**Test procedure**

1. EUT set to test mode
2. Center frequency is set to test frequency
3. Span it set to zero span
4. Resolution bandwidth is set large enough to accurately capture transmission bursts
5. Total transmission time is measured

**Test results**

| Channel | Frequency [MHz] | Duty Cycle [% @ 100ms] | Duty Cycle correction [dB] |
|---|---|---|---|
| $F_{MID}$ | 902.875 | 100 | 0 |

Comments: Duty cycle correction is used if pulsed operation is employed and field strength limits are expressed in terms of average value.

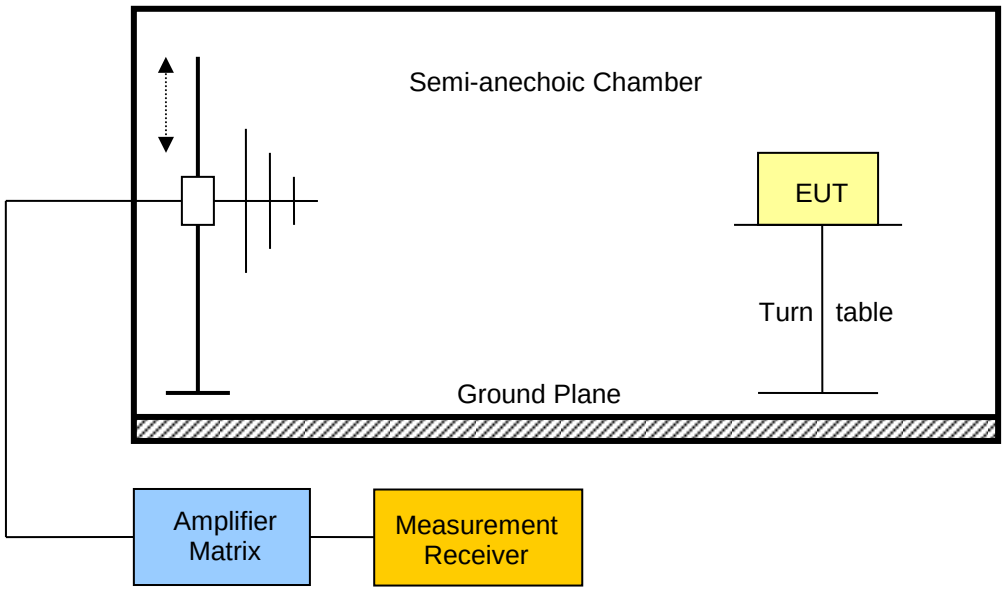
### 3.3 Test Conditions and Results – Fundamental field strength emissions

| **Field strength emissions acc. to FCC 47 CFR 15.249 / IC RSS-210** | | | | **Verdict: N/R** |
|---|---|---|---|---|
| Test according referenced standards | | Reference Method | | |
| | | FCC 15.249(a),(c),(e) / IC RSS-210 B.10(a) | | |
| Test according to measurement reference | | Reference Method | | |
| | | ANSI C63.10 | | |
| Test frequency range | | Tested frequencies | | |
| | | $F_{MID}$ | | |
| EUT test mode | | Transmit | | |
| **Limits** | | | | |
| Frequency range [MHz] | Detector | Limit [mV/m] | Limit [dBµV/m] | Limit Distance [m] |
| 902 – 928 | Quasi-Peak | 50 | 94 | 3 |
| 2400 – 2483.5 | Average | 50 | 94 | 3 |
| 5725 - 5875 | Average | 50 | 94 | 3 |

FCC 15.249(e): for frequencies above 1000 MHz, the field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation.

Below 1GHz a CISPR quasi-peak detector is used.

**Test setup**

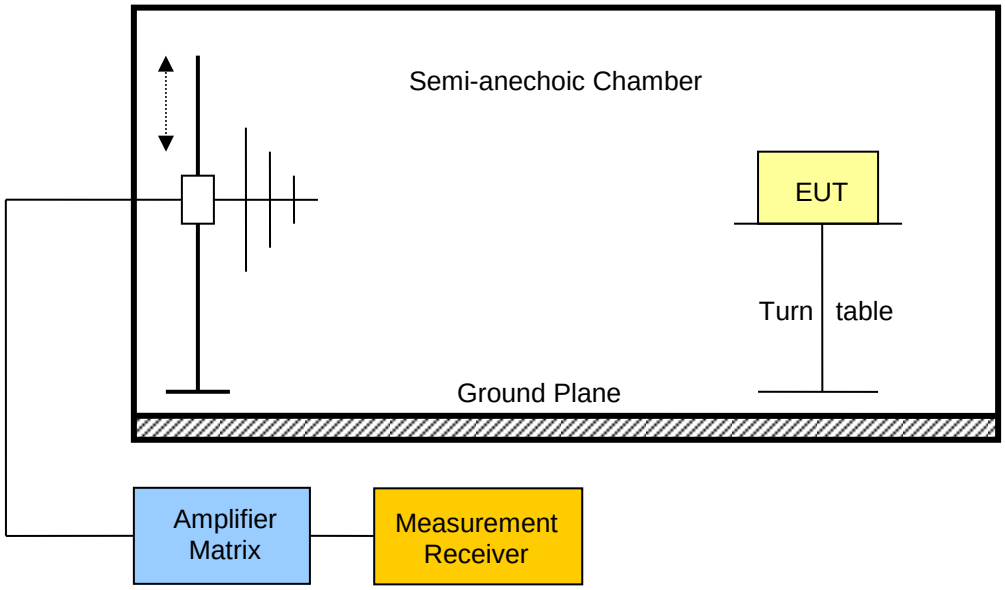


| Test procedure | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1. EUT set to test mode<br>2. Span it set according to measurement range<br>3. Below 1 GHz the resolution bandwidth is set according to CISPR 16 to 120 kHz with peak/quasi-peak detector.<br>4. Above 1 GHz the resolution bandwidth is set to 1 MHz with peak/average detector. Pulsed emissions are averaged over 100 ms with duty cycle correction.<br>5. Markers are set to maximum emission levels | | | | | | | | |
| **Test results non-pulsed emissions** | | | | | | | | |
| Channel | Frequency [MHz] | Emission [MHz] | Level [dBµV/m] | Detector | Pol. | Limit [dBµV/m] | Limit distance [m]* | Margin [dB] |
| $F_{MID}$ | 902.875 | 902.908 | 89.29 | avg | hor | 94.00 | 3 | -04.71 |
| $F_{MID}$ | 902.875 | 902.92 | 79.86 | avg | ver | 94.00 | 3 | -14.14 |
| Comments: * Physical distance between EUT and measurement antenna. | | | | | | | | |

### 3.4 Test Conditions and Results – Emissions radiated outside the specified frequency band

| **Radiated out-of-band band emissions acc. to FCC 47 CFR 15.249 / IC RSS-210** | | | | **Verdict: PASS** |
|---|---|---|---|---|
| Test according referenced standards | Reference Method | | | |
| | FCC 15.249(a),(c),(d),(e) / IC RSS-210 B.10(b) | | | |
| Test according to measurement reference | Reference Method | | | |
| | ANSI C63.10 | | | |
| Test frequency range | Tested frequencies | | | |
| | 30 MHz – 10th harmonic | | | |
| EUT test mode | Transmit | | | |
| **Limits - Harmonics** | | | | |
| The field strength of harmonic emissions, measured at 3 m, shall not exceed 500 µV/m (54 dBµV/m). | | | | |
| **Limits - General** | | | | |
| Frequency range [MHz] | Detector | Limit [µV/m] | Limit [dBµV/m] | Limit Distance [m] |
| 30 – 88 | Quasi-Peak | 100 | 40 | 3 |
| 88 – 216 | Quasi-Peak | 150 | 43.5 | 3 |
| 216 – 960 | Quasi-Peak | 200 | 46 | 3 |
| 960 – 1000 | Quasi-Peak | 500 | 54 | 3 |
| > 1000 | Average | 500 | 54 | 3 |
| For frequencies above 1000 MHz, the field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation.<br><br>Except the higher order harmonics, emission radiated outside the specified frequency band shall be attenuated by at least 50 dB below the level of the fundamental or to the general field strength limits listed in 15.209 / RSS-Gen, whichever is less stringent. | | | | |

**Test setup**




**Test procedure**

1. EUT set to test mode
2. Span it set according to measurement range
3. Resolution bandwidth below 1 GHz is set according to CISPR 16 with peak/quasi-peak detector and RBW of 1 MHz with peak/average detector is used above 1 GHz
4. Markers are set to maximum emission levels

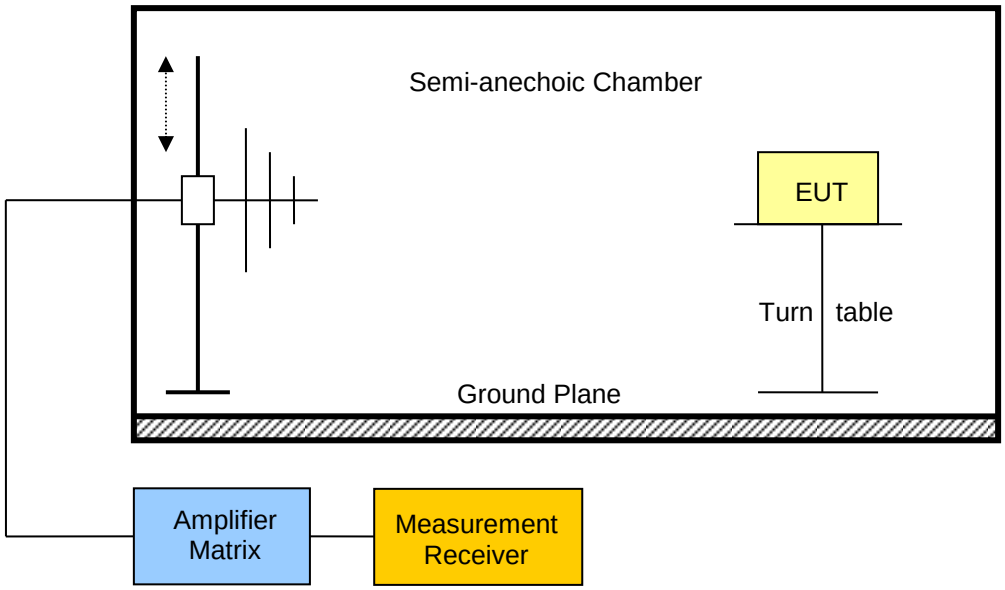
**Test results**

| Channel | Frequency [MHz] | Emission [MHz] | Level [dBµV/m] | Detector | Pol. | Limit [dBµV/m] | Margin [dB] |
|---|---|---|---|---|---|---|---|
| $F_{MID}$ | 902.875 | 901.99 | 33.66 | Q-Peak | hor | 46.00 | -12.34 |
| $F_{MID}$ | 902.875 | 1806.0 | 48.88 | Average | hor | 48.88 | -5.12 |
| $F_{MID}$ | 902.875 | 2709.0 | 47.18 | Average | hor | 47.18 | -6.82 |
| $F_{MID}$ | 902.875 | 3611.0 | 52.79 | Average | hor | 52.79 | -1.21 |
| $F_{MID}$ | 902.875 | 1806.0 | 49.17 | Average | ver | 49.17 | -4.83 |
| $F_{MID}$ | 902.875 | 2709.0 | 46.70 | Average | ver | 46.70 | -7.30 |
| $F_{MID}$ | 902.875 | 3611.0 | 52.47 | Average | ver | 52.47 | -1.52 |

Comments:

### 3.5 Test Conditions and Results – Receiver radiated emissions

| **Receiver radiated emissions acc. to IC RSS-210** | | | | **Verdict: PASS** |
|---|---|---|---|---|
| Test according referenced standards | Reference Method | | | |
| | RSS-Gen 7.1 | | | |
| Test according to measurement reference | Reference Method | | | |
| | ANSI C63.10 | | | |
| Test frequency range | Tested frequencies | | | |
| | 30 MHz – 5th Harmonic | | | |
| EUT test mode | Receive | | | |
| **Limits** | | | | |
| Frequency range [MHz] | Detector | Limit [µV/m] | Limit [dBµV/m] | Limit Distance [m] |
| 30 – 88 | Quasi-Peak | 100 | 40 | 3 |
| 88 – 216 | Quasi-Peak | 150 | 43.5 | 3 |
| 216 – 960 | Quasi-Peak | 200 | 46 | 3 |
| 960 – 1000 | Quasi-Peak | 500 | 54 | 3 |
| > 1000 | Average | 500 | 54 | 3 |
| **Test setup** | | | | |



| Test procedure | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1. EUT set to receive mode (Communication tester is used if needed)<br>2. Span it set according to measurement range<br>3. Resolution bandwidth below 1 GHz is set according to CISPR 16 with peak/quasi-peak detector and RBW of 1 MHz with peak/average detector is used above 1 GHz<br>4. Markers are set to peak emission levels | | | | | | | |
| **Test results** | | | | | | | |
| Channel | Frequency [MHz] | Emission [MHz] | Level [dBµV/m] | Detector | Pol. | Limit [dBµV/m] | Margin [dB] |
| $F_{MID}$ | 902.875 | 195.3 | 32.2 | PK | Ver | 43.5 | -11.30 |
| The stated emission level corresponds to ambient noise floor. No real spurious emission has been measured. | | | | | | | |

# ANNEX A Transmitter radiated spurious emissions

**Spurious emissions according to FCC 15.249**

Project number: G0M-1704-6415

| | |
|---|---|
| Applicant: | Kieback & Peter GmbH & Co. KG |
| EUT Name: | Actuator |
| Model: | MD15-CFL-HE |
| Test Site: | Eurofins Product Service GmbH |
| Operator: | Mr. Treffke |
| Test Conditions: | Tnom: 25°C, Vnom: 3.3 VDC (lithium battery) |
| Antenna: | Rohde & Schwarz HK 116, Horizontal |
| Measurement distance: | 3 m |
| Mode: | TX; 2-FSK; 902.875 MHz |
| Test Date: | 2017-05-06 |
| Note: | |

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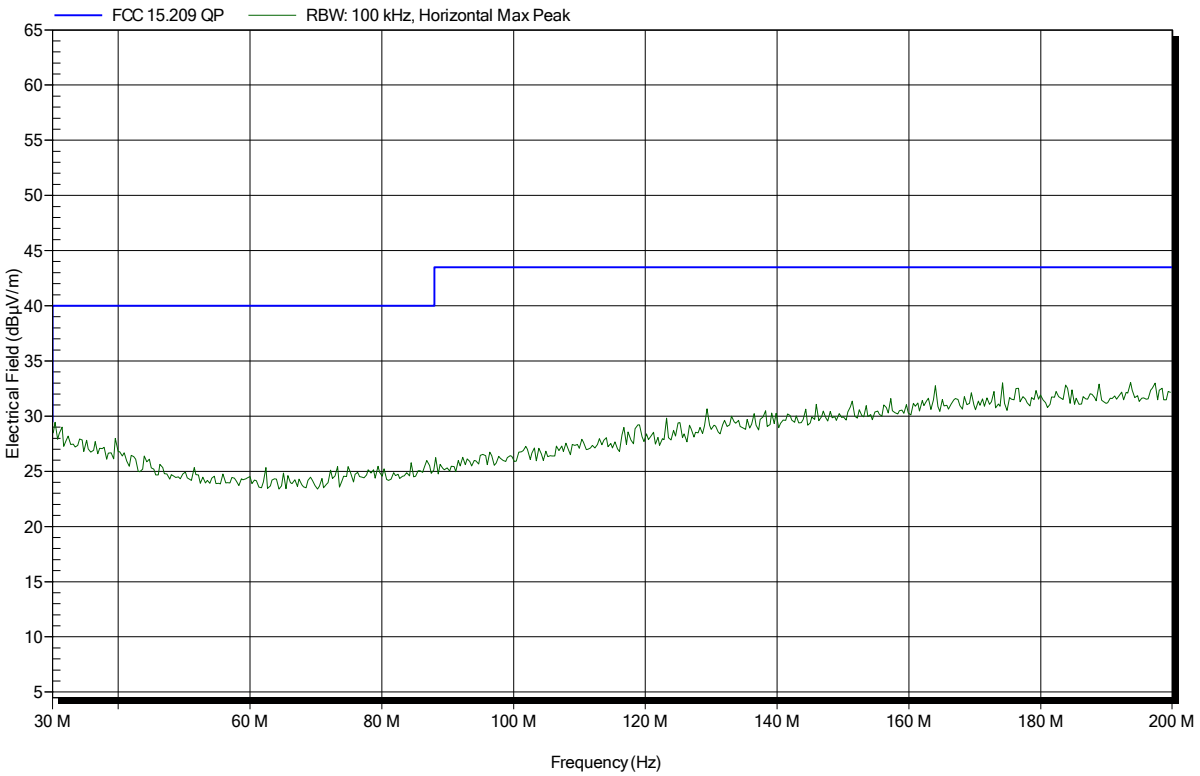

**Spurious emissions according to FCC 15.249**

Project number: G0M-1704-6415

| | |
|---|---|
| Applicant: | Kieback & Peter GmbH & Co. KG |
| EUT Name: | Actuator |
| Model: | MD15-CFL-HE |
| Test Site: | Eurofins Product Service GmbH |
| Operator: | Mr. Treffke |
| Test Conditions: | Tnom: 25°C, Vnom: 3.3 VDC (lithium battery) |
| Antenna: | Rohde & Schwarz HK 116, Vertical |
| Measurement distance: | 3 m |
| Mode: | TX; 2-FSK; 902.875 MHz |
| Test Date: | 2017-05-06 |
| Note: | |

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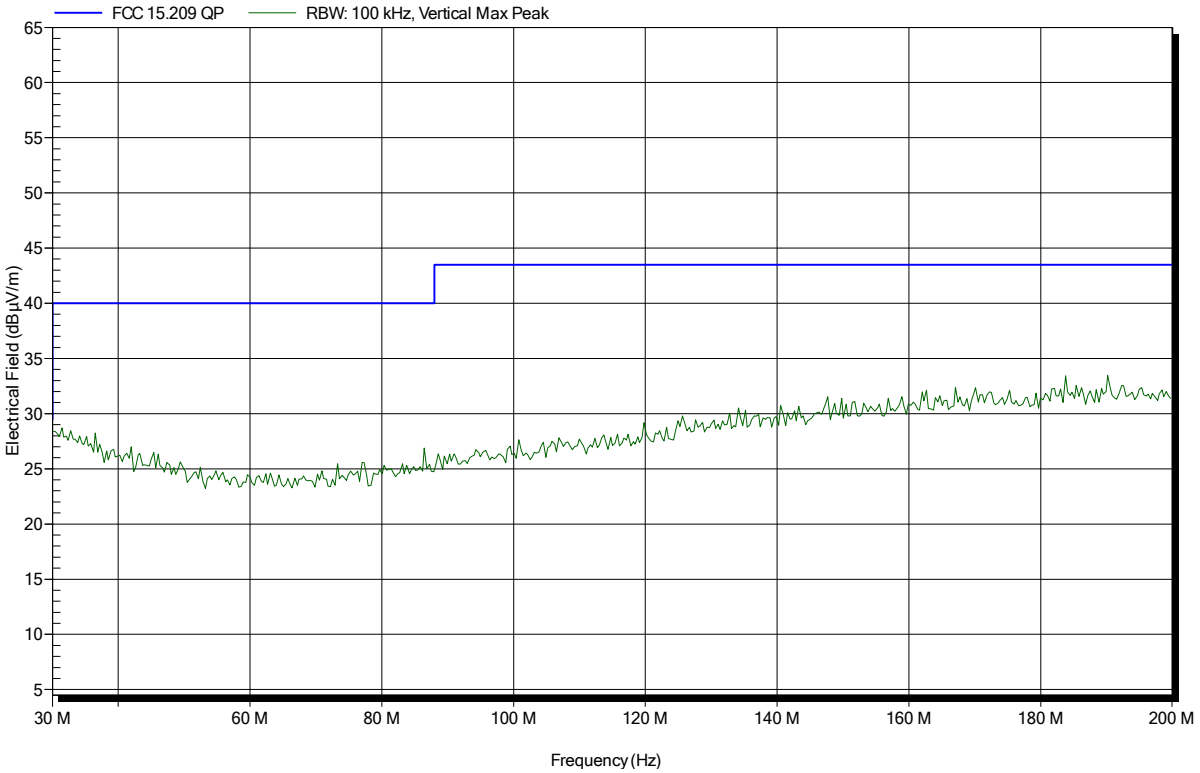

**Spurious emissions according to FCC 15.249**

Project number: G0M-1704-6415

| | |
|---|---|
| Applicant: | Kieback & Peter GmbH & Co. KG |
| EUT Name: | Actuator |
| Model: | MD15-CFL-HE |
| Test Site: | Eurofins Product Service GmbH |
| Operator: | Mr. Treffke |
| Test Conditions: | Tnom: 25°C, Vnom: 3.3 VDC (lithium battery) |
| Antenna: | Rohde & Schwarz HL 223, Horizontal |
| Measurement distance: | 3 m |
| Mode: | TX; 2-FSK; 902.875 MHz |
| Test Date: | 2017-05-06 |
| Note: | |

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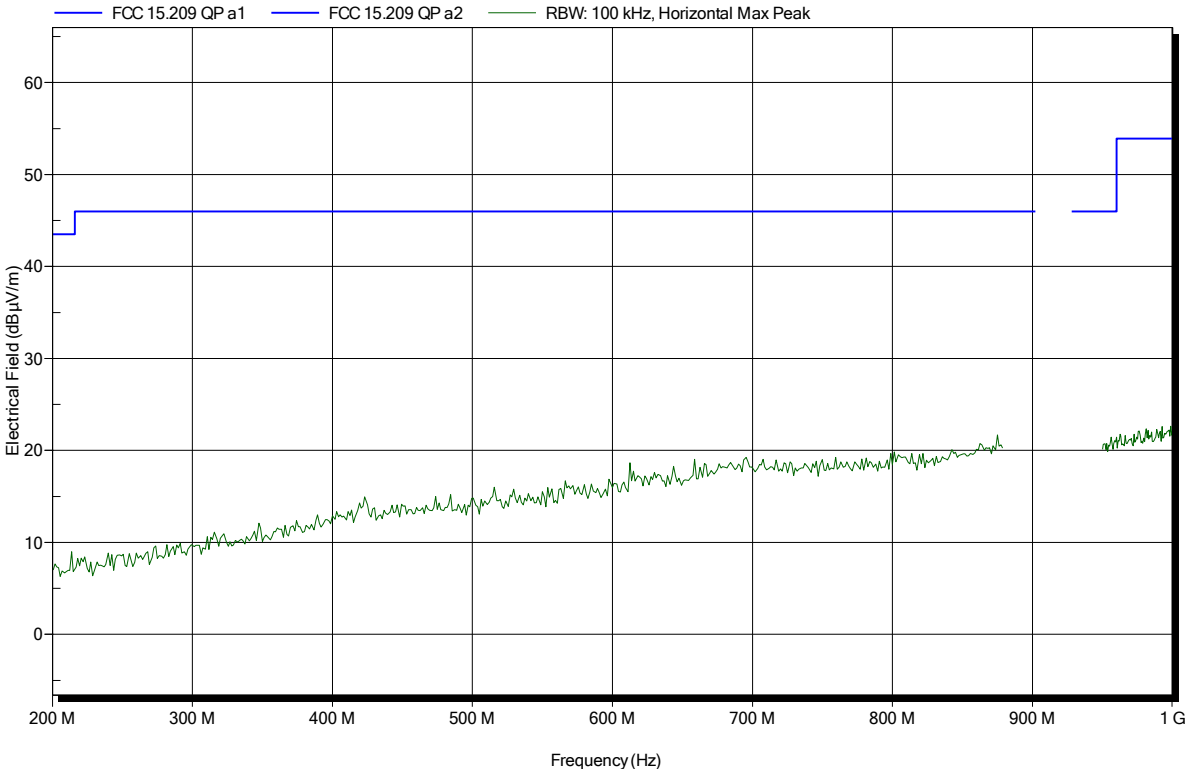

**Spurious emissions according to FCC 15.249**

Project number: G0M-1704-6415

| | |
|---|---|
| Applicant: | Kieback & Peter GmbH & Co. KG |
| EUT Name: | Actuator |
| Model: | MD15-CFL-HE |
| Test Site: | Eurofins Product Service GmbH |
| Operator: | Mr. Treffke |
| Test Conditions: | Tnom: 25°C, Vnom: 3.3 VDC (lithium battery) |
| Antenna: | Rohde & Schwarz HL 223, Vertical |
| Measurement distance: | 3 m |
| Mode: | TX; 2-FSK; 902.875 MHz |
| Test Date: | 2017-05-06 |
| Note: | |

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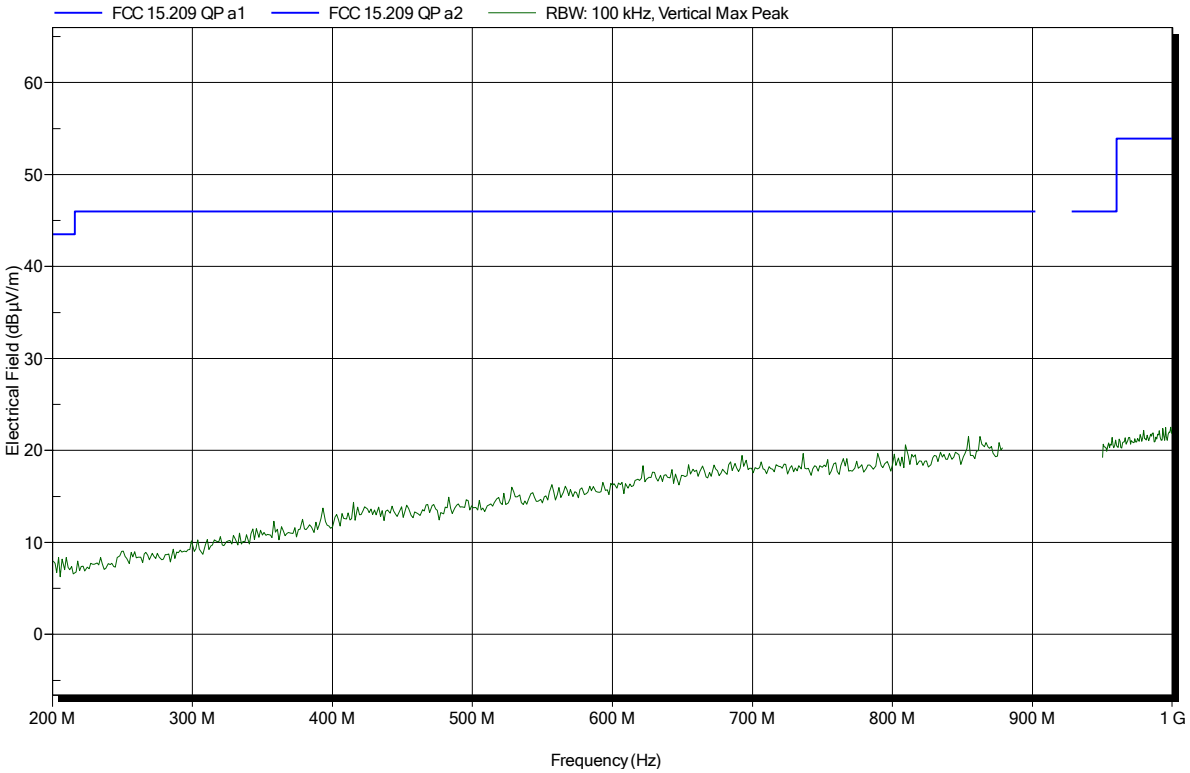

**Spurious emissions according to FCC 15.249**

Project number: G0M-1704-6415

| | |
|---|---|
| Applicant: | Kieback & Peter GmbH & Co. KG |
| EUT Name: | Actuator |
| Model: | MD15-CFL-HE |
| Test Site: | Eurofins Product Service GmbH |
| Operator: | Mr. Treffke |
| Test Conditions: | Tnom: 25°C, Vnom: 3.3 VDC (lithium battery) |
| Antenna: | Rohde & Schwarz HL 223, Horizontal |
| Measurement distance: | 3 m |
| Mode: | TX; 2-FSK; 902.875 MHz |
| Test Date: | 2017-05-06 |
| Note: | Band Edge |

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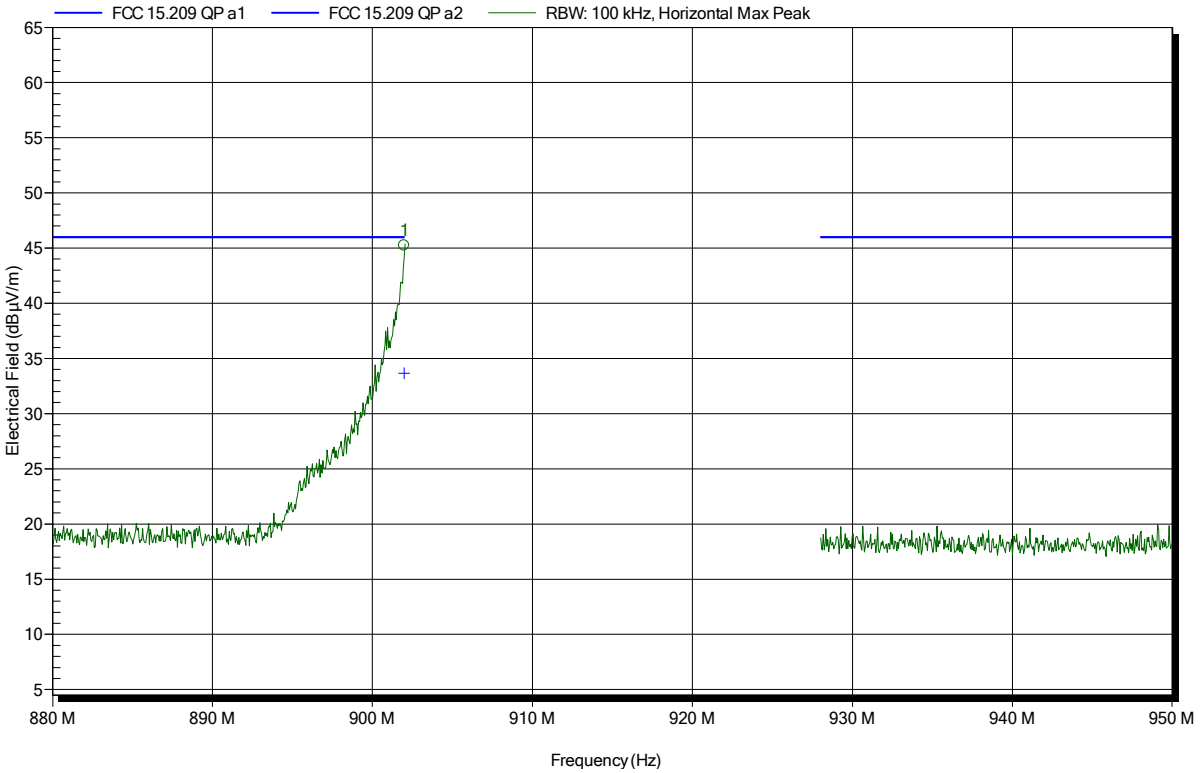


| Frequency | Peak | Q- Peak | Peak Difference | Peak Status |
|---|---|---|---|---|
| 901.99 MHz | 45.22 dBµV/m | 33.66 dBµV/m | -11.56 dB | Pass |

**Spurious emissions according to FCC 15.249**

Project number: G0M-1704-6415

| | |
|---|---|
| Applicant: | Kieback & Peter GmbH & Co. KG |
| EUT Name: | Actuator |
| Model: | MD15-CFL-HE |
| Test Site: | Eurofins Product Service GmbH |
| Operator: | Mr. Treffke |
| Test Conditions: | Tnom: 25°C, Vnom: 3.3 VDC (lithium battery) |
| Antenna: | Rohde & Schwarz HL 223, Vertical |
| Measurement distance: | 3 m |
| Mode: | TX; 2-FSK; 902.875 MHz |
| Test Date: | 2017-05-06 |
| Note: | Band Edge |

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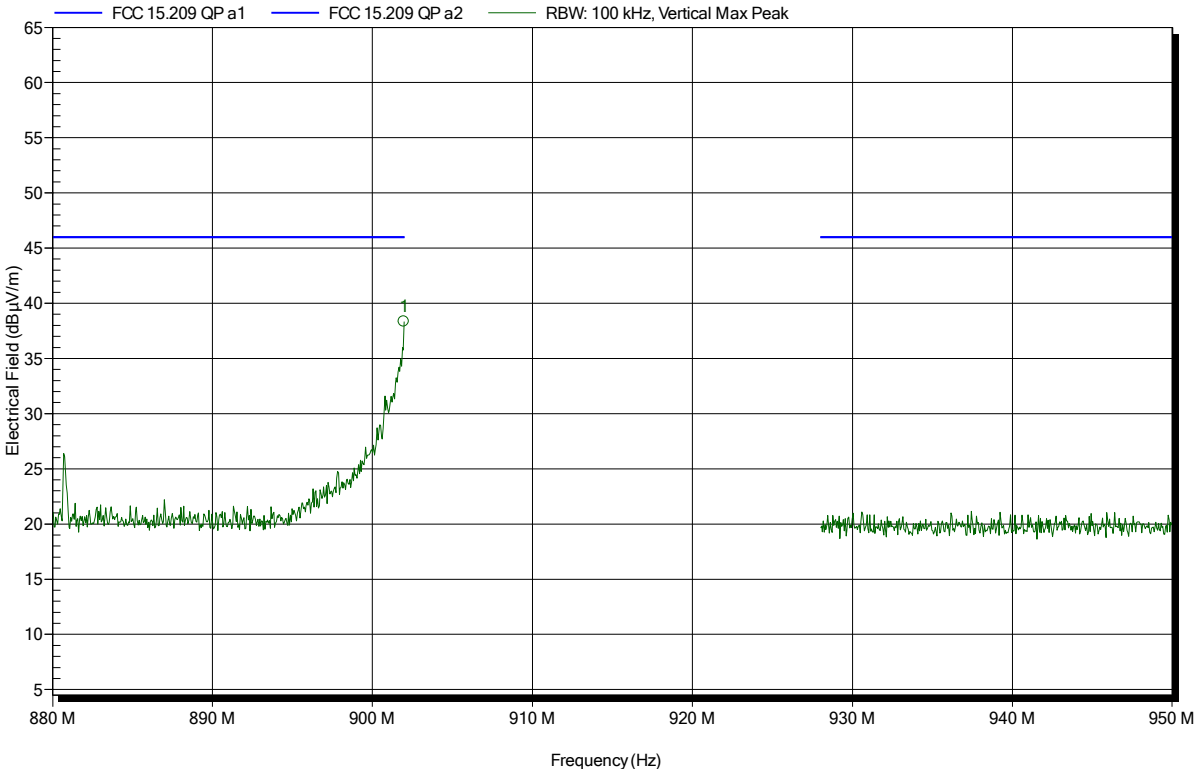


| Frequency | Peak | Peak Limit | Peak Difference | Peak Status |
|---|---|---|---|---|
| 901.956 MHz | 38.35 dBµV/m | 46 dBµV/m | -7.65 dB | Pass |

**Spurious emissions according to FCC 15.249**

Project number: G0M-1704-6415

| | |
|---|---|
| Applicant: | Kieback & Peter GmbH & Co. KG |
| EUT Name: | Actuator |
| Model: | MD15-CFL-HE |
| Test Site: | Eurofins Product Service GmbH |
| Operator: | Mr. Treffke |
| Test Conditions: | Tnom: 25°C, Vnom: 3.3 VDC (lithium battery) |
| Antenna: | Schwarzbeck BBHA 9120D, Horizontal |
| Measurement distance: | 3 m |
| Mode: | TX; 2-FSK; 902.875 MHz |
| Test Date: | 2017-05-06 |
| Note: | |

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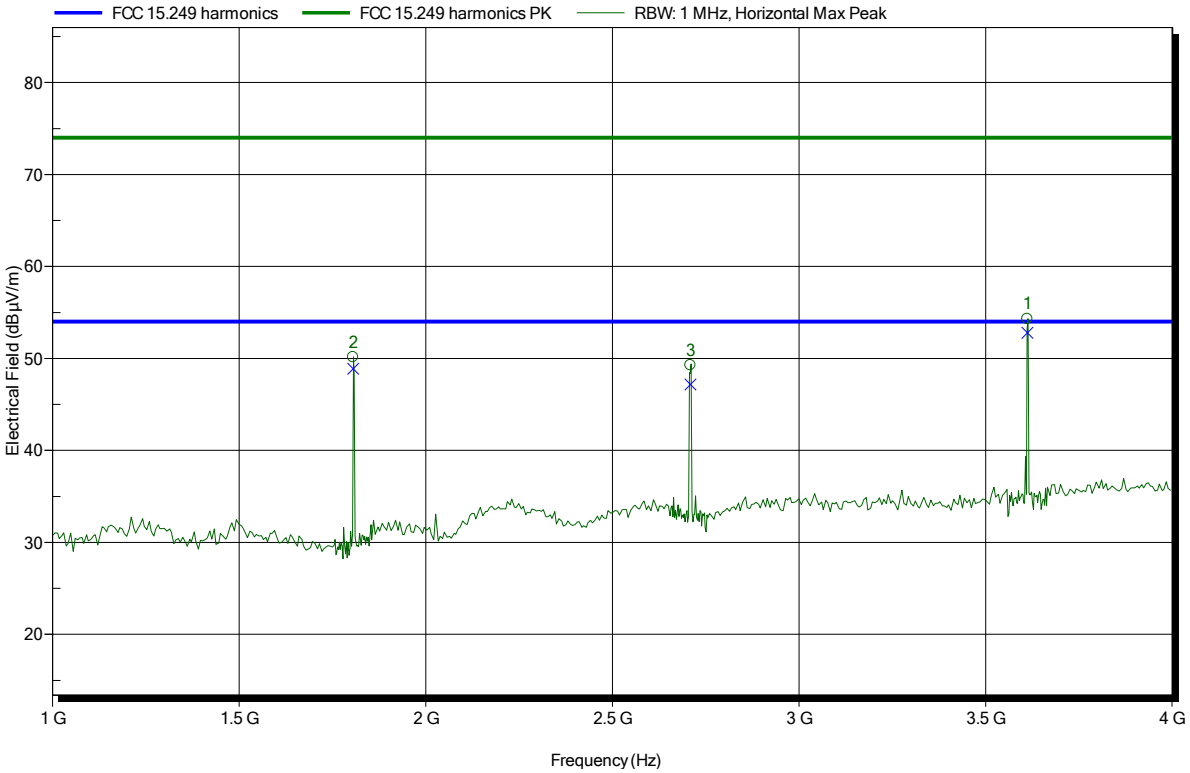


| Frequency | Peak | Peak Limit | Peak Difference | Peak Status |
|---|---|---|---|---|
| 1.806 GHz | 50.15 dBµV/m | 74 dBµV/m | -23.85 dB | Pass |
| 2.709 GHz | 49.26 dBµV/m | 74 dBµV/m | -24.74 dB | Pass |
| 3.611 GHz | 54.3 dBµV/m | 74 dBµV/m | -19.7 dB | Pass |

| Frequency | Average | Average Limit | Average Difference | Average Status |
|---|---|---|---|---|
| 1.806 GHz | 48.88 dBµV/m | 54 dBµV/m | -5.12 dB | Pass |
| 2.709 GHz | 47.18 dBµV/m | 54 dBµV/m | -6.82 dB | Pass |
| 3.611 GHz | 52.79 dBµV/m | 54 dBµV/m | -1.21 dB | Pass |

**Spurious emissions according to FCC 15.249**

Project number: G0M-1704-6415

| | |
|---|---|
| Applicant: | Kieback & Peter GmbH & Co. KG |
| EUT Name: | Actuator |
| Model: | MD15-CFL-HE |
| Test Site: | Eurofins Product Service GmbH |
| Operator: | Mr. Treffke |
| Test Conditions: | Tnom: 25°C, Vnom: 3.3 VDC (lithium battery) |
| Antenna: | Schwarzbeck BBHA 9120D, Vertical |
| Measurement distance: | 3 m |
| Mode: | TX; 2-FSK; 902.875 MHz |
| Test Date: | 2017-05-06 |
| Note: | |

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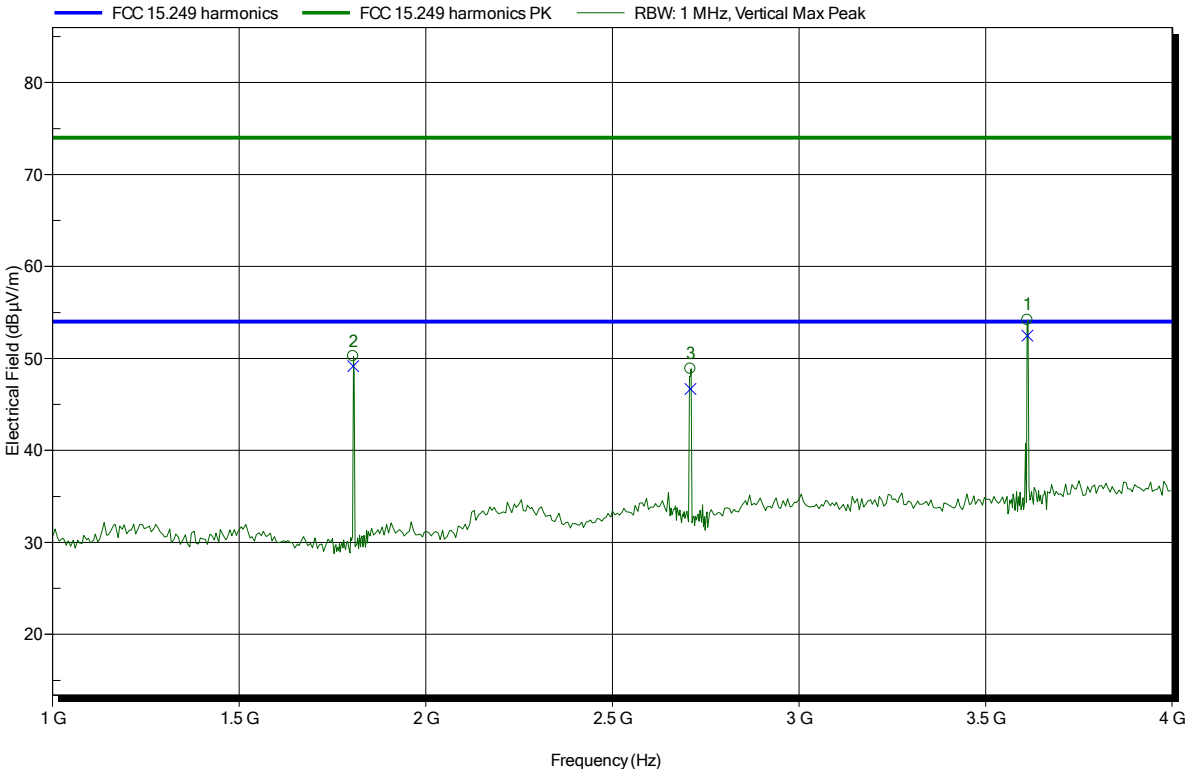


| Frequency | Peak | Peak Limit | Peak Difference | Peak Status |
|---|---|---|---|---|
| 1.806 GHz | 50.24 dBµV/m | 74 dBµV/m | -23.76 dB | Pass |
| 2.709 GHz | 48.89 dBµV/m | 74 dBµV/m | -25.11 dB | Pass |
| 3.611 GHz | 54.17 dBµV/m | 74 dBµV/m | -19.83 dB | Pass |

| Frequency | Average | Average Limit | Average Difference | Average Status |
|---|---|---|---|---|
| 1.806 GHz | 49.17 dBµV/m | 54 dBµV/m | -4.83 dB | Pass |
| 2.709 GHz | 46.7 dBµV/m | 54 dBµV/m | -7.3 dB | Pass |
| 3.611 GHz | 52.47 dBµV/m | 54 dBµV/m | -1.53 dB | Pass |

**Spurious emissions according to FCC 15.249**

Project number: G0M-1704-6415

| | |
|---|---|
| Applicant: | Kieback & Peter GmbH & Co. KG |
| EUT Name: | Actuator |
| Model: | MD15-CFL-HE |
| Test Site: | Eurofins Product Service GmbH |
| Operator: | Mr. Treffke |
| Test Conditions: | Tnom: 25°C, Vnom: 3.3 VDC (lithium battery) |
| Antenna: | Schwarzbeck BBHA 9120D, Horizontal |
| Measurement distance: | 3 m |
| Mode: | TX; 2-FSK; 902.875 MHz |
| Test Date: | 2017-05-06 |
| Note: | |

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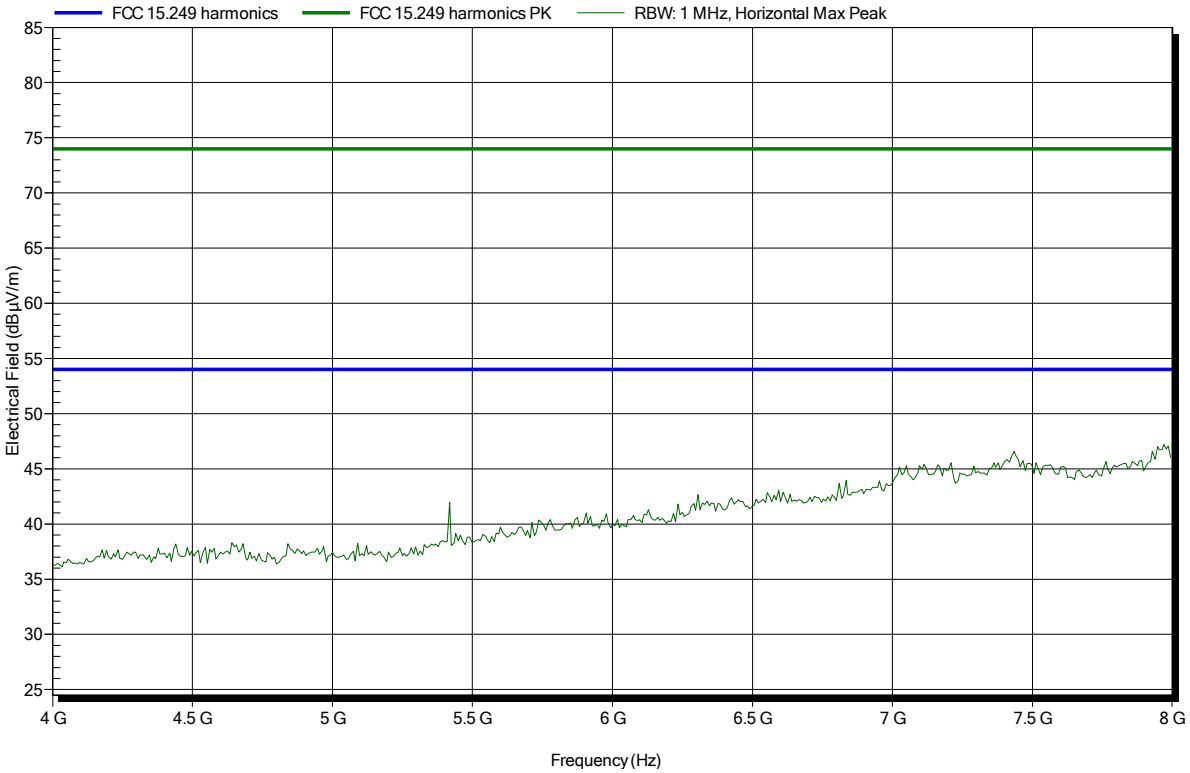

**Spurious emissions according to FCC 15.249**

Project number: G0M-1704-6415

| | |
|---|---|
| Applicant: | Kieback & Peter GmbH & Co. KG |
| EUT Name: | Actuator |
| Model: | MD15-CFL-HE |
| Test Site: | Eurofins Product Service GmbH |
| Operator: | Mr. Treffke |
| Test Conditions: | Tnom: 25°C, Vnom: 3.3 VDC (lithium battery) |
| Antenna: | Schwarzbeck BBHA 9120D, Vertical |
| Measurement distance: | 3 m |
| Mode: | TX; 2-FSK; 902.875 MHz |
| Test Date: | 2017-05-06 |
| Note: | |

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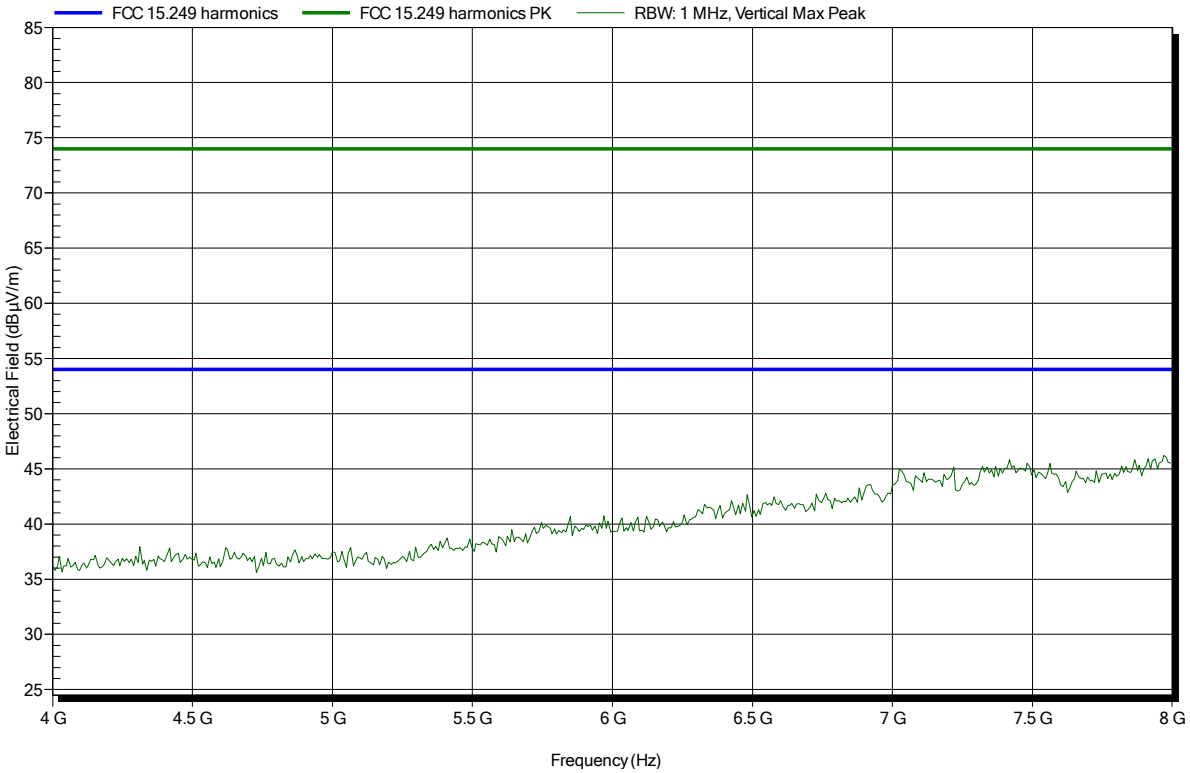

**Spurious emissions according to FCC 15.249**

Project number: G0M-1704-6415

| | |
|---|---|
| Applicant: | Kieback & Peter GmbH & Co. KG |
| EUT Name: | Actuator |
| Model: | MD15-CFL-HE |
| Test Site: | Eurofins Product Service GmbH |
| Operator: | Mr. Treffke |
| Test Conditions: | Tnom: 25°C, Vnom: 3.3 VDC (lithium battery) |
| Antenna: | Schwarzbeck BBHA 9120D, Horizontal |
| Measurement distance: | 1 m |
| Mode: | TX; 2-FSK; 902.875 MHz |
| Test Date: | 2017-05-06 |
| Note: | |

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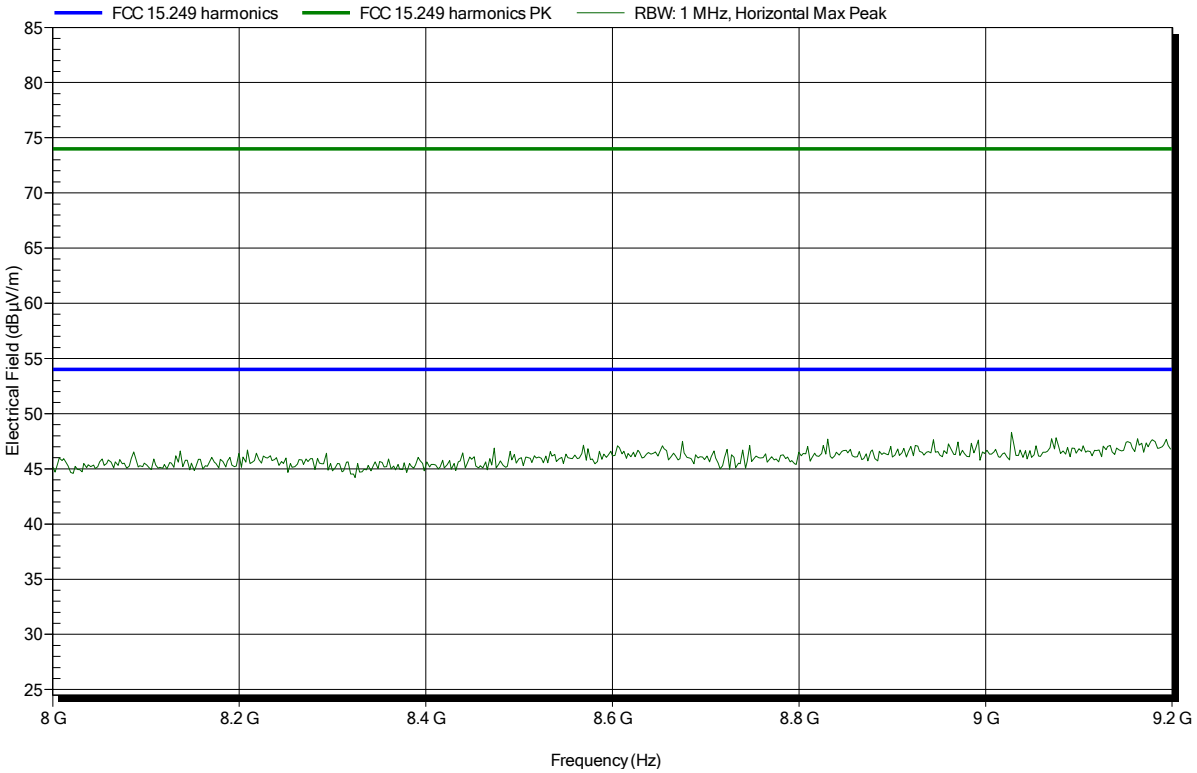

**Spurious emissions according to FCC 15.249**

Project number: G0M-1704-6415

| | |
|---|---|
| Applicant: | Kieback & Peter GmbH & Co. KG |
| EUT Name: | Actuator |
| Model: | MD15-CFL-HE |
| Test Site: | Eurofins Product Service GmbH |
| Operator: | Mr. Treffke |
| Test Conditions: | Tnom: 25°C, Vnom: 3.3 VDC (lithium battery) |
| Antenna: | Schwarzbeck BBHA 9120D, Vertical |
| Measurement distance: | 1 m |
| Mode: | TX; 2-FSK; 902.875 MHz |
| Test Date: | 2017-05-06 |
| Note: | |

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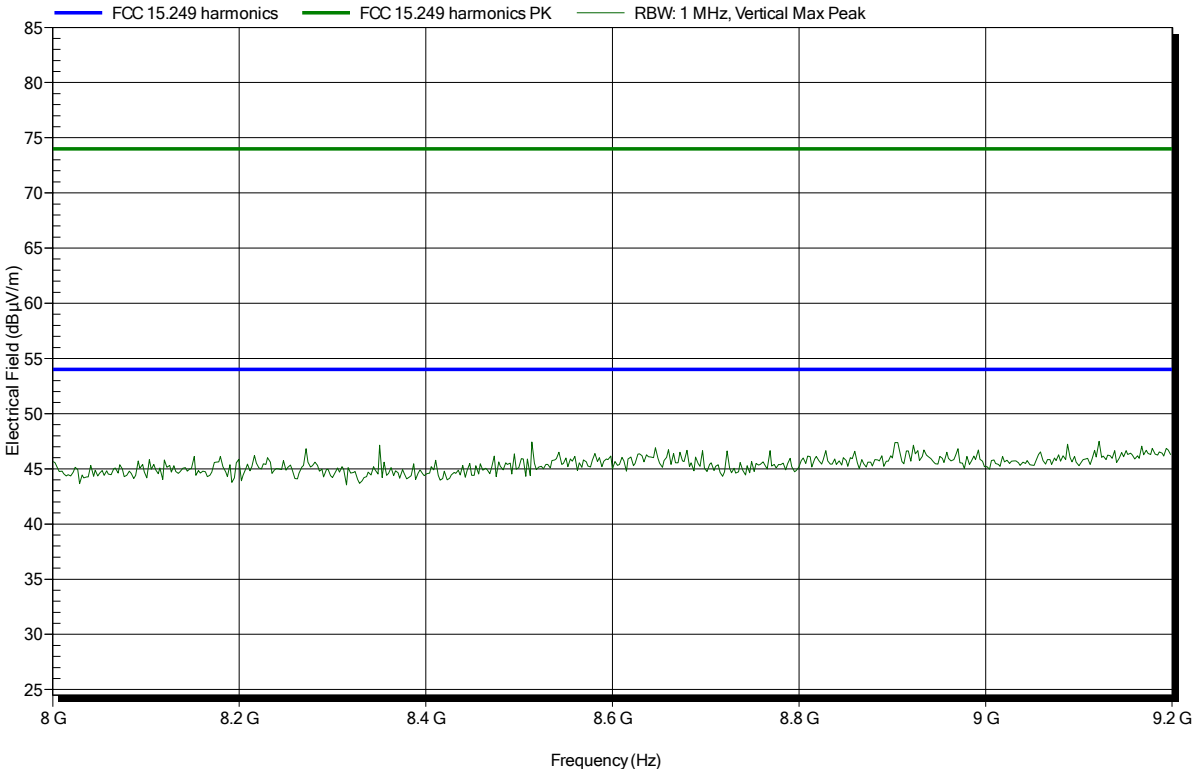

# ANNEX B Receiver radiated spurious emissions

**Spurious emissions according to RSS-Gen Issue 4**

Project number: G0M-1704-6415

| | |
|---|---|
| Applicant: | Kieback & Peter GmbH & Co. KG |
| EUT Name: | Actuator |
| Model: | MD15-CFL-HE |
| Test Site: | Eurofins Product Service GmbH |
| Operator: | Mr. Treffke |
| Test Conditions: | Tnom: 25°C, Vnom: 3.3 VDC (lithium battery) |
| Antenna: | Rohde & Schwarz HK 116, Horizontal |
| Measurement distance: | 3 m |
| Mode: | RX; 902.875 MHz |
| Test Date: | 2017-05-06 |
| Note: | |

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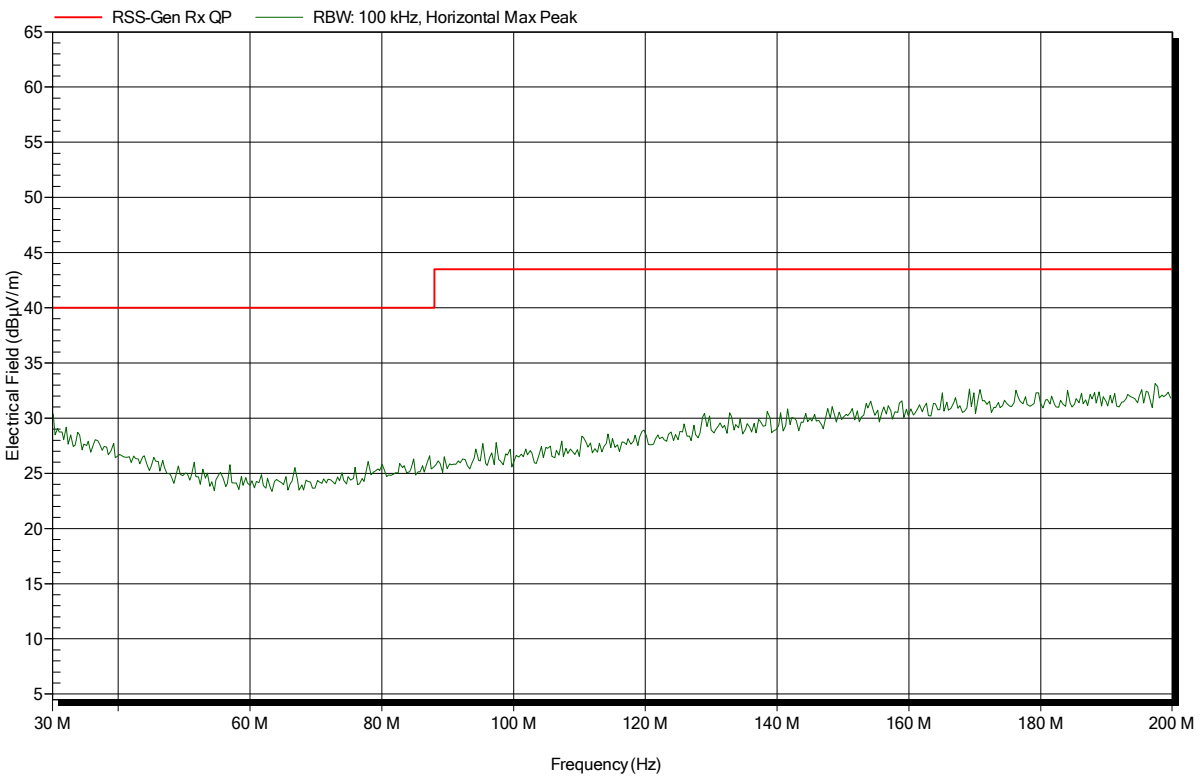

**Spurious emissions according to RSS-Gen Issue 4**

Project number: G0M-1704-6415

| | |
|---|---|
| Applicant: | Kieback & Peter GmbH & Co. KG |
| EUT Name: | Actuator |
| Model: | MD15-CFL-HE |
| Test Site: | Eurofins Product Service GmbH |
| Operator: | Mr. Treffke |
| Test Conditions: | Tnom: 25°C, Vnom: 3.3 VDC (lithium battery) |
| Antenna: | Rohde & Schwarz HK 116, Vertical |
| Measurement distance: | 3 m |
| Mode: | RX; 902.875 MHz |
| Test Date: | 2017-05-06 |
| Note: | |

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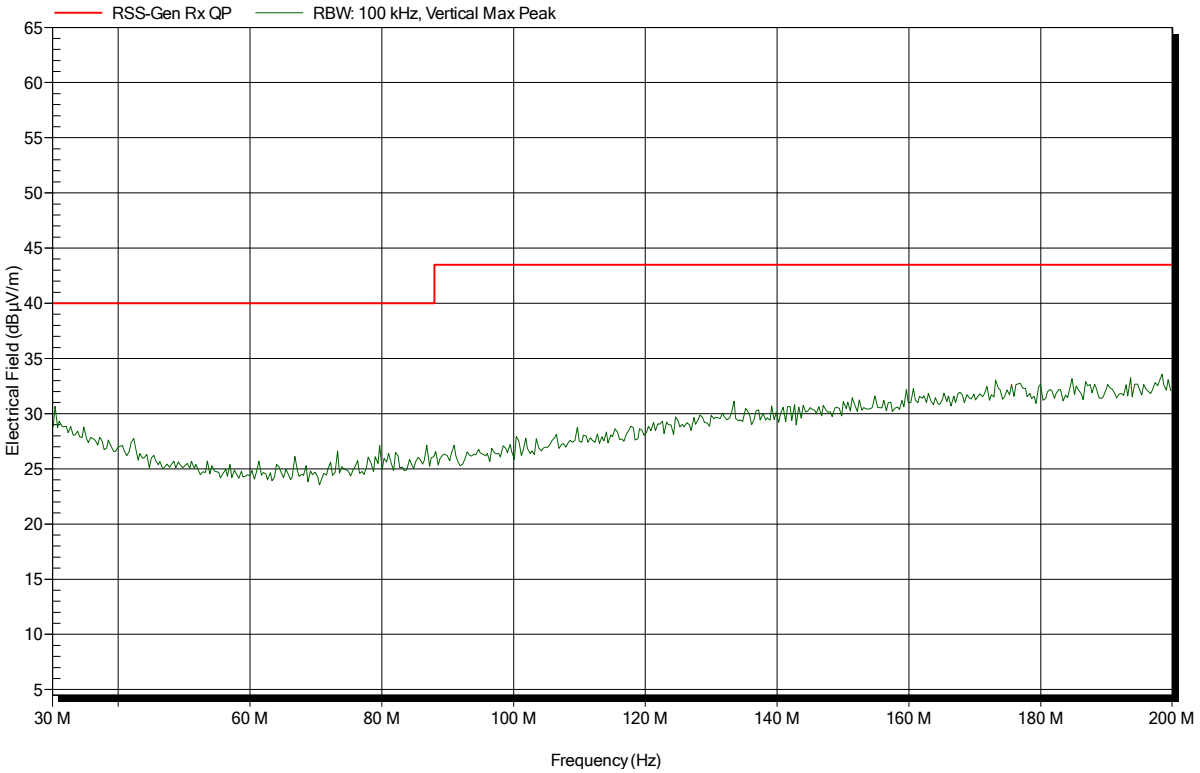

**Spurious emissions according to RSS-Gen Issue 4**

Project number: G0M-1704-6415

| | |
|---|---|
| Applicant: | Kieback & Peter GmbH & Co. KG |
| EUT Name: | Actuator |
| Model: | MD15-CFL-HE |
| Test Site: | Eurofins Product Service GmbH |
| Operator: | Mr. Treffke |
| Test Conditions: | Tnom: 25°C, Vnom: 3.3 VDC (lithium battery) |
| Antenna: | Rohde & Schwarz HL 223, Horizontal |
| Measurement distance: | 3 m |
| Mode: | RX; 902.875 MHz |
| Test Date: | 2017-05-06 |
| Note: | |

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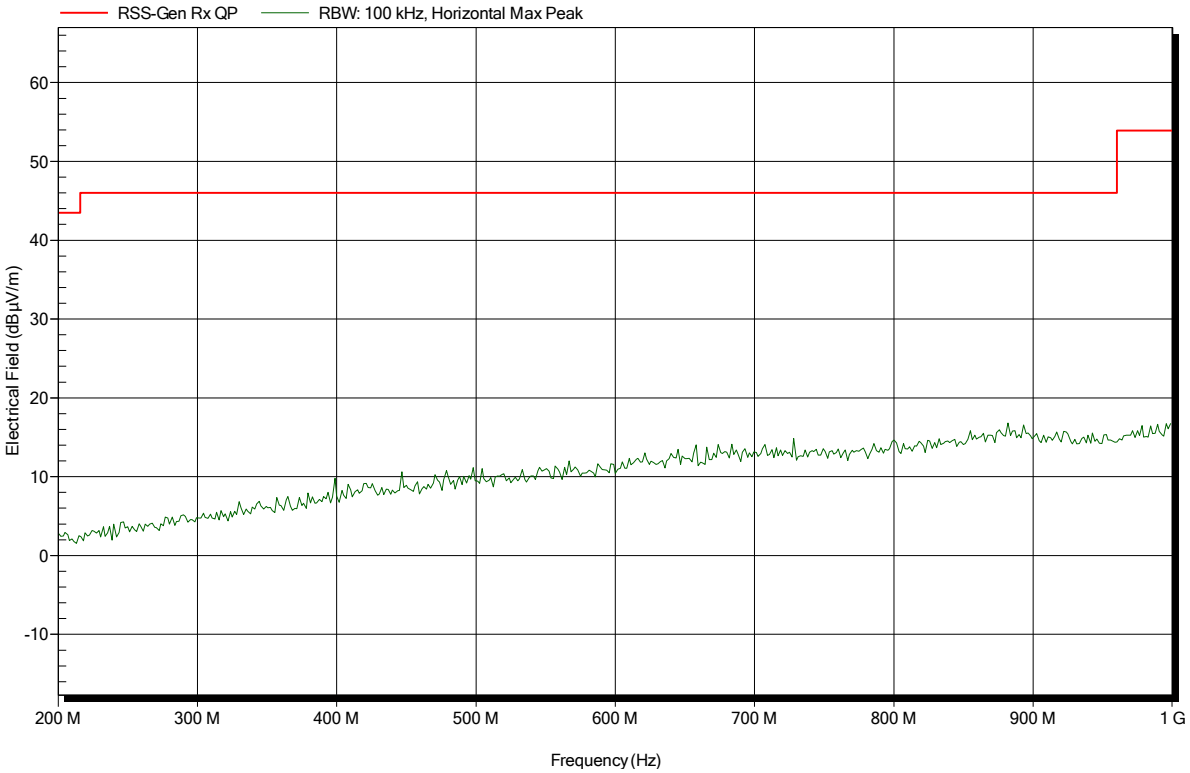

**Spurious emissions according to RSS-Gen Issue 4**

Project number: G0M-1704-6415

| | |
|---|---|
| Applicant: | Kieback & Peter GmbH & Co. KG |
| EUT Name: | Actuator |
| Model: | MD15-CFL-HE |
| Test Site: | Eurofins Product Service GmbH |
| Operator: | Mr. Treffke |
| Test Conditions: | Tnom: 25°C, Vnom: 3.3 VDC (lithium battery) |
| Antenna: | Rohde & Schwarz HL 223, Vertical |
| Measurement distance: | 3 m |
| Mode: | RX; 902.875 MHz |
| Test Date: | 2017-05-06 |
| Note: | |

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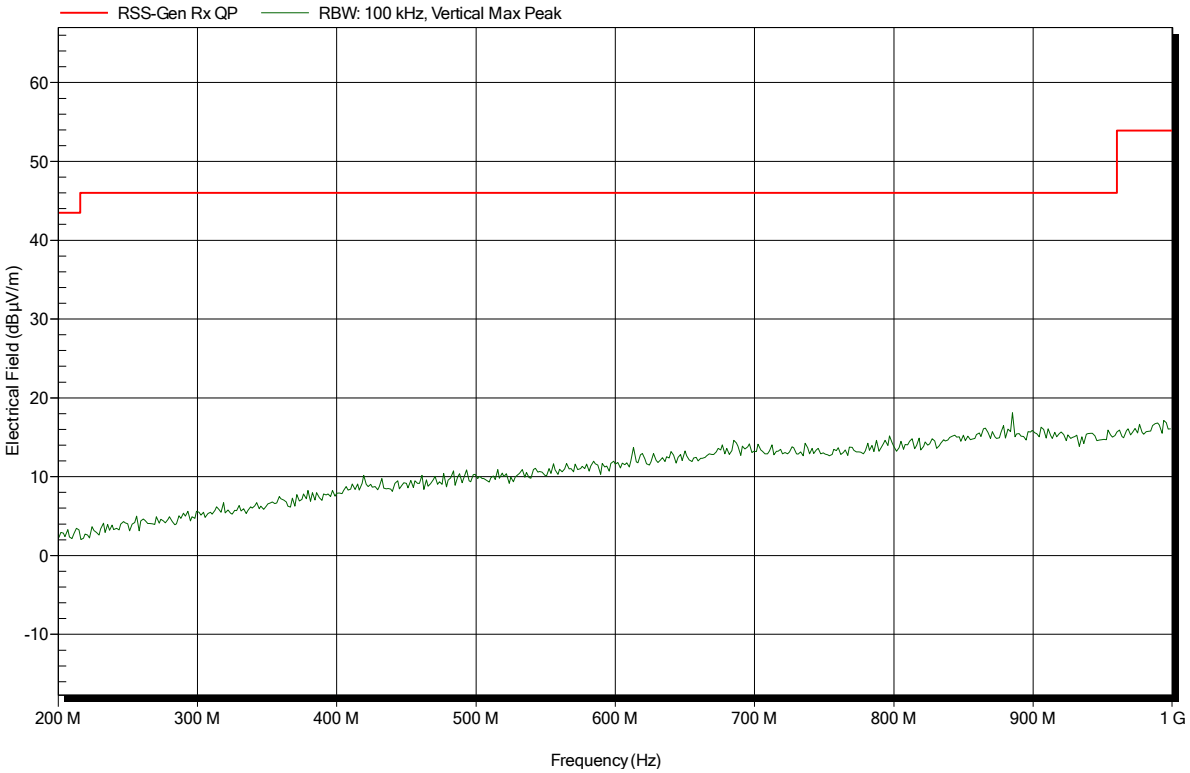

**Spurious emissions according to RSS-Gen Issue 4**

Project number: G0M-1704-6415

| | |
|---|---|
| Applicant: | Kieback & Peter GmbH & Co. KG |
| EUT Name: | Actuator |
| Model: | MD15-CFL-HE |
| Test Site: | Eurofins Product Service GmbH |
| Operator: | Mr. Treffke |
| Test Conditions: | Tnom: 25°C, Vnom: 3.3 VDC (lithium battery) |
| Antenna: | Schwarzbeck BBHA 9120D, Horizontal |
| Measurement distance: | 3 m |
| Mode: | RX; 902.875 MHz |
| Test Date: | 2017-05-06 |
| Note: | |

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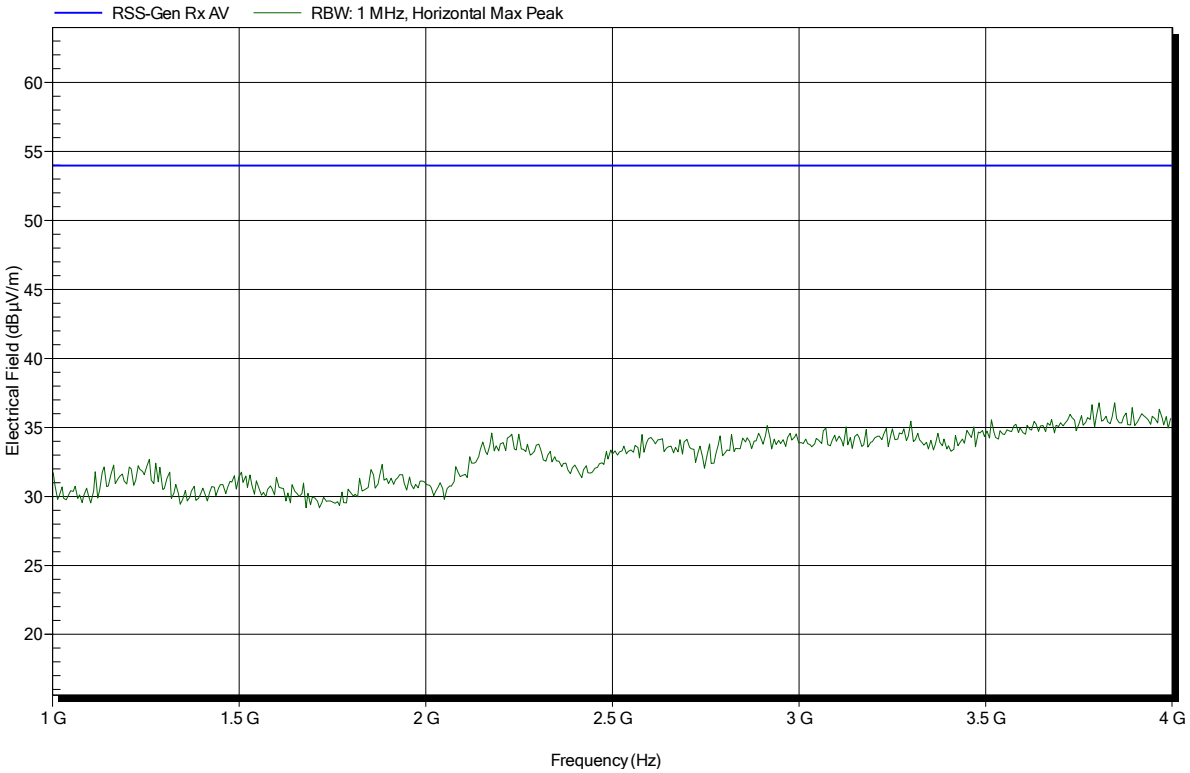

**Spurious emissions according to RSS-Gen Issue 4**

Project number: G0M-1704-6415

| | |
|---|---|
| Applicant: | Kieback & Peter GmbH & Co. KG |
| EUT Name: | Actuator |
| Model: | MD15-CFL-HE |
| Test Site: | Eurofins Product Service GmbH |
| Operator: | Mr. Treffke |
| Test Conditions: | Tnom: 25°C, Vnom: 3.3 VDC (lithium battery) |
| Antenna: | Schwarzbeck BBHA 9120D, Vertical |
| Measurement distance: | 3 m |
| Mode: | RX; 902.875 MHz |
| Test Date: | 2017-05-06 |
| Note: | |

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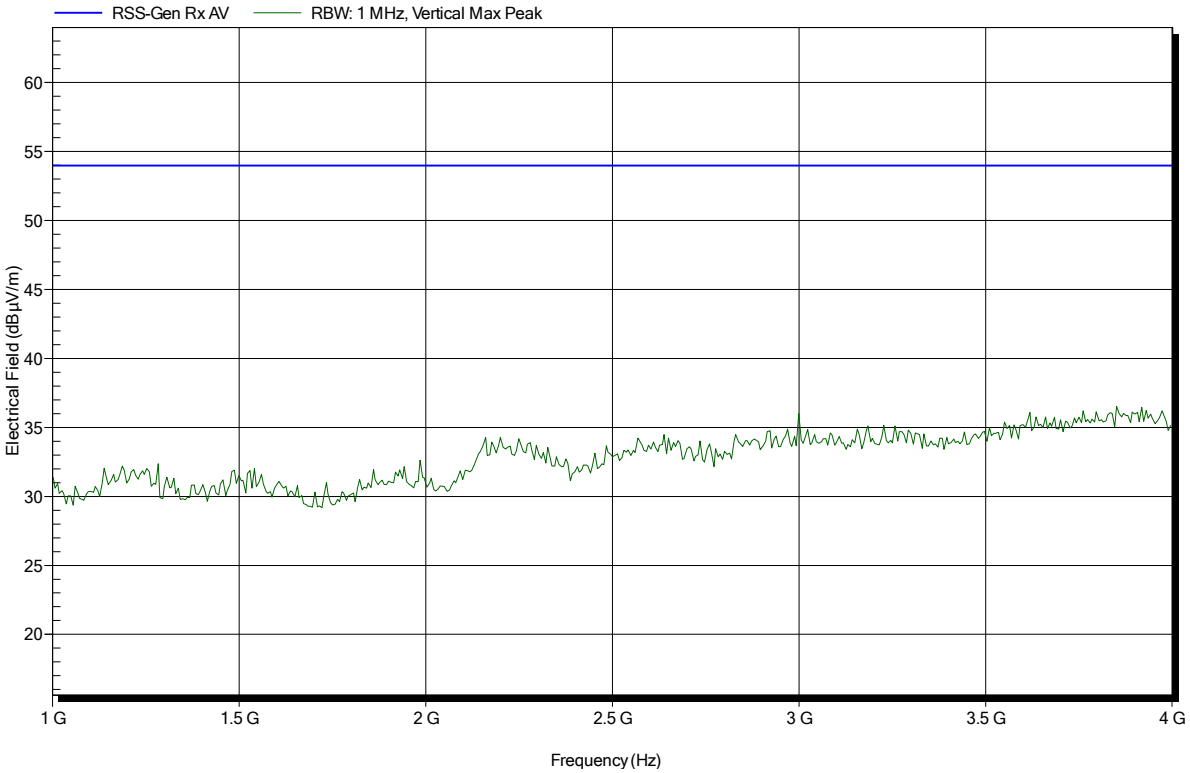

**Spurious emissions according to RSS-Gen Issue 4**

Project number: G0M-1704-6415

| | |
|---|---|
| Applicant: | Kieback & Peter GmbH & Co. KG |
| EUT Name: | Actuator |
| Model: | MD15-CFL-HE |
| Test Site: | Eurofins Product Service GmbH |
| Operator: | Mr. Treffke |
| Test Conditions: | Tnom: 25°C, Vnom: 3.3 VDC (lithium battery) |
| Antenna: | Schwarzbeck BBHA 9120D, Horizontal |
| Measurement distance: | 3 m |
| Mode: | RX; 902.875 MHz |
| Test Date: | 2017-05-06 |
| Note: | |

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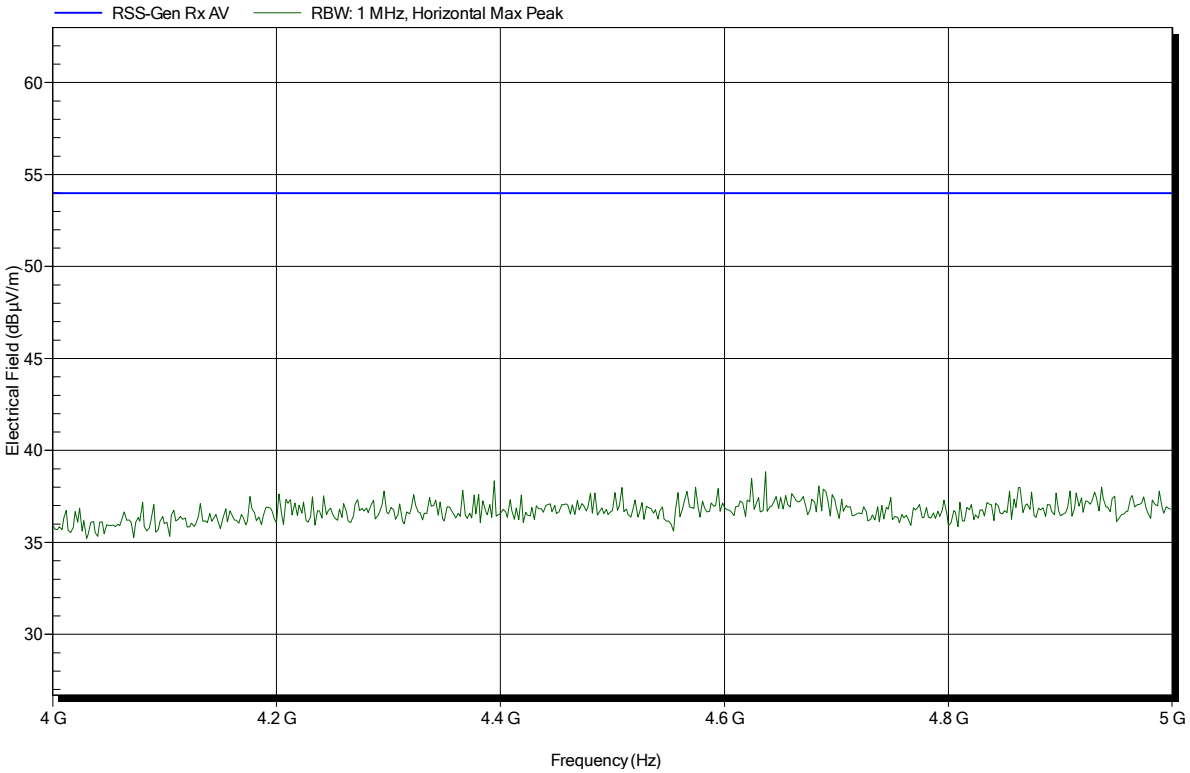
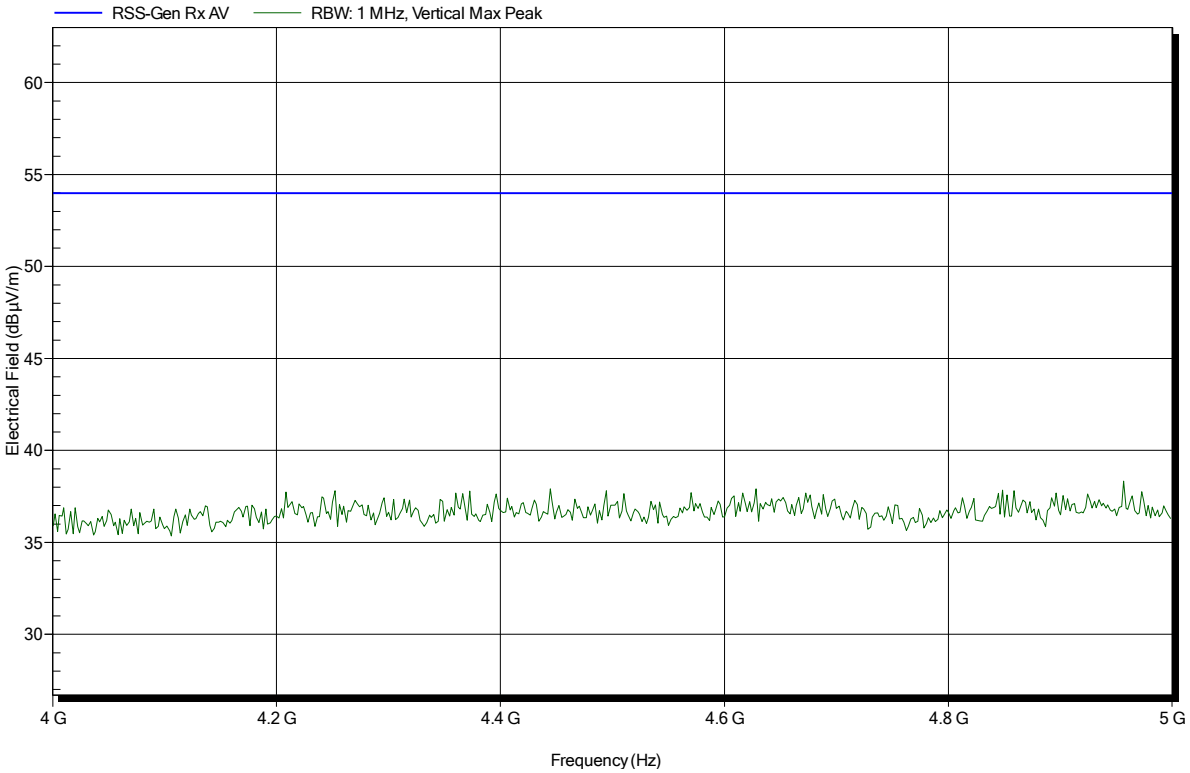


**Spurious emissions according to RSS-Gen Issue 4**

Project number: G0M-1704-6415

| | |
|---|---|
| Applicant: | Kieback & Peter GmbH & Co. KG |
| EUT Name: | Actuator |
| Model: | MD15-CFL-HE |
| Test Site: | Eurofins Product Service GmbH |
| Operator: | Mr. Treffke |
| Test Conditions: | Tnom: 25°C, Vnom: 3.3 VDC (lithium battery) |
| Antenna: | Schwarzbeck BBHA 9120D, Vertical |
| Measurement distance: | 3 m |
| Mode: | RX; 902.875 MHz |
| Test Date: | 2017-05-06 |
| Note: | |

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