Senton GmbH
Aeussere Fruehlingstrasse 45
D-94315 Straubing

Straubing, June 25, 2008

# T E S T - R E P O R T

## No. 56113-080538 (Edition 1)

## for

## 5691

## SHOW DMX Transceiver

Applicant: City Theatrical, Inc.

Test Specifications: FCC Code of Federal Regulations,
CFR 47, Part 15,
Sections 15.107, 15.109, 15.205, 15.207,
15.215 and 15.247

Industry Canada Radio Standards Specifications
RSS-Gen Issue 2, Sections 7.2.2, 7.2.3 and
RSS-210 Issue 7, Sections 2.2, A8
(Category I Equipment)

Reason for Class II Permissive Change:
Four antennas shall be added to the certification

## Table of Contents

# 1 Description of the Equipment Under Test (EUT)

| **General data of EUT** | |
|---|---|
| Type designation[1]: | 5691 |
| Parts[2]: | |
| Serial number(s): | |
| Manufacturer: | City Theatrical, Inc. |
| Type of equipment: | SHOW DMX Transceiver |
| Version: | as received |
| FCC ID: | VU65691 |
| Additional parts/accessories: | |

| **Technical data of EUT** | | | | |
|---|---|---|---|---|
| Application frequency range: | 2400 - 2483.5 MHz | | | |
| Frequency range: | 2406 – 2476 MHz | | | |
| Operating frequency: | Low channel: 2406 MHz<br>Middle channel: 2440 MHz<br>High channel: 2476 MHz | | | |
| Type of modulation: | FSK | | | |
| Pulse train: | See Protocol Data Systems Test Report No. 03229 | | | |
| Pulse width: | See Protocol Data Systems Test Report No. 03229 | | | |
| Number of RF-channels: | 72 | | | |
| Channel spacing: | 2 MHz | | | |
| Designation of emissions[3]: | | | | |
| **Type of antenna:** | Type | Gain | Length | Tested |
| Maxrad MP24008XFPT | Panel | 8.5 dBi | 12.9 x 11.9 x 3.8 cm | No |
| Maxrad MP24012CPLXFPT | Panel | 12.0 dBic | 22.4 x 20.6 x 4.06 cm | Yes |
| Maxrad MYP24010PT | Yagi | 10 dBi | 114 x 76 mm | No |
| Maxrad MYP24014PT | Yagi | 14 dBi | 356 x 76 mm | Yes |

[1] Type designation of the system if EUT consists of more than one part.
[2] Type designations of the parts of the system, if applicable.
[3] Also known as "Class of Emission".

| | |
|---|---|
| Statement for antennas covered by this report: | The antenna with the highest gain of each type has been tested. |
| Type of power supply: | DC supply |
| Specifications for power supply: | nominal voltage: 5.00 V<br>minimum voltage: 4.75 V<br>maximum voltage: 5.25 V |

## 2 Administrative Data

| Application details | |
|---|---|
| Applicant (full address): | City Theatrical, Inc.<br>475 Barell Ave.,<br>Carlstadt, NJ 07072<br>USA |
| Contact person: | Larry Dunn |
| Contract identification: | Purchase Order LD-102235 |
| Receipt of EUT: | May 06, 2008 |
| Date(s) of test: | May/June 2008 |
| Note(s): | |

| Report details | |
|---|---|
| Report number: | 56113-080538 |
| Edition: | 1 |
| Issue date: | June 25, 2008 |

# 3 Identification of the Test Laboratory

| Details of the Test Laboratory | |
|---|---|
| Company name: | Senton GmbH EMI/EMC Test Center |
| Address: | Aeussere Fruehlingstrasse 45<br>D-94315 Straubing<br>Germany |
| Laboratory accreditation: | DAR-Registration No. DAT-P-171/94-02 |
| FCC test site registration number | 90926 |
| Industry Canada test site registration: | 3050A-1 |
| Contact person: | Mr. Johann Roidt<br><br>Phone: (+49) (0)9421 5522-0<br>Fax: (+49) (0)9421 5522-99 |

# 4 Summary

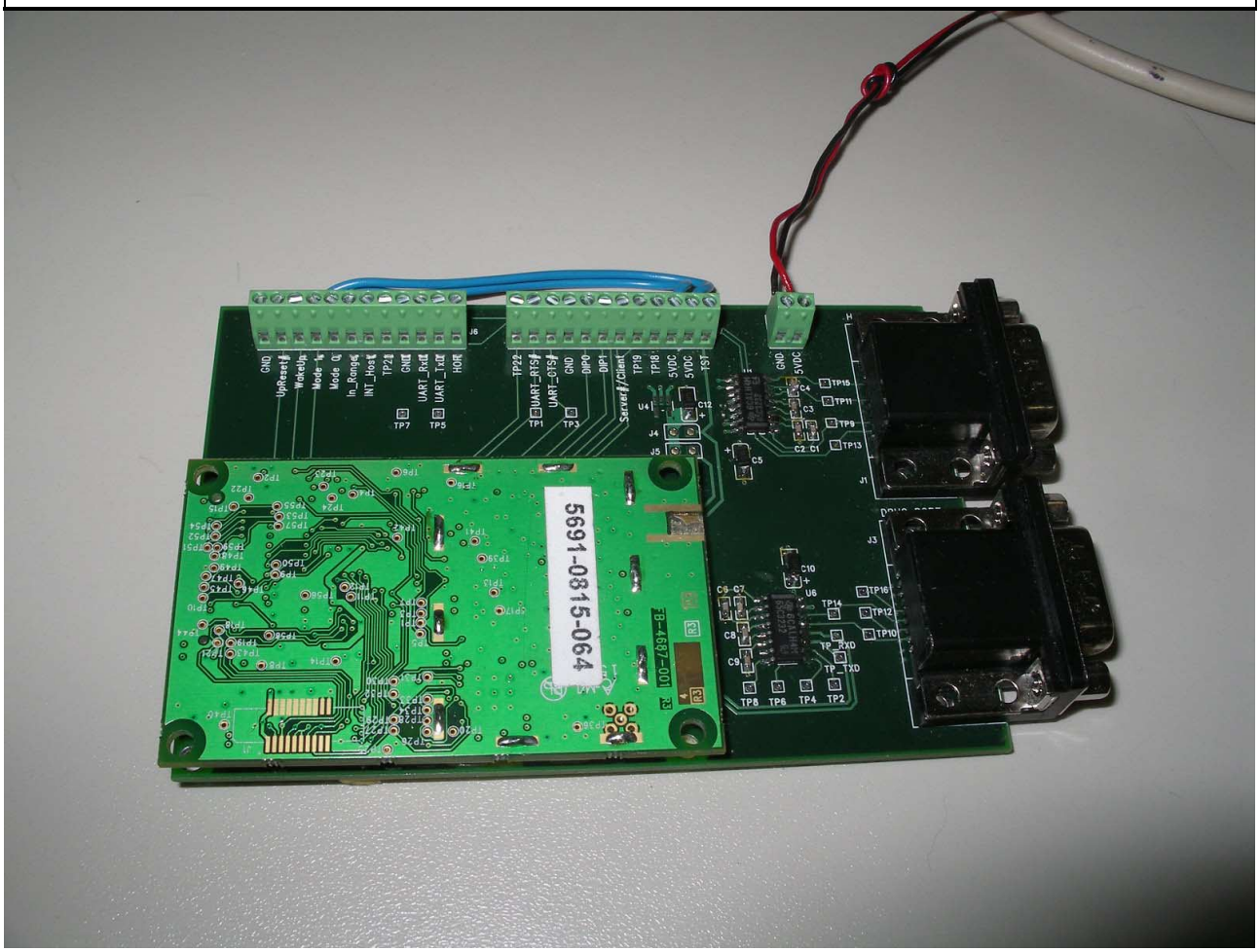
| **Summary of test results** |
|---|
| The tested sample complies with the requirements set forth in the<br>**Code of Federal Regulations CFR 47, Part 15, Sections 15.109, 15.204, 15.205, 15.215, 15.247 and 2.1093**<br>of the Federal Communication Commission (FCC) and the<br>**Radio Standards Specifications**<br>**RSS-Gen Issue 2, Section 7.2.3 and**<br>**RSS-210 Issue 7, Sections 2.2, 2.6, 7.1.4 and A8 (Category I Equipment)**<br>of Industry Canada (IC). |

| **Personnel involved in this report** | |
|---|---|
| Laboratory Manager: |  <br>Mr. Johann Roidt |
| Responsible for testing: | Mr. Johann Roidt |
| Responsible for test report: | Mr. Johann Roidt |

# 5 Operation Mode and Configuration of EUT

| **Operation Mode(s)** |
|---|
| Transmitter operating continuously<br>Full TX tests were performed on lowest, middle and highest RF channel<br>RX mode was tested on the middle channel.<br><br>Low channel: 2406 MHz<br>Middle channel: 2440 MHz<br>Highest Channel: 2476 MHz |

| **Configuration(s) of EUT** |
|---|
| A full test setup was supplied by the applicant, see EUT mounted on the test board below |



| List of ports and cables | | | | |
|---|---|---|---|---|
| *Port* | *Description* | *Classification*[4] | *Cable type* | *Cable length* |
| 1 | DC supply input | | | |
| 2 | Serial interface 5 V TTL | | | |

| List of devices connected to EUT | | | | |
|---|---|---|---|---|
| *Item* | *Description* | *Type Designation* | *Serial no. or ID* | *Manufacturer* |
| 1 | Notebook PC Latitude | D810 | | DELL |

| List of support devices | | | | |
|---|---|---|---|---|
| *Item* | *Description* | *Type Designation* | *Serial no. or ID* | *Manufacturer* |
| | Test board | N/A | N/A | City Theatrical, Inc. |

[4] Ports shall be classified as ac power, dc power or signal/control port

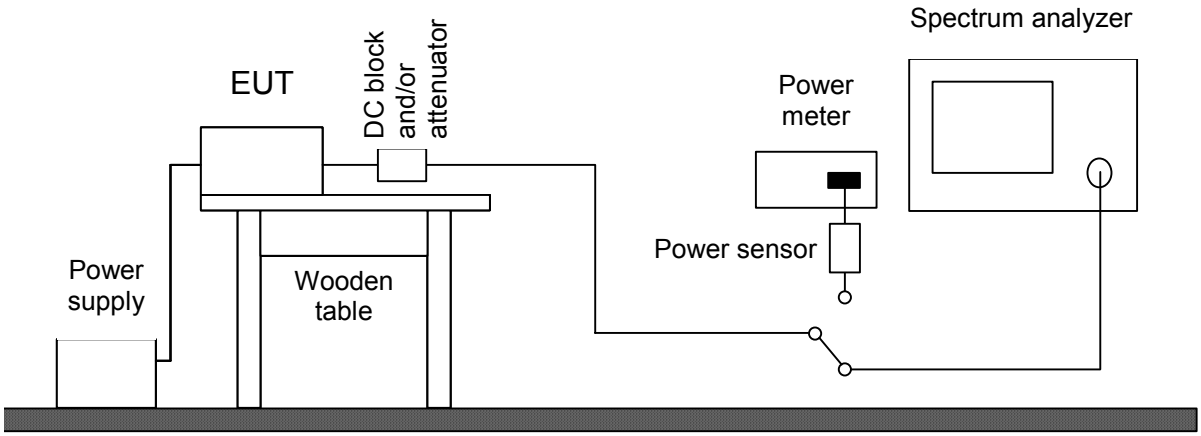
# 6 Measurement Procedures

## 6.1 Conducted Output Power

| **Measurement Procedure:** | |
|---|---|
| Rules and specifications: | CFR 47 Part 2, section 2.1046(a)<br>IC RSS-Gen Issue 2, section 4.8 |
| Guide: | CFR 47 Part 2, section 2.1046 / IC RSS-Gen Issue 2 |

Conducted output power is measured at the RF output terminals (e.g. antenna connector if antenna is detachable) when the transmitter is adjusted in accordance with the tune-up procedure, if applicable. The RF output terminals are connected to a spectrum analyzer and/or a power meter with appropriate sensor. If required, a resistive matching network equal to the impedance specified or employed for the antenna is used as well as dc block and appropriate attenuators (50 Ohms). The electrical characteristics of the radio frequency load attached to the output terminals shall be stated, if applicable.

If a spectrum analyzer is used and no other settings are specified resolution bandwidth shall be selected according to the carrier frequency $f_c$ and set to 10 kHz (150 kHz $\leq f_c <$ 30 MHz), 100 kHz (30 MHz $\leq f_c <$ 1 GHz) or 1 MHz ($f_c \geq$ 1 GHz). The video bandwidth shall be at least three times greater than the resolution bandwidth. The settings used have to be indicated within the appropriate test record(s).




Test instruments used:

| Used | Type | Model | Serial No. or ID | Manufacturer |
|---|---|---|---|---|
| ☒ | Spectrum Analyzer | FSP 30 | 100063 | Rohde & Schwarz |
| ☐ | EMI test receiver | ESPI7 | 836914/0002 | Rohde & Schwarz |
| ☐ | EMI test receiver | ESMI | 839379/013<br>839587/006 | Rohde & Schwarz |
| ☐ | Power meter | NRVS | 836856/015 | Rohde & Schwarz |
| ☐ | Peak power sensor | NRV-Z31 | 8579604.03 | Rohde & Schwarz |
| ☐ | Power sensor | NRV-Z52 | 837901/030 | Rohde & Schwarz |
| ☐ | Power sensor | NRV-Z4 | 863828/015 | Rohde & Schwarz |
| ☐ | DC-block | 7006 | A2798 | Weinschel |
| ☐ | Attenuator | 4776-10 | 9412 | Narda |
| ☐ | Attenuator | 4776-20 | 9503 | Narda |

## 6.2 Bandwidth Measurements

| **Measurement Procedure:** | |
|---|---|
| Rules and specifications: | CFR 47 Part 2, section 2.202(a)<br>CFR 47 Part 15, section 15.215(c)<br>IC RSS-Gen Issue 2, sections 4.6.1 and 4.6.2<br>IC RSS-210 Issue 7, section A1.1.3<br>ANSI C63.4, annex H.6 |
| Guide: | ANSI C63.4 / IC RSS-Gen Issue 2, sections 4.6.1 and 4.6.2 |
| Measurement setup: | ☐ Conducted: See below<br>☒ Radiated: Radiated Emission in Fully or Semi Anechoic Room (6.4) |
| If antenna is detachable bandwidth measurements shall be performed at the antenna connector (conducted measurement) when the transmitter is adjusted in accordance with the tune-up procedure, if applicable. The RF output terminals are connected to a spectrum analyzer. If required, a resistive matching network equal to the impedance specified or employed for the antenna is used as well as dc block and appropriate attenuators (50 Ohms). The electrical characteristics of the radio frequency load attached to the output terminals shall be stated, if applicable.<br>If radiated measurements are performed the same test setups and instruments are used as with radiated emission measurements for the appropriate frequency range.<br>The analyzer settings are specified by the test description of the appropriate test record(s). | |

## 6.3 Radiated Emission Measurement 9 kHz to 30 MHz

| **Measurement Procedure:** | |
|---|---|
| Rules and specifications: | CFR 47 Part 15, sections 15.205(b) and 15.247<br>IC RSS-210 Issue 7, sections 2.2(b)(c), 2.6 and A8.5 |
| Guide: | ANSI C63.4 |

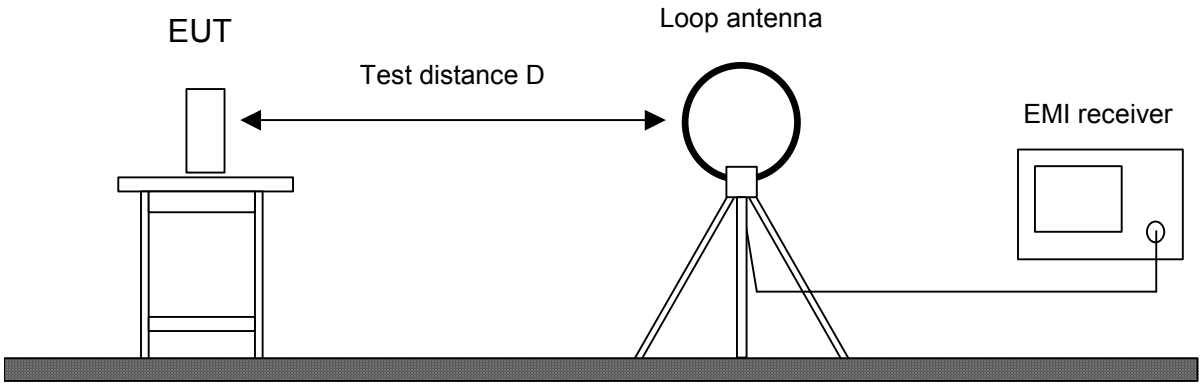
Radiated emission in the frequency range 9 kHz to 30 MHz is measured using an active loop antenna. First the whole spectrum of emission caused by the equipment is recorded at a distance of 3 meters in a fully or semi anechoic room with the detector of the spectrum analyzer or EMI receiver set to peak. This configuration is also used for recording the spectrum of intentional radiators.

Hand-held or body-worn devices are rotated through three orthogonal axes to determine which attitude and configuration produces the highest emission relative to the limit and therefore shall be used for final testing.

EUT is rotated all around to find the maximum levels of emissions. Equipment and cables are placed and moved within the range of position likely to find their maximum emissions.
If worst case emission of the EUT cannot be recorded with EUT in standard position and loop antenna in vertical polarization the EUT (or the radiating part of the EUT) is rotated by 90 degrees instead of changing the loop antenna to horizontal polarization. This procedure is selected to minimize the influence of the environment (e.g. effects caused by the floor especially with longer distances).

Final measurement is performed at a test distance D of 30 meters using an open field test site. In case the regulation requires testing at other distances, the result is extrapolated by either making measurements at an additional distance D of 10 meters to determine the proper extrapolation factor or by using the square of an inverse linear distance extrapolation factor (40 dB/decade). In cases of very low emissions measurements are performed at shorter distances and results are extrapolated to the required distance. The provisions of CFR 47 Part 15 sections 15.31(d) and (f)(2) apply. According to CFR 47 Part 15 section 15.209(d) final measurement is performed with detector function set to quasi-peak except for the frequency bands 9 to 90 kHz and 110 to 490 kHz where, for non-pulsed operation, average detector is employed.

If the radiated emission limits are expressed in terms of the average value of the emission there also is a peak limit corresponding to 20 dB above the maximum permitted average limit. Additionally, if pulsed operation is employed, the average field strength is determined by averaging over one complete pulse train, including blanking intervals, as specified in CFR 47 Part 15 section 15.35(c). If the pulse train exceeds 0.1 second that 0.1 second interval during which the value of the emission is at its maximum is selected for calculation. The pulse train correction is added to the peak value of the emission to get the average value.



Test instruments used:

| Used | Type | Model | Serial No. or ID | Manufacturer |
|---|---|---|---|---|
| ☒ | Spectrum Analyzer | FSP 30 | 100063 | Rohde & Schwarz |
| ☐ | EMI test receiver | ESMI | 839379/013<br>839587/006 | Rohde & Schwarz |
| ☐ | Test receiver | ESHS 10 | 860043/016 | Rohde & Schwarz |
| ☐ | Preamplifier | CPA9231A | 3393 | Schaffner |
| ☒ | Loop antenna | HFH2-Z2 | 882964/1 | Rohde & Schwarz |
| ☒ | Fully anechoic room | No. 2 | 1452 | Albatross Projects |
| ☐ | Semi-anechoic room | No. 3 | 1453 | Siemens |
| ☐ | Open field test site | EG 1 | 1450 | Senton |

## 6.4 Radiated Emission in Fully or Semi Anechoic Room

| **Measurement Procedure:** | |
|---|---|
| Rules and specifications: | CFR 47 Part 15, sections 15.109, 15.215(b) and 15.249<br>IC RSS-Gen Issue 2, sections 6(a), 7.2.3.2<br>IC RSS-210 Issue 7, section A2.9 |
| Guide: | ANSI C63.4 |

Radiated emission in fully or semi anechoic room is measured in the frequency range from 30 MHz to the maximum frequency as specified in CFR 47 Part 15 section 15.33.

Measurements are made in both the horizontal and vertical planes of polarization in a fully anechoic room using a spectrum analyzer with the detector function set to peak and resolution as well as video bandwidth set to 100 kHz (below 1 GHz) or 1 MHz (above 1 GHz).

Testing up to 1 GHz is performed with a linear polarized logarithmic periodic antenna combined with a 4:1 broadband dipole ("Trilog broadband antenna"). For testing above 1 GHz horn antennas are used.

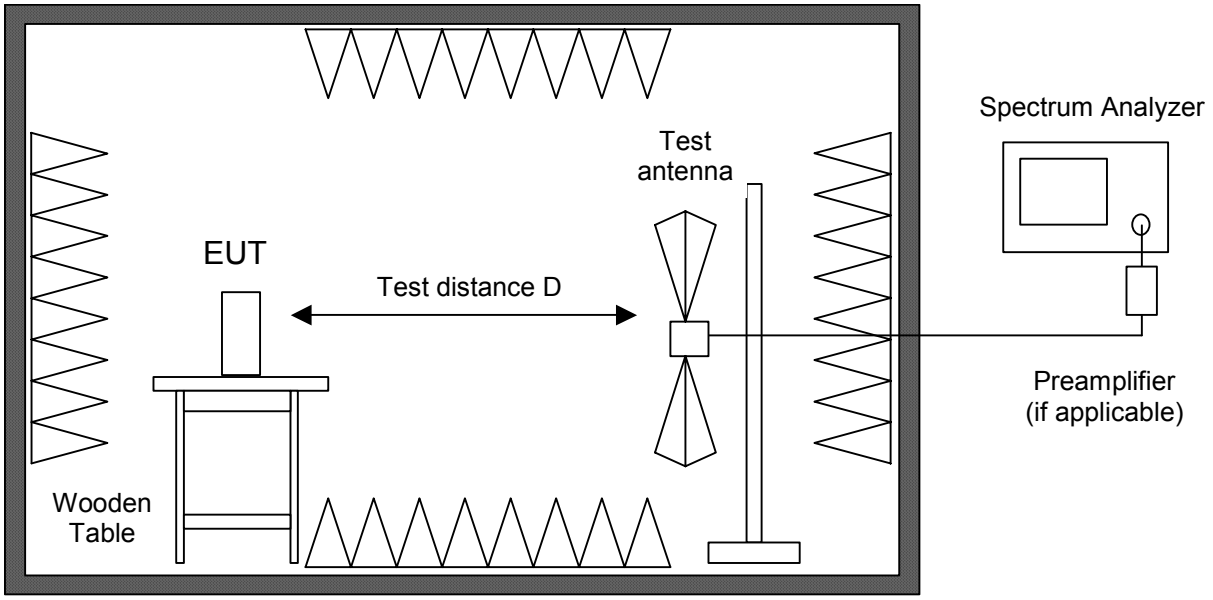
All tests below 18 GHz are performed at a test distance D of 3 meters. For higher frequencies the test distance is reduced (e.g. to 1 meter) due to the sensitivity of the measuring instrument(s) and the test results are calculated according to CFR 47 Part 15 section 15.31(f)(1) using an extrapolation factor of 20 dB/decade. If required, preamplifiers are used for the whole frequency range. Special care is taken to avoid overload, using appropriate attenuators and filters, if necessary.

If the radiated emission limits are expressed in terms of the average value of the emission there also is a peak limit corresponding to 20 dB above the maximum permitted average limit. Additionally, if pulsed operation is employed, the average field strength is determined by averaging over one complete pulse train, including blanking intervals, as specified in CFR 47 Part 15 section 15.35(c). If the pulse train exceeds 0.1 second that 0.1 second interval during which the value of the emission is at its maximum is selected for calculation. The pulse train correction is added to the peak value of the emission to get the average value.

Hand-held or body-worn devices are rotated through three orthogonal axes to determine which attitude and configuration produces the highest emission relative to the limit and therefore shall be used for final testing.

During testing the EUT is rotated all around to find the maximum levels of emissions. Equipment and cables are placed and moved within the range of position likely to find their maximum emissions.

For final testing below 1 GHz an open field test-site is used and the plots recorded in the fully or semi anechoic room are indicated as prescans.




Fully or semi anechoic room

Test instruments used:

| Used | Type | Model | Serial No. or ID | Manufacturer |
|---|---|---|---|---|
| ☒ | Spectrum Analyzer | FSP 30 | 100063 | Rohde & Schwarz |
| ☐ | Spectrum analyzer | R 3271 | 05050023 | Advantest |
| ☒ | EMI test receiver | ESMI | 839379/013<br>839587/006 | Rohde & Schwarz |
| ☒ | Preamplifier | CPA9231A | 3393 | Schaffner |
| ☒ | Preamplifier | R14601 | | Advantest |
| ☒ | Preamplifier 1-8 GHz | AFS3-00100800-32-LN | 847743 | Miteq |
| ☒ | Preamplifier 0.5-8 GHz | AMF-4D-005080-25-13P | 860149 | Miteq |
| ☒ | Preamplifier 8-18 GHz | ACO/180-3530 | 32641 | CTT |
| ☒ | External Mixer | WM782A | 845881/005 | Tektronix |
| ☒ | Harmonic Mixer Accessories | FS-Z30 | 843389/007 | Rohde & Schwarz |
| ☒ | Trilog broadband antenna | VULB 9163 | 9163-188 | Schwarzbeck |
| ☒ | Horn antenna | 3115 | 9508-4553 | EMCO |
| ☒ | Horn antenna | 3160-03 | 9112-1003 | EMCO |
| ☒ | Horn antenna | 3160-04 | 9112-1001 | EMCO |
| ☒ | Horn antenna | 3160-05 | 9112-1001 | EMCO |
| ☒ | Horn antenna | 3160-06 | 9112-1001 | EMCO |
| ☒ | Horn antenna | 3160-07 | 9112-1008 | EMCO |
| ☒ | Horn antenna | 3160-08 | 9112-1002 | EMCO |
| ☒ | Horn antenna | 3160-09 | 9403-1025 | EMCO |
| ☒ | Horn antenna | 3160-10 | 399185 | EMCO |
| ☒ | Fully anechoic room | No. 2 | 1452 | Albatross Projects |
| ☐ | Semi-anechoic room | No. 3 | 1453 | Siemens |

## 6.5 Radiated Emission at Open Field Test Site

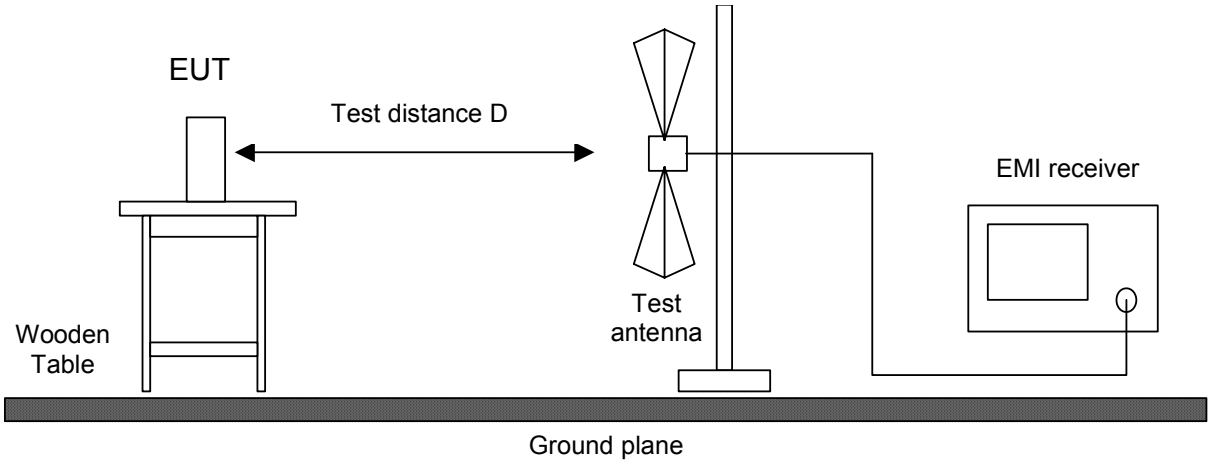
| **Measurement Procedure:** | |
|---|---|
| Rules and specifications: | CFR 47 Part 15, sections 15.109, 15.215(b) and 15.249<br>IC RSS-Gen Issue 2, sections 6(a), 7.2.3.2<br>IC RSS-210 Issue 7, section A2.9 |
| Guide: | ANSI C63.4 |

Radiated emission at open field test site is measured in the frequency range 30 MHz to 1 GHz using a biconical antenna up to 300 MHz and a logarithmic periodic antenna above. The measurement bandwidth of the test receiver is set to 120 kHz with quasi-peak detector selected.

If the radiated emission limits are expressed in terms of the average value of the emission there also is a peak limit corresponding to 20 dB above the maximum permitted average limit. Additionally, if pulsed operation is employed, the average field strength is determined by averaging over one complete pulse train, including blanking intervals, as specified in CFR 47 Part 15 section 15.35(c). If the pulse train exceeds 0.1 second that 0.1 second interval during which the value of the emission is at its maximum is selected for calculation. The pulse train correction is added to the peak value of the emission to get the average value.

Hand-held or body-worn devices are tested in the position producing the highest emission relative to the limit as verified by prescans in the fully anechoic room. EUT is rotated all around and receiving antenna is raised and lowered within 1 meter to 4 meters to find the maximum levels of emission. Equipment and cables are placed and moved within the range of position likely to find their maximum emissions.

For measuring emissions of intentional radiators and receivers a test distance D of 3 meters is selected. Testing of unintentional radiators is performed at a distance of 10 meters. If limits specified for 3 meters shall be used for measurements performed at 10 meters distance the limits are calculated according to CFR 47 Part 15 section 15.31(d) and (f)(1) using an inverse linear-distance extrapolation factor of 20 dB/decade.

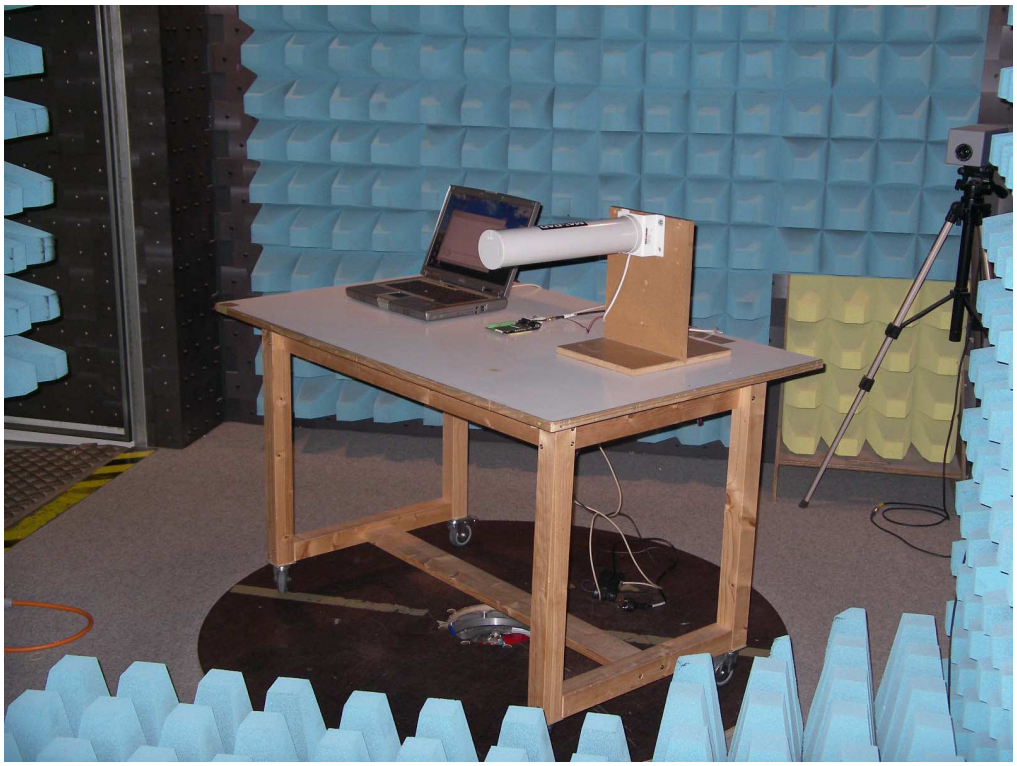


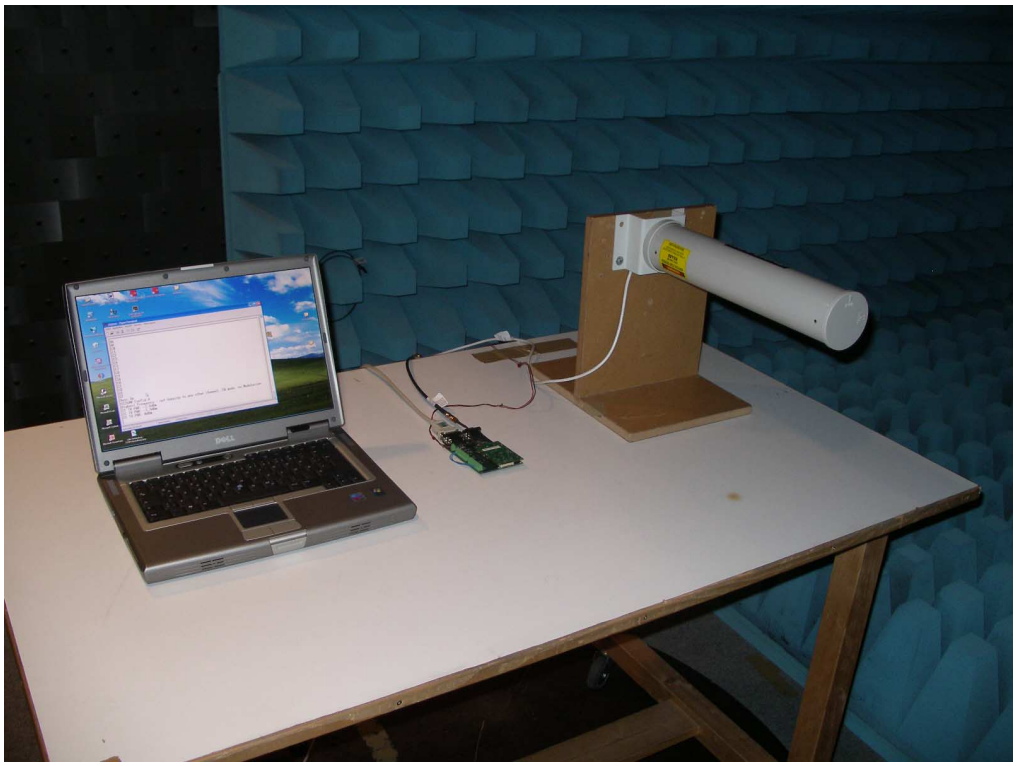

Test instruments used:

| Used | Type | | Model | Serial No. or ID | Manufacturer |
|---|---|---|---|---|---|
| ☒ | EMI receiver | | ESVP | 881120/024 | Rohde & Schwarz |
| ☒ | Biconical antenna | EG 1 | HK 116 | 842204/001 | Rohde & Schwarz |
| ☒ | Log. per. antenna | EG 1 | HL 223 | 841516/023 | Rohde & Schwarz |
| ☒ | Open field test site | | EG 1 | 1450 | Senton |

# 7 Photographs Taken During Testing

## Test setup for radiated emission measurement (fully anechoic room)





# 8 Test Results for Transmitter

| FCC CFR 47 Parts 2 and 15 | | | |
|---|---|---|---|
| *Section(s)* | *Test* | *Page* | *Result* |
| 2.1046(a) | Conducted output power | 26 | Test passed |
| 2.202(a) | Occupied bandwidth | --- | Not applicable |
| 15.204 | Antenna requirement | 22 | Test passed |
| 15.215(c) | Bandwidth of the emission | --- | Not applicable |
| 2.201, 2.202 | Class of emission | --- | Not applicable |
| 15.35(c) | Pulse train measurement for pulsed operation | --- | See Protocol Data Systems Test Report No. 03229 |
| 15.205(a) | Restricted bands of operation | 24 | Test passed |
| 15.247(a)(1)(i) | Channel Bandwidth | --- | Not tested |
| 15.247(a)(1) | Hopping channel separation | --- | Not tested |
| 15.247(a)(1)(i) | Number of hopping frequencies used | --- | Not tested |
| 15.247(a)(1)(i) | Time occupancy on any channel | --- | Not tested |
| 15.247(b)(2) | Maximum peak output power | 26 | Test passed |
| 15.207 | Conducted AC powerline emission<br>150 kHz to 30 MHz | --- | Not applicable |
| 15.205(b)<br>15.247 | Radiated emission<br>9 kHz to 30 MHz | 27 | Test passed |
| 15.205(b)<br>15.215(b)<br>15.247(d) | Radiated emission<br>30 MHz to 26 GHz | 28 | Test passed |
| 15.247(i)<br>2.1093 | RF exposure requirement | 31 | Test passed |

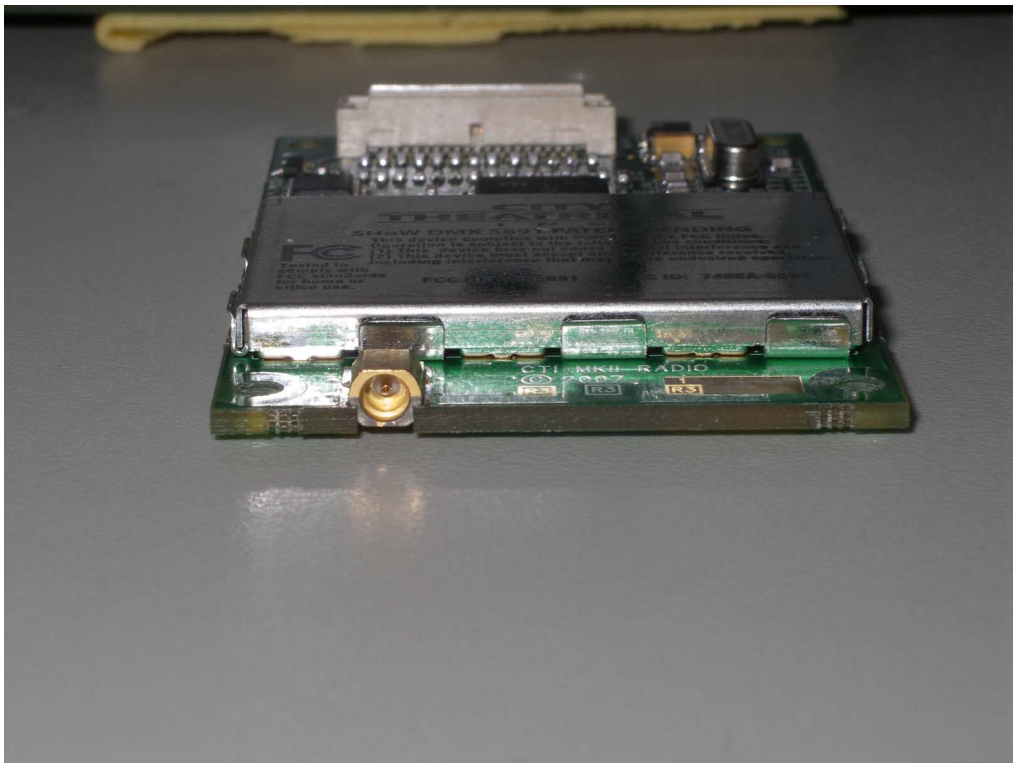
| **IC RSS-Gen Issue 2** | | | |
|---|---|---|---|
| *Section(s)* | *Test* | *Page* | *Result* |
| 4.8 | Transmitter output power (conducted) | 26 | Test passed |
| 4.6.1 | Occupied Bandwidth | --- | Not applicable |
| 3.2(h), 8 | Designation of emissions | --- | Not applicable |
| 4.5 | Pulsed operation | --- | See Protocol Data Systems Test Report No. 03229 |
| 7.2.2 | Transmitter AC power lines conducted emissions 150 kHz to 30 MHz | --- | Not applicable |
| 5.5 | Exposure of Humans to RF Fields | 33 | Exempted from SAR and RF evaluation |

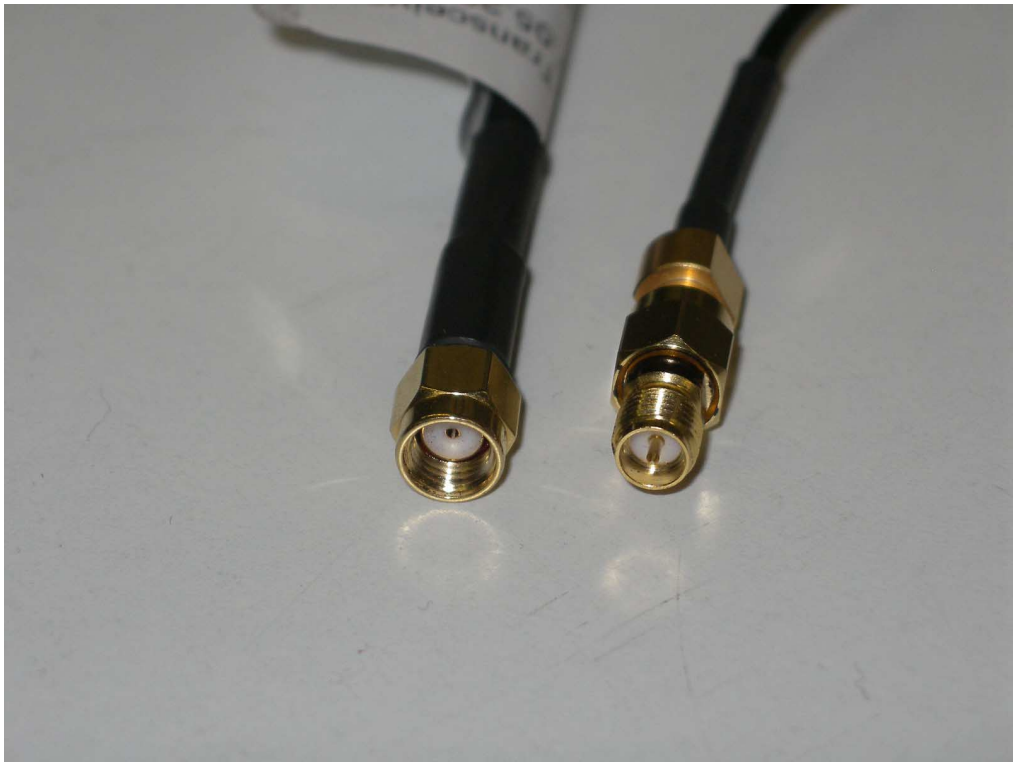
| **IC RSS-210 Issue 7** | | | |
|---|---|---|---|
| *Section(s)* | *Test* | *Page* | *Result* |
| 2.2(a) | Restricted bands and unwanted emission frequencies | 24 | Test passed |
| 7.1.4 | Antenna requirement | 22 | Test passed |
| A8.1(c) | Channel bandwidth | --- | Not tested |
| A8.1(b) | Hopping channel separation | --- | Not tested |
| A8.1(c) | Number of hopping frequencies used | --- | Not tested |
| A8.1(c) | Time occupancy on any channel | --- | Not tested |
| A8.4(1) | Maximum output power | 26 | Test passed |
| 2.2(b)(c)<br>2.6<br>A8.5 | Unwanted emissions<br>9 kHz to 30 MHz | 27 | Test passed |
| 2.2(b)(c)<br>2.6<br>A8.5 | Unwanted emissions<br>30 MHz to 26 GHz | 28 | Test passed |

## Antenna requirement

| | |
|---|---|
| Rules and Specifications: | 15.204 |
| Guide: | --- |
| Limit: | An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this Section. |

| | |
|---|---|
| Test Result | Pass |
| | The UUT employs a MMCX connector and reverse SMA connectors which meets the requirements for an unique antenna coupler |
| | |





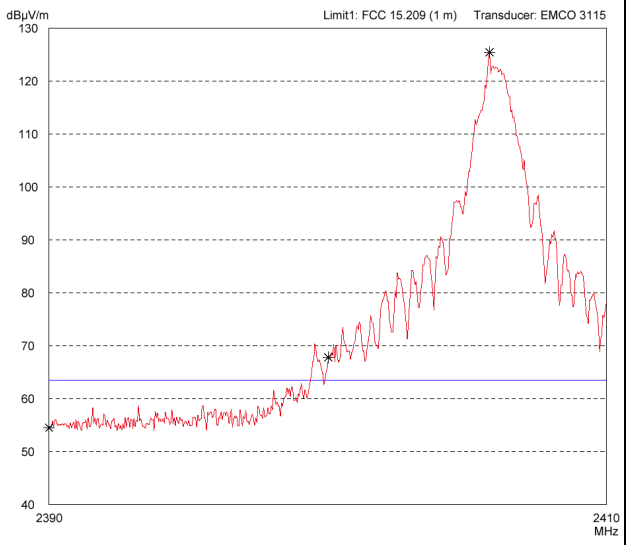
## 8.1 Restricted Bands of Operation

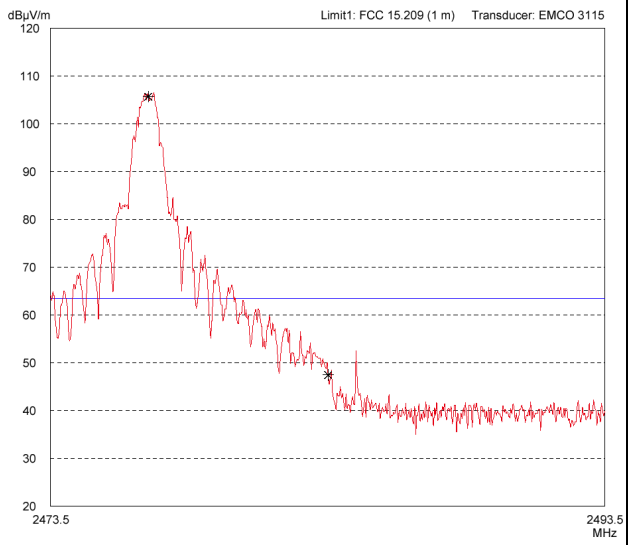
| | |
|---|---|
| Rules and specifications: | CFR 47 Part 15, section 15.205(a)<br>IC RSS-210 Issue 7, section 2.2(a) |
| Guide: | ANSI C63.4 |
| Limit: | Only spurious emissions are permitted in any of the frequency bands listed in CFR 47 Part 15, section 15.205(a) or IC RSS-210 Issue 7, section 2.2(a). |
| Measurement procedure: | Radiated Emission in Fully or Semi Anechoic Room (6.4) |

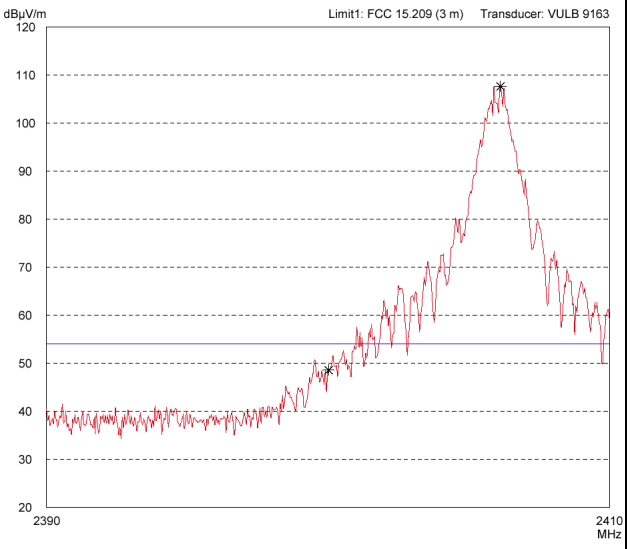
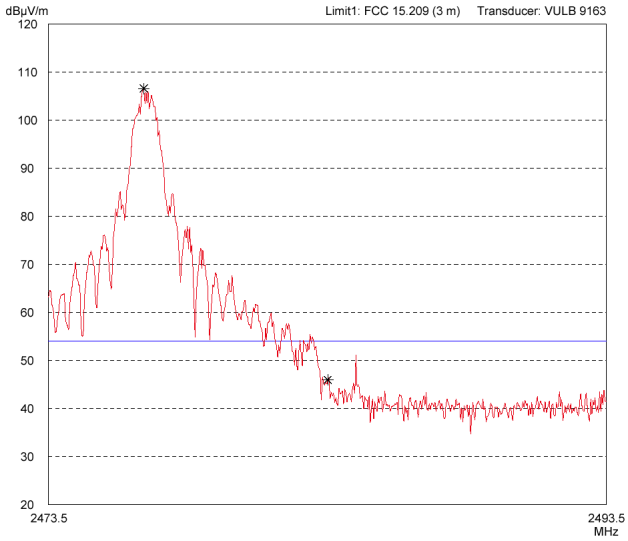
| | |
|---|---|
| Comment: | Radiated Measurement |
| Date of test: | 20 June 2008 |
| Test site: | Fully anechoic room, cabin no. 2 |
| Test distance: | 3 meters |

| | |
|---|---|
| Test Result: | Test passed |

**Antenna MP24012CPLXFPTNF**



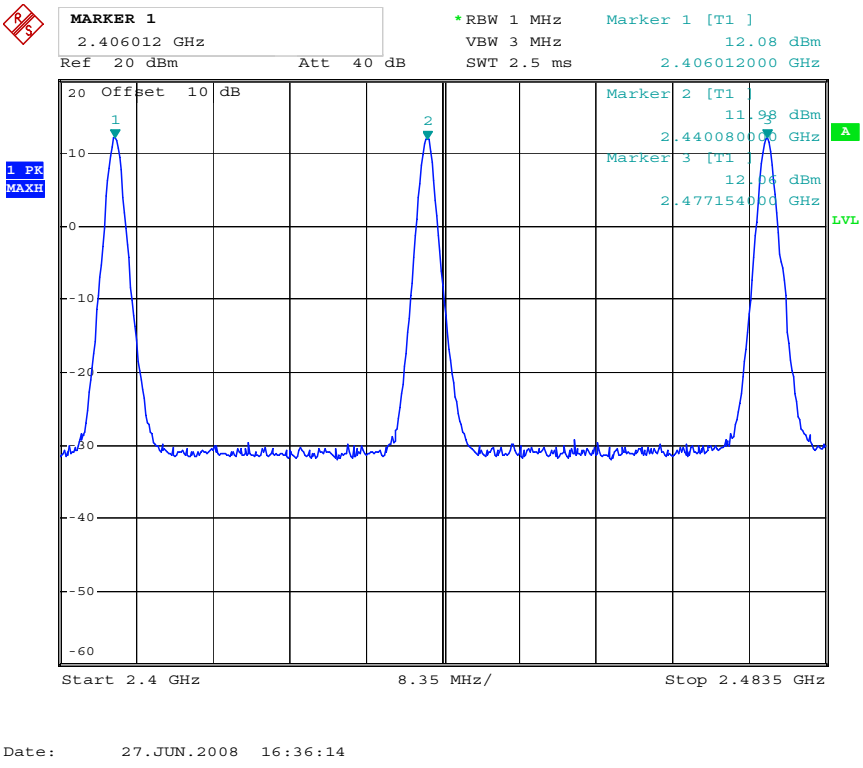
| Antenna MYP24014PTNF | |
|---|---|
|  |  |

## 8.2 Maximum output power

| | |
|---|---|
| Rules and specifications: | CFR 47 Part 15, section 15.247(b)(1)<br>IC RSS-210 Issue 7, section A8.4(1) |
| Guide: | ANSI C63.4 |
| Limit: | For frequency hopping systems operating in the 2400 - 2483.5 MHz band employing at least 75 non-overlapping channels the maximum peak conducted power ist 1 W (30 dBm). For all other frequency hopping systems 0.125 W (21 dBm). |
| Measurement procedure: | Conducted Output Power (6.1) |

| | |
|---|---|
| Comment: | |
| Date of test: | June 20, 2008 |
| Test site: | Fully anechoic room, cabin no. 2 |
| Test distance: | Conducted measurement |

| Frequency (MHz) | Output power (dBm) | Limit (dBm) | Result |
|---|---|---|---|
| 2406 | 12.08 | 21 | Pass |
| 2440 | 11.98 | 21 | Pass |
| 2476 | 12.06 | 21 | Pass |




| | |
|---|---|
| Test Result: | Test passed |

## 8.3 Radiated Emission Measurement 9 kHz to 30 MHz

| | | | | |
|---|---|---|---|---|
| Rules and specifications: | CFR 47 Part 15, sections 15.205 and 15.209<br>IC RSS-210 Issue 7, sections 2.2 and 2.6 | | | |
| Guide: | ANSI C63.4 | | | |
| Limit: | Frequency of Emission (MHz) | Field Strength (µV/m) | Field Strength (dBµV/m) | Measurement Distance d (meters) |
| | 0.009 - 0.490 | 2400/F(kHz) | 67.6 - 20 · log(F(kHz)) | 300 |
| | 0.490 - 1.705 | 24000/F(kHz) | 87.6 - 20 · log(F(kHz)) | 30 |
| | 1.705 - 30.000 | 30 | 29.5 | 30 |
| | Additionally, the level of any unwanted emissions shall not exceed the level of the fundamental emission. | | | |
| Measurement procedure: | Radiated Emission Measurement 9 kHz to 30 MHz (6.3) | | | |

| | |
|---|---|
| Comment: | |
| Date of test: | June 20, 2008 |
| Test site: | Open field test site |

All emissions show more than 20 dB margin to the limit, no values recorded.

| | |
|---|---|
| Test Result: | Test passed |

## 8.4 Radiated Emission Measurement 30 MHz to 26 GHz

| | | | |
|---|---|---|---|
| Rules and specifications: | CFR 47 Part 15, sections 15.215(b) and 15.247<br>IC RSS-210 Issue 7, section A8 | | |
| Guide: | ANSI C63.4 | | |
| Limit: | Frequency of Emission (MHz) | Field Strength (µV/m) | Field Strength (dBµV/m) |
| | 30 - 88 | 100 | 40.0 |
| | 88 - 216 | 150 | 43.5 |
| | 216 - 960 | 200 | 46.0 |
| | Above 960 | 500 | 54.0 |
| | Additionally, the level of any unwanted emissions shall not exceed the level of the fundamental emission. | | |
| Measurement procedures: | Radiated Emission in Fully or Semi Anechoic Room (6.4)<br>Radiated Emission at Open Field Test Site (6.5) | | |

| | |
|---|---|
| Test Result: | Test passed |

| | |
|---|---|
| Comment: | |
| Mode: | Antenna: Maxrad MP24012CPLXFPT |
| Date of test: | June 20, 2008 |
| Test site: | Frequencies ≤ 1 GHz: Open field test site<br>Frequencies > 1 GHz: Fully anechoic room, cabin no. 2 |
| Test distance: | Frequencies ≤ 8.2 GHz: 3 meters<br>Frequencies > 8.2 GHz: 1 meters (results converted for 3 m test distance) |

| Frequency (MHz) | Antenna Polarisation | Meter Reading (dBµV) | Antenna Correction (dB) | Duty Cycle Correction (dB) | Field Strength (dBµV/m) | Limit (dBµV/m) | Margin (dB) |
|---|---|---|---|---|---|---|---|
| 2406.0 | Horizontal | 90.91 | 33.32 | -26.02 | 97.40 | Fundamental | --- |
| 2440.0 | Horizontal | 90.64 | 36.20 | -26.02 | 100.78 | Fundamental | |
| 2476.0 | Horizontal | 89.85 | 36.37 | -26.02 | 100.13 | Fundamental | |
| | | | | | | | |
| **Band Edge Compliance** | | | | | | | |
| 2400,0 | Horizontal | 24.45 | 33.38 | | 57.83 | 77.40 | N.R.B. |
| 2483.5 | Horizontal | -0.71 | 33.59 | | 32.88 | 54.0 | 21.12 |
| **Low channel** | | | | | | | |
| 156.100 | horizontal | 26.07 | 10.18 | | 36.25 | 43.5 | 7.25 |
| 798.240 | horizontal | 14.56 | 22.90 | | 37.46 | 43.5 | 6.04 |
| 2428.000 | horizontal | 29.01 | 33.45 | -26.02 | 36.44 | 54.0 | 17.56 |
| 7230.000 | vertical | 24.43 | 45.99 | -26.02 | 44.40 | 54.0 | 9.60 |
| 9623.800 | vertical | 18.13 | 44.13 | -26.02 | 36.24 | 54.0 | 17.76 |
| **Middle channel** | | | | | | | |
| 158.040 | vertical | 25.05 | 10.27 | | 35.32 | 43.5 | 8.18 |
| 2442.000 | horizontal | 33.83 | 33.48 | -26.02 | 41.29 | 54.0 | 12.71 |
| 7328.000 | vertical | 18.17 | 46.31 | -26.02 | 38.46 | 54.0 | 15.54 |
| 9762.400 | vertical | 12.70 | 44.22 | -26.02 | 30.90 | 54.0 | 23.10 |
| 12206.800 | vertical | 12.54 | 46.11 | -26.02 | 32.63 | 54.0 | 21.37 |
| **High channel** | | | | | | | |
| 158.04 | horizontal | 26.89 | 10.27 | | 37.16 | 43.5 | 6.34 |
| 835.10 | vertical | 16.13 | 23.38 | | 39.51 | 46.0 | 6.49 |
| 2442.000 | horizontal | 28.38 | 33.48 | -26.02 | 35.84 | 54.0 | 18.16 |
| 2498.000 | vertical | 27.76 | 33.63 | -26.02 | 35.37 | 54.0 | 18.63 |
| 9905.200 | vertical | 14.81 | 44.38 | -26.02 | 33,17 | 54.0 | 20.83 |

**Sample calculation of final values:**

Final Value (dBµV/m) = Reading Value (dBµV) + Correction Factor (dB/m) + Pulse Train Correction (dB)

| | |
|---|---|
| Comment: | |
| Mode: | Antenna: Maxrad MYP24014PT |
| Date of test: | June 20, 2008 |
| Test site: | Frequencies ≤ 1 GHz: Open field test site<br>Frequencies > 1 GHz: Fully anechoic room, cabin no. 2 |
| Test distance: | Frequencies ≤ 8.2 GHz: 3 meters<br>Frequencies > 8.2 GHz: 1 meters (results converted for 3 m test distance) |

| Frequency (MHz) | Antenna Polarisation | Meter Reading (dBµV) | Antenna Correction (dB) | Duty Cycle Correction (dB) | Field Strength (dBµV/m) | Limit (dBµV/m) | Margin (dB) |
|---|---|---|---|---|---|---|---|
| 2406.0 | Vertical | 93.5 | 33.32 | -26.02 | 100.8 | Fundamental | |
| 2440.0 | Vertical | 94.0 | 33.48 | -26.02 | 101.46 | Fundamental | |
| 2476.0 | Vertical | 96.0 | 33.57 | -26.02 | 103.55 | Fundamental | |
| | | | | | | | |
| **Band Edge Compliance** | | | | | | | |
| 2400.0 | Horizontal | 12.54 | 36.02 | | 48.56 | 80.8 | N.R.B. |
| 2483.5 | Horizontal | 9.57 | 36.40 | | 45.97 | 54.00 | 8.03 |
| **Low channel** | | | | | | | |
| 159.980 | vertical | 28.69 | 10.35 | | 39.04 | 43.5 | 4.46 |
| 2386.000 | horizontal | 25.43 | 33.34 | -26.02 | 32.75 | 54.0 | 21.25 |
| 7230.000 | vertical | 23.46 | 45.99 | -26.02 | 43.43 | 54.0 | 10.57 |
| 9619.600 | vertical | 16.90 | 44.13 | -26.02 | 35.01 | 54.0 | 18.99 |
| 12030.400 | vertical | 7.00 | 45.98 | -26.02 | 26.96 | 54.0 | 27.04 |
| **Middle channel** | | | | | | | |
| 798.240 | horizontal | 16.91 | 22.90 | | 39.81 | 46.0 | 6.19 |
| 2442.000 | horizontal | 31.42 | 33.48 | -26.02 | 38.88 | 54.0 | 15.12 |
| 7328.000 | horizontal | 12.69 | 46.31 | -26.02 | 32.98 | 54.0 | 21.02 |
| 9762.400 | vertical | 12.32 | 44.22 | -26.02 | 30.52 | 54.0 | 23.48 |
| 12206.800 | vertical | 11.99 | 46.11 | -26.02 | 32.08 | 54.0 | 21.92 |
| **High channel** | | | | | | | |
| 798.240 | vertical | 16.75 | 22.90 | | 39.65 | 46.0 | 6.35 |
| 2470.000 | horizontal | 28.57 | 33.55 | -26.02 | 36.10 | 54.0 | 17.90 |
| 2498.000 | horizontal | 27.66 | 33.63 | -26.02 | 35.27 | 54.0 | 18.73 |
| 7440.000 | vertical | 8.92 | 46.66 | -26.02 | 29.56 | 54.0 | 24.44 |
| 9905.200 | horizontal | 13.03 | 44.38 | -26.02 | 31.39 | 54.0 | 22.61 |

**Sample calculation of final values:**

Final Value (dBµV/m) = Reading Value (dBµV) + Correction Factor (dB/m) + Pulse Train Correction (dB)

## 8.5 RF exposure requirement

Antenna: Maxrad MP24012CPLXFPT

| | |
|---|---|
| Rules and specifications: | CFR 47 Part 15, section 15.247(i)<br>CFR 47 Part 1, sections 1.1307(b)(1) |
| Guide: | OET Bulletin 65, Edition 97-01 |
| Limits: | Limits for general population / uncontrolled exposure |

| Frequency Range (MHz) | Electric Field Strength (E) (V/m) | Magnetic Field Strength (H) (A/m) | Power Density (S) (mW/cm²) | Averaging Time (minutes) |
|---|---|---|---|---|
| 0.3 - 1.34 | 614 | 1.63 | (100)* | 30 |
| 1.34 - 30 | 824 / f | 2.19 / f | (180 / f²)* | 30 |
| 30 - 300 | 27.5 | 0.073 | 0.2 | 30 |
| 300 - 1500 | --- | --- | f/1500 | 30 |
| 1500 - 100000 | --- | --- | 1.0 | 30 |

f = frequency in MHz
* Plane-wave equivalent power density

| **Spectral power density** | | Declared by applicant | Measured |
|---|---|---|---|
| Prediction [5]: | S = P G / 4 π R² | | |
| Where: | S = Power density | | |
| | P = Power input of antenna | | |
| | G = Power gain of the antenna relativ to an isotropic radiator | | |
| | R = Distance to the center of radiation of the antenna | | |
| Maximum output power: | P = 12.08 dBm = 16.14 mW | | ☒ |
| Antenna gain: | G = 12 dBi = 15.84 | ☒ | |
| Prediction distance: | R = 20 cm | | |
| Power density at 20 cm: | **S = 0.05 mW/cm²** | | |

| | |
|---|---|
| Test Result: | Test passed |

[5] MPE Prediction of MPE according to equation from page 19 of OET Bulletin 65, Ed. 97-01

## 8.6 RF exposure requirement

Antenna: Maxrad MYP24014PT

| | |
|---|---|
| Rules and specifications: | CFR 47 Part 15, section 15.247(i)<br>CFR 47 Part 1, sections 1.1307(b)(1) |
| Guide: | OET Bulletin 65, Edition 97-01 |
| Limits: | Limits for general population / uncontrolled exposure |

| Frequency Range (MHz) | Electric Field Strength (E) (V/m) | Magnetic Field Strength (H) (A/m) | Power Density (S) (mW/cm²) | Averaging Time (minutes) |
|---|---|---|---|---|
| 0.3 - 1.34 | 614 | 1.63 | (100)* | 30 |
| 1.34 - 30 | 824 / f | 2.19 / f | (180 / f²)* | 30 |
| 30 - 300 | 27.5 | 0.073 | 0.2 | 30 |
| 300 - 1500 | --- | --- | f/1500 | 30 |
| 1500 - 100000 | --- | --- | 1.0 | 30 |

f = frequency in MHz
* Plane-wave equivalent power density

| **Spectral power density** | | Declared by applicant | Measured |
|---|---|---|---|
| Prediction [6]: | S = P G / 4 π R² | | |
| Where: | S = Power density | | |
| | P = Power input of antenna | | |
| | G = Power gain of the antenna relativ to an isotropic radiator | | |
| | R = Distance to the center of radiation of the antenna | | |
| Maximum output power: | P = 12.08 dBm = 16.14 mW | | ☒ |
| Antenna gain: | G = 14 dBi = 25.11 | ☒ | |
| Prediction distance: | R = 20 cm | | |
| Power density at 20 cm: | **S = 0.08 mW/cm²** | | |

| | |
|---|---|
| Test Result: | Test passed |

[6] MPE Prediction of MPE according to equation from page 19 of OET Bulletin 65, Ed. 97-01

## 8.7 Exposure of Humans to RF Fields

Antenna: Maxrad MP24012CPLXFPT

| | |
|---|---|
| Rules and specifications: | IC RSS-Gen Issue 2, section 5.5 |
| Guide: | IC RSS-102 Issue 2, section 2.5 |

| Exposure of Humans to RF Fields | Applicable | Declared by applicant | Measured | Exemption |
|---|---|---|---|---|
| The antenna is | | | | |
| ☒ detachable | | | | |
| The conducted output power (CP in watts) is measured at the antenna connector: $CP$ = **0.016 W** | | | ☒ | |
| The effective isotropic radiated power (EIRP in watts) is calculated using | | | | |
| ☒ the numerical antenna gain: $G$ = **15.84**; $EIRP = G \cdot CP \Rightarrow EIRP$ = **0.253 W** | | ☒ | | |
| ☐ the field strength[7] in V/m: $FS$ = **..... V/m**; $EIRP = \frac{(FS \cdot D)^2}{30} \Rightarrow EIRP$ = **..... W** | | | ☐ | |
| with: Distance between the antennas in m: $D$ = **..... m** | | | ☐ | |
| ☐ not detachable | | | | |
| A field strength measurement is used to determine the effective isotropic radiated power (EIRP in watts) given by[7]: $EIRP = \frac{(FS \cdot D)^2}{30} \Rightarrow EIRP$ = **..... W** | | | | |
| with: Field strength in V/m: $FS$ = **..... dBµV/m** = **..... V/m** | | | ☐ | |
| Distance between the two antennas in m: $D$ = **..... m** | | | ☐ | |
| Selection of output power | | | | |
| The output power TP is the higher of the conducted or effective isotropic radiated power (e.i.r.p.): $TP$ = **.....W** | | | | |

[7] The conversion formula is valid only for properly matched antennas. In other cases the transmitter output power may have to be measured by a terminated measurement when applying the exemption clauses.
If an open area test site is used for field strength measurement, the effect due to the metal ground reflecting plane should be subtracted from the maximum field strength value in order to reference it to free space, before calculating TP.

| Exposure of Humans to RF Fields (continued) | Applicable | Declared by applicant | Measured | Exemption |
|---|---|---|---|---|
| Separation distance between the user and the transmitting device is | | | | |
| ☐ less than or equal to 20 cm ☒ greater than 20 cm | | ☒ | | |
| Transmitting device is | | | | |
| ☐ in the vicinity of the human head ☐ body-worn | | ☐ | | |
| SAR evaluation | | | | |
| SAR evaluation is required if the separation distance between the user and the device is less than or equal to 20 cm. | | | | |
| ☐ The device operates from 3 kHz up to 1 GHz inclusively and its source-based time-averaged output power is less than, or equal to 200 mW for General Public Use and 1000 mW for Controlled Use. | | | | ☐ |
| ☐ The device operates above 1 GHz up to 2.2 GHz inclusively and its source-based time-averaged output power is less than, or equal to 100 mW for General Public Use and 500 mW for Controlled Use. | | | | ☐ |
| ☐ The device operates above 2.2 GHz up to 3 GHz inclusively and its source-based time-averaged output power is less than, or equal to 20 mW for General Public Use and 100 mW for Controlled Use. | | | | ☐ |
| ☐ The device operates above 3 GHz up to 6 GHz inclusively and its source-based time-averaged output power) is less than, or equal to 10 mW for General Public Use and 50 mW for Controlled Use. | | | | ☐ |
| ☐ SAR evaluation is documented in test report no. ..... | | | | |
| RF exposure evaluation | | | | |
| RF exposure evaluation is required if the separation distance between the user and the device is greater than 20 cm. | | | | |
| ☐ The device operates below 1.5 GHz and its e.i.r.p. is equal to or less than 2.5 W. | | | | ☐ |
| ☒ The device operates at or above 1.5 GHz and the e.i.r.p. of the device is equal to or less than 5 W. | | | | ☒ |
| ☐ RF exposure evaluation is documented in test report no. ..... | | | | |

## 8.8 Exposure of Humans to RF Fields

Antenna: Maxrad MYP24014PT

| | |
|---|---|
| Rules and specifications: | IC RSS-Gen Issue 2, section 5.5 |
| Guide: | IC RSS-102 Issue 2, section 2.5 |

| Exposure of Humans to RF Fields | Applicable | Declared by applicant | Measured | Exemption |
|---|---|---|---|---|
| The antenna is | | | | |
| ☒ detachable | | | | |
| The conducted output power (CP in watts) is measured at the antenna connector: $CP$ = **0.016 W** | | | ☒ | |
| The effective isotropic radiated power (EIRP in watts) is calculated using | | | | |
| ☒ the numerical antenna gain: $G$ = **25.11**; $EIRP = G \cdot CP \Rightarrow EIRP$ = **0.401 W** | | ☒ | | |
| ☐ the field strength[8] in V/m: $FS$ = **..... V/m**; $EIRP = \frac{(FS \cdot D)^2}{30} \Rightarrow EIRP$ = **..... W** | | | ☐ | |
| with: Distance between the antennas in m: $D$ = **..... m** | | | ☐ | |
| ☐ not detachable | | | | |
| A field strength measurement is used to determine the effective isotropic radiated power (EIRP in watts) given by[7]: $EIRP = \frac{(FS \cdot D)^2}{30} \Rightarrow EIRP$ = **..... W**; with: Field strength in V/m: $FS$ = **..... dBµV/m** = **..... V/m**; Distance between the two antennas in m: $D$ = **..... m** | | | ☐ ☐ | |
| Selection of output power | | | | |
| The output power TP is the higher of the conducted or effective isotropic radiated power (e.i.r.p.): $TP$ = **.....W** | | | | |

[8] The conversion formula is valid only for properly matched antennas. In other cases the transmitter output power may have to be measured by a terminated measurement when applying the exemption clauses.
If an open area test site is used for field strength measurement, the effect due to the metal ground reflecting plane should be subtracted from the maximum field strength value in order to reference it to free space, before calculating TP.

| Exposure of Humans to RF Fields (continued) | Applicable | Declared by applicant | Measured | Exemption |
|---|---|---|---|---|
| Separation distance between the user and the transmitting device is | | | | |
| ☐ less than or equal to 20 cm ☐ greater than 20 cm | | ☐ | | |
| Transmitting device is | | | | |
| ☐ in the vicinity of the human head ☐ body-worn | | ☐ | | |
| SAR evaluation | | | | |
| SAR evaluation is required if the separation distance between the user and the device is less than or equal to 20 cm. | | | | |
| ☐ The device operates from 3 kHz up to 1 GHz inclusively and its source-based time-averaged output power is less than, or equal to 200 mW for General Public Use and 1000 mW for Controlled Use. | | | | ☐ |
| ☐ The device operates above 1 GHz up to 2.2 GHz inclusively and its source-based time-averaged output power is less than, or equal to 100 mW for General Public Use and 500 mW for Controlled Use. | | | | ☐ |
| ☐ The device operates above 2.2 GHz up to 3 GHz inclusively and its source-based time-averaged output power is less than, or equal to 20 mW for General Public Use and 100 mW for Controlled Use. | | | | ☐ |
| ☐ The device operates above 3 GHz up to 6 GHz inclusively and its source-based time-averaged output power) is less than, or equal to 10 mW for General Public Use and 50 mW for Controlled Use. | | | | ☐ |
| ☐ SAR evaluation is documented in test report no. ..... | | | | |
| RF exposure evaluation | | | | |
| RF exposure evaluation is required if the separation distance between the user and the device is greater than 20 cm. | | | | |
| ☐ The device operates below 1.5 GHz and its e.i.r.p. is equal to or less than 2.5 W. | | | | ☐ |
| ☒ The device operates at or above 1.5 GHz and the e.i.r.p. of the device is equal to or less than 5 W. | | | | ☐ |
| ☐ RF exposure evaluation is documented in test report no. ..... | | | | |

# 9 Test Results for Receiver

| **FCC CFR 47 Part 15** | | | |
|---|---|---|---|
| *Section(s)* | *Test* | *Page* | *Result* |
| 15.107 | Conducted AC powerline emission<br>150 kHz to 30 MHz | --- | Not applicable |
| 15.109 | Radiated emission<br>30 MHz to 12.5 GHz | 38 | Test passed |
| 15.111(a) | Antenna power conduction emission of receivers<br>9 kHz to 12.5 GHz | --- | Not applicable |

| **IC RSS-Gen Issue 2** | | | |
|---|---|---|---|
| *Section(s)* | *Test* | *Page* | *Result* |
| 7.2.2 | Transmitter AC power lines conducted emissions<br>150 kHz to 30 MHz | --- | Not applicable |
| 6(a), 7.2.3.2 | Receiver spurious emissions (radiated)<br>30 MHz to 12.5 GHz | 38 | Test passed |
| 6(b), 7.2.3.1 | Receiver spurious emissions (antenna conducted)<br>9 kHz to 12.5 GHz | --- | Not applicable |

## 9.1 Radiated Emission Measurement 30 MHz to 12.5 GHz

| | | |
|---|---|---|
| Rules and specifications: | CFR 47 Part 15, section 15.109 (Class B)<br>IC ICES-003 Issue 4, section 5.5 | |
| Guide: | ANSI C63.4 | |
| Limit: | Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated at least 50 dB below the level of the fundamental or to the general radiated emission limits below, whichever is the lesser attenuation | |
| Limit: | Frequency of Emission (MHz) | Field Strength (microvolts/meter) |
| | 30 - 88 | 100 |
| | 88 - 216 | 150 |
| | 216 - 960 | 200 |
| | Above 960 | 500 |
| Measurement procedures: | Radiated Emission in Fully or Semi Anechoic Room (6.4)<br>Radiated Emission at Open Field Test Site (6.5) | |

| | |
|---|---|
| Comment: | |
| Date of test: | June 20, 2008 |
| Mode: | Antenna: Maxrad MP24012CPLXFPT<br>Middle Frequency: 2440 MHz |
| Test site: | Frequencies ≤ 1 GHz: Open field test site<br>Frequencies > 1 GHz: Fully anechoic room, cabin no. 2 |
| Test distance: | 3 meters |

| | |
|---|---|
| Test Result: | Test passed |

| Frequency (MHz) | Detector | Antenna Polarization | Analyzer Reading (dBµV) | Correction Factor (dB/m) | Field Strength (dBµV/m) | Limit (dBµV/m) | Margin (dB) |
|---|---|---|---|---|---|---|---|
| 798.240 | Peak | Vertical | 16.23 | 22.90 | 39.12 | 46.00 | 6.88 |
| 1476.000 | Peak | Vertical | 14.97 | 29.51 | 44.48 | 54.00 | 9.52 |
| 2484.000 | Peak | Vertical | 17.63 | 33.59 | 51.22 | 54.00 | 2.78 |
| 2498.000 | Peak | Vertical | 18.00 | 33.63 | 51.63 | 54.00 | 2.37 |
| 7930.000 | Peak | Vertical | -1.55 | 47.33 | 45.78 | 54.00 | 8.22 |

**Sample calculation of final values:**

Final Value (dBµV/m) = Analyzer Reading (dBµV) + Correction Factor (dB/m)

| | |
|---|---|
| Comment: | |
| Date of test: | June 20, 2008 |
| Mode: | Antenna: Maxrad MYP24014PT<br>Middle Frequency: 2440 MHz |
| Test site: | Frequencies ≤ 1 GHz: Open field test site<br>Frequencies > 1 GHz: Fully anechoic room, cabin no. 2 |
| Test distance: | 3 meters |

| | |
|---|---|
| Test Result: | Test passed |

| Frequency (MHz) | Detector | Antenna Polarization | Analyzer Reading (dBµV) | Correction Factor (dB/m) | Field Strength (dBµV/m) | Limit (dBµV/m) | Margin (dB) |
|---|---|---|---|---|---|---|---|
| 154.16 | Peak | Horizontal | 25.79 | 10.10 | 35.89 | 43.5 | 7.61 |
| 163.860 | Peak | Vertical | 25.86 | 10.48 | 36.34 | 43.5 | 7.16 |
| 299.660 | Peak | Vertical | 23.33 | 15.02 | 38.35 | 46.0 | 7.65 |
| 7440.000 | Peak | Horizontal | -2.54 | 46.66 | 44.12 | 54.0 | 9.88 |
| 7972.000 | Peak | Horizontal | -2.80 | 47.37 | 44.57 | 54.0 | 9.43 |

**Sample calculation of final values:**

Final Value (dBµV/m) = Analyzer Reading (dBµV) + Correction Factor (dB/m)

## 10 Referenced Regulations

All tests were performed with reference to the following regulations and standards:

| | | | |
|---|---|---|---|
| ☒ | CFR 47 Part 2 | Code of Federal Regulations Part 2 (Frequency allocation and radio treaty matters; General rules and regulations) of the Federal Communication Commission (FCC) | October 1, 2006 |
| ☒ | CFR 47 Part 15 | Code of Federal Regulations Part 15 (Radio Frequency Devices) of the Federal Communication Commission (FCC) | May 4, 2007 |
| ☒ | ANSI C63.4 | American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz | December 11, 2003 (published on January 30, 2004) |
| ☒ | RSS-Gen | Radio Standards Specification RSS-Gen Issue 2 containing General Requirements and Information for the Certification of Radiocommunication Equimpment, published by Industry Canada | June 2007 |
| ☒ | RSS-210 | Radio Standards Specification RSS-210 Issue 7 for Low Power Licence-Exempt Radiocommunication Devices (All Frequency Bands): Category I Equipment, published by Industry Canada | June 2007 |
| ☐ | RSS-310 | Radio Standards Specification RSS-310 Issue 1 for Low Power Licence-Ecempt Radiocommunicaton Devices (All Frequency Bands): Category II Equipment, published by Industry Canada | September 2005 |
| ☒ | RSS-102 | Radio Standards Specification RSS-102 Issue 2: Radio Frequency Exposure Compliance of Radiocommunication Apparatus (All Frequency Bands) | November 2005 |
| ☐ | ICES-003 | Interference-Causing Equipment Standard ICES-003 Issue 4 for Digital Apparatus, published by Industry Canada | February 7, 2004 |
| ☒ | CISPR 22 | Third Edition of the International Special Committee on Radio Interference (CISPR), Pub. 22, “Information Technology Equipment – Radio Disturbance Characteristics – Limits and Methods of Measurement” | 1997 |
| ☐ | CAN/CSA-CEI/IEC CISPR 22 | Limits and Methods of Measurement of Radio Disturbance Characteristics of Information Technology Equipment | 2002 |
| ☒ | TRC-43 | Notes Regarding Designation of Emission (Including Necessary Bandwidth and Classification), Class of Station and Nature of Service, published by Industry Canada | October 9, 1982 |

## 11 Revision History

| Revision History | | | |
|---|---|---|---|
| *Edition* | *Date* | *Issued by* | *Modifications* |
| 1 | June 25, 2008 | Johann Roidt (cj) | Edition 1 |

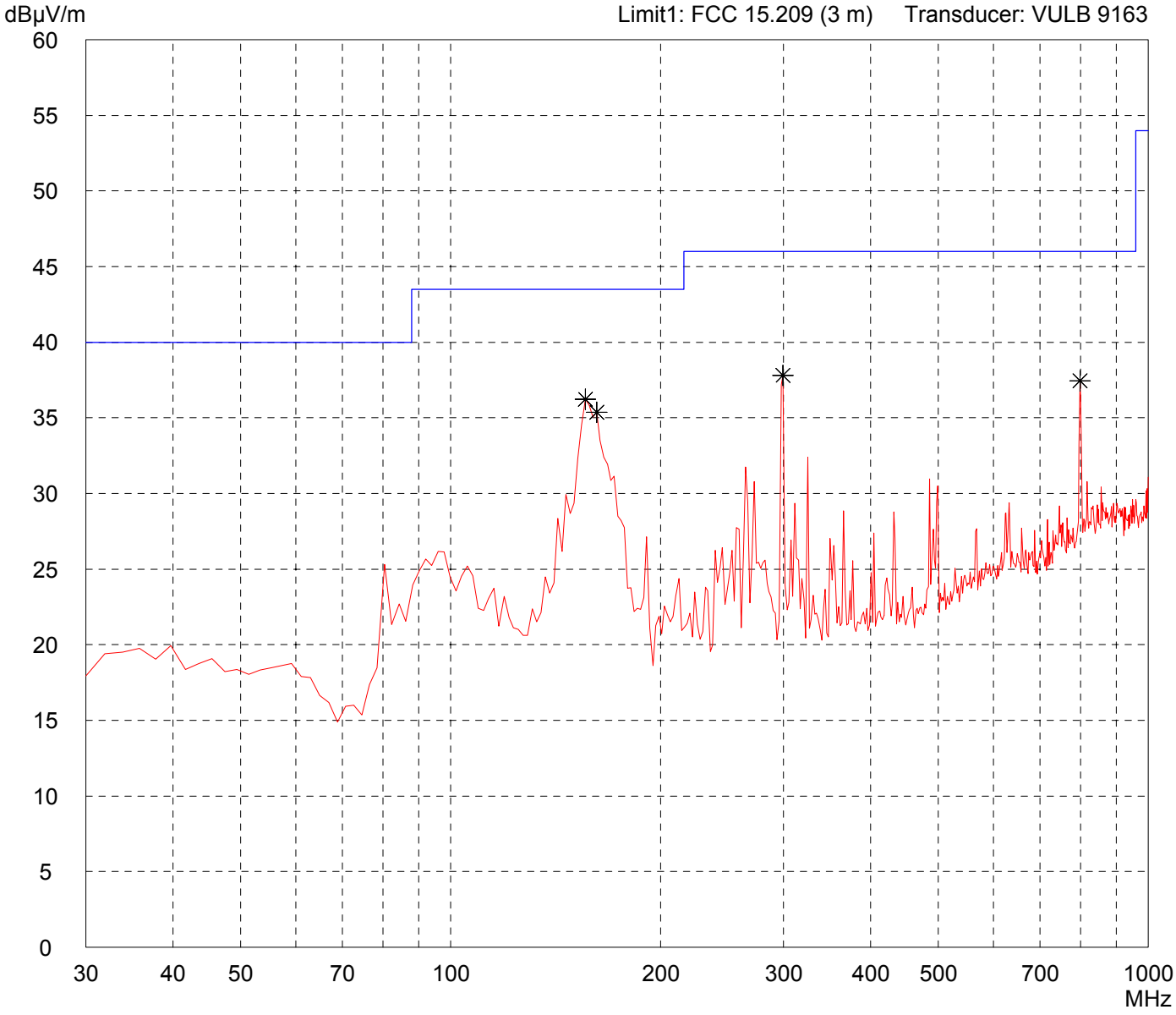
## 12 Charts taken during testing

Three enclosures are attached to this test report:
- Test sheets for ANT-2 tx mode
- Test sheets for ANT-4 tx mode
- Test sheets for ANT-2 and ANT-4 rx mode

# Radiated Emission Test 30 MHz - 1 GHz
# acc. to FCC Part 15 Subpart C (FAR)

| | |
|---|---|
| Model: #5691 SHoW DMX Transceiver | Comment: - with module on test board controlled by DELL laptop PC - DC 5 V power supply - TX mode: lowest channel (2406 MHz) no modulation - Antenna: Maxrad MP24012CPLXFPTNF |
| Serial no.: Test Sample 1 | |
| Applicant: City Theatrical, Inc. | |
| Test site: Fully anechoic room, cabin no. 2 | |
| Tested on: Test distance 3 metres Horizontal Polarization | |
| Date of test: 06/20/2008 / Operator: J. Roidt | |
| Test performed: automatically / File name: default.emi | |

| | |
|---|---|
| Detector: Peak | List of values: 10 dB Margin / 50 Subranges |

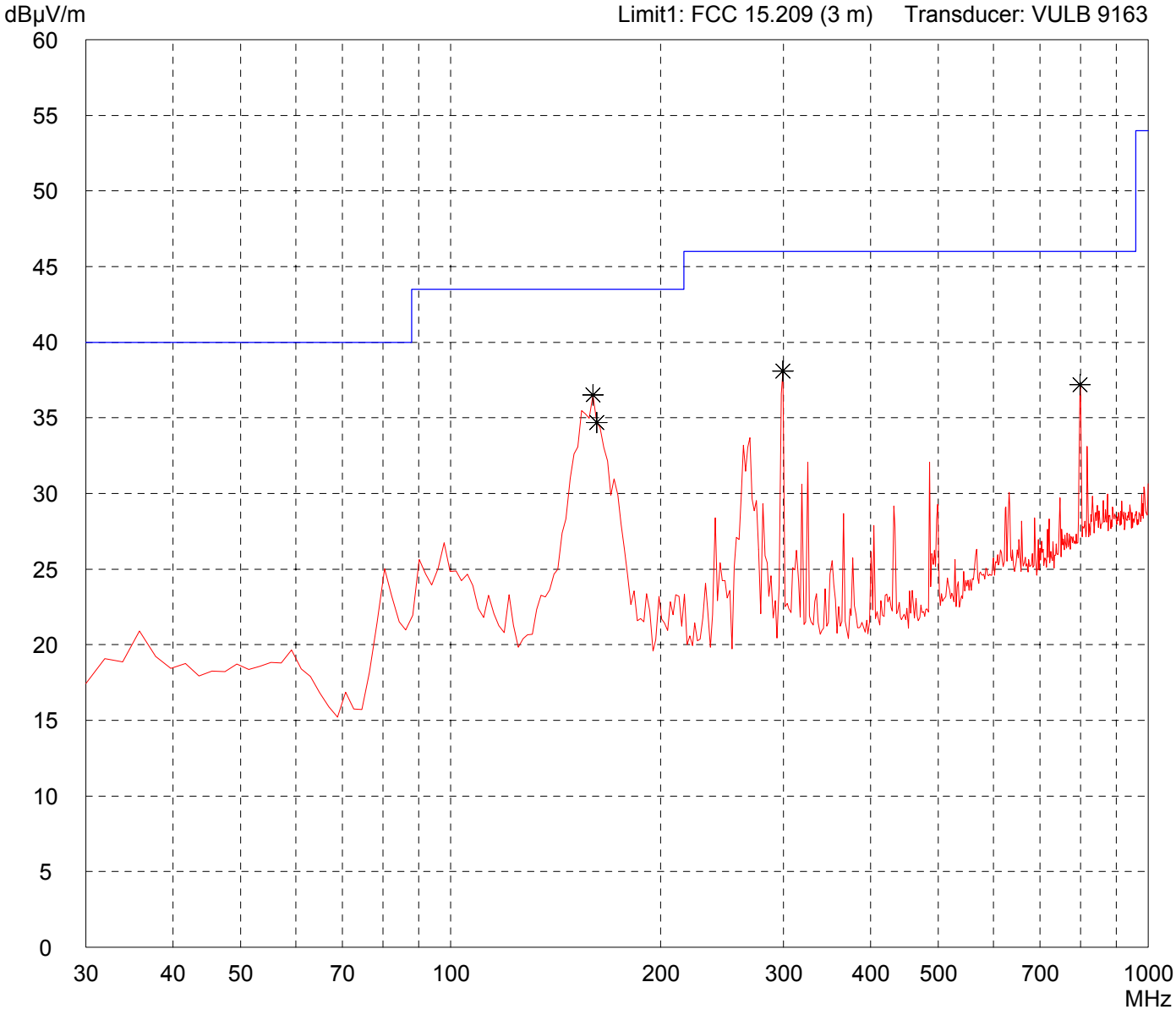



| | |
|---|---|
| Result: Limit kept | Project file: 56113-80538 |

# Radiated Emission Test 30 MHz - 1 GHz
# acc. to FCC Part 15 Subpart C (FAR)

| | |
|---|---|
| Model: #5691 SHoW DMX Transceiver | Comment: - with module on test board controlled by DELL laptop PC - DC 5 V power supply - TX mode: lowest channel (2406 MHz) no modulation - Antenna: Maxrad MP24012CPLXFPTNF |
| Serial no.: Test Sample 1 | |
| Applicant: City Theatrical, Inc. | |
| Test site: Fully anechoic room, cabin no. 2 | |
| Tested on: Test distance 3 metres Vertical Polarization | |
| Date of test: 06/20/2008 / Operator: J. Roidt | |
| Test performed: automatically / File name: default.emi | |

| | |
|---|---|
| Detector: Peak | List of values: 10 dB Margin / 50 Subranges |

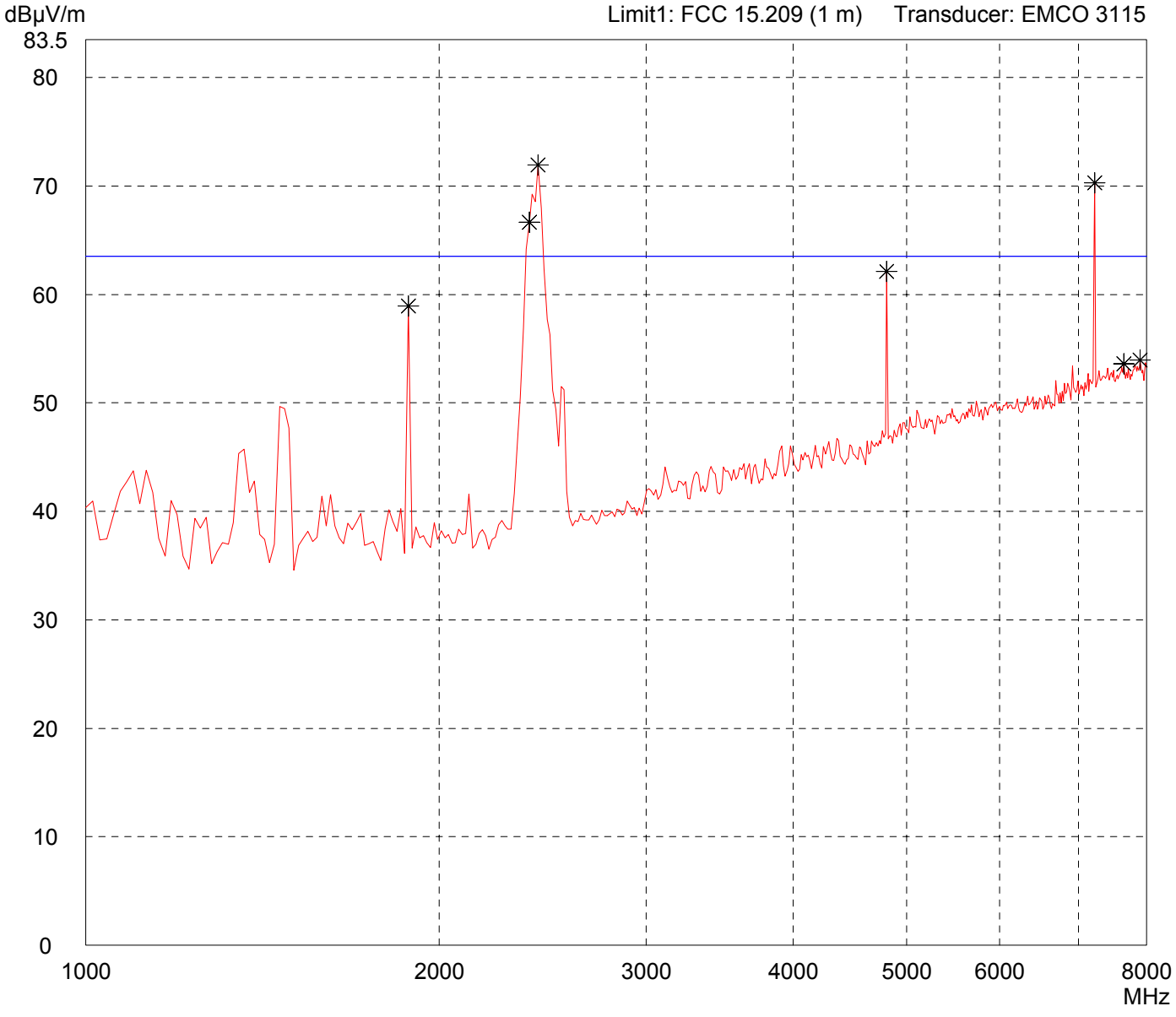



| | |
|---|---|
| Result: Limit kept | Project file: 56113-80538 |

# Radiated Emission Test 1 GHz - 8 GHz
# acc. to FCC Part 15 Subpart C (FAR)

| | |
|---|---|
| Model: #5691 SHoW DMX Transceiver | Comment: |
| Serial no.: Test Sample 1 | - with module on test board controlled by DELL laptop PC<br>- DC 5 V power supply<br>- TX mode:<br>- Lowest channel channel (2406 MHz)<br>- no modulation<br>- Antenna: Maxrad MP24012CPLXFPTNF<br><br>- Notch filter on fundamental frequency |
| Applicant: City Theatrical, Inc. | |
| Test site: Fully anechoic room, cabin no. 2 | |
| Tested on: Test distance 1 metre Horizontal Polarization | |
| Date of test: 06/20/2008 / Operator: J. Roidt | |
| Test performed: automatically / File name: default.emi | |

| | |
|---|---|
| Detector: Peak | List of values: 10 dB Margin / 50 Subranges |

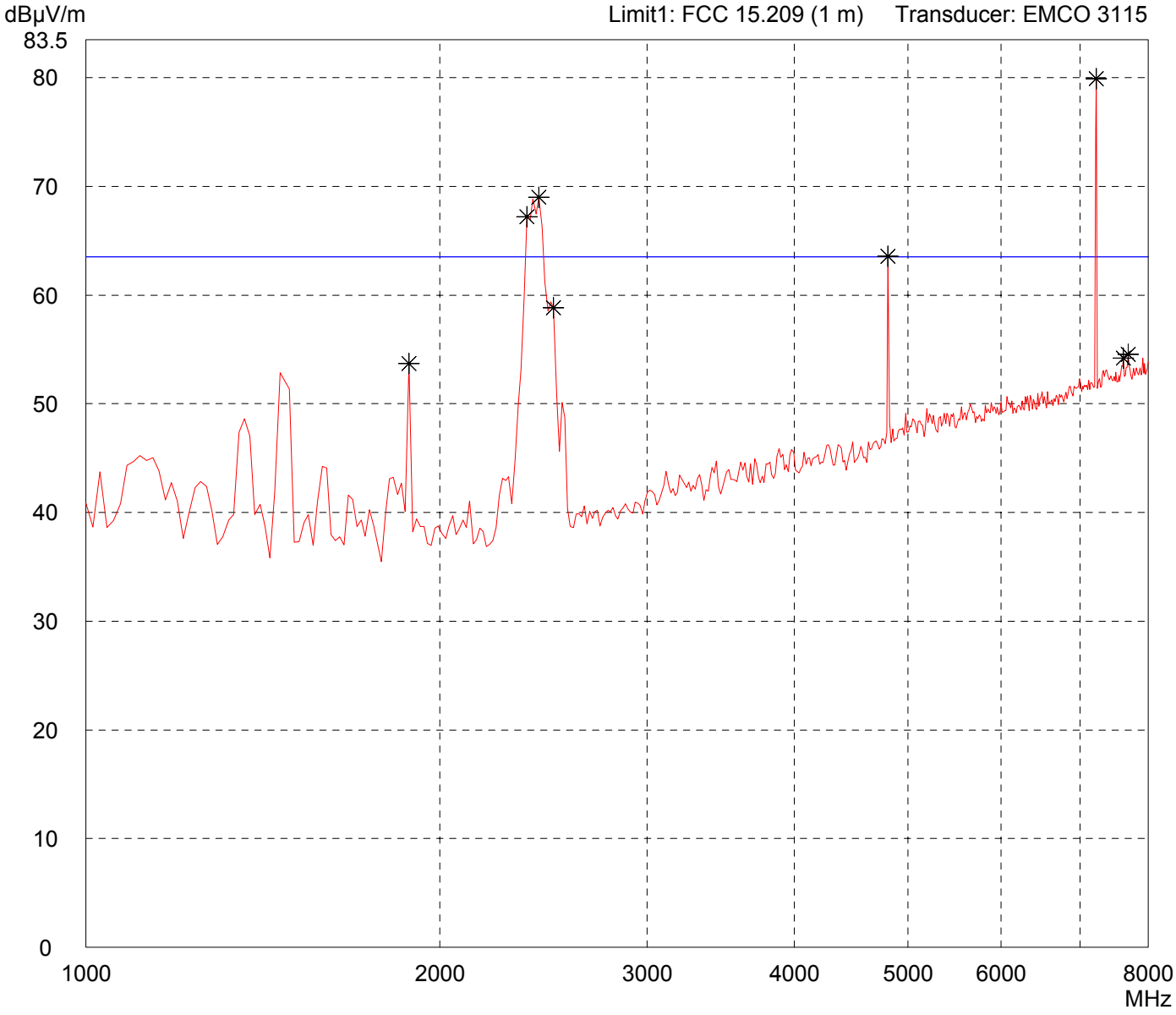



| | |
|---|---|
| Result: Limit kept | Project file: 56113-80538 |

# Radiated Emission Test 1 GHz - 8 GHz
# acc. to FCC Part 15 Subpart C (FAR)

| | |
|---|---|
| Model: #5691 SHoW DMX Transceiver | Comment: |
| Serial no.: Test Sample 1 | - with module on test board controlled by DELL laptop PC<br>- DC 5 V power supply<br>- TX mode:<br>- Lowest channel channel (2406 MHz)<br>- no modulation<br>- Antenna:<br>Maxrad MP24012CPLXFPTNF<br><br>- Notch filter on fundamental frequency |
| Applicant: City Theatrical, Inc. | |
| Test site: Fully anechoic room, cabin no. 2 | |
| Tested on: Test distance 1 metre<br>Vertical Polarization | |
| Date of test: 06/20/2008 / Operator: J. Roidt | |
| Test performed: automatically / File name: default.emi | |

| | |
|---|---|
| Detector: Peak | List of values: 10 dB Margin / 50 Subranges |




| | |
|---|---|
| Result: Limit kept | Project file: 56113-80538 |

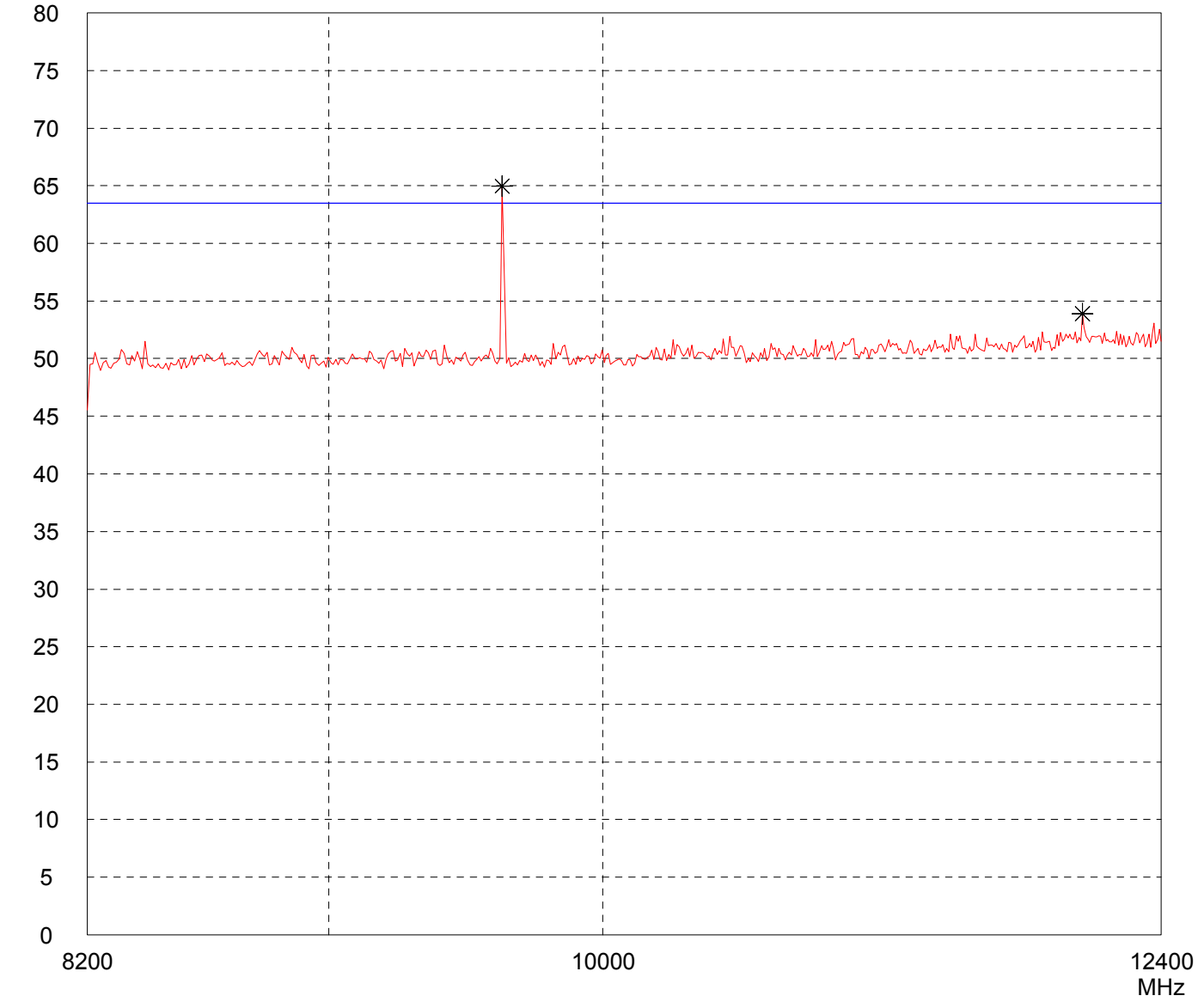
# Radiated Emission Test 8.2 GHz - 12.4 GHz
# acc. to FCC Part 15 Subpart C (FAR)

| | |
|---|---|
| Model: #5691 SHoW DMX Transceiver | Comment: |
| Serial no.: Test Sample 1 | - with module on test board controlled by DELL laptop PC<br>- DC 5 V power supply<br>- TX mode:<br>- Lowest channel channel (2406 MHz)<br>- no modulation<br>- Antenna: Maxrad MP24012CPLXFPTNF<br><br>- Notch filter on fundamental frequency |
| Applicant: City Theatrical, Inc. | |
| Test site: Fully anechoic room, cabin no. 2 | |
| Tested on: Test distance 1 meter Horizontal Polarization | |
| Date of test: 06/20/2008 / Operator: J. Roidt | |
| Test performed: automatically / File name: default.emi | |

| | |
|---|---|
| Detector: Peak | List of values: 10 dB Margin / 50 Subranges |

dBµV/m

Limit1: FCC 15.209 (1 m)  Transducer: EMCO 3160




| | |
|---|---|
| Result: Limit kept | Project file: 56113-80538 |

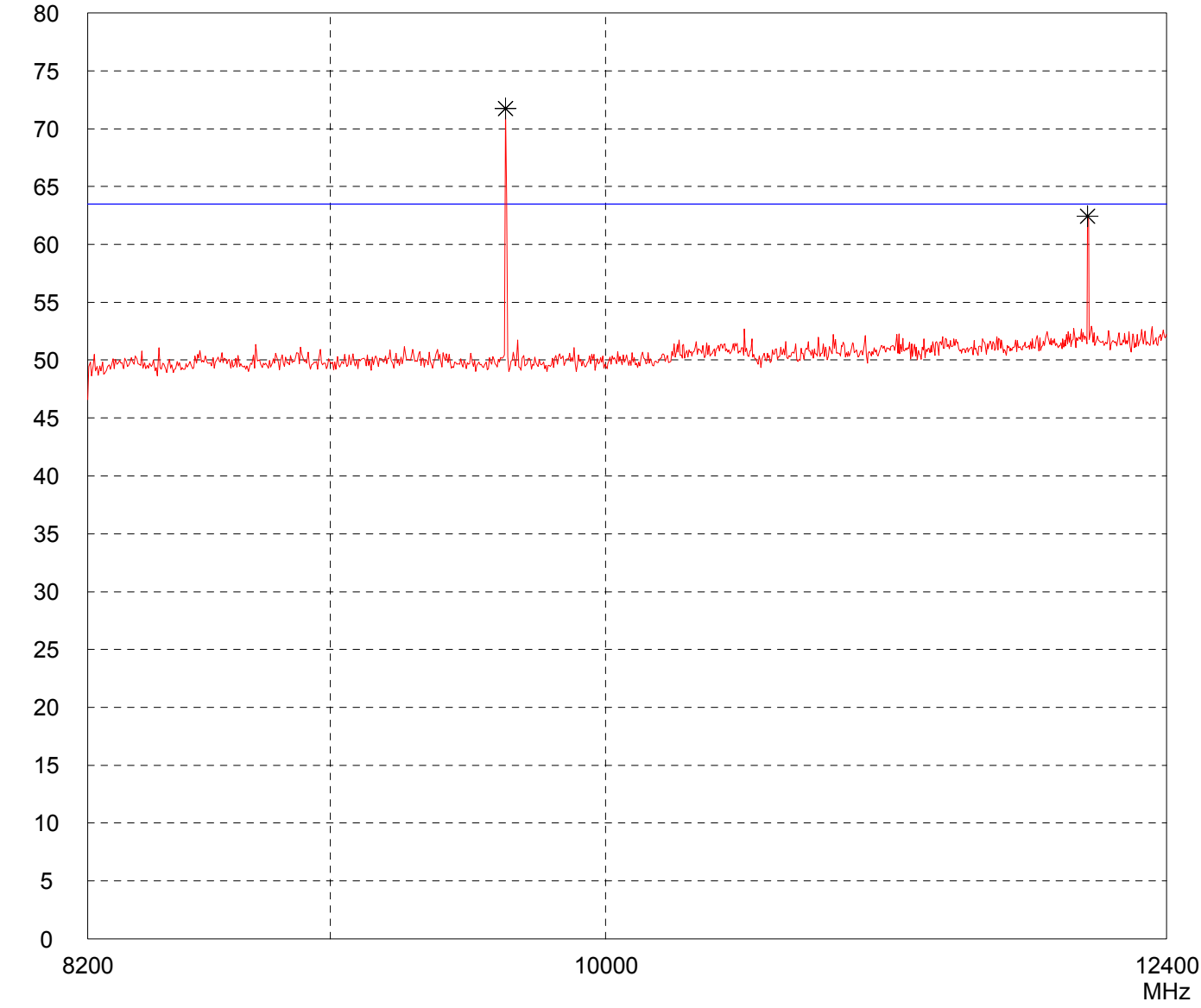
# Radiated Emission Test 8.2 GHz - 12.4 GHz
# acc. to FCC Part 15 Subpart C (FAR)

| | |
|---|---|
| Model: #5691 SHoW DMX Transceiver | Comment: |
| Serial no.: Test Sample 1 | - with module on test board controlled by DELL laptop PC<br>- DC 5 V power supply<br>- TX mode:<br>- Lowest channel channel (2476 MHz)<br>- no modulation<br>- Antenna: Maxrad MP24012CPLXFPTNF<br><br>- Notch filter on fundamental frequency |
| Applicant: City Theatrical, Inc. | |
| Test site: Fully anechoic room, cabin no. 2 | |
| Tested on: Test distance 1 meter<br>Vertical Polarization | |
| Date of test: 06/20/2008 / Operator: J. Roidt | |
| Test performed: automatically / File name: default.emi | |

| | |
|---|---|
| Detector: Peak | List of values: 10 dB Margin / 50 Subranges |

dBµV/m

Limit1: FCC 15.209 (1 m)  Transducer: EMCO 3160




| | |
|---|---|
| Result: Limit kept | Project file: 56113-80538 |

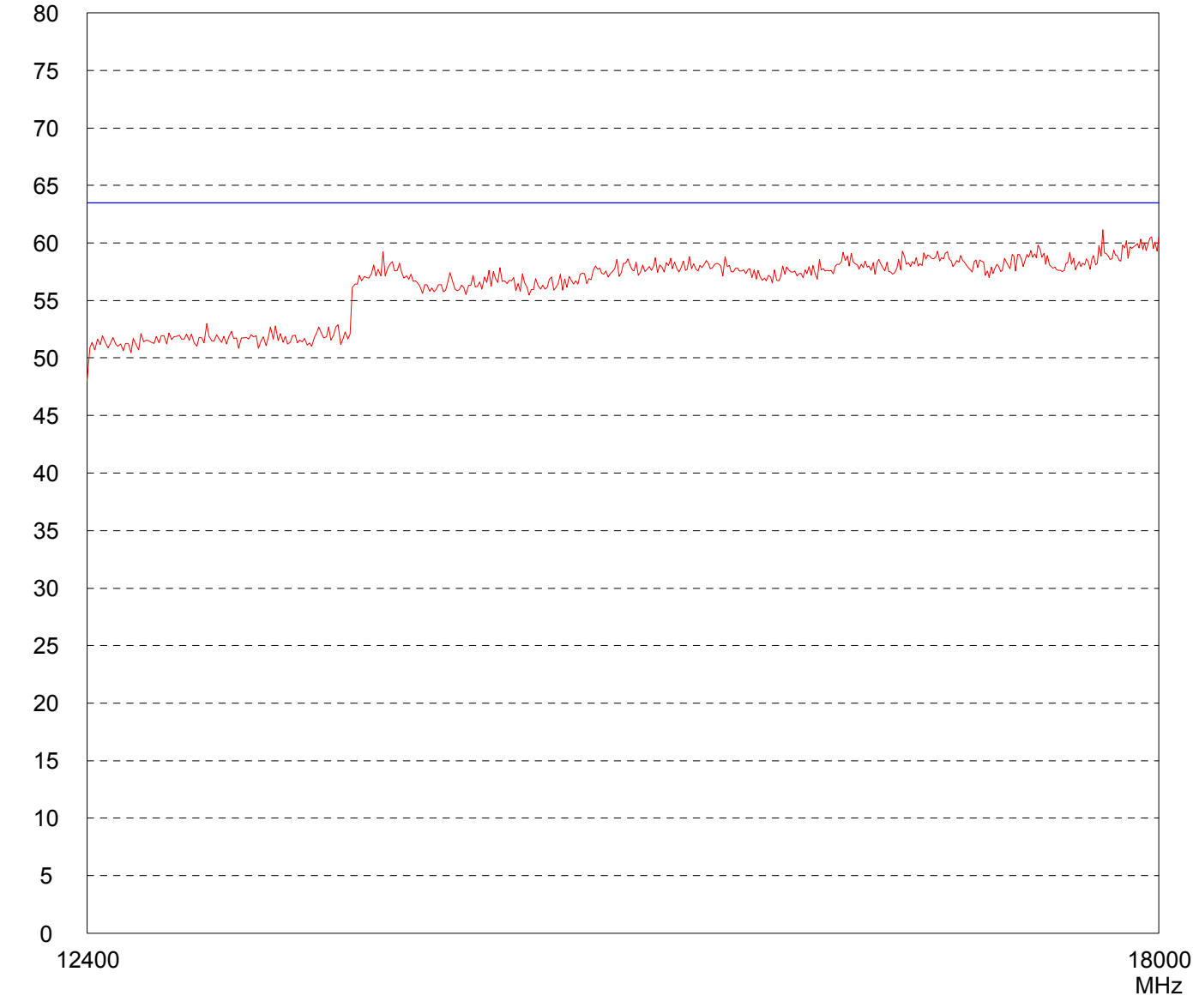
# Radiated Emission Test 12.4 GHz - 18 GHz
# acc. to FCC Part 15 Subpart C (FAR)

| | |
|---|---|
| Model: #5691 SHoW DMX Transceiver | Comment: |
| Serial no.: Test Sample 1 | - with module on test board controlled by DELL laptop PC<br>- DC 5 V power supply<br>- TX mode:<br>- Lowest channel channel (2406 MHz)<br>- no modulation<br>- Antenna:<br>Maxrad MP24012CPLXFPTNF<br><br>- Notch filter on fundamental frequency |
| Applicant: City Theatrical, Inc. | |
| Test site: Fully anechoic room, cabin no. 2 | |
| Tested on: Test distance 1 meter<br>Vertical Polarization | |
| Date of test: 06/20/2008 / Operator: J. Roidt | |
| Test performed: by hand / File name: default.emi | |

| | |
|---|---|
| Detector: Peak | List of values: Selected by hand |

dBµV/m

Limit1: FCC 15.209 (1 m) Transducer: EMCO 3160




| | |
|---|---|
| Result: Limit kept | Project file: 56113-80538 |

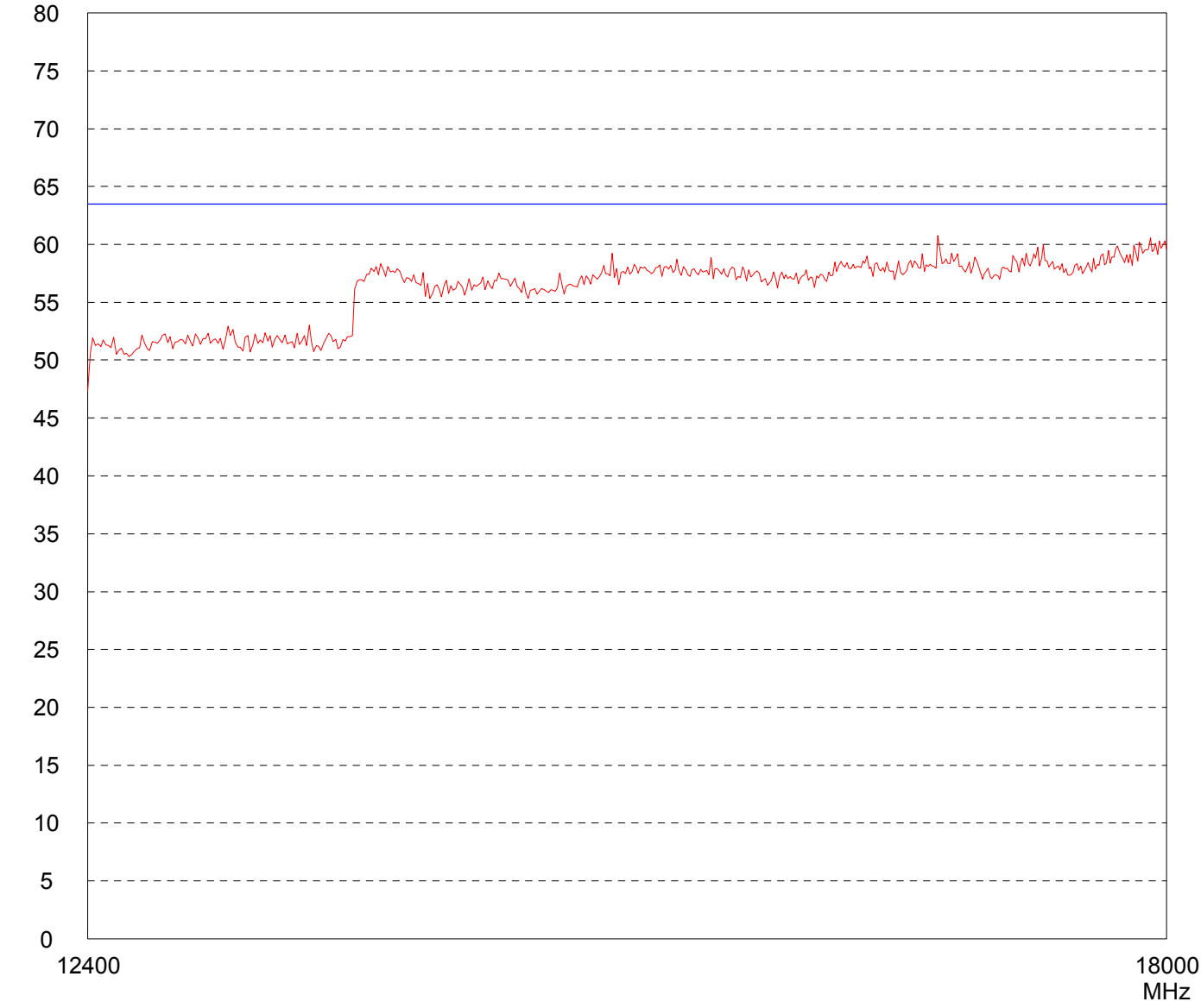
# Radiated Emission Test 12.4 GHz - 18 GHz
# acc. to FCC Part 15 Subpart C (FAR)

| | |
|---|---|
| Model: #5691 SHoW DMX Transceiver | Comment: |
| Serial no.: Test Sample 1 | - with module on test board controlled by DELL laptop PC<br>- DC 5 V power supply<br>- TX mode:<br>- Lowest channel channel (2476 MHz)<br>- no modulation<br>- Antenna: Maxrad MP24012CPLXFPTNF<br><br>- Notch filter on fundamental frequency |
| Applicant: City Theatrical, Inc. | |
| Test site: Fully anechoic room, cabin no. 2 | |
| Tested on: Test distance 1 meter Horizontal Polarization | |
| Date of test: 06/20/2008 / Operator: J. Roidt | |
| Test performed: by hand / File name: default.emi | |

| | |
|---|---|
| Detector: Peak | List of values: Selected by hand |

dBµV/m

Limit1: FCC 15.209 (1 m) Transducer: EMCO 3160




| | |
|---|---|
| Result: Limit kept | Project file: 56113-80538 |

# Spurious emissions according to FCC Rules

| | |
|---|---|
| Model: | Mode: |
| Serial No.: | - with module on test board, controlled by DELL laptop PC<br>- DC 5 V power supply<br>- TX mode:<br>- Lowest channel (2406 MHz)<br>- no modulation<br>- Antenna:<br>Maxrad MP24012CPLXFPTNF<br><br>Test distance 1 m , reading without antenna correction |
| Applicant:<br>City Theatrical, Inc. | |
| | |
| | |
| | |
| | |

Ref.Level 87 dBµV ATT 0 dB
10 dB/Div.


Start 18.000 GHz Stop 26.500 GHz
RBW 100 kHz VBW 100 kHz SWP 2.60 s

| | |
|---|---|
| Tested by:<br>Johann Roidt | Project-No.:<br>56113-080538 |
| Date:<br>20 June 2008 | |

# Radiated Emission Test 30 MHz - 1 GHz
# acc. to FCC Part 15 Subpart C (FAR)

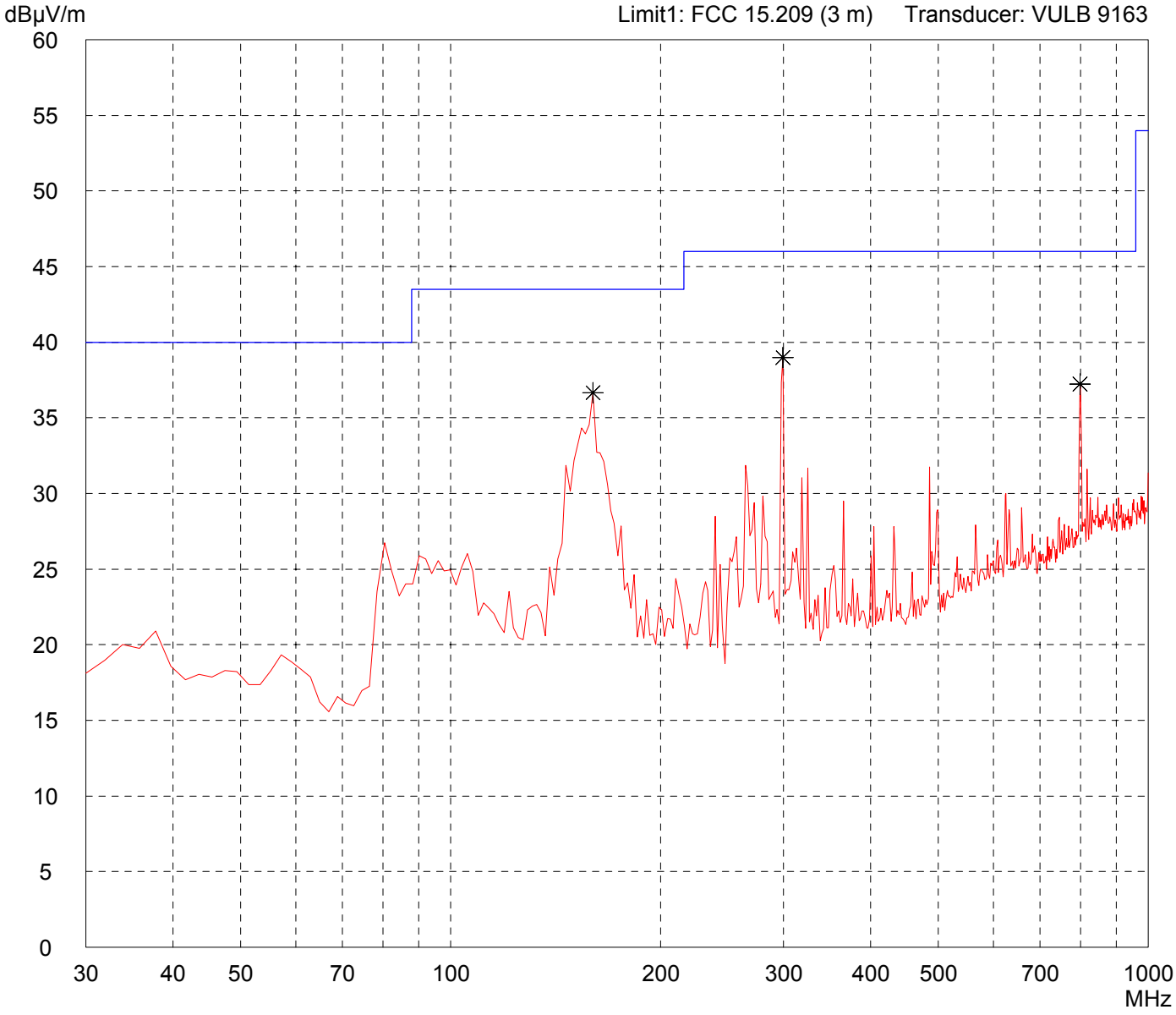
| | |
|---|---|
| Model: | #5691 SHoW DMX Transceiver |
| Serial no.: | Test Sample 1 |
| Applicant: | City Theatrical, Inc. |
| Test site: | Fully anechoic room, cabin no. 2 |
| Tested on: | Test distance 3 metres<br>Horizontal Polarization |
| Date of test: / Operator: | 06/20/2008 / J. Roidt |
| Test performed: / File name: | automatically / default.emi |

Comment:

- with module on test board controlled by DELL laptop PC
- DC 5 V power supply
- TX mode:
- Middle channel (2440 MHz) no modulation
- Antenna: Maxrad MP24012CPLXFPTNF

Detector: Peak

List of values: 10 dB Margin 50 Subranges




Result: Limit kept

Project file: 56113-80538

# Radiated Emission Test 30 MHz - 1 GHz
# acc. to FCC Part 15 Subpart C (FAR)

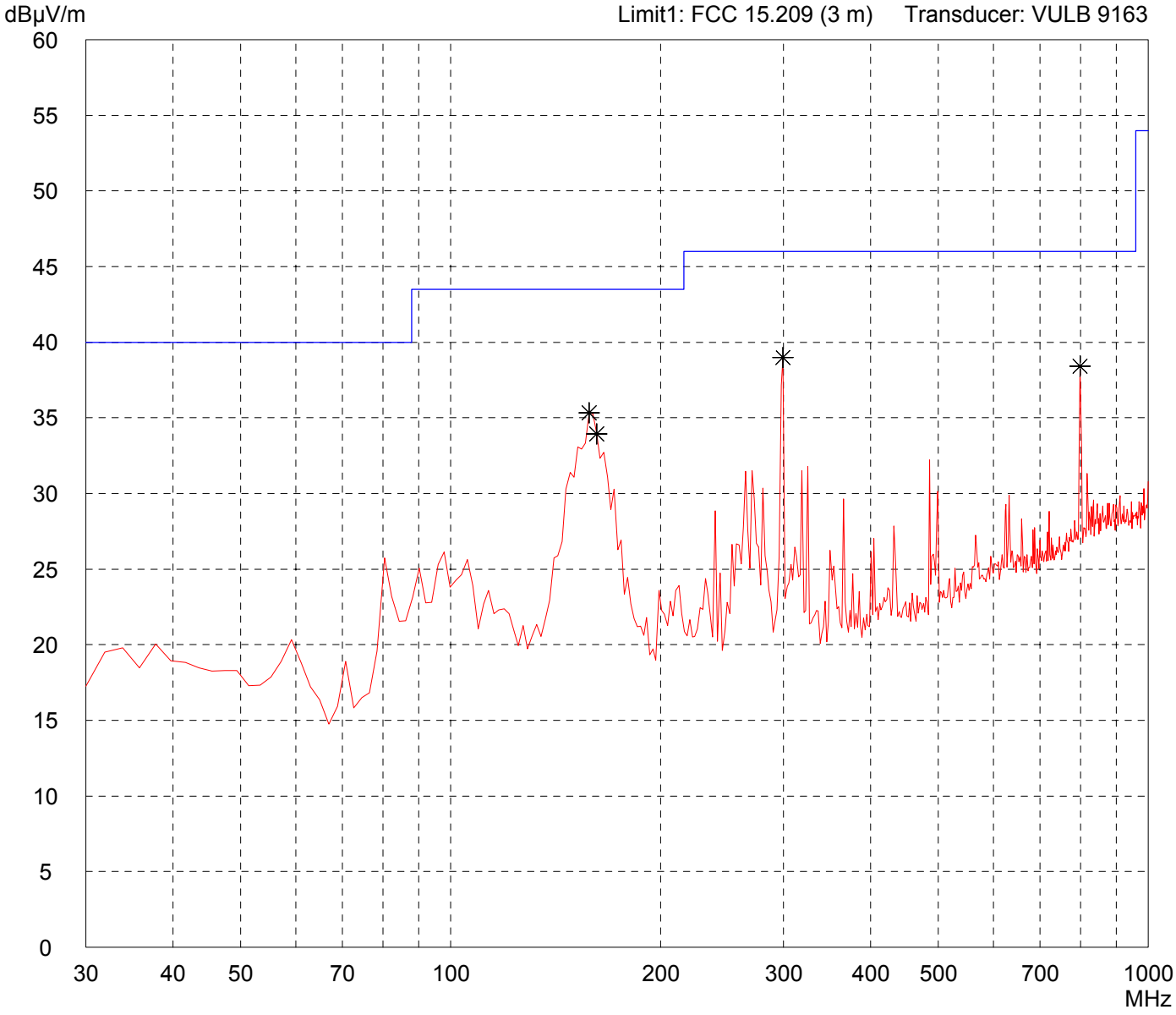
| | |
|---|---|
| Model: | #5691 SHoW DMX Transceiver |
| Serial no.: | Test Sample 1 |
| Applicant: | City Theatrical, Inc. |
| Test site: | Fully anechoic room, cabin no. 2 |
| Tested on: | Test distance 3 metres<br>Vertical Polarization |
| Date of test: / Operator: | 06/20/2008 / J. Roidt |
| Test performed: / File name: | automatically / default.emi |

Comment:

- with module on test board controlled by DELL laptop PC
- DC 5 V power supply
- TX mode:
- Middle channel (2440 MHz) no modulation
- Antenna: Maxrad MP24012CPLXFPTNF

Detector: Peak

List of values: 10 dB Margin 50 Subranges



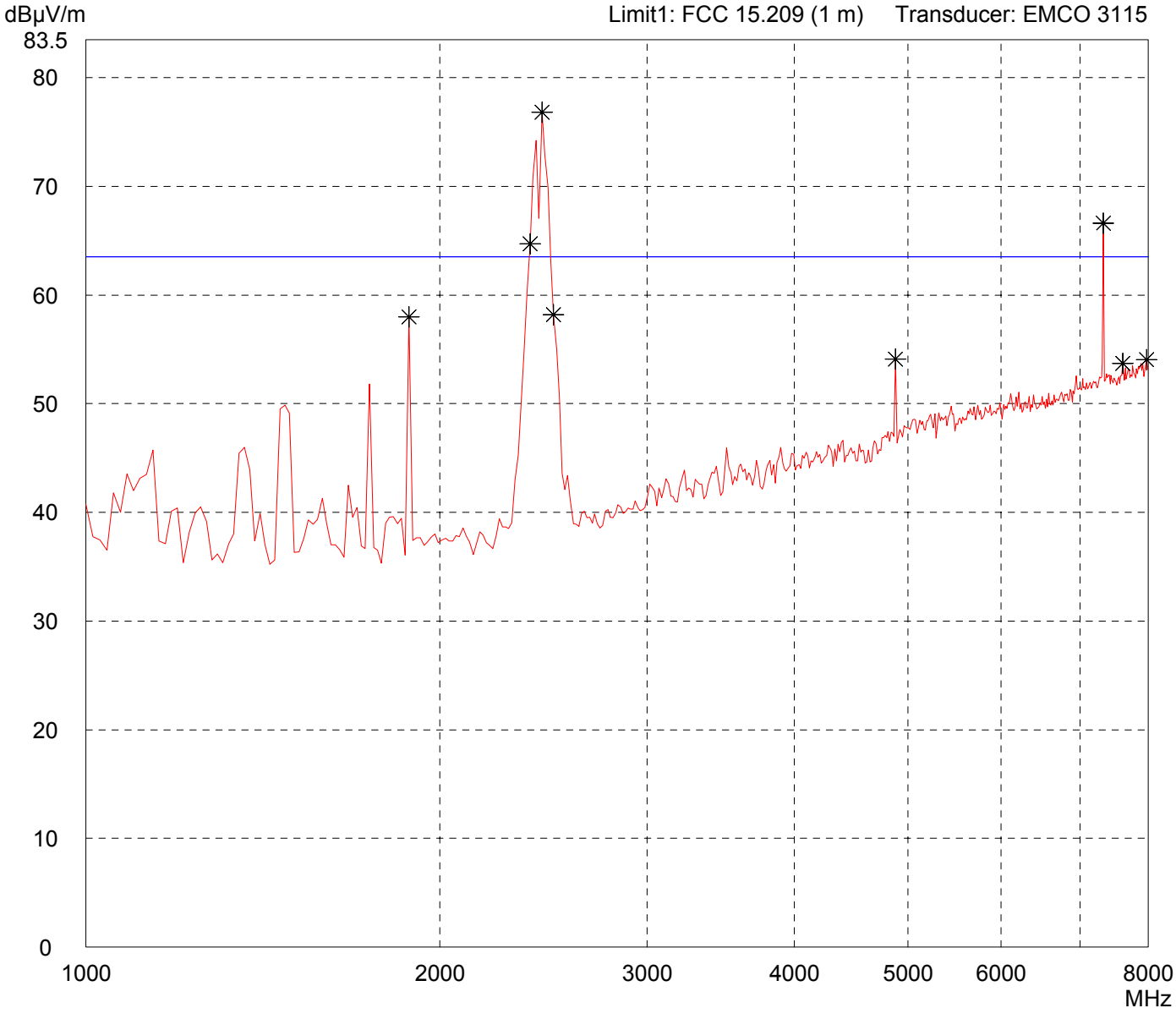

Result: Limit kept

Project file: 56113-80538

# Radiated Emission Test 1 GHz - 8 GHz
# acc. to FCC Part 15 Subpart C (FAR)

| | |
|---|---|
| Model: #5691 SHoW DMX Transceiver | Comment: |
| Serial no.: Test Sample 1 | - with module on test board controlled by DELL laptop PC<br>- DC 5 V power supply<br>- TX mode:<br>- Middle channel channel (2440 MHz)<br>- no modulation<br>- Antenna:<br>Maxrad MP24012CPLXFPTNF<br><br>- Notch filter on fundamental frequency |
| Applicant: City Theatrical, Inc. | |
| Test site: Fully anechoic room, cabin no. 2 | |
| Tested on: Test distance 1 metre<br>Horizontal Polarization | |
| Date of test: 06/20/2008 / Operator: J. Roidt | |
| Test performed: automatically / File name: default.emi | |

| | |
|---|---|
| Detector: Peak | List of values: 10 dB Margin / 50 Subranges |

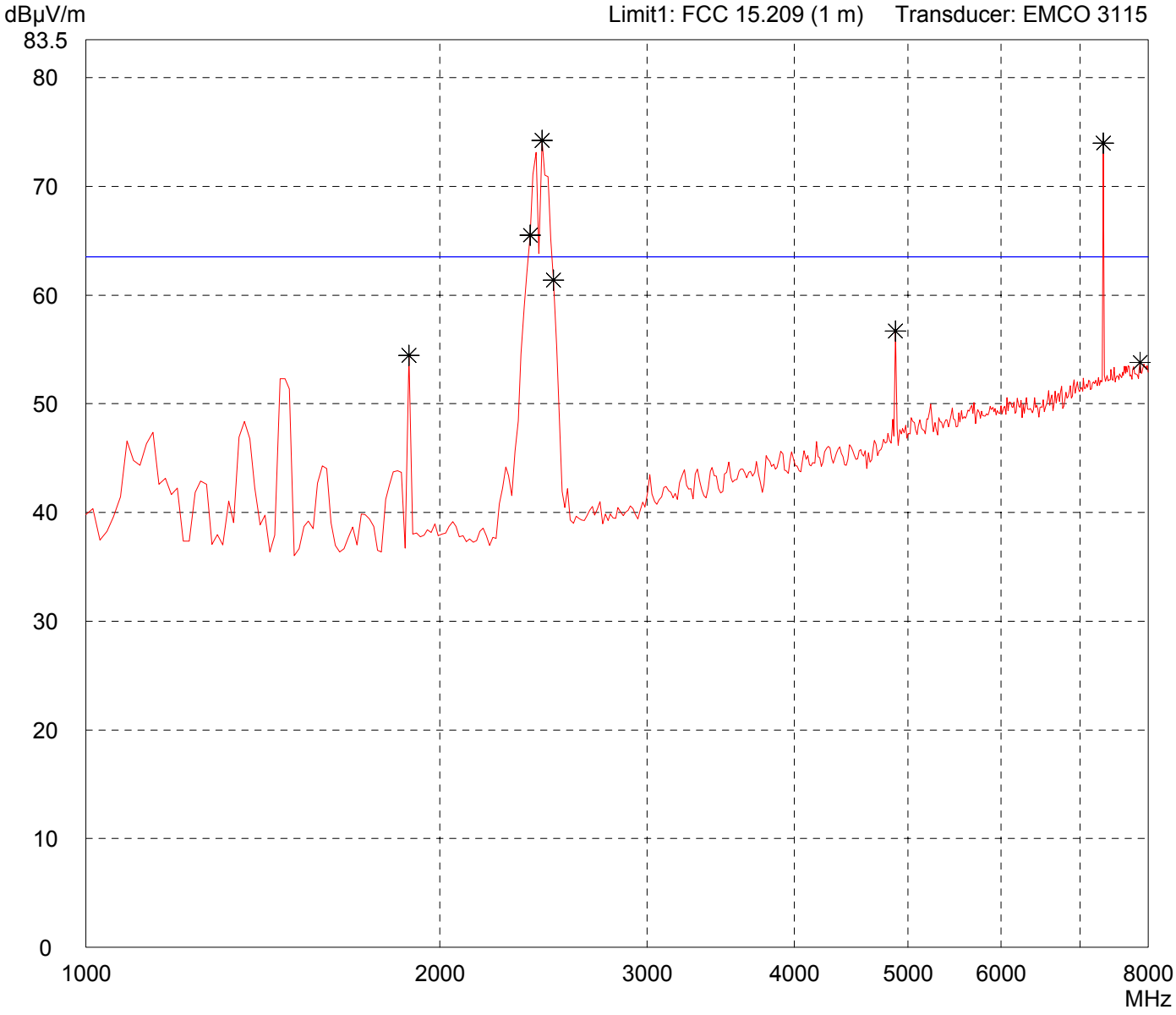



| | |
|---|---|
| Result: Limit kept | Project file: 56113-80538 |

# Radiated Emission Test 1 GHz - 8 GHz
# acc. to FCC Part 15 Subpart C (FAR)

| | |
|---|---|
| Model: #5691 SHoW DMX Transceiver | Comment: |
| Serial no.: Test Sample 1 | - with module on test board controlled by DELL laptop PC<br>- DC 5 V power supply<br>- TX mode:<br>- Middle channel channel (2440 MHz)<br>- no modulation<br>- Antenna:<br>Maxrad MP24012CPLXFPTNF<br><br>- Notch filter on fundamental frequency |
| Applicant: City Theatrical, Inc. | |
| Test site: Fully anechoic room, cabin no. 2 | |
| Tested on: Test distance 1 metre<br>Vertical Polarization | |
| Date of test: 06/20/2008 / Operator: J. Roidt | |
| Test performed: automatically / File name: default.emi | |

| | |
|---|---|
| Detector: Peak | List of values: 10 dB Margin / 50 Subranges |

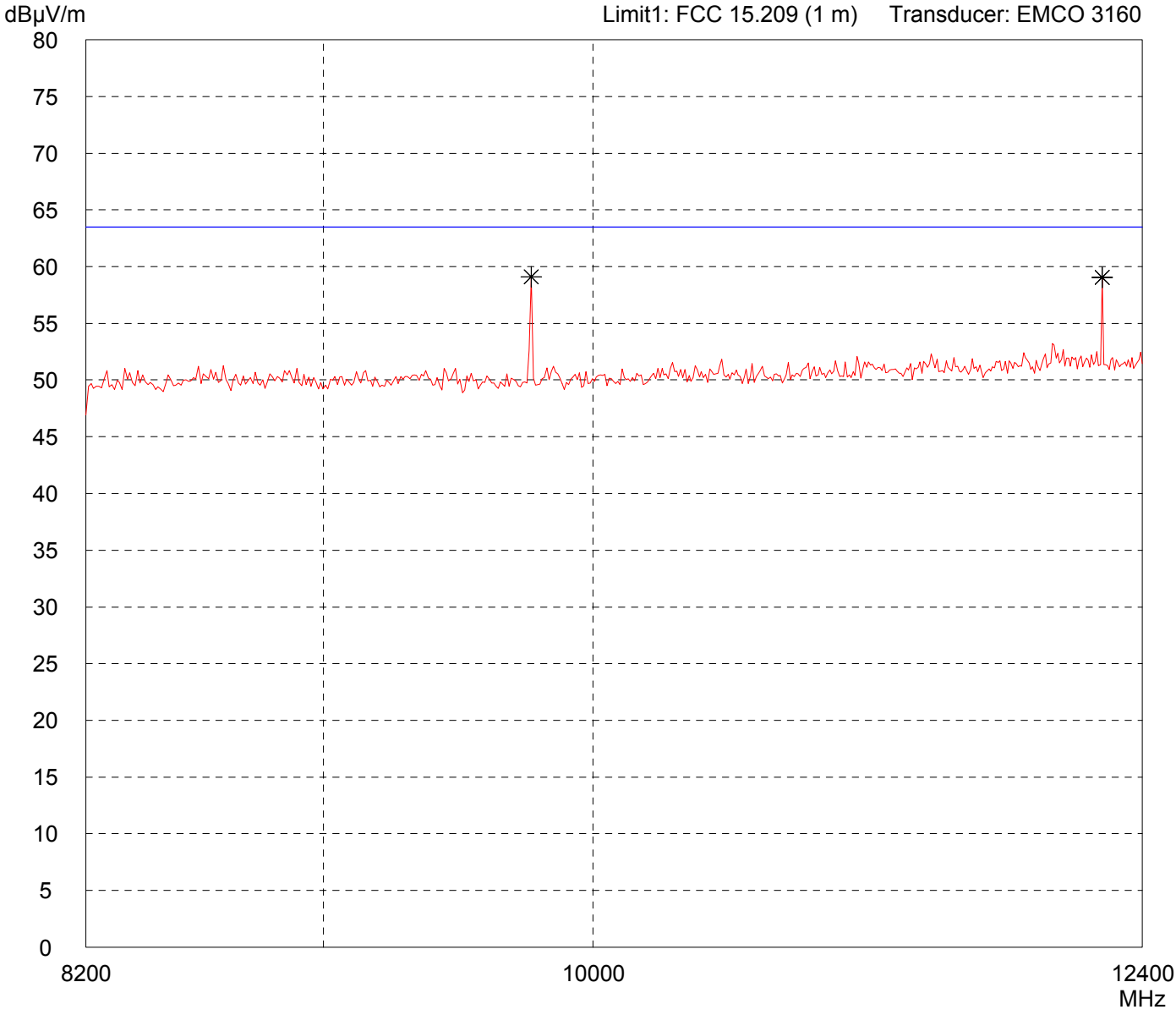



| | |
|---|---|
| Result: Limit kept | Project file: 56113-80538 |

# Radiated Emission Test 8.2 GHz - 12.4 GHz
# acc. to FCC Part 15 Subpart C (FAR)

| | |
|---|---|
| Model: #5691 SHoW DMX Transceiver | Comment: |
| Serial no.: Test Sample 1 | - with module on test board controlled by DELL laptop PC<br>- DC 5 V power supply<br>- TX mode:<br>- Middle channel channel (2440 MHz)<br>- no modulation<br>- Antenna: Maxrad MP24012CPLXFPTNF<br><br>- Notch filter on fundamental frequency |
| Applicant: City Theatrical, Inc. | |
| Test site: Fully anechoic room, cabin no. 2 | |
| Tested on: Test distance 1 meter Horizontal Polarization | |
| Date of test: 06/20/2008 / Operator: J. Roidt | |
| Test performed: automatically / File name: default.emi | |

| | |
|---|---|
| Detector: Peak | List of values: 10 dB Margin / 50 Subranges |




| | |
|---|---|
| Result: Limit kept | Project file: 56113-80538 |

# Radiated Emission Test 8.2 GHz - 12.4 GHz
# acc. to FCC Part 15 Subpart C (FAR)

| | |
|---|---|
| Model: | #5691 SHoW DMX Transceiver |
| Serial no.: | Test Sample 1 |
| Applicant: | City Theatrical, Inc. |
| Test site: | Fully anechoic room, cabin no. 2 |
| Tested on: | Test distance 1 meter<br>Vertical Polarization |
| Date of test: | 06/20/2008 |
| Operator: | J. Roidt |
| Test performed: | automatically |
| File name: | default.emi |

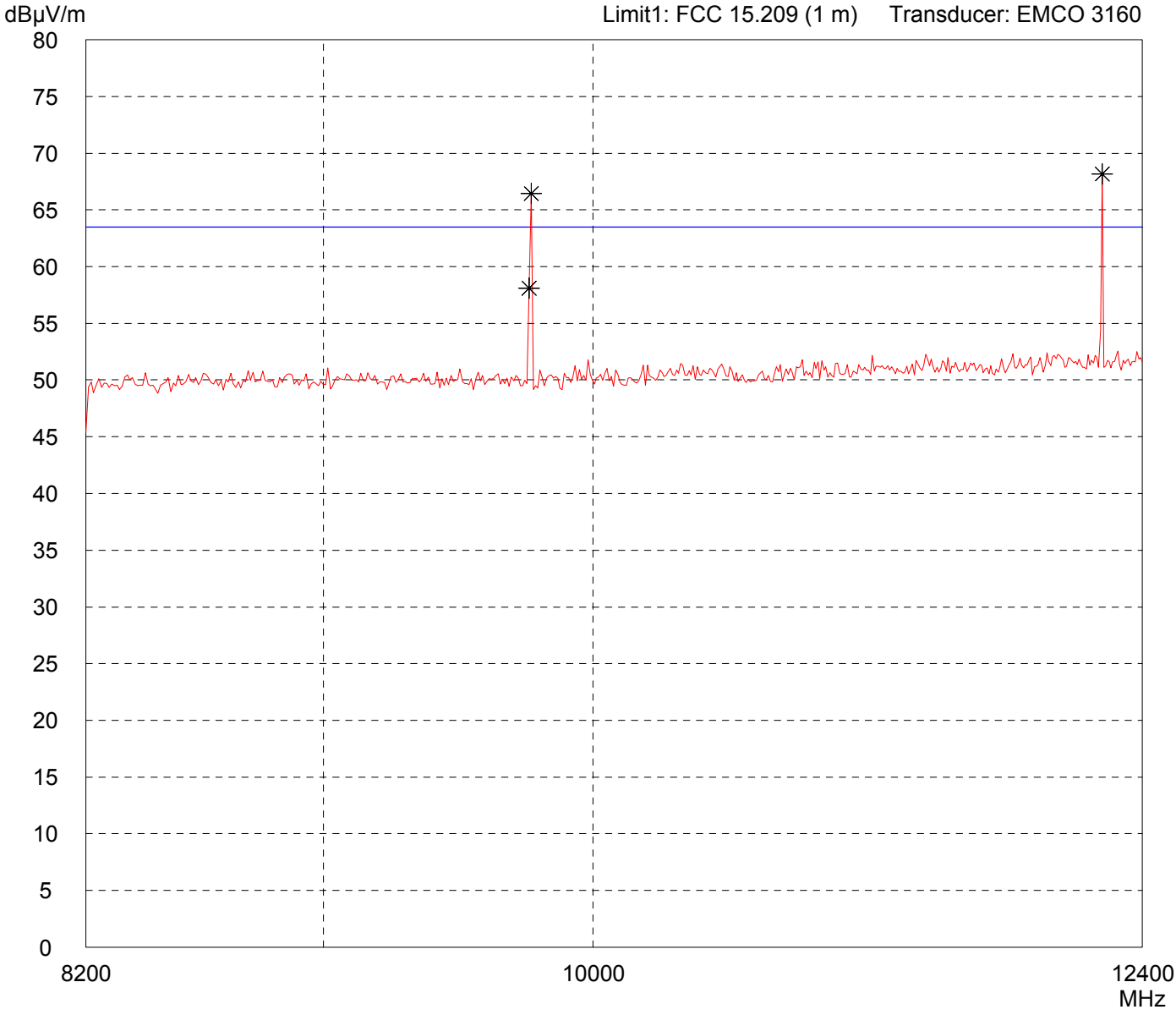
Comment:

- with module on test board controlled by DELL laptop PC
- DC 5 V power supply
- TX mode:
- Middle channel channel (2440 MHz)
- no modulation
- Antenna: Maxrad MP24012CPLXFPTNF

- Notch filter on fundamental frequency

Detector: Peak

List of values: 10 dB Margin 50 Subranges




Result: Limit kept

Project file: 56113-80538

# Radiated Emission Test 12.4 GHz - 18 GHz
# acc. to FCC Part 15 Subpart C (FAR)

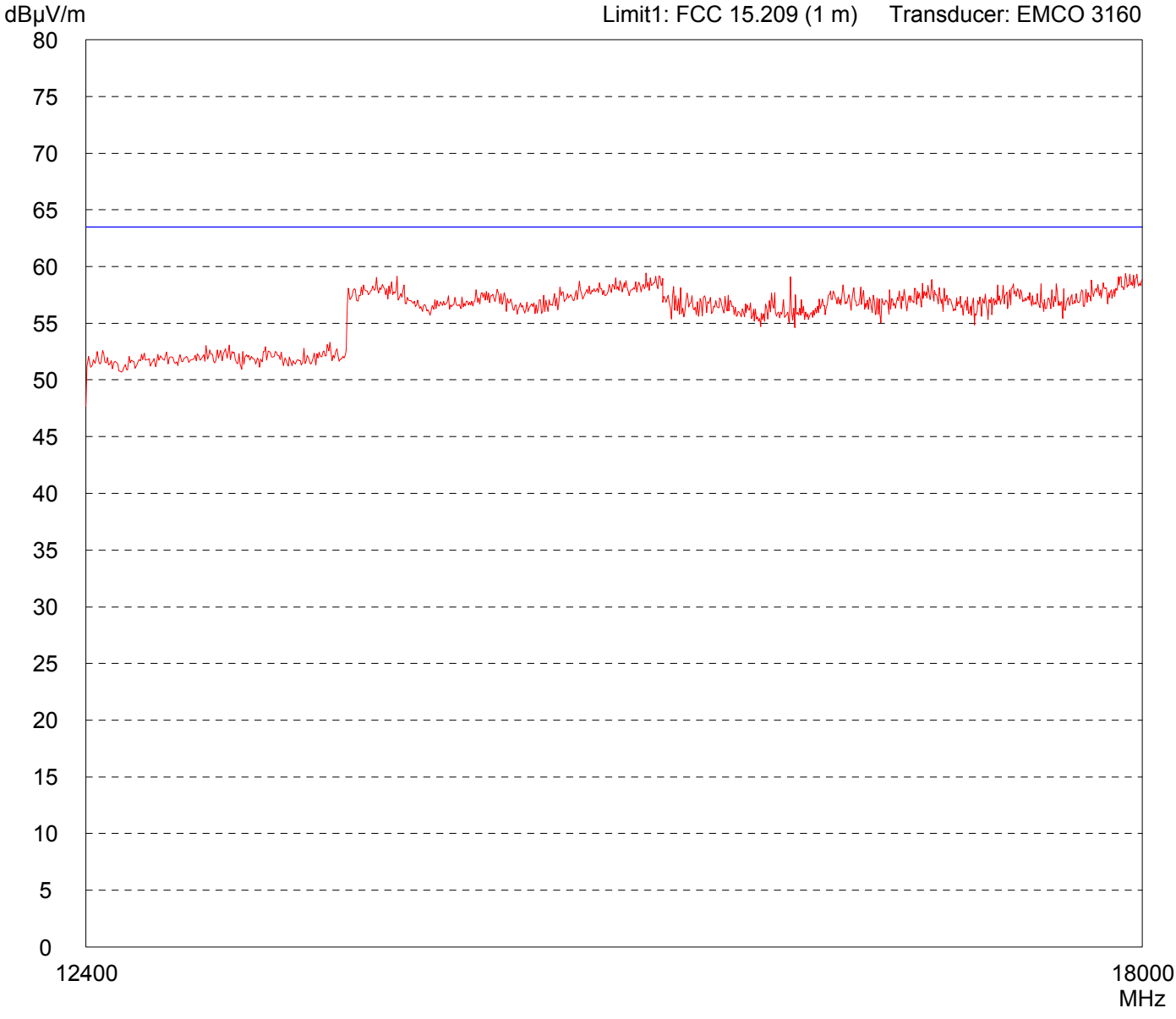
| | |
|---|---|
| Model: | #5691 SHoW DMX Transceiver |
| Serial no.: | Test Sample 1 |
| Applicant: | City Theatrical, Inc. |
| Test site: | Fully anechoic room, cabin no. 2 |
| Tested on: | Test distance 1 meter<br>Horizontal Polarization |
| Date of test: | 06/20/2008 |
| Operator: | J. Roidt |
| Test performed: | by hand |
| File name: | default.emi |

Comment:

- with module on test board controlled by DELL laptop PC
- DC 5 V power supply
- TX mode:
- Middle channel channel (2440 MHz)
- no modulation
- Antenna: Maxrad MP24012CPLXFPTNF

- Notch filter on fundamental frequency

| | |
|---|---|
| Detector: | Peak |
| List of values: | Selected by hand |




| | |
|---|---|
| Result: | Limit kept |
| Project file: | 56113-80538 |

# Radiated Emission Test 12.4 GHz - 18 GHz
# acc. to FCC Part 15 Subpart C (FAR)

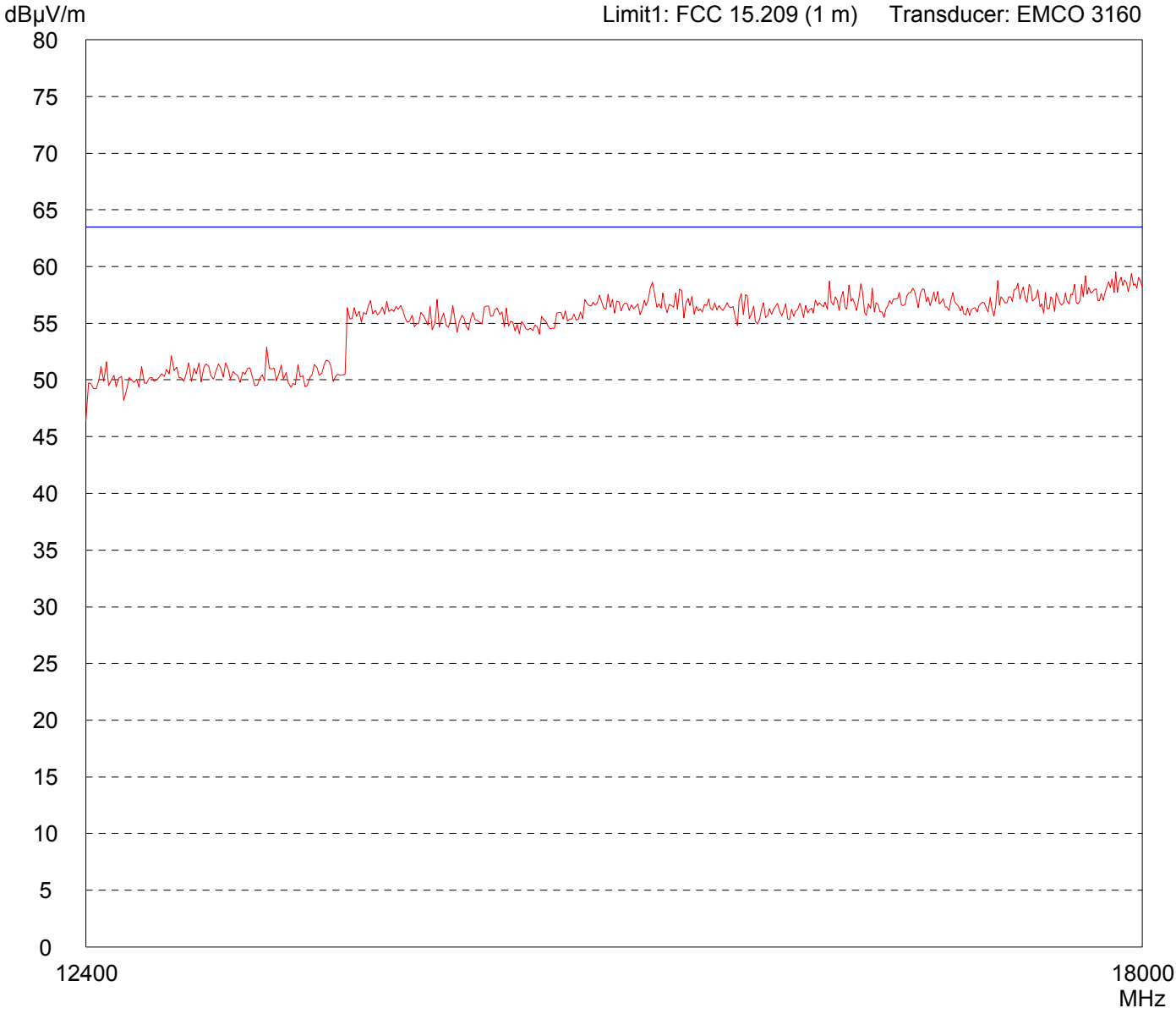
| | |
|---|---|
| Model: | #5691 SHoW DMX Transceiver |
| Serial no.: | Test Sample 1 |
| Applicant: | City Theatrical, Inc. |
| Test site: | Fully anechoic room, cabin no. 2 |
| Tested on: | Test distance 1 meter<br>Vertical Polarization |
| Date of test: | 06/20/2008 |
| Operator: | J. Roidt |
| Test performed: | by hand |
| File name: | default.emi |

Comment:

- with module on test board controlled by DELL laptop PC
- DC 5 V power supply
- TX mode:
- Middle channel channel (2440 MHz)
- no modulation
- Antenna: Maxrad MP24012CPLXFPTNF

- Notch filter on fundamental frequency

| | |
|---|---|
| Detector: | Peak |
| List of values: | Selected by hand |

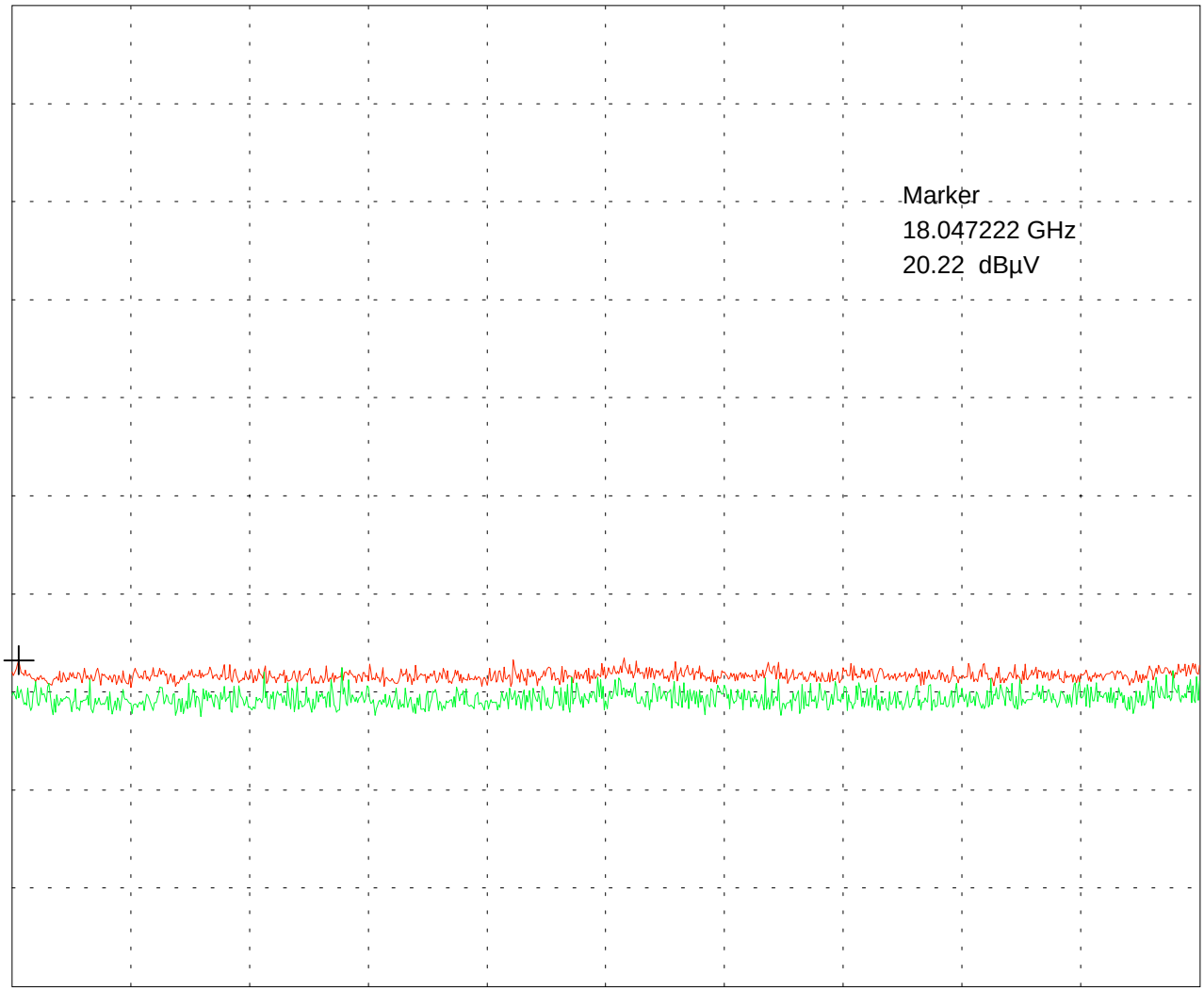



| | |
|---|---|
| Result: | Limit kept |
| Project file: | 56113-80538 |

# Spurious emissions according to FCC Rules

| | |
|---|---|
| Model: | Mode: |
| Serial No.: | - with module on test board, controlled by DELL laptop PC<br>- DC 5 V power supply<br>- TX mode:<br>- Middle channel (2440 MHz)<br>- no modulation<br>- Antenna:<br>Maxrad MP24012CPLXFPTNF |
| Applicant:<br>City Theatrical, Inc. | Test distance 1 m , reading without antenna correction |
| | |
| | |
| | |
| | |

Ref.Level 87 dBµV ATT 0 dB
10 dB/Div.




Start 18.000 GHz Stop 26.500 GHz
RBW 100 kHz VBW 100 kHz SWP 2.60 s

| | |
|---|---|
| Tested by:<br>Johann Roidt | Project-No.:<br>56113-080538 |
| Date:<br>20 June 2008 | |

# Radiated Emission Test 30 MHz - 1 GHz
# acc. to FCC Part 15 Subpart C (FAR)

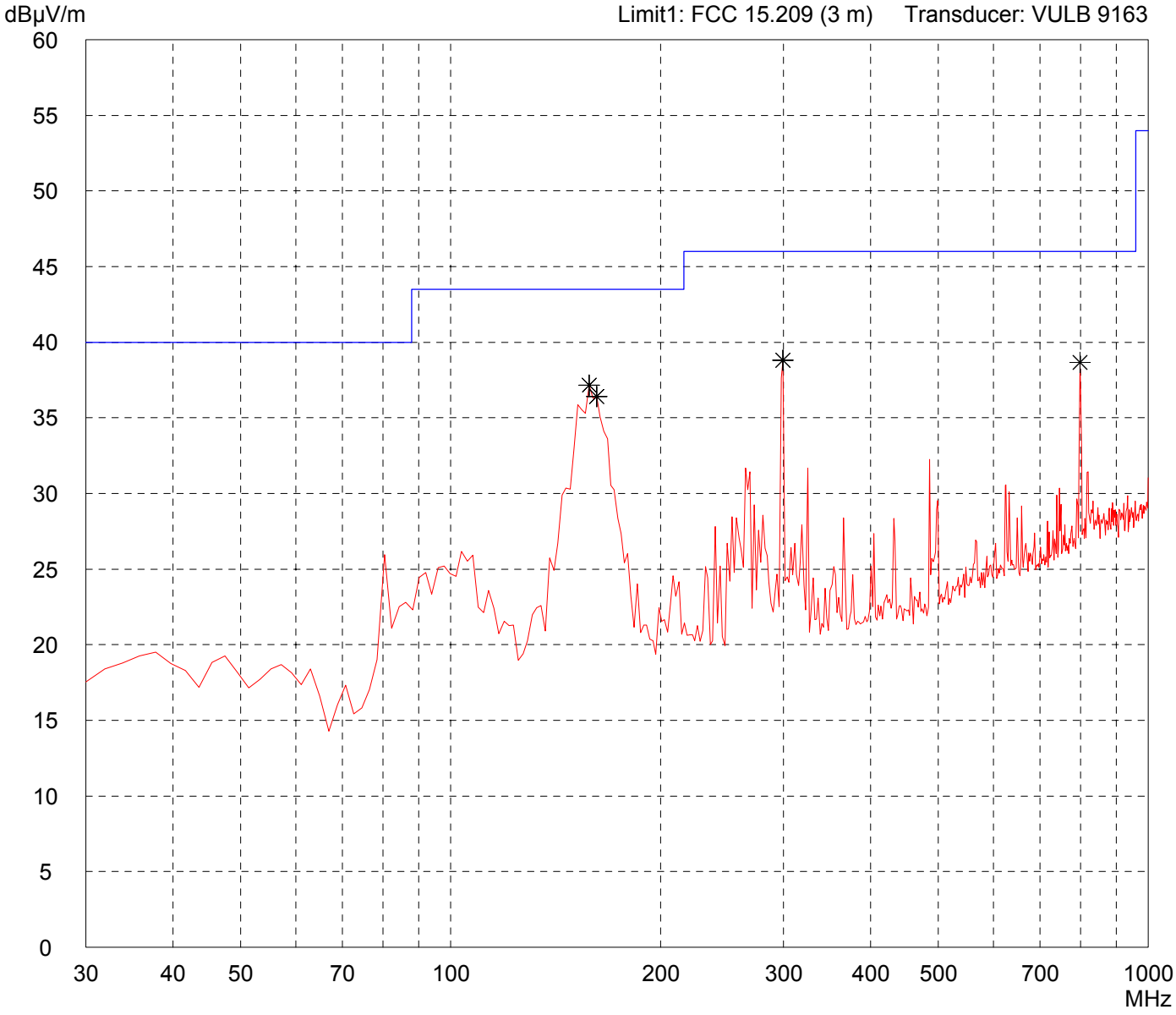
| | |
|---|---|
| Model: | #5691 SHoW DMX Transceiver |
| Serial no.: | Test Sample 1 |
| Applicant: | City Theatrical, Inc. |
| Test site: | Fully anechoic room, cabin no. 2 |
| Tested on: | Test distance 3 metres<br>Horizontal Polarization |
| Date of test: / Operator: | 06/20/2008 / J. Roidt |
| Test performed: / File name: | automatically / default.emi |

Comment:

- with module on test board
controlled by DELL laptop PC
- DC 5 V power supply
- TX mode:
- Highest channel (2476 MHz)
no modulation
- Antenna:
Maxrad MP24012CPLXFPTNF

Detector: Peak

List of values: 10 dB Margin 50 Subranges



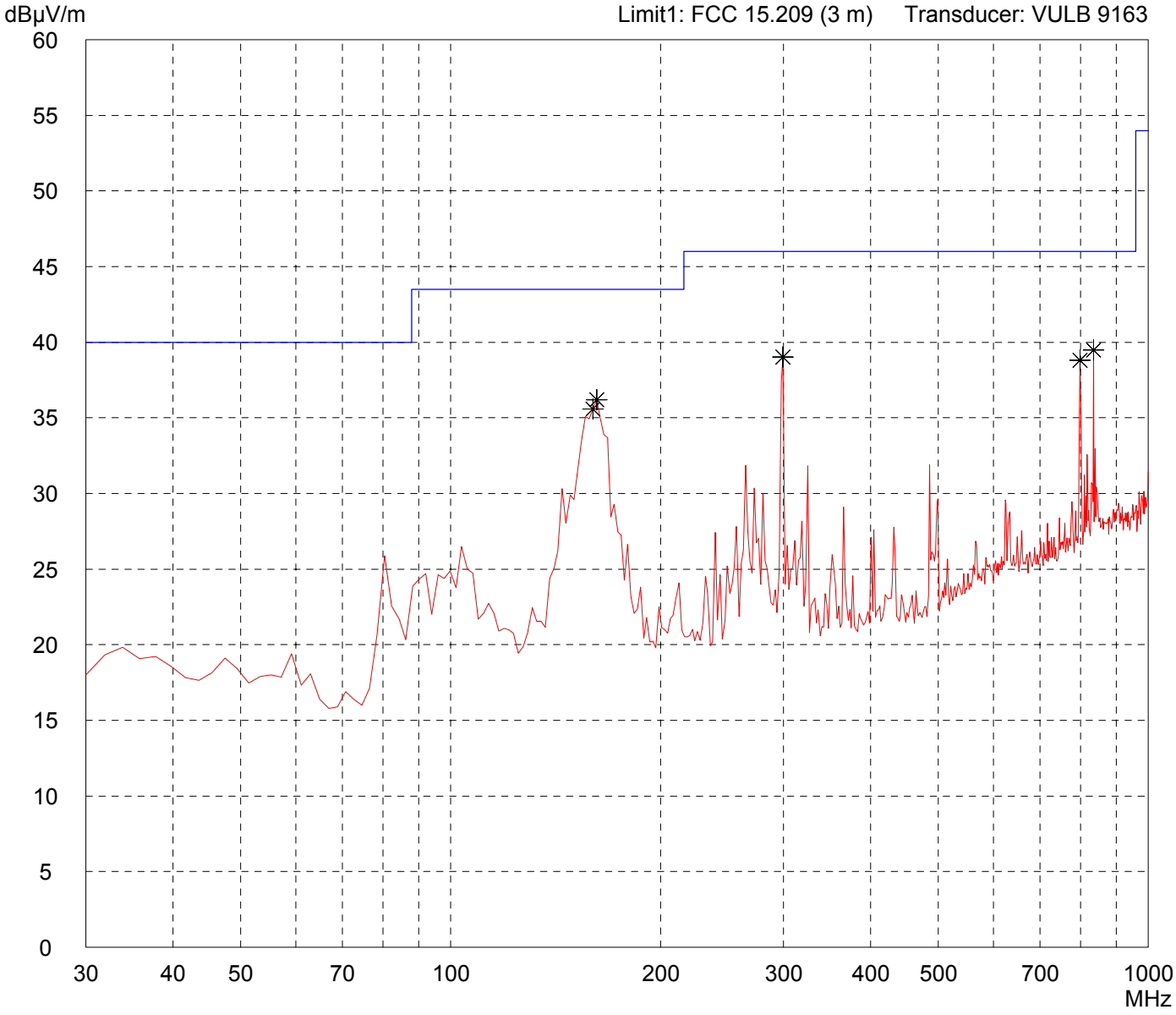

Result: Limit kept

Project file: 56113-80538

# Radiated Emission Test 30 MHz - 1 GHz
# acc. to FCC Part 15 Subpart C (FAR)

| | |
|---|---|
| Model: #5691 SHoW DMX Transceiver | Comment: - with module on test board controlled by DELL laptop PC<br>- DC 5 V power supply<br>- TX mode:<br>- Highest channel (2476 MHz)<br>no modulation<br>- Antenna:<br>Maxrad MP24012CPLXFPTNF |
| Serial no.: Test Sample 1 | |
| Applicant: City Theatrical, Inc. | |
| Test site: Fully anechoic room, cabin no. 2 | |
| Tested on: Test distance 3 metres<br>Vertical Polarization | |
| Date of test: 06/20/2008 / Operator: J. Roidt | |
| Test performed: automatically / File name: default.emi | |

| | |
|---|---|
| Detector: Peak | List of values: 10 dB Margin / 50 Subranges |

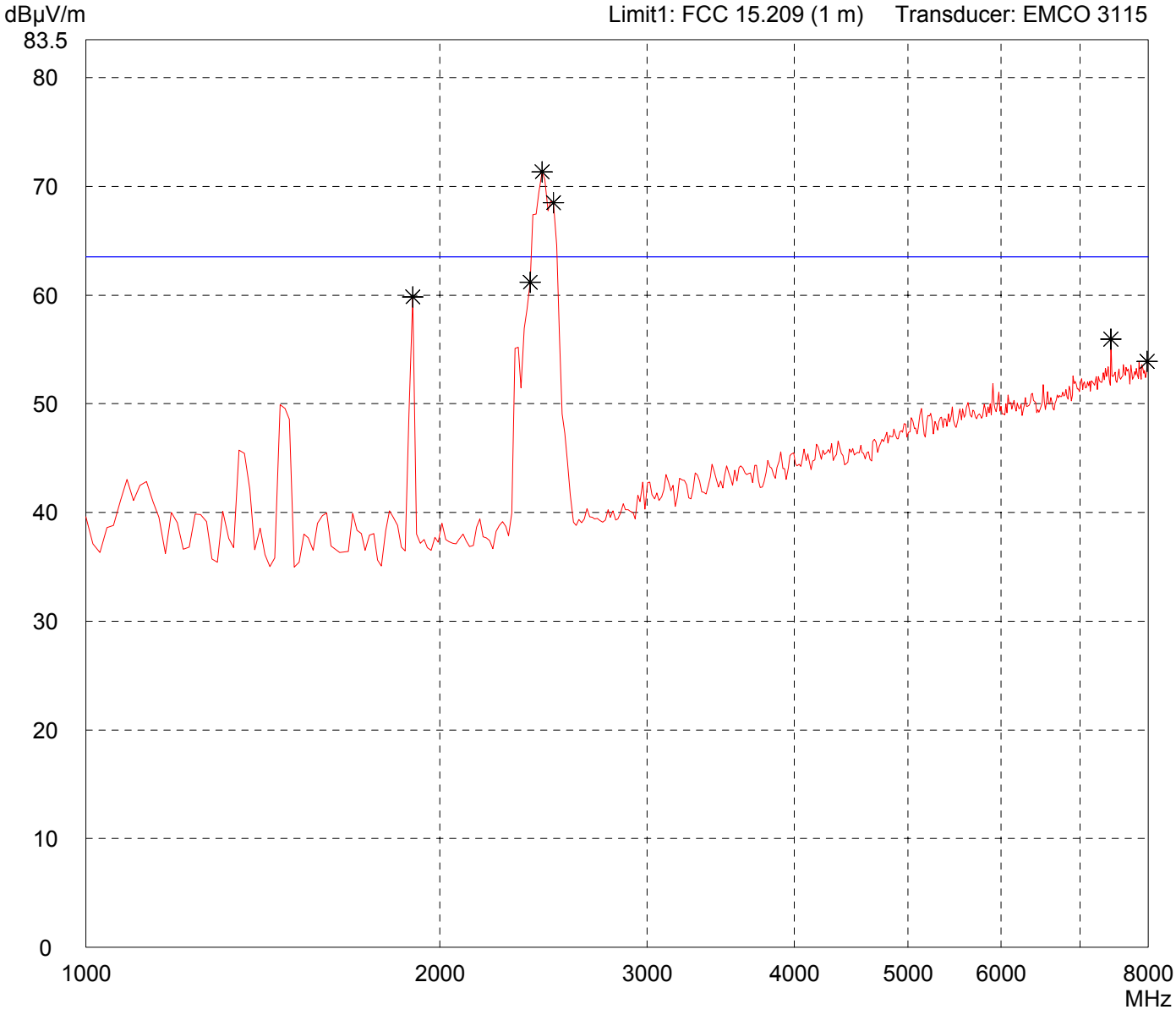



| | |
|---|---|
| Result: Limit kept | Project file: 56113-80538 |

# Radiated Emission Test 1 GHz - 8 GHz
# acc. to FCC Part 15 Subpart C (FAR)

| | |
|---|---|
| Model: #5691 SHoW DMX Transceiver | Comment: |
| Serial no.: Test Sample 1 | - with module on test board controlled by DELL laptop PC<br>- DC 5 V power supply<br>- TX mode:<br>- Highest channel channel (2476 MHz)<br>- no modulation<br>- Antenna: Maxrad MP24012CPLXFPTNF<br><br>- Notch filter on fundamental frequency |
| Applicant: City Theatrical, Inc. | |
| Test site: Fully anechoic room, cabin no. 2 | |
| Tested on: Test distance 1 metre Horizontal Polarization | |
| Date of test: 06/20/2008 / Operator: J. Roidt | |
| Test performed: automatically / File name: default.emi | |

| | |
|---|---|
| Detector: Peak | List of values: 10 dB Margin / 50 Subranges |

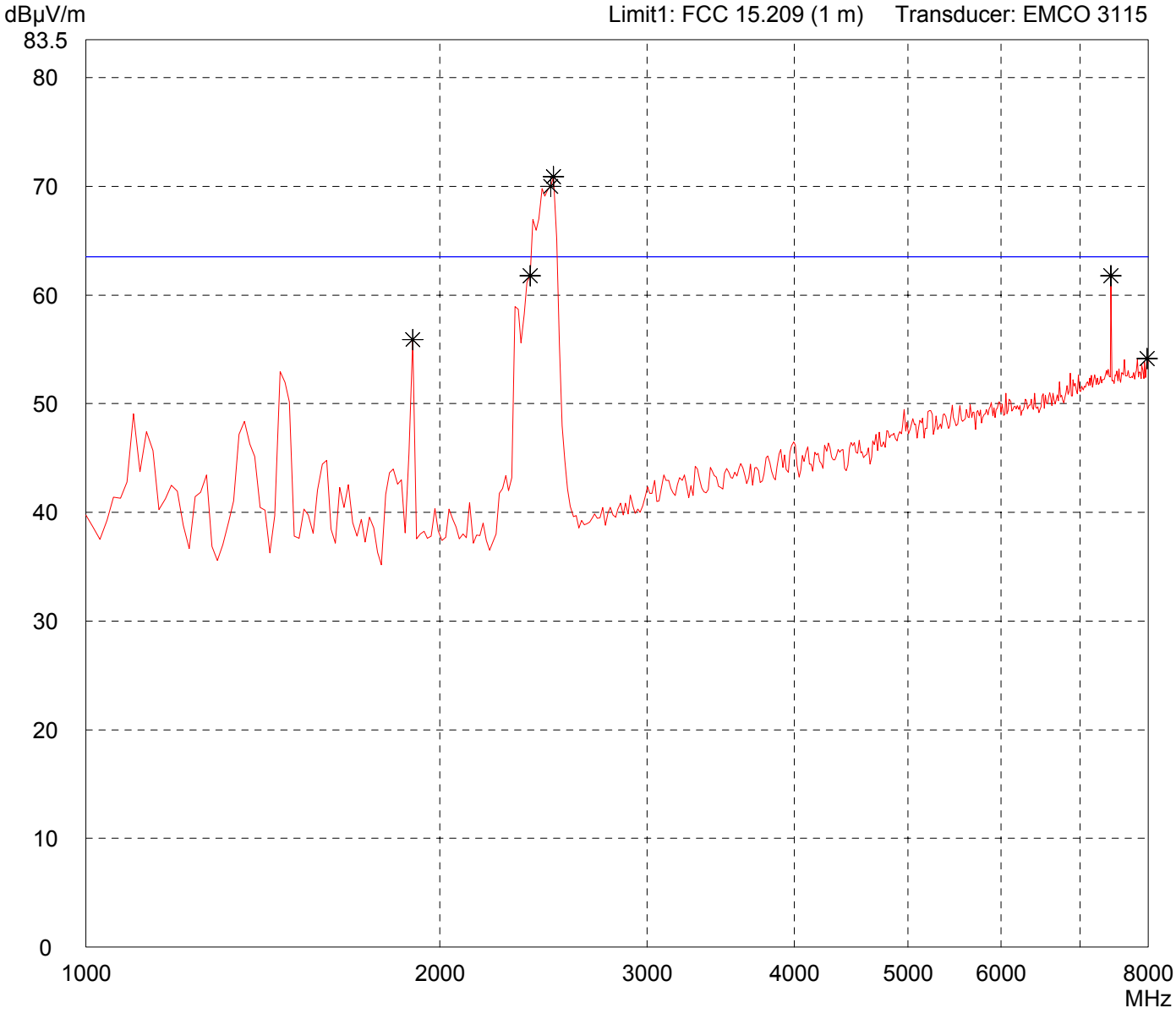



| | |
|---|---|
| Result: Limit kept | Project file: 56113-80538 |

# Radiated Emission Test 1 GHz - 8 GHz
# acc. to FCC Part 15 Subpart C (FAR)

| | |
|---|---|
| Model: #5691 SHoW DMX Transceiver | Comment: |
| Serial no.: Test Sample 1 | - with module on test board controlled by DELL laptop PC<br>- DC 5 V power supply<br>- TX mode:<br>- Highest channel channel (2476 MHz)<br>- no modulation<br>- Antenna: Maxrad MP24012CPLXFPTNF<br><br>- Notch filter on fundamental frequency |
| Applicant: City Theatrical, Inc. | |
| Test site: Fully anechoic room, cabin no. 2 | |
| Tested on: Test distance 1 metre<br>Vertical Polarization | |
| Date of test: 06/20/2008 / Operator: J. Roidt | |
| Test performed: automatically / File name: default.emi | |

| | |
|---|---|
| Detector: Peak | List of values: 10 dB Margin / 50 Subranges |

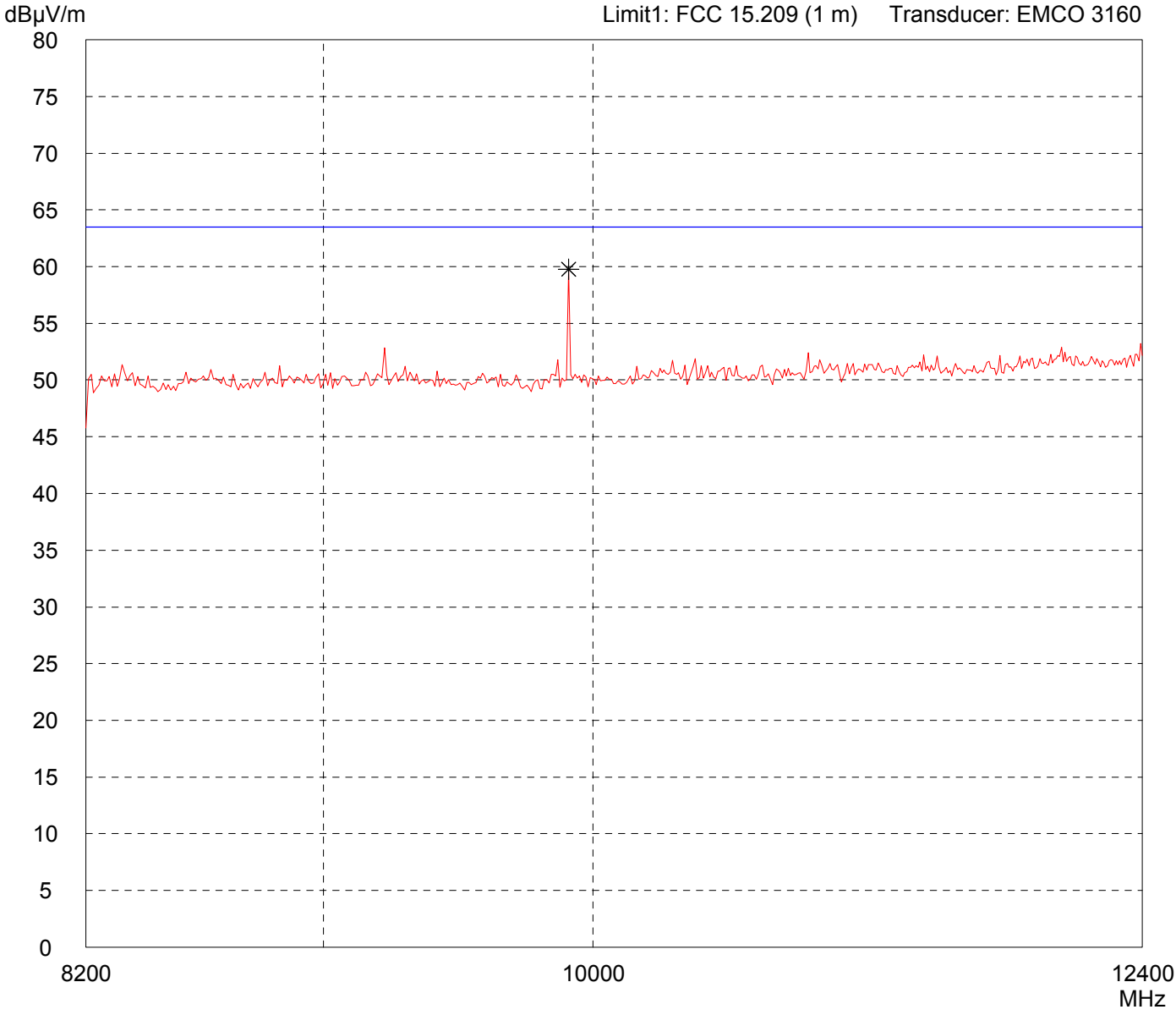



| | |
|---|---|
| Result: Limit kept | Project file: 56113-80538 |

# Radiated Emission Test 8.2 GHz - 12.4 GHz
# acc. to FCC Part 15 Subpart C (FAR)

| | |
|---|---|
| Model: #5691 SHoW DMX Transceiver | Comment: |
| Serial no.: Test Sample 1 | - with module on test board controlled by DELL laptop PC<br>- DC 5 V power supply<br>- TX mode:<br>- Highest channel channel (2476 MHz)<br>- no modulation<br>- Antenna: Maxrad MP24012CPLXFPTNF<br><br>- Notch filter on fundamental frequency |
| Applicant: City Theatrical, Inc. | |
| Test site: Fully anechoic room, cabin no. 2 | |
| Tested on: Test distance 1 meter Horizontal Polarization | |
| Date of test: 06/20/2008 / Operator: J. Roidt | |
| Test performed: automatically / File name: default.emi | |

| | |
|---|---|
| Detector: Peak | List of values: 10 dB Margin / 50 Subranges |



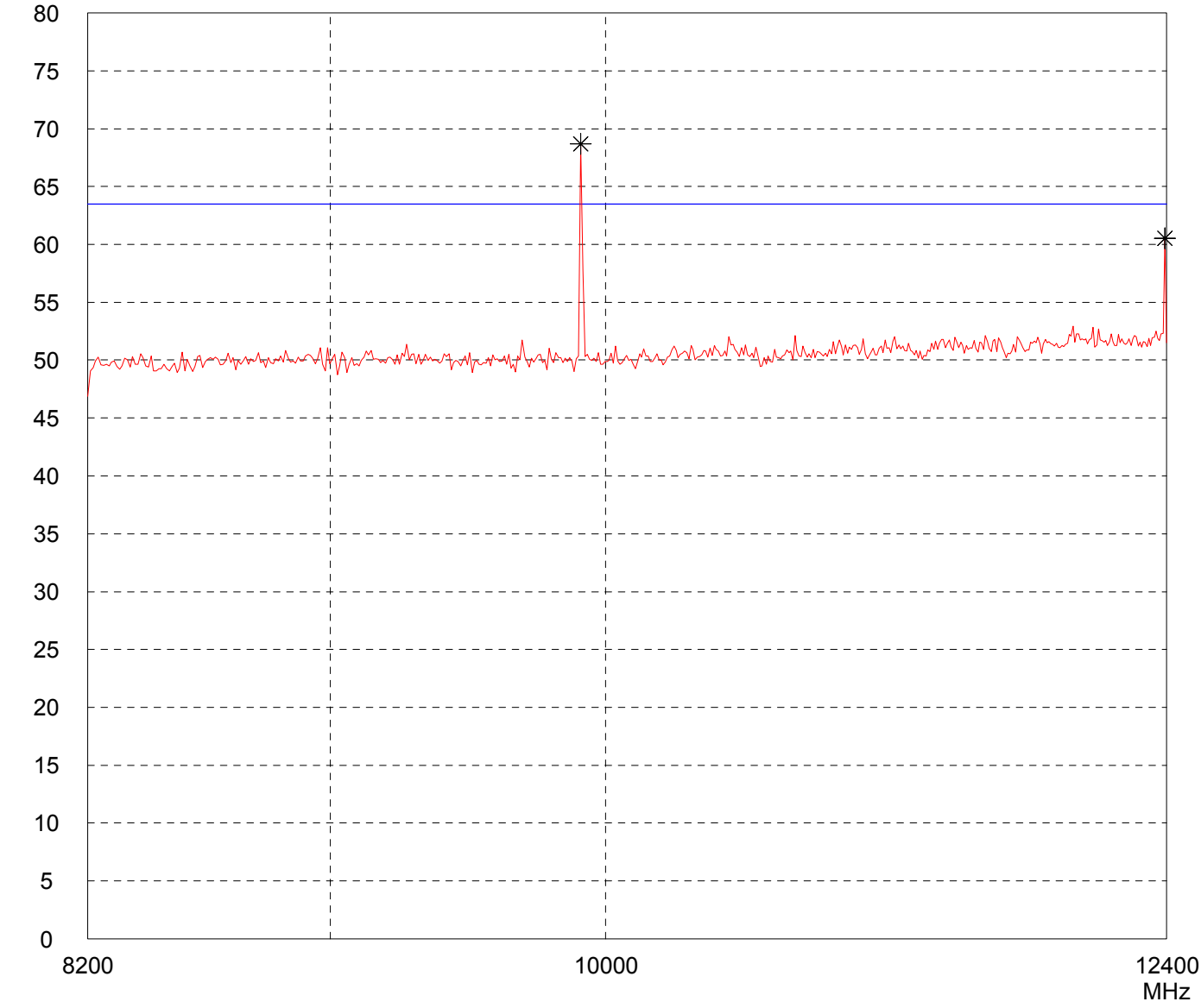

| | |
|---|---|
| Result: Limit kept | Project file: 56113-80538 |

# Radiated Emission Test 8.2 GHz - 12.4 GHz
# acc. to FCC Part 15 Subpart C (FAR)

| | |
|---|---|
| Model: #5691 SHoW DMX Transceiver | Comment: |
| Serial no.: Test Sample 1 | - with module on test board controlled by DELL laptop PC<br>- DC 5 V power supply<br>- TX mode:<br>- Highest channel channel (2476 MHz)<br>- no modulation<br>- Antenna: Maxrad MP24012CPLXFPTNF<br><br>- Notch filter on fundamental frequency |
| Applicant: City Theatrical, Inc. | |
| Test site: Fully anechoic room, cabin no. 2 | |
| Tested on: Test distance 1 meter Vertical Polarization | |
| Date of test: 06/20/2008 / Operator: J. Roidt | |
| Test performed: automatically / File name: default.emi | |

| | |
|---|---|
| Detector: Peak | List of values: 10 dB Margin / 50 Subranges |

dBµV/m — Limit1: FCC 15.209 (1 m) — Transducer: EMCO 3160




| | |
|---|---|
| Result: Limit kept | Project file: 56113-80538 |

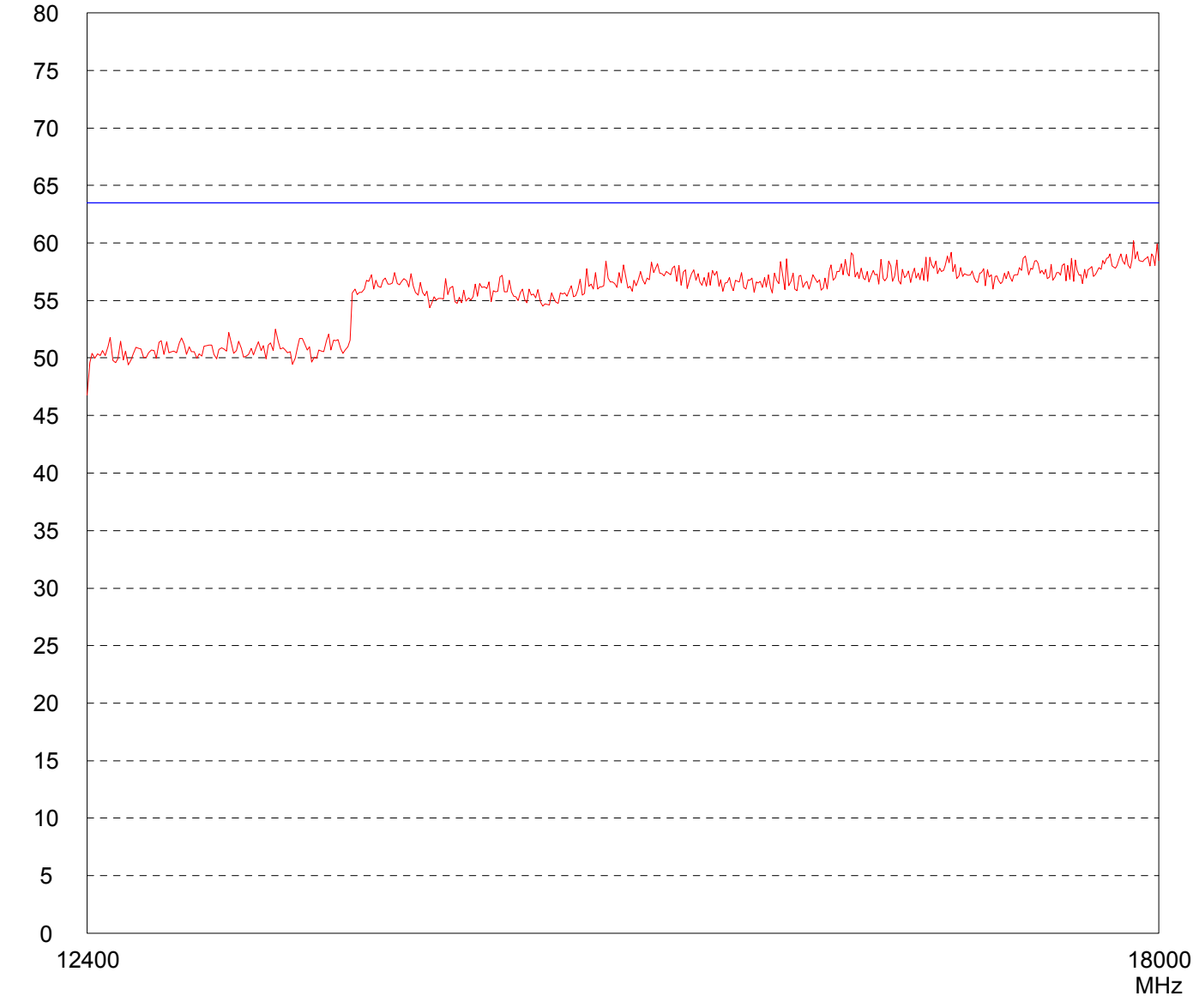
# Radiated Emission Test 12.4 GHz - 18 GHz
# acc. to FCC Part 15 Subpart C (FAR)

| | |
|---|---|
| Model: #5691 SHoW DMX Transceiver | Comment: |
| Serial no.: Test Sample 1 | - with module on test board controlled by DELL laptop PC<br>- DC 5 V power supply<br>- TX mode:<br>- Highest channel channel (2476 MHz)<br>- no modulation<br>- Antenna:<br>Maxrad MP24012CPLXFPTNF<br><br>- Notch filter on fundamental frequency |
| Applicant: City Theatrical, Inc. | |
| Test site: Fully anechoic room, cabin no. 2 | |
| Tested on: Test distance 1 meter<br>Horizontal Polarization | |
| Date of test: 06/20/2008 / Operator: J. Roidt | |
| Test performed: by hand / File name: default.emi | |

| | |
|---|---|
| Detector: Peak | List of values: Selected by hand |

dBµV/m

Limit1: FCC 15.209 (1 m) Transducer: EMCO 3160




| | |
|---|---|
| Result: Limit kept | Project file: 56113-80538 |

# Radiated Emission Test 12.4 GHz - 18 GHz
# acc. to FCC Part 15 Subpart C (FAR)

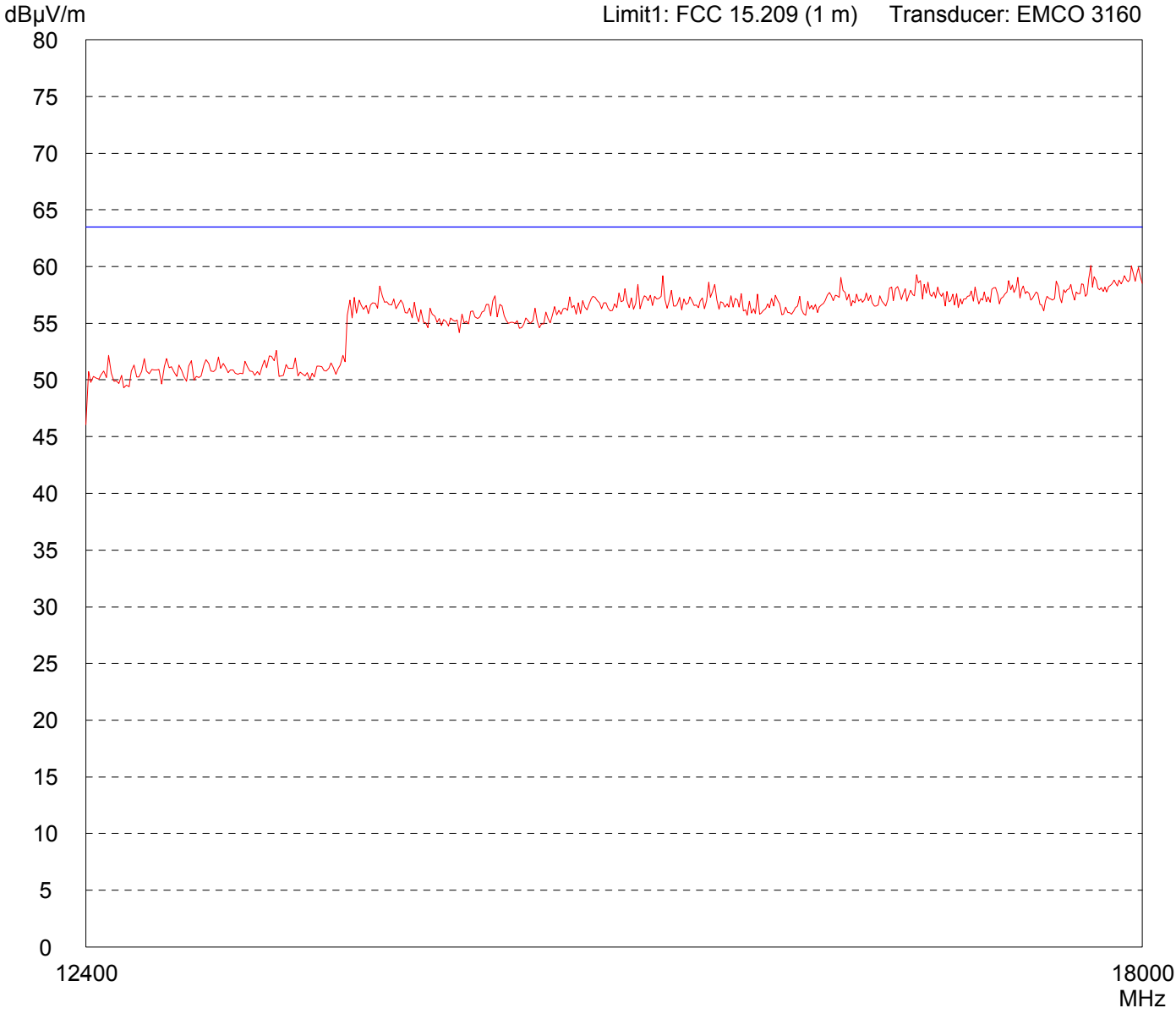
| | |
|---|---|
| Model: | #5691 SHoW DMX Transceiver |
| Serial no.: | Test Sample 1 |
| Applicant: | City Theatrical, Inc. |
| Test site: | Fully anechoic room, cabin no. 2 |
| Tested on: | Test distance 1 meter<br>Vertical Polarization |
| Date of test: | 06/20/2008 |
| Operator: | J. Roidt |
| Test performed: | by hand |
| File name: | default.emi |

Comment:

- with module on test board controlled by DELL laptop PC
- DC 5 V power supply
- TX mode:
- Highest channel channel (2476 MHz)
- no modulation
- Antenna: Maxrad MP24012CPLXFPTNF

- Notch filter on fundamental frequency

| | |
|---|---|
| Detector: | Peak |
| List of values: | Selected by hand |

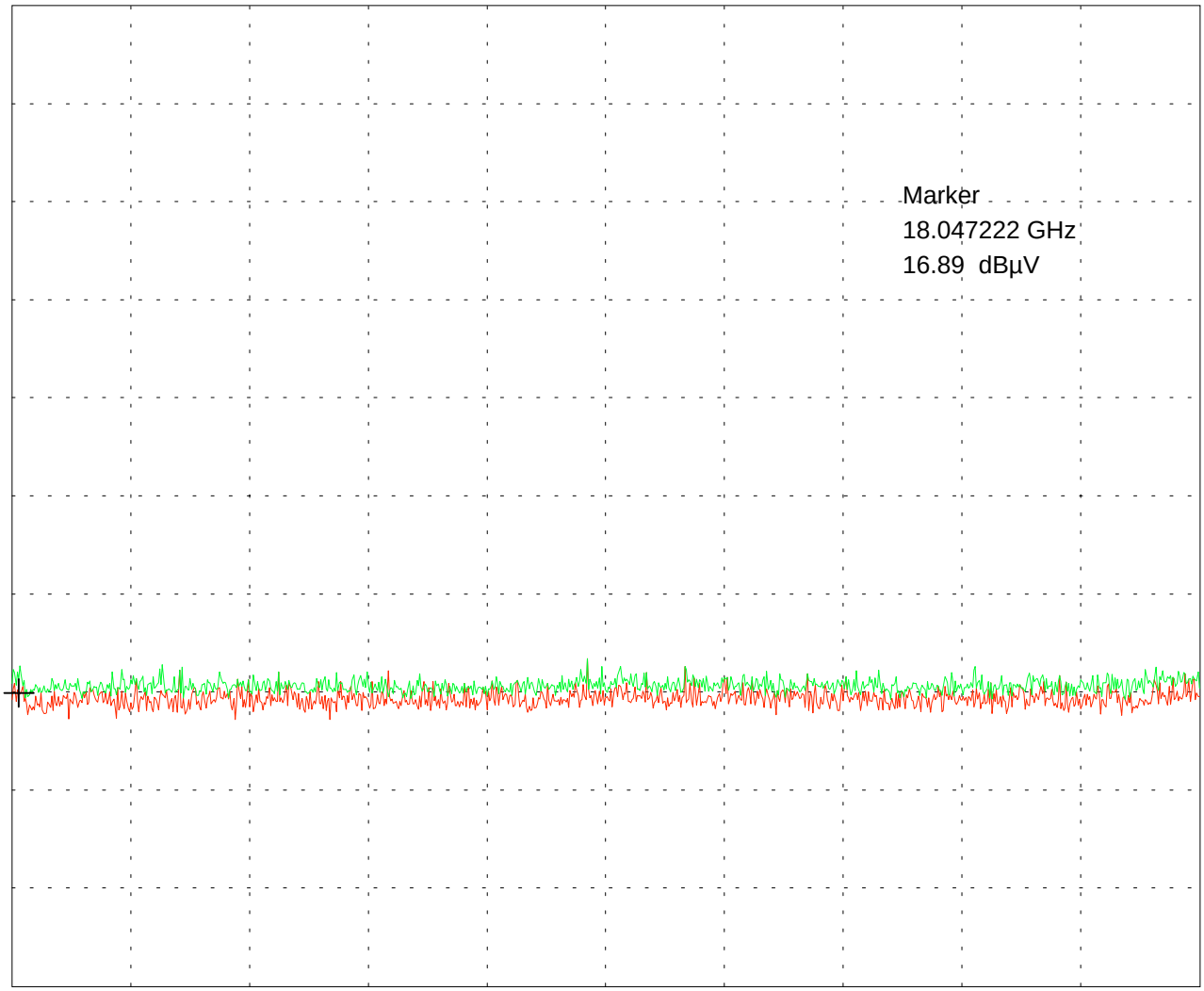



| | |
|---|---|
| Result: | Limit kept |
| Project file: | 56113-80538 |

# Spurious emissions according to FCC Rules

| | |
|---|---|
| Model: | Mode: |
| Serial No.: | - with module on test board, controlled by DELL laptop PC<br>- DC 5 V power supply<br>- TX mode:<br>- Highest channel (2476 MHz)<br>- no modulation<br>- Antenna:<br>Maxrad MP24012CPLXFPTNF<br><br>Test distance 1 m , reading without antenna correction |
| Applicant:<br>City Theatrical, Inc. | |
| | |
| | |
| | |
| | |

Ref.Level 87 dBµV ATT 0 dB
10 dB/Div.



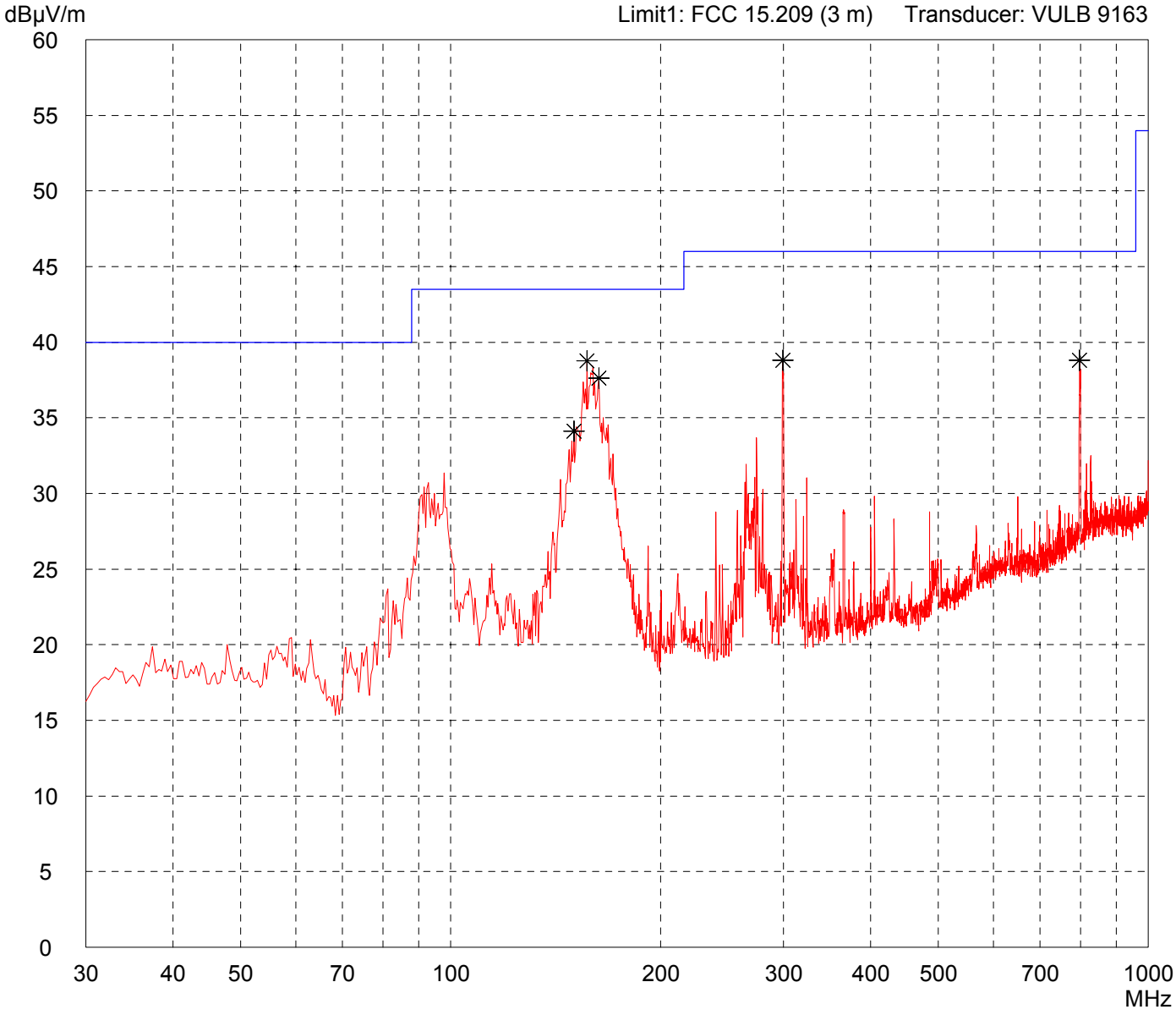

Start 18.000 GHz Stop 26.500 GHz
RBW 100 kHz VBW 100 kHz SWP 2.60 s

| | |
|---|---|
| Tested by:<br>Johann Roidt | Project-No.:<br>56113-080538 |
| Date:<br>20 June 2008 | |

# Radiated Emission Test 30 MHz - 1 GHz
# acc. to FCC Part 15 Subpart C (FAR)

| | |
|---|---|
| Model: #5691 SHoW DMX Transceiver | Comment: - with module on test board controlled by DELL laptop PC<br>- DC 5 V power supply<br>- TX mode:<br>- Lowest channel channel (2406 MHz)<br>- without modulation<br>- Antenna: Maxrad MYP24014PTNF<br>- |
| Serial no.: Test Sample 1 | |
| Applicant: City Theatrical, Inc. | |
| Test site: Fully anechoic room, cabin no. 2 | |
| Tested on: Test distance 3 metres Horizontal Polarization | |
| Date of test: 06/20/2008 / Operator: J. Roidt | |
| Test performed: automatically / File name: default.emi | |

| | |
|---|---|
| Detector: Peak | List of values: 10 dB Margin / 50 Subranges |




| | |
|---|---|
| Result: Limit kept | Project file: 56113-80538 |

# Radiated Emission Test 30 MHz - 1 GHz
# acc. to FCC Part 15 Subpart C (FAR)

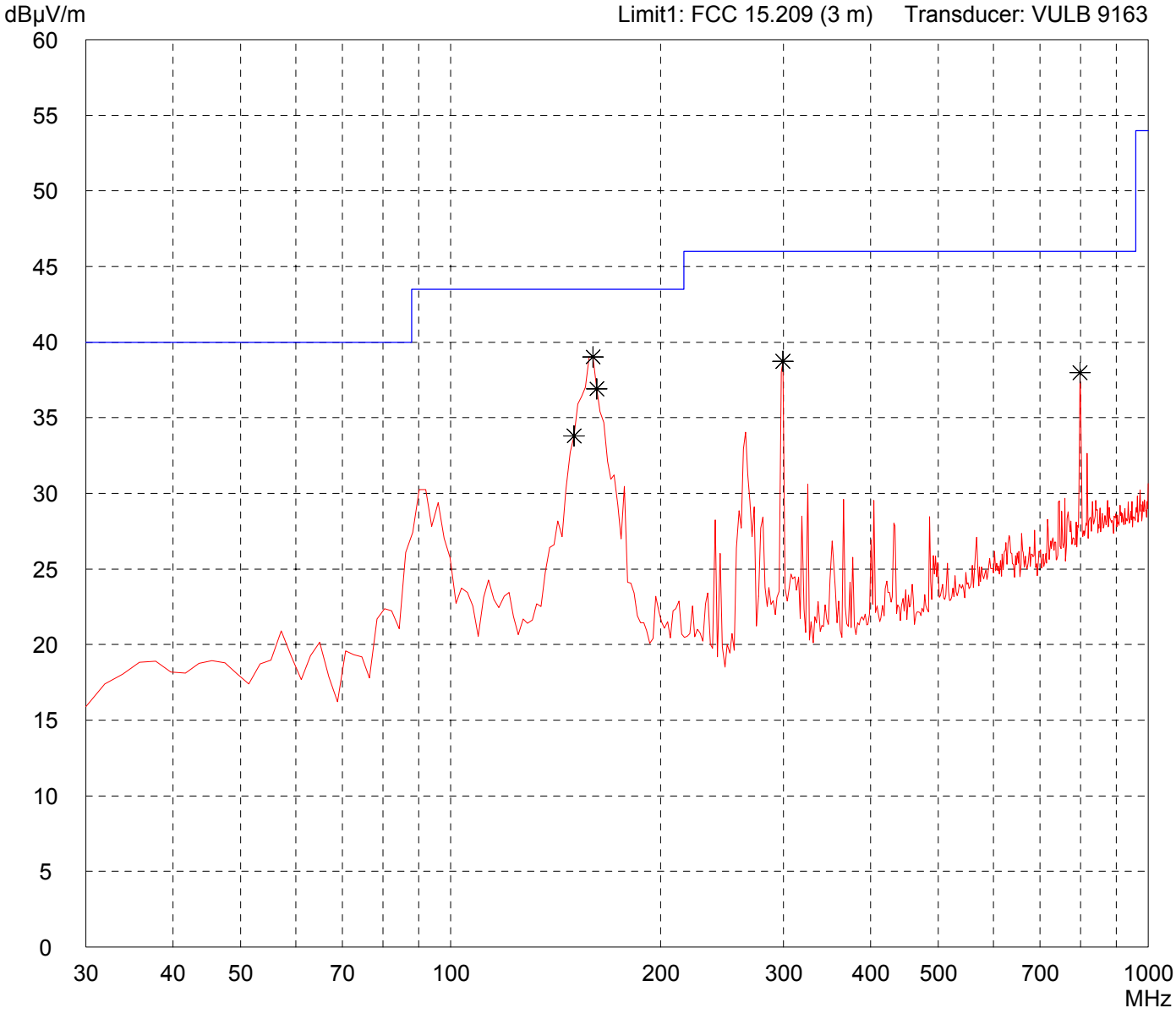
| | |
|---|---|
| Model: | #5691 SHoW DMX Transceiver |
| Serial no.: | Test Sample 1 |
| Applicant: | City Theatrical, Inc. |
| Test site: | Fully anechoic room, cabin no. 2 |
| Tested on: | Test distance 3 metres<br>Vertical Polarization |
| Date of test: / Operator: | 06/20/2008 / J. Roidt |
| Test performed: / File name: | automatically / default.emi |

Comment:

- with module on test board controlled by DELL laptop PC
- DC 5 V power supply
- TX mode:
- Lowest channel channel (2406 MHz)
- without modulation
- Antenna: Maxrad MYP24014PTNF
-

Detector: Peak

List of values: 10 dB Margin 50 Subranges




Result: Limit kept

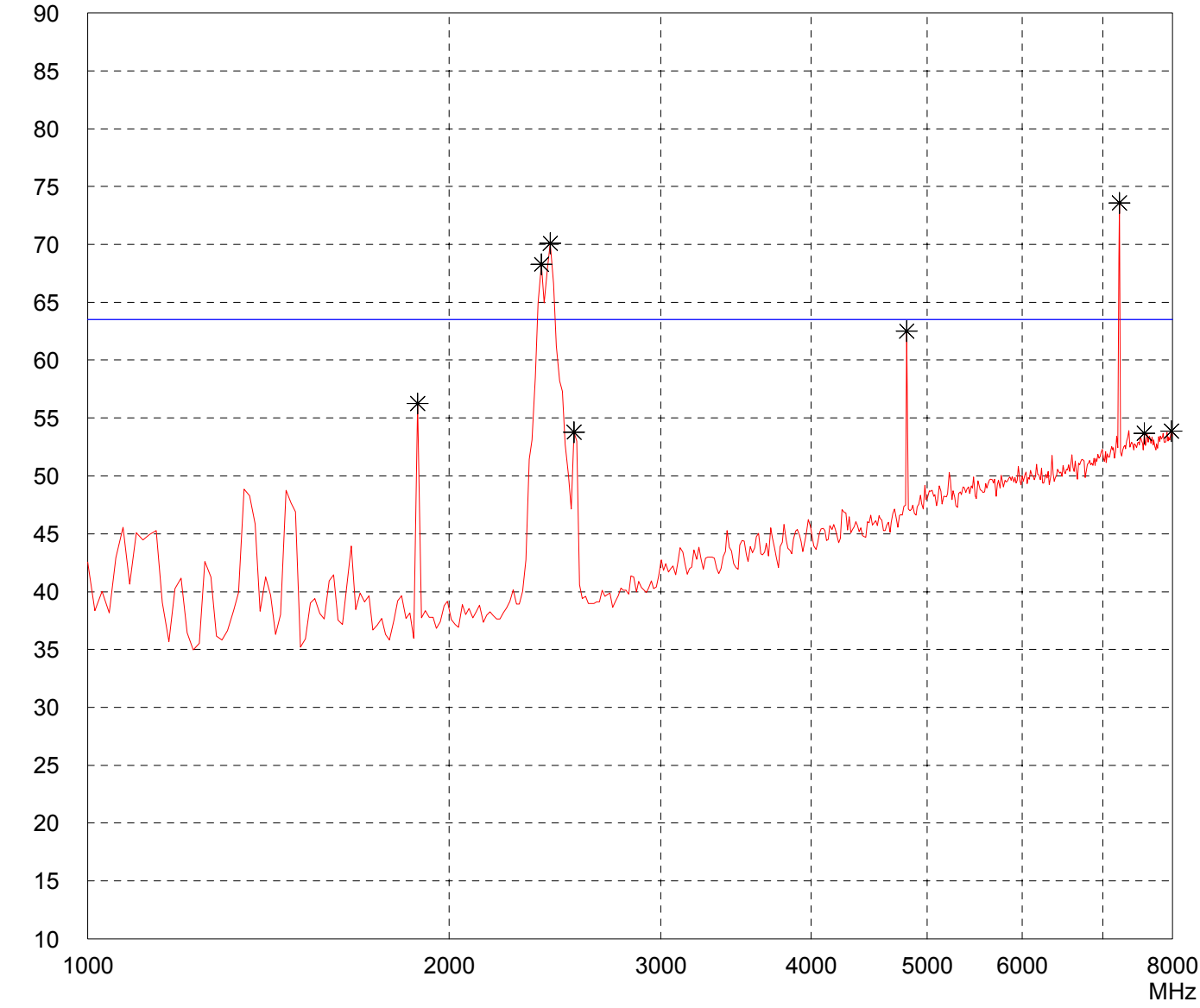
Project file: 56113-80538

# Radiated Emission Test 1 GHz - 8 GHz
# acc. to FCC Part 15 Subpart C (FAR)

| | |
|---|---|
| Model: #5691 SHoW DMX Transceiver | Comment: |
| Serial no.: Test Sample 1 | - with module on test board controlled by DELL laptop PC<br>- DC 5 V power supply<br>- TX mode:<br>- Low channel channel (2406 MHz)<br>- without modulation<br>- Antenna: Maxrad MYP24014PTNF<br>- |
| Applicant: City Theatrical, Inc. | |
| Test site: Fully anechoic room, cabin no. 2 | |
| Tested on: Test distance 1 metre Horizontal Polarization | |
| Date of test: 06/20/2008 / Operator: J. Roidt | |
| Test performed: automatically / File name: default.emi | |

| | |
|---|---|
| Detector: Peak | List of values: 10 dB Margin / 50 Subranges |

dBµV/m — Limit1: FCC 15.209 (1 m) — Transducer: EMCO 3115

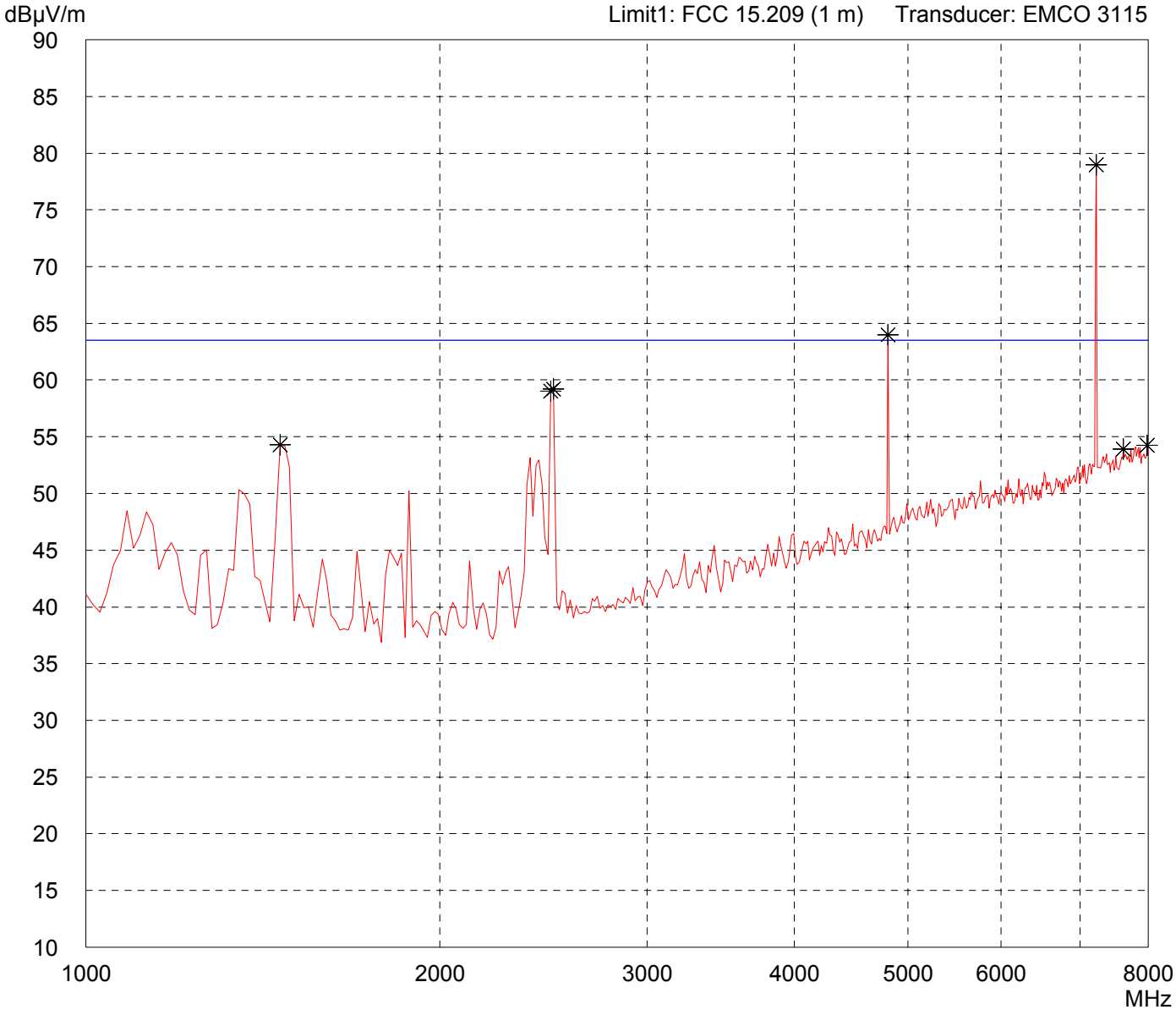



| | |
|---|---|
| Result: Limit kept | Project file: 56113-80538 |

# Radiated Emission Test 1 GHz - 8 GHz
# acc. to FCC Part 15 Subpart C (FAR)

| | |
|---|---|
| Model: #5691 SHoW DMX Transceiver | Comment: - with module on test board controlled by DELL laptop PC<br>- DC 5 V power supply<br>- TX mode:<br>- Low channel channel (2406 MHz)<br>- without modulation<br>- Antenna: Maxrad MYP24014PTNF<br>- |
| Serial no.: Test Sample 1 | |
| Applicant: City Theatrical, Inc. | |
| Test site: Fully anechoic room, cabin no. 2 | |
| Tested on: Test distance 1 metre<br>Vertical Polarization | |
| Date of test: 06/20/2008 / Operator: J. Roidt | |
| Test performed: automatically / File name: default.emi | |

| | |
|---|---|
| Detector: Peak | List of values: 10 dB Margin / 50 Subranges |



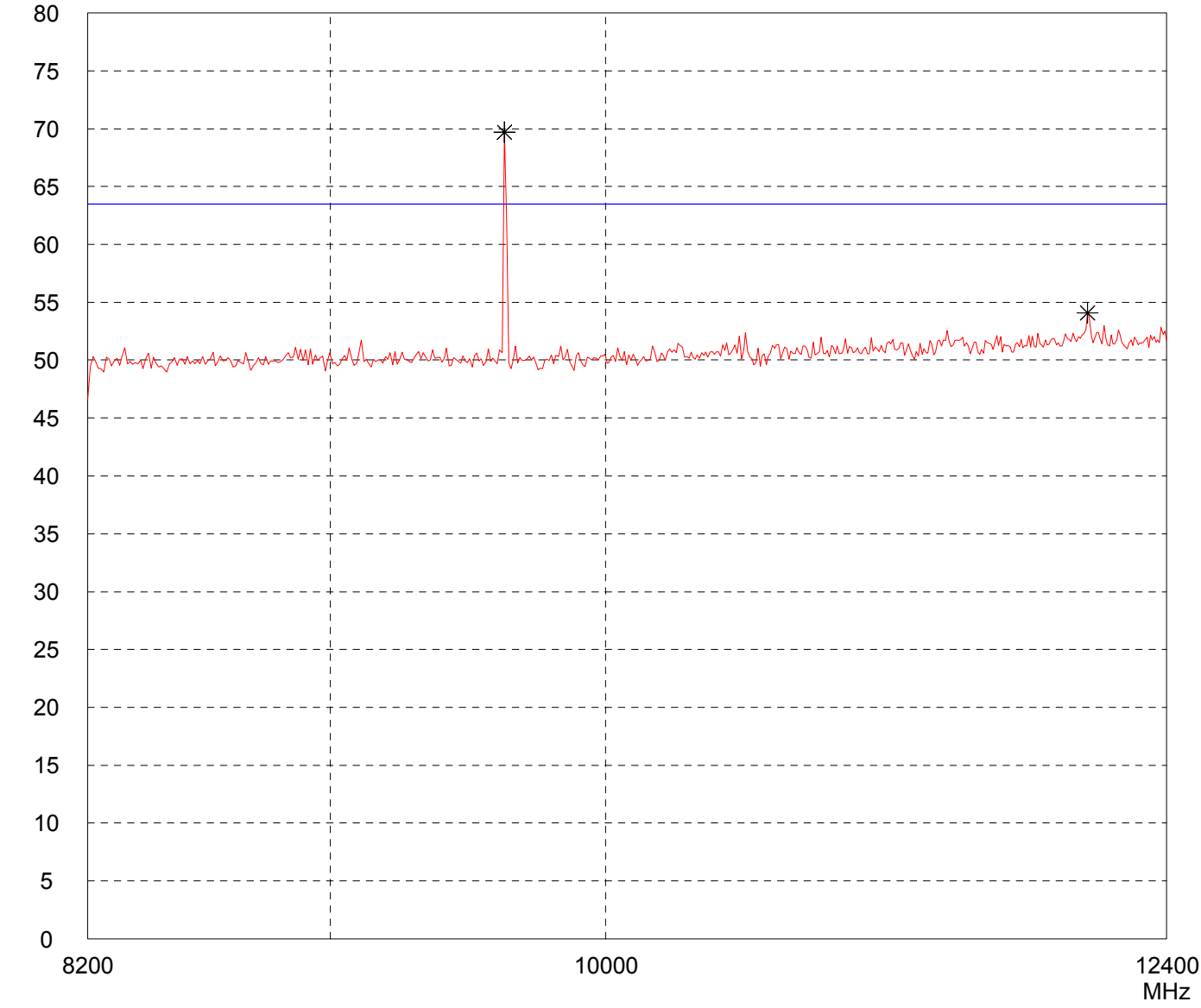

| | |
|---|---|
| Result: Limit kept | Project file: 56113-80538 |

# Radiated Emission Test 8.2 GHz - 12.4 GHz
# acc. to FCC Part 15 Subpart C (FAR)

| | |
|---|---|
| Model: #5691 SHoW DMX Transceiver | Comment: |
| Serial no.: Test Sample 1 | - with module on test board controlled by DELL laptop PC<br>- DC 5 V power supply<br>- TX mode:<br>- Lowest channel channel (2406 MHz)<br>- without modulation<br>- Antenna: Maxrad MYP24014PTNF<br>- |
| Applicant: City Theatrical, Inc. | |
| Test site: Fully anechoic room, cabin no. 2 | |
| Tested on: Test distance 1 meter Horizontal Polarization | |
| Date of test: 06/20/2008 / Operator: J. Roidt | |
| Test performed: automatically / File name: default.emi | |

| | |
|---|---|
| Detector: Peak | List of values: 10 dB Margin / 50 Subranges |

dBµV/m — Limit1: FCC 15.209 (1 m) — Transducer: EMCO 3160



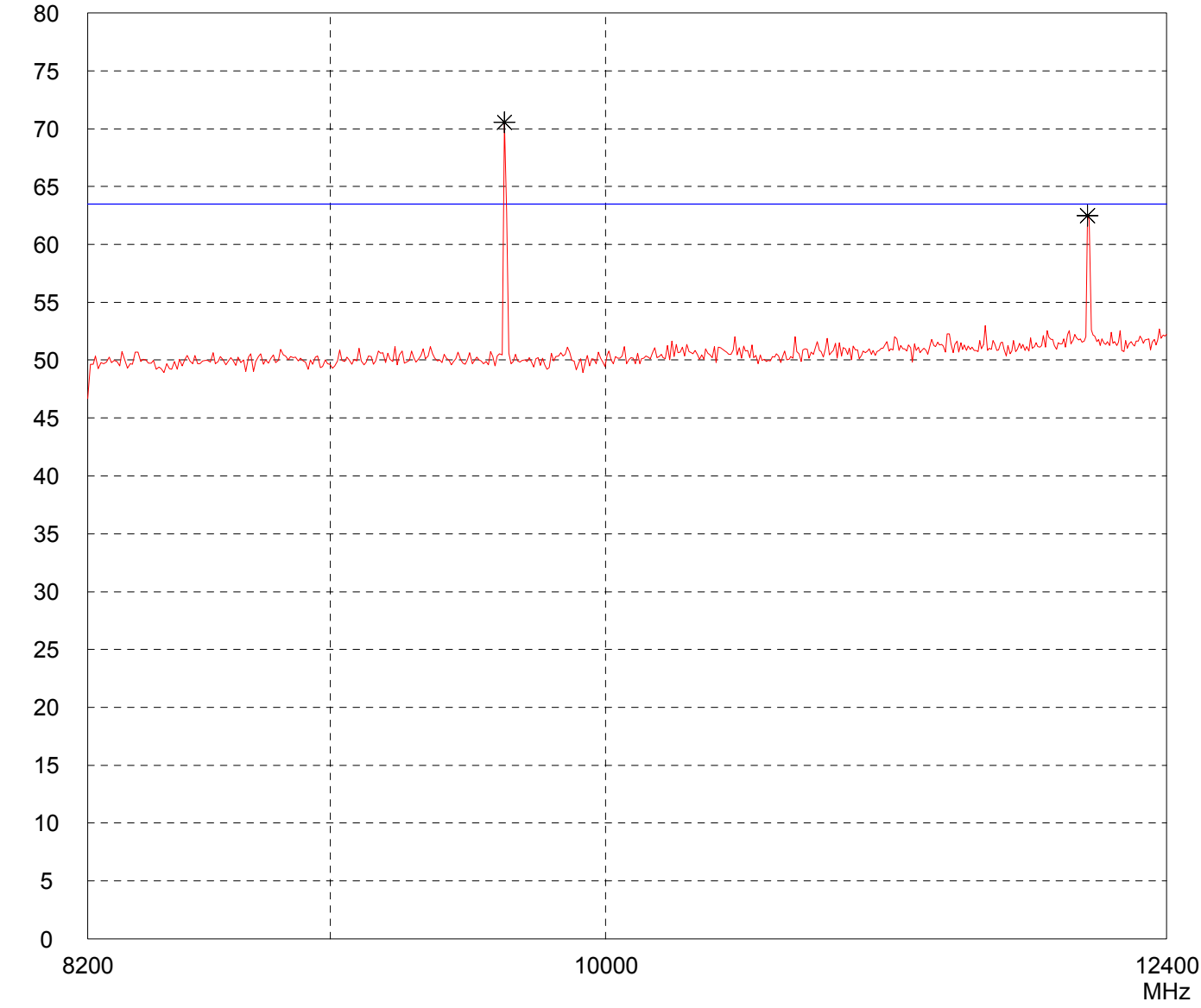

| | |
|---|---|
| Result: Limit kept | Project file: 56113-80538 |

# Radiated Emission Test 8.2 GHz - 12.4 GHz
# acc. to FCC Part 15 Subpart C (FAR)

| | |
|---|---|
| Model: #5691 SHoW DMX Transceiver | Comment: |
| Serial no.: Test Sample 1 | - with module on test board controlled by DELL laptop PC<br>- DC 5 V power supply<br>- TX mode:<br>- Lowest channel channel (2406 MHz)<br>- without modulation<br>- Antenna: Maxrad MYP24014PTNF<br>- |
| Applicant: City Theatrical, Inc. | |
| Test site: Fully anechoic room, cabin no. 2 | |
| Tested on: Test distance 1 meter Vertical Polarization | |
| Date of test: 06/20/2008 / Operator: J. Roidt | |
| Test performed: automatically / File name: default.emi | |

| | |
|---|---|
| Detector: Peak | List of values: 10 dB Margin / 50 Subranges |

dBµV/m — Limit1: FCC 15.209 (1 m) — Transducer: EMCO 3160

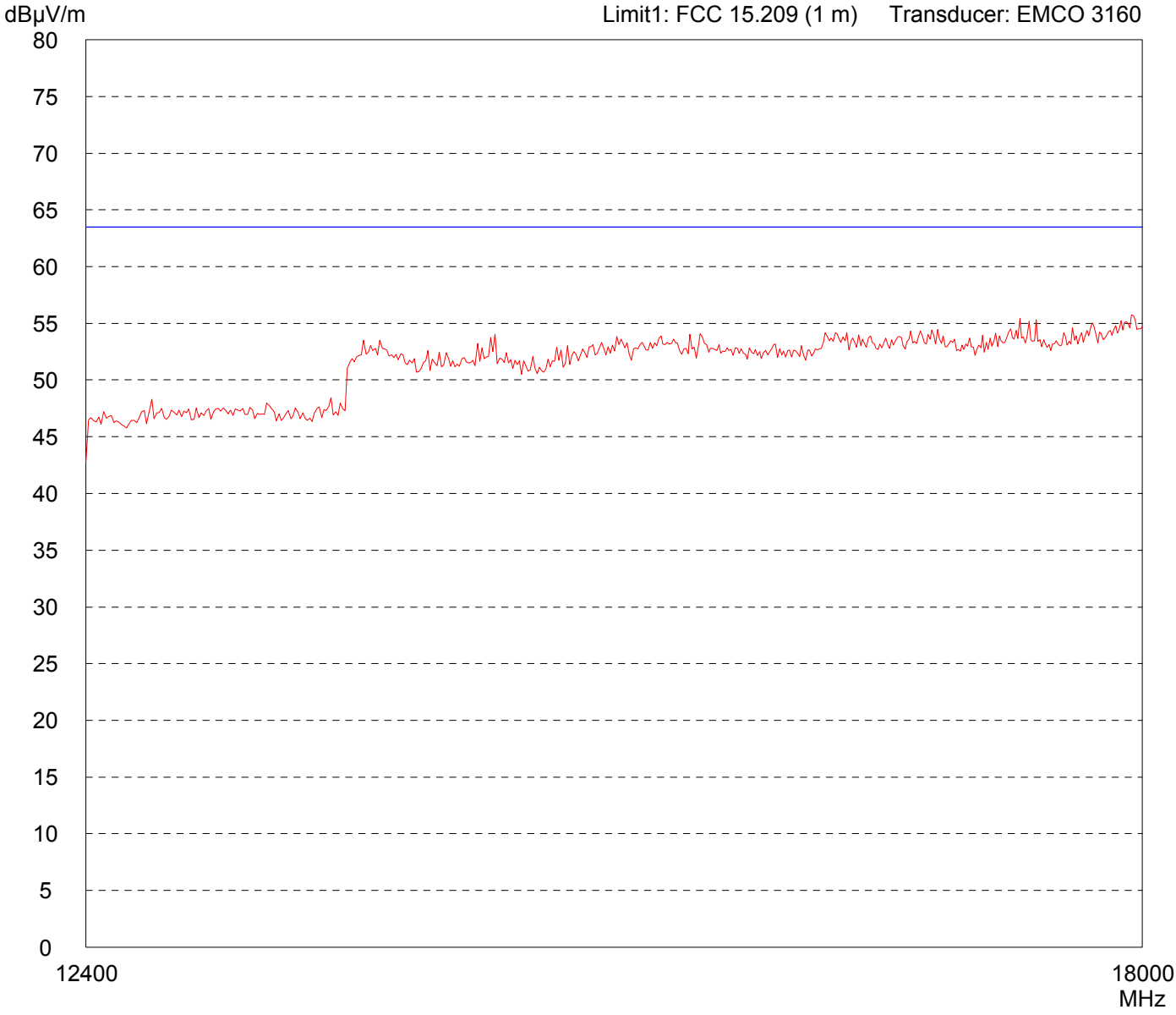



| | |
|---|---|
| Result: Limit kept | Project file: 56113-80538 |

# Radiated Emission Test 12.4 GHz - 18 GHz
# acc. to FCC Part 15 Subpart C (FAR)

| | |
|---|---|
| Model: #5691 SHoW DMX Transceiver | Comment: - with module on test board controlled by DELL laptop PC<br>- DC 5 V power supply<br>- TX mode:<br>- Lowest channel channel (2406 MHz)<br>- without modulation<br>- Antenna: Maxrad MYP24014PTNF<br>- |
| Serial no.: Test Sample 1 | |
| Applicant: City Theatrical, Inc. | |
| Test site: Fully anechoic room, cabin no. 2 | |
| Tested on: Test distance 1 meter Horizontal Polarization | |
| Date of test: 06/20/2008 / Operator: J. Roidt | |
| Test performed: by hand / File name: default.emi | |

| | |
|---|---|
| Detector: Peak | List of values: Selected by hand |



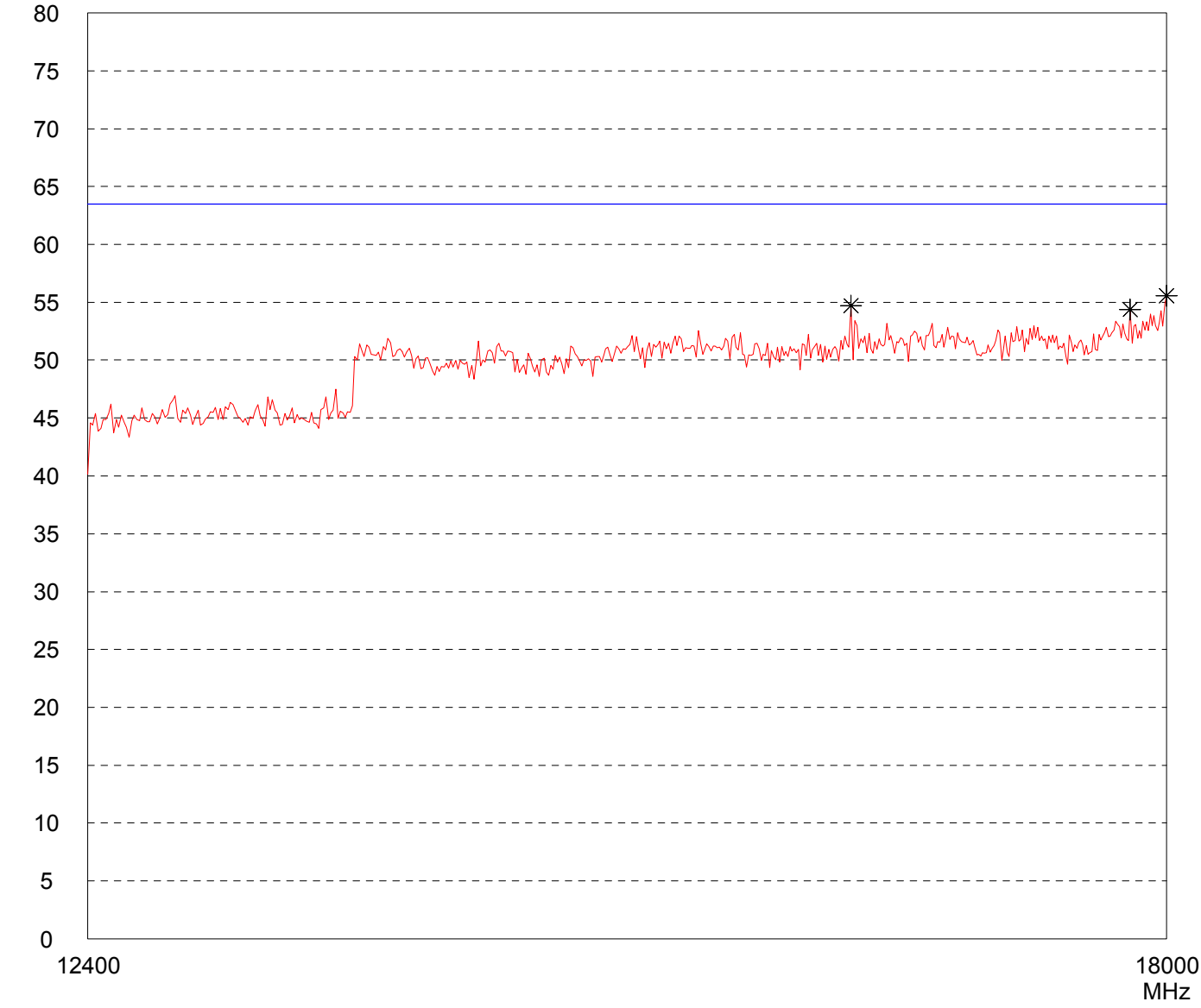

| | |
|---|---|
| Result: Limit kept | Project file: 56113-80538 |

# Radiated Emission Test 12.4 GHz - 18 GHz
# acc. to FCC Part 15 Subpart C (FAR)

| | |
|---|---|
| Model: #5691 SHoW DMX Transceiver | Comment: |
| Serial no.: Test Sample 1 | - with module on test board controlled by DELL laptop PC<br>- DC 5 V power supply<br>- TX mode:<br>- Lowest channel channel (2406 MHz)<br>- without modulation<br>- Antenna: Maxrad MYP24014PTNF<br>- |
| Applicant: City Theatrical, Inc. | |
| Test site: Fully anechoic room, cabin no. 2 | |
| Tested on: Test distance 1 meter Vertical Polarization | |
| Date of test: 06/20/2008 / Operator: J. Roidt | |
| Test performed: by hand / File name: default.emi | |

| | |
|---|---|
| Detector: Peak | List of values: 10 dB Margin / 50 Subranges |

dBµV/m — Limit1: FCC 15.209 (1 m) — Transducer: EMCO 3160




| | |
|---|---|
| Result: Limit kept | Project file: 56113-80538 |

# Spurious emissions according to FCC Rules

| | |
|---|---|
| Model: | Mode: |
| Serial No.: | - with module on test board, controlled by DELL laptop PC<br>- DC 5 V power supply<br>- TX mode:<br>- Low channel (2406 MHz)<br>- no modulation<br>- Antenna:<br>Maxrad MYP24014TNF |
| Applicant:<br>City Theatrical, Inc. | Test distance 1 m , reading without antenna correction |
| | |
| | |
| | |
| | |

Ref.Level 87 dBµV ATT 0 dB
10 dB/Div.


Start 18.000 GHz Stop 26.500 GHz
RBW 100 kHz VBW 100 kHz SWP 2.60 s

| | |
|---|---|
| Tested by:<br>Johann Roidt | Project-No.:<br>56113-080538 |
| Date:<br>20 June 2008 | |

# Radiated Emission Test 30 MHz - 1 GHz
# acc. to FCC Part 15 Subpart C (FAR)

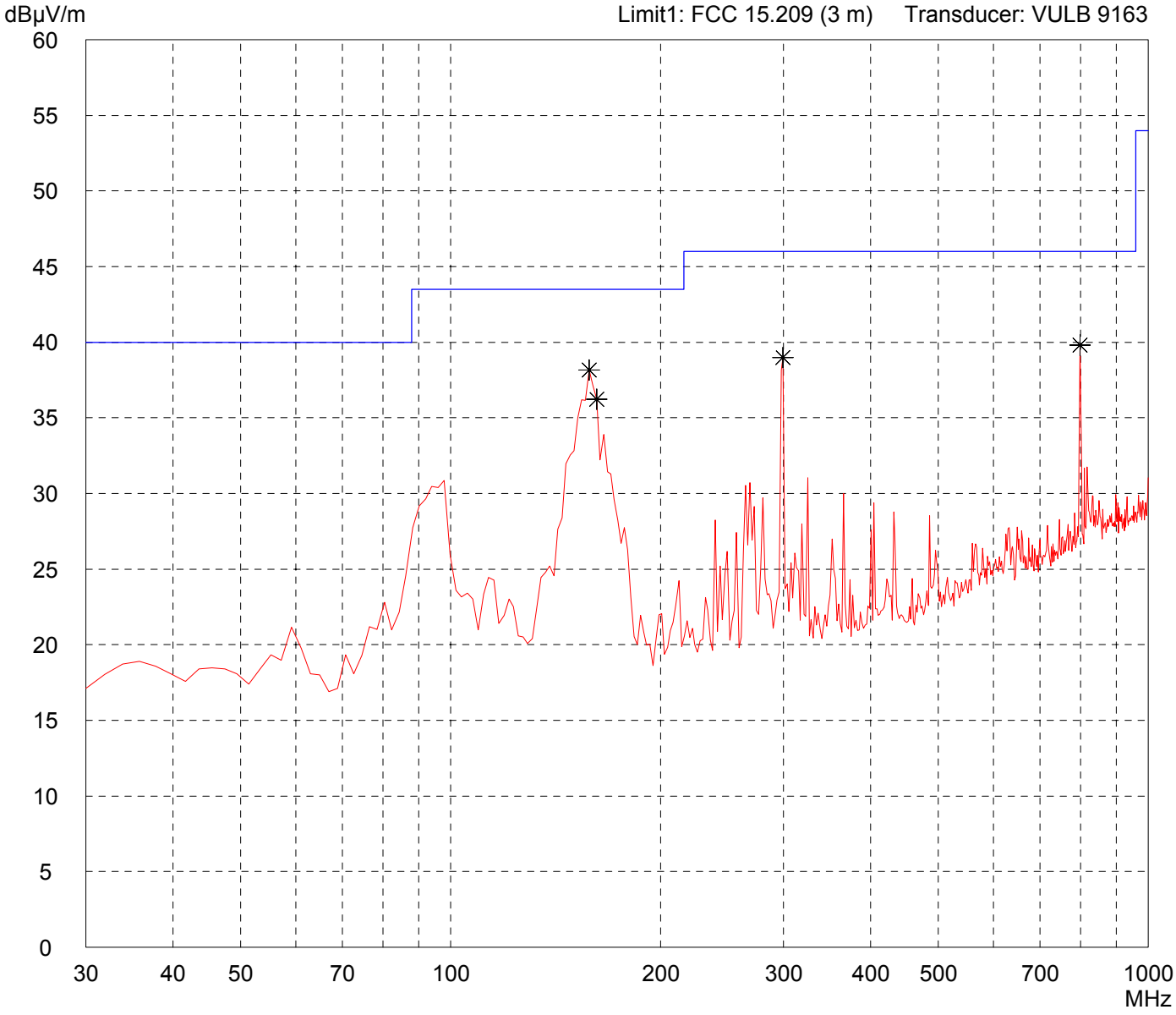
| | |
|---|---|
| Model: | #5691 SHoW DMX Transceiver |
| Serial no.: | Test Sample 1 |
| Applicant: | City Theatrical, Inc. |
| Test site: | Fully anechoic room, cabin no. 2 |
| Tested on: | Test distance 3 metres<br>Horizontal Polarization |
| Date of test: | 06/20/2008 |
| Operator: | J. Roidt |
| Test performed: | automatically |
| File name: | default.emi |

Comment:

- with module on test board
controlled by DELL laptop PC
- DC 5 V power supply
- TX mode:
- Middle channel channel (2406 MHz)
- without modulation
- Antenna:
Maxrad MYP24014PTNF
-

Detector: Peak

List of values: 10 dB Margin 50 Subranges




Result: Limit kept

Project file: 56113-80538

# Radiated Emission Test 30 MHz - 1 GHz
# acc. to FCC Part 15 Subpart C (FAR)

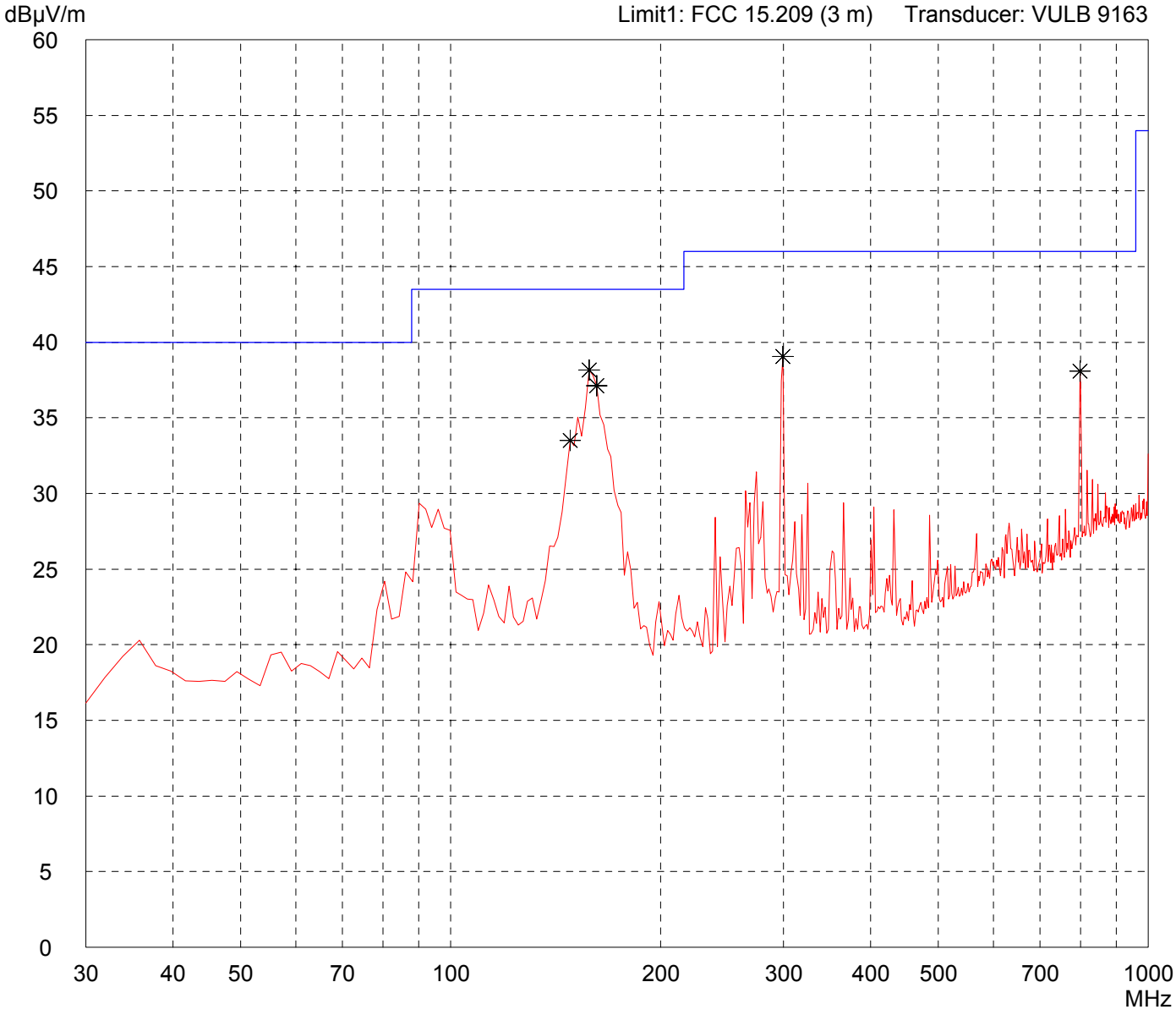
| | |
|---|---|
| Model: | #5691 SHoW DMX Transceiver |
| Serial no.: | Test Sample 1 |
| Applicant: | City Theatrical, Inc. |
| Test site: | Fully anechoic room, cabin no. 2 |
| Tested on: | Test distance 3 metres<br>Vertical Polarization |
| Date of test: / Operator: | 06/20/2008 / J. Roidt |
| Test performed: / File name: | automatically / default.emi |

Comment:

- with module on test board controlled by DELL laptop PC
- DC 5 V power supply
- TX mode:
- Middle channel channel (2406 MHz)
- without modulation
- Antenna: Maxrad MYP24014PTNF
-

Detector: Peak

List of values: 10 dB Margin 50 Subranges



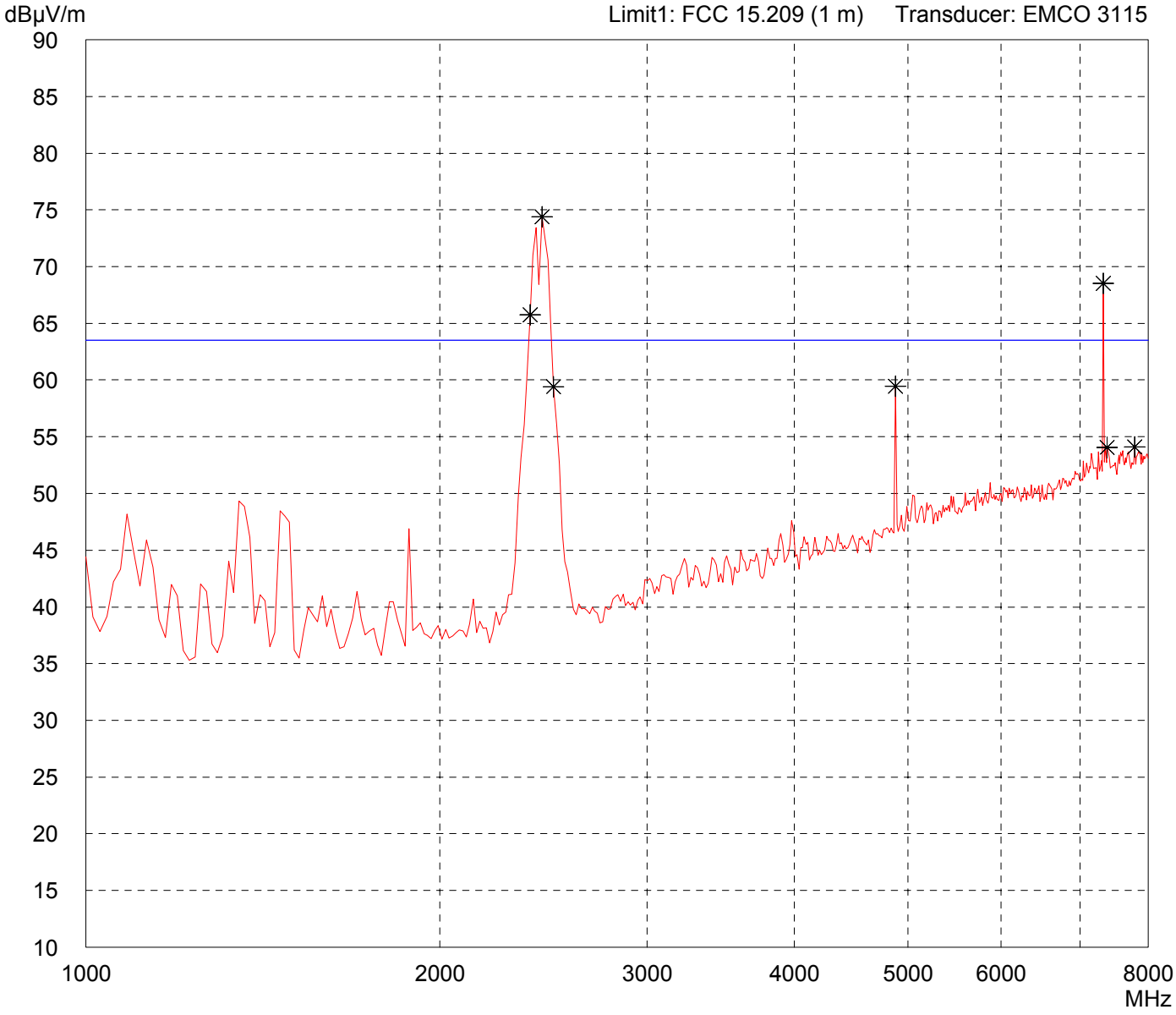

Result: Limit kept

Project file: 56113-80538

# Radiated Emission Test 1 GHz - 8 GHz
# acc. to FCC Part 15 Subpart C (FAR)

| | |
|---|---|
| Model: #5691 SHoW DMX Transceiver | Comment: - with module on test board controlled by DELL laptop PC<br>- DC 5 V power supply<br>- TX mode:<br>- Midlle channel channel (2440 MHz)<br>- without modulation<br>- Antenna: Maxrad MYP24014PTNF<br>- |
| Serial no.: Test Sample 1 | |
| Applicant: City Theatrical, Inc. | |
| Test site: Fully anechoic room, cabin no. 2 | |
| Tested on: Test distance 1 metre<br>Horizontal Polarization | |
| Date of test: 06/20/2008 / Operator: J. Roidt | |
| Test performed: automatically / File name: default.emi | |

| | |
|---|---|
| Detector: Peak | List of values: 10 dB Margin / 50 Subranges |

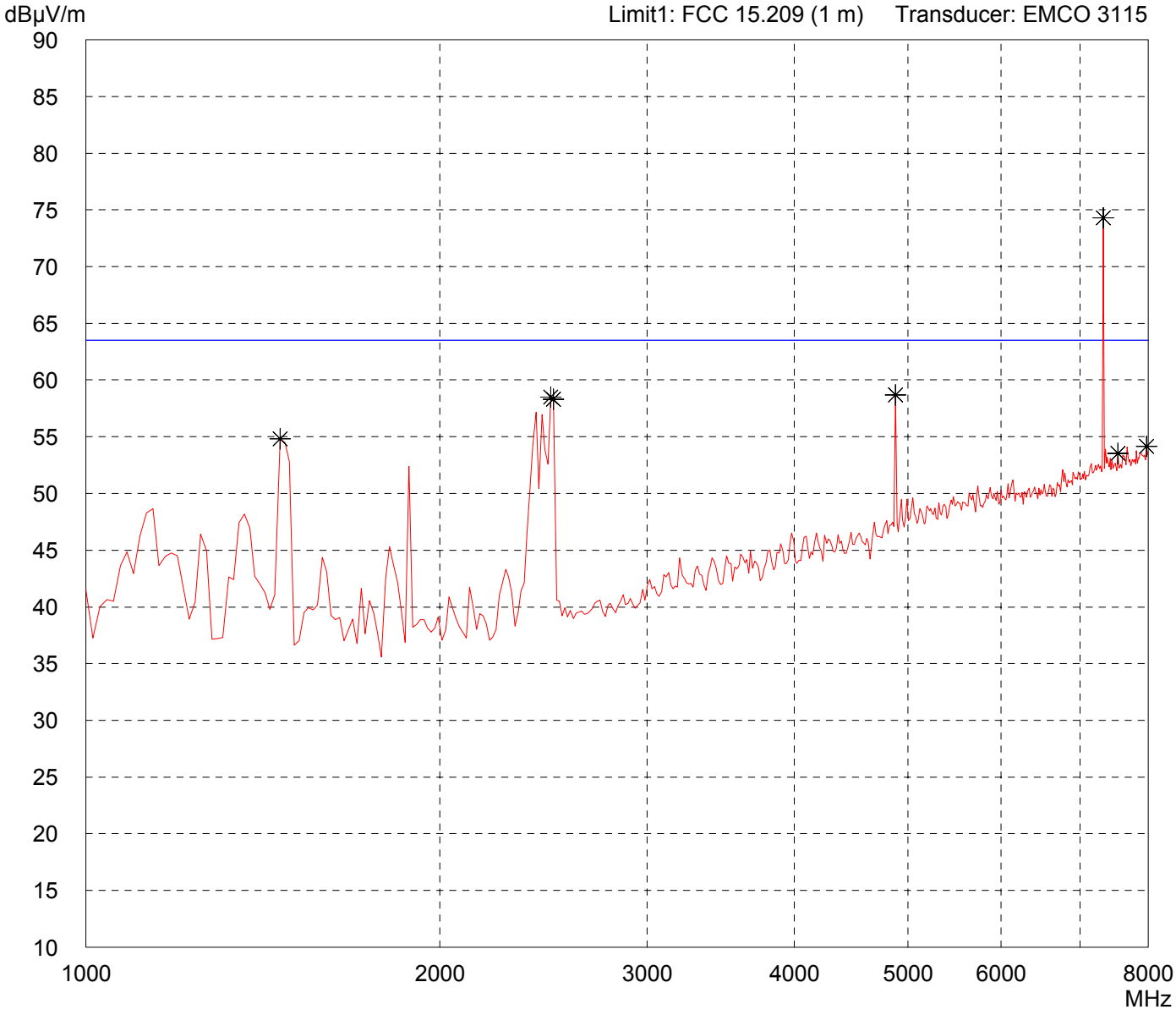



| | |
|---|---|
| Result: Limit kept | Project file: 56113-80538 |

# Radiated Emission Test 1 GHz - 8 GHz
# acc. to FCC Part 15 Subpart C (FAR)

| | |
|---|---|
| Model: #5691 SHoW DMX Transceiver | Comment: - with module on test board controlled by DELL laptop PC<br>- DC 5 V power supply<br>- TX mode:<br>- Midlle channel channel (2440 MHz)<br>- without modulation<br>- Antenna: Maxrad MYP24014PTNF<br>- |
| Serial no.: Test Sample 1 | |
| Applicant: City Theatrical, Inc. | |
| Test site: Fully anechoic room, cabin no. 2 | |
| Tested on: Test distance 1 metre<br>Vertical Polarization | |
| Date of test: 06/20/2008 / Operator: J. Roidt | |
| Test performed: automatically / File name: default.emi | |

| | |
|---|---|
| Detector: Peak | List of values: 10 dB Margin / 50 Subranges |

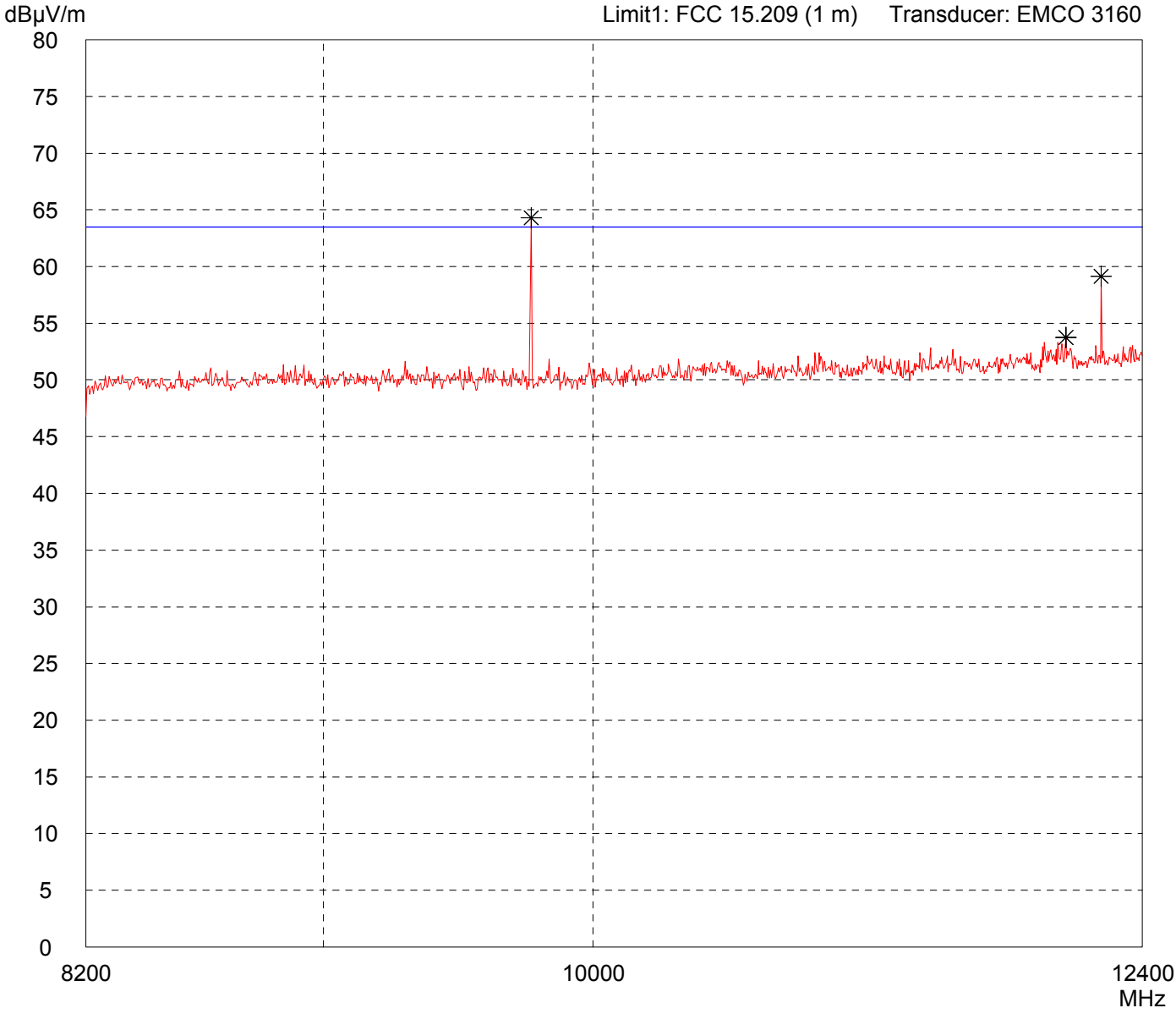



| | |
|---|---|
| Result: Limit kept | Project file: 56113-80538 |

# Radiated Emission Test 8.2 GHz - 12.4 GHz
# acc. to FCC Part 15 Subpart C (FAR)

| | |
|---|---|
| Model: #5691 SHoW DMX Transceiver | Comment: |
| Serial no.: Test Sample 1 | - with module on test board controlled by DELL laptop PC<br>- DC 5 V power supply<br>- TX mode:<br>- Middle channel channel (2440 MHz)<br>- without modulation<br>- Antenna: Maxrad MYP24014PTNF<br>- |
| Applicant: City Theatrical, Inc. | |
| Test site: Fully anechoic room, cabin no. 2 | |
| Tested on: Test distance 1 meter Horizontal Polarization | |
| Date of test: 06/20/2008 / Operator: J. Roidt | |
| Test performed: automatically / File name: default.emi | |

| | |
|---|---|
| Detector: Peak | List of values: 10 dB Margin / 50 Subranges |



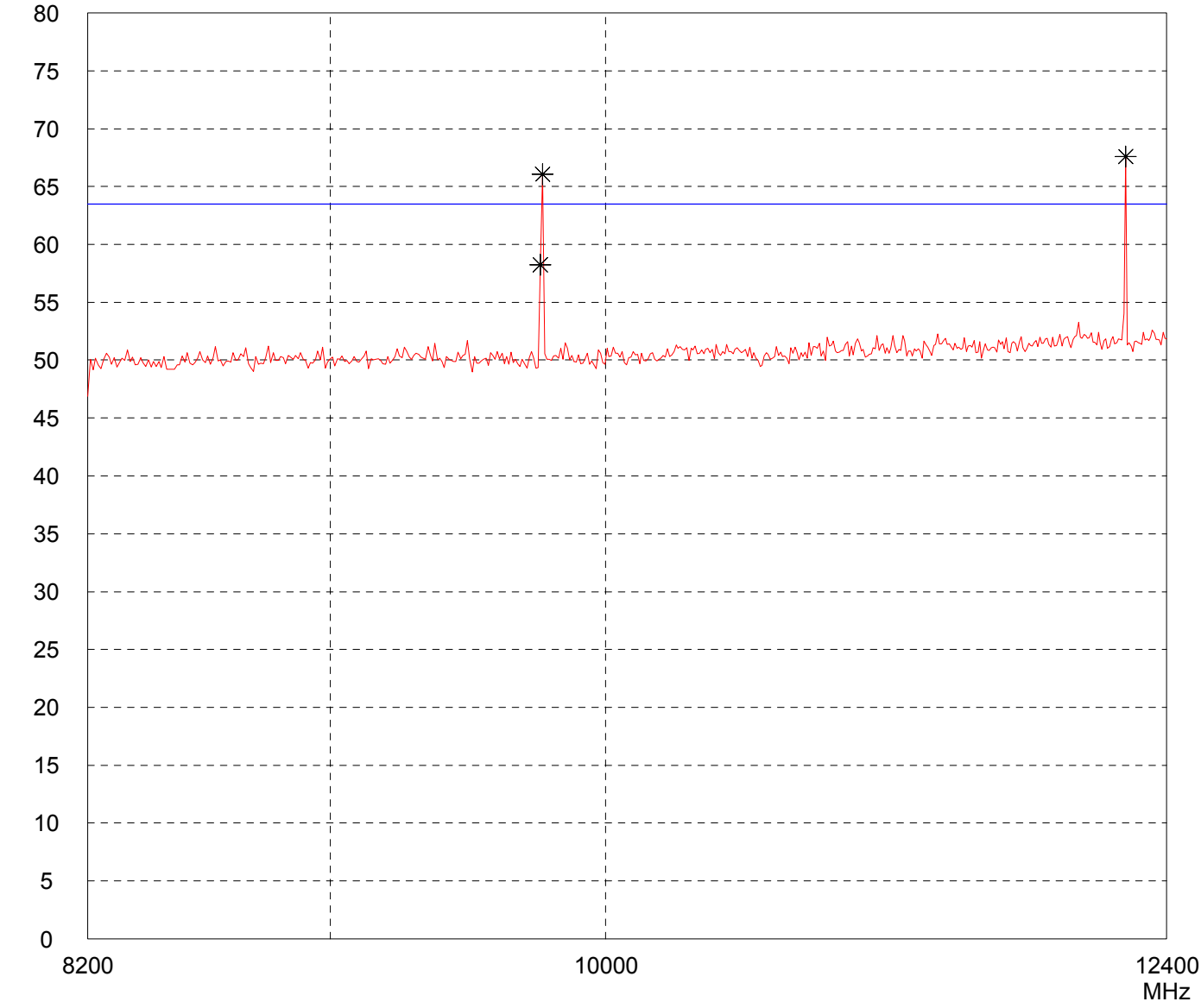

| | |
|---|---|
| Result: Limit kept | Project file: 56113-80538 |

# Radiated Emission Test 8.2 GHz - 12.4 GHz
# acc. to FCC Part 15 Subpart C (FAR)

| | |
|---|---|
| Model: #5691 SHoW DMX Transceiver | Comment: |
| Serial no.: Test Sample 1 | - with module on test board controlled by DELL laptop PC<br>- DC 5 V power supply<br>- TX mode:<br>- Middle channel channel (2440 MHz)<br>- without modulation<br>- Antenna: Maxrad MYP24014PTNF<br>- |
| Applicant: City Theatrical, Inc. | |
| Test site: Fully anechoic room, cabin no. 2 | |
| Tested on: Test distance 1 meter Vertical Polarization | |
| Date of test: 06/20/2008 / Operator: J. Roidt | |
| Test performed: automatically / File name: default.emi | |

| | |
|---|---|
| Detector: Peak | List of values: 10 dB Margin / 50 Subranges |

dBµV/m — Limit1: FCC 15.209 (1 m) — Transducer: EMCO 3160




| | |
|---|---|
| Result: Limit kept | Project file: 56113-80538 |

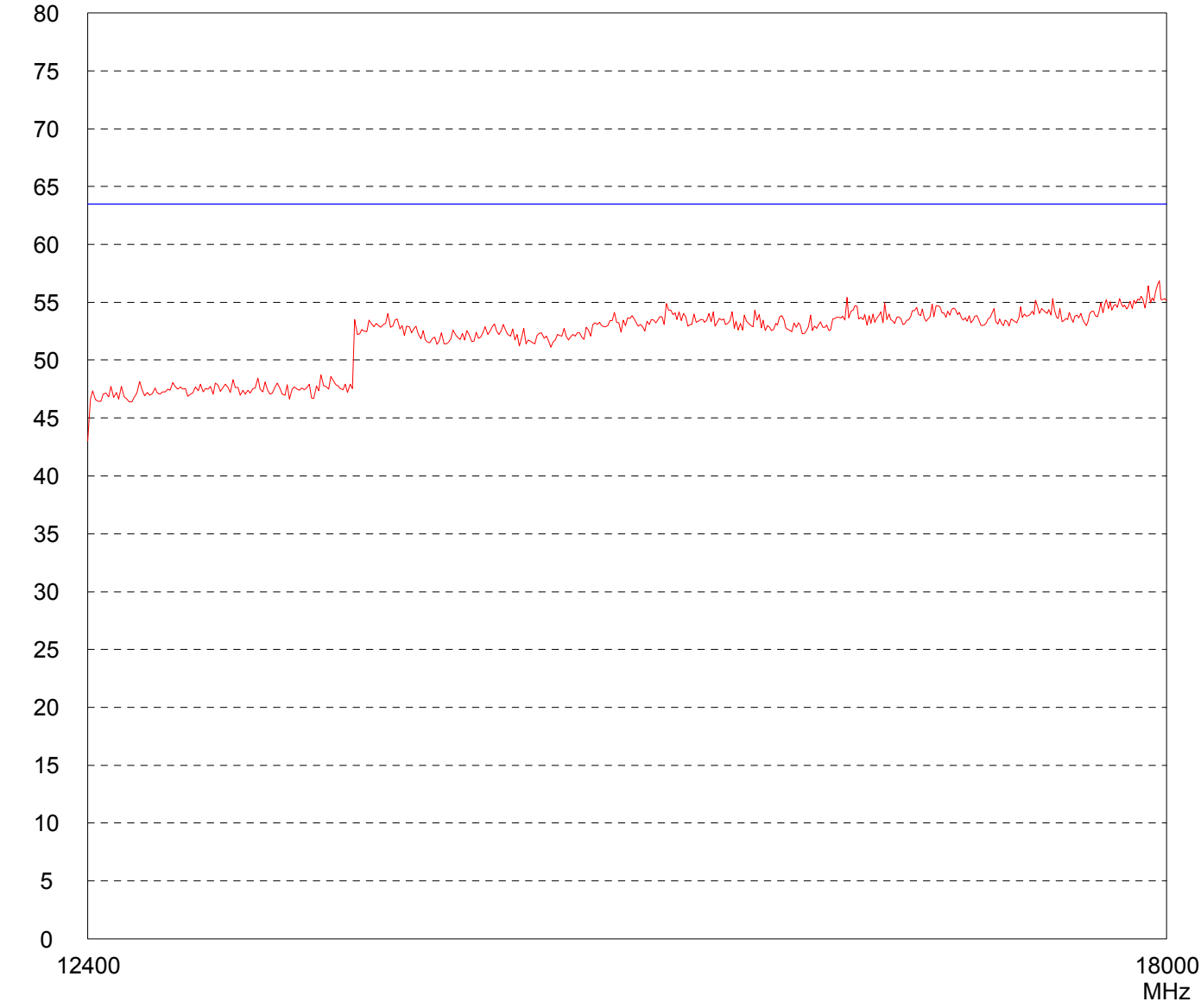
# Radiated Emission Test 12.4 GHz - 18 GHz
# acc. to FCC Part 15 Subpart C (FAR)

| | |
|---|---|
| Model: #5691 SHoW DMX Transceiver | Comment: |
| Serial no.: Test Sample 1 | - with module on test board controlled by DELL laptop PC<br>- DC 5 V power supply<br>- TX mode:<br>- Middle channel channel (2440 MHz)<br>- without modulation<br>- Antenna:<br>Maxrad MYP24014PTNF<br>- |
| Applicant: City Theatrical, Inc. | |
| Test site: Fully anechoic room, cabin no. 2 | |
| Tested on: Test distance 1 meter<br>Horizontal Polarization | |
| Date of test: 06/20/2008 / Operator: J. Roidt | |
| Test performed: by hand / File name: default.emi | |

| | |
|---|---|
| Detector: Peak | List of values: Selected by hand |

dBµV/m

Limit1: FCC 15.209 (1 m) Transducer: EMCO 3160

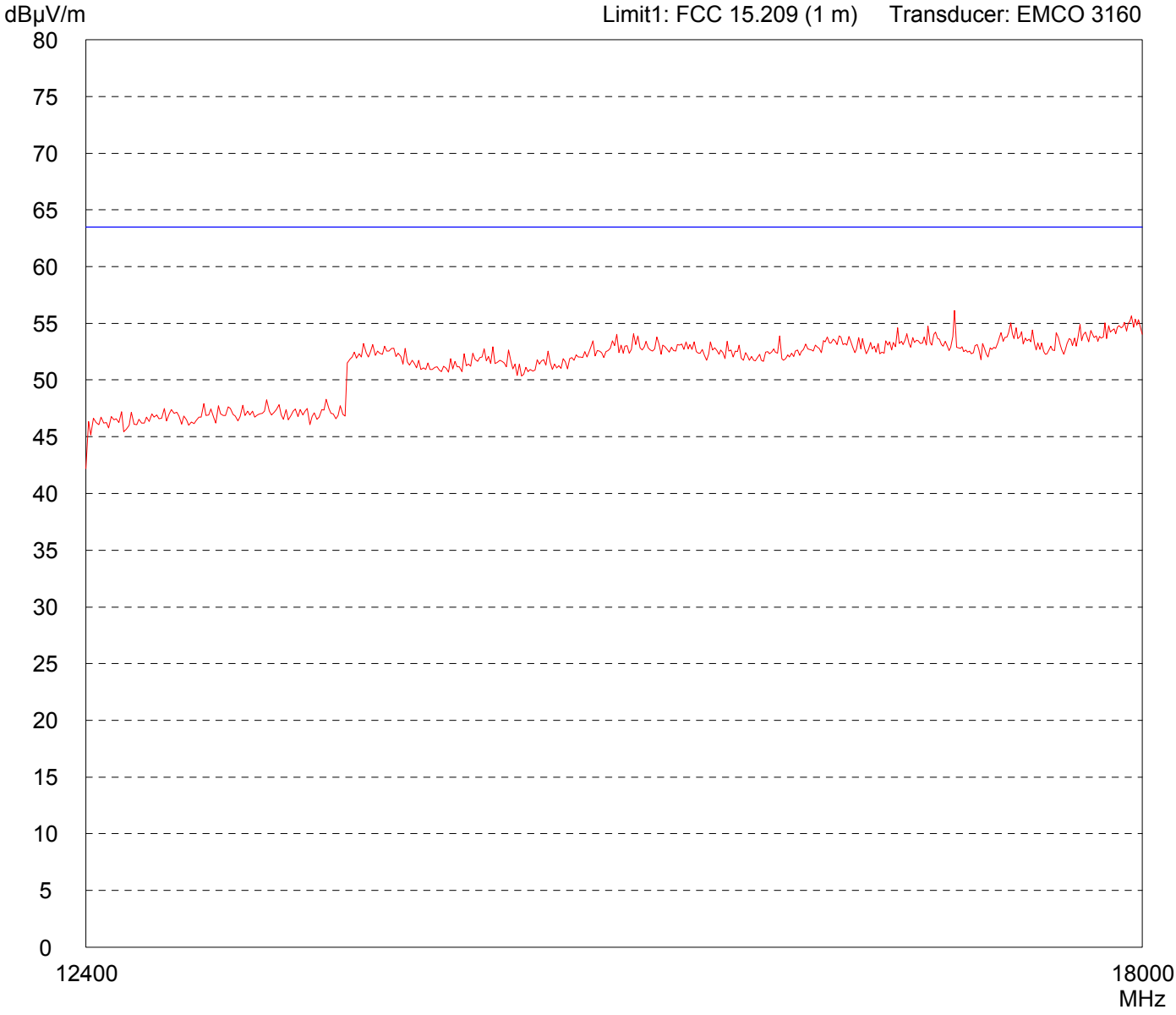



| | |
|---|---|
| Result: Limit kept | Project file: 56113-80538 |

# Radiated Emission Test 12.4 GHz - 18 GHz
# acc. to FCC Part 15 Subpart C (FAR)

| | |
|---|---|
| Model: #5691 SHoW DMX Transceiver | Comment: - with module on test board controlled by DELL laptop PC<br>- DC 5 V power supply<br>- TX mode:<br>- Middle channel channel (2440 MHz)<br>- without modulation<br>- Antenna:<br>Maxrad MYP24014PTNF<br>- |
| Serial no.: Test Sample 1 | |
| Applicant: City Theatrical, Inc. | |
| Test site: Fully anechoic room, cabin no. 2 | |
| Tested on: Test distance 1 meter<br>Vertical Polarization | |
| Date of test: 06/20/2008 / Operator: J. Roidt | |
| Test performed: by hand / File name: default.emi | |

| | |
|---|---|
| Detector: Peak | List of values: Selected by hand |




| | |
|---|---|
| Result: Limit kept | Project file: 56113-80538 |

# Spurious emissions according to FCC Rules

| | |
|---|---|
| Model: | Mode: |
| Serial No.: | - with module on test board, controlled by DELL laptop PC<br>- DC 5 V power supply<br>- TX mode:<br>- Middle channel (2440 MHz)<br>- no modulation<br>- Antenna:<br>Maxrad MYP24014TNF<br><br>Test distance 1 m , reading without antenna correction |
| Applicant:<br>City Theatrical, Inc. | |
| | |
| | |
| | |
| | |

Ref.Level 87 dBµV ATT 0 dB
10 dB/Div.


Start 18.000 GHz Stop 26.500 GHz
RBW 100 kHz VBW 100 kHz SWP 2.60 s

| | |
|---|---|
| Tested by:<br>Johann Roidt | Project-No.:<br>56113-080538 |
| Date:<br>20 June 2008 | |

# Radiated Emission Test 30 MHz - 1 GHz
# acc. to FCC Part 15 Subpart C (FAR)

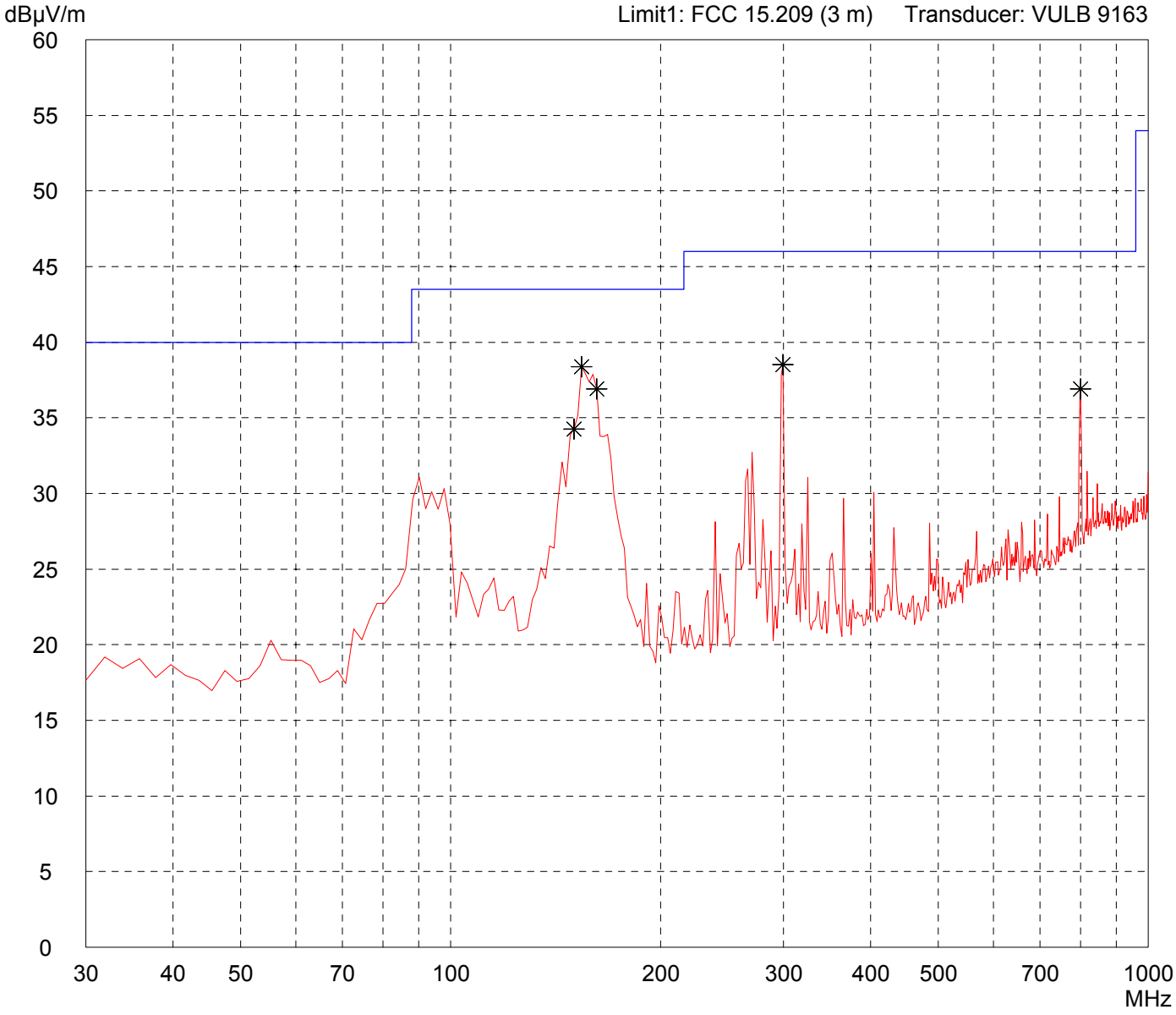
| | |
|---|---|
| Model: | #5691 SHoW DMX Transceiver |
| Serial no.: | Test Sample 1 |
| Applicant: | City Theatrical, Inc. |
| Test site: | Fully anechoic room, cabin no. 2 |
| Tested on: | Test distance 3 metres<br>Horizontal Polarization |
| Date of test: | 06/20/2008 |
| Operator: | J. Roidt |
| Test performed: | automatically |
| File name: | default.emi |

Comment:

- with module on test board
controlled by DELL laptop PC
- DC 5 V power supply
- TX mode:
- Highest channel channel (2476 MHz)
- without modulation
- Antenna:
  Maxrad MYP24014PTNF
-

Detector: Peak

List of values: 10 dB Margin 50 Subranges



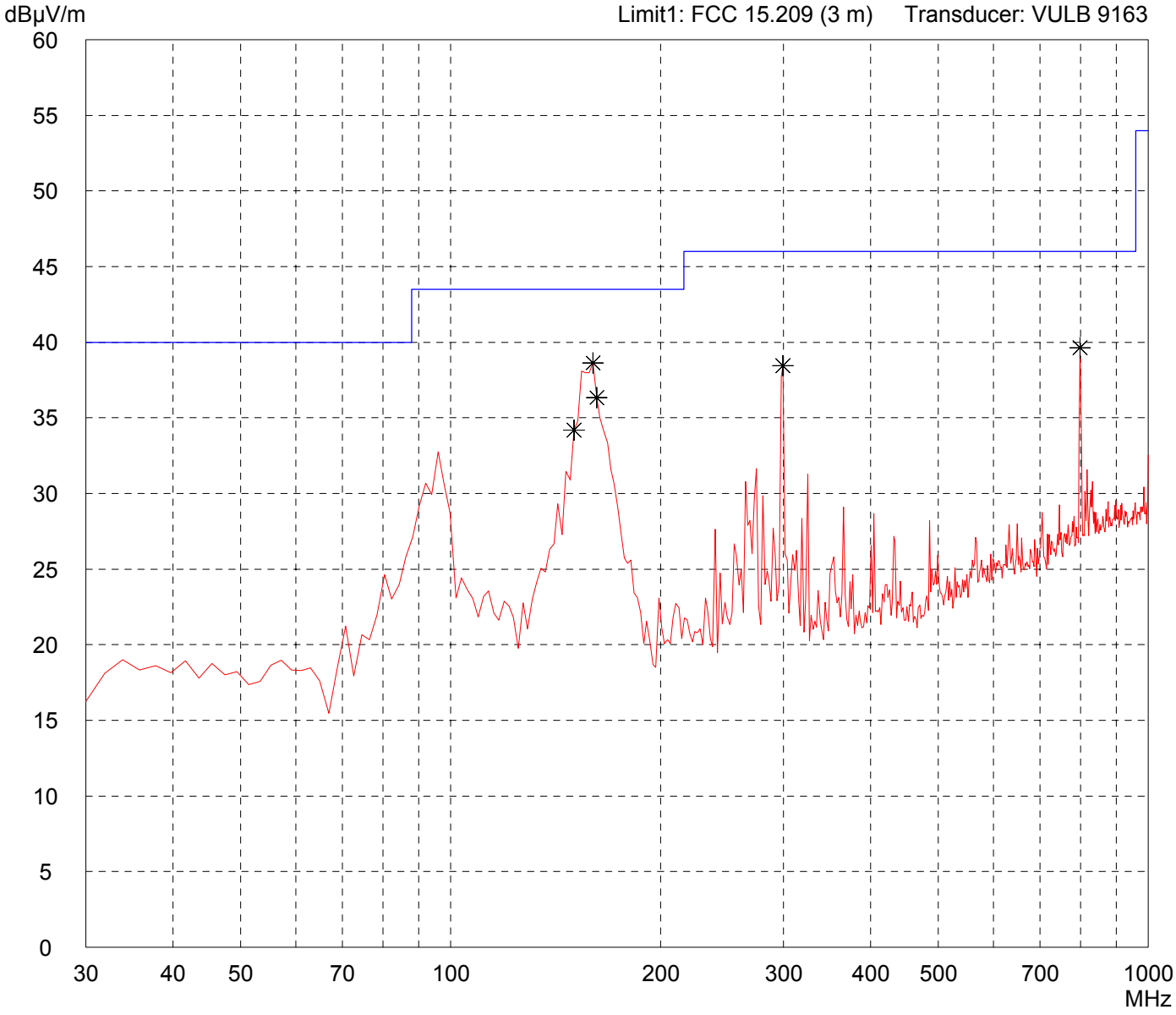

Result: Limit kept

Project file: 56113-80538

# Radiated Emission Test 30 MHz - 1 GHz
# acc. to FCC Part 15 Subpart C (FAR)

| | |
|---|---|
| Model: #5691 SHoW DMX Transceiver | Comment: - with module on test board controlled by DELL laptop PC<br>- DC 5 V power supply<br>- TX mode:<br>- Highest channel channel (2476 MHz)<br>- without modulation<br>- Antenna: Maxrad MYP24014PTNF<br>- |
| Serial no.: Test Sample 1 | |
| Applicant: City Theatrical, Inc. | |
| Test site: Fully anechoic room, cabin no. 2 | |
| Tested on: Test distance 3 metres Vertical Polarization | |
| Date of test: 06/20/2008 / Operator: J. Roidt | |
| Test performed: automatically / File name: default.emi | |

| | |
|---|---|
| Detector: Peak | List of values: 10 dB Margin / 50 Subranges |

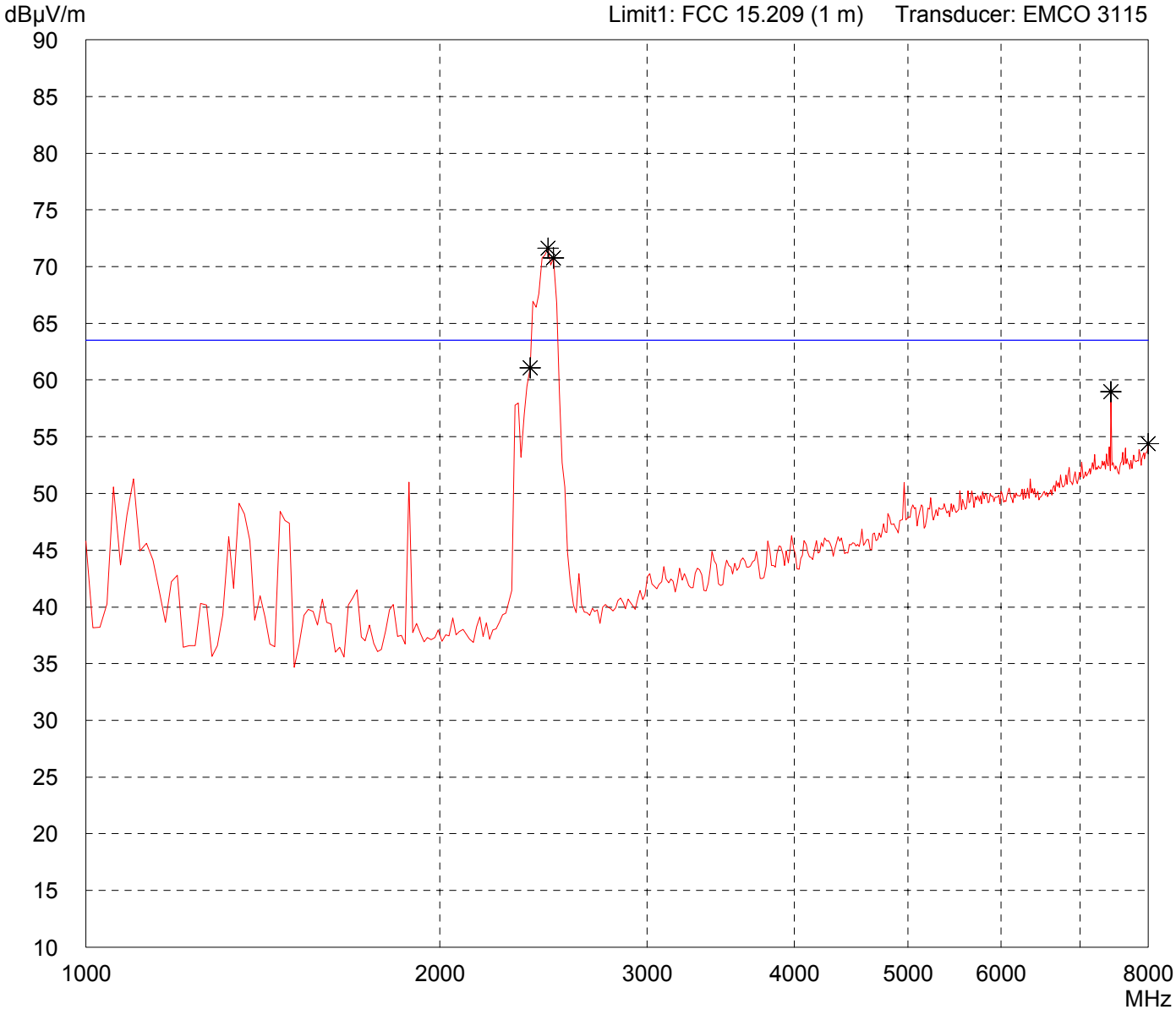



| | |
|---|---|
| Result: Limit kept | Project file: 56113-80538 |

# Radiated Emission Test 1 GHz - 8 GHz
# acc. to FCC Part 15 Subpart C (FAR)

| | |
|---|---|
| Model: #5691 SHoW DMX Transceiver | Comment: - with module on test board controlled by DELL laptop PC<br>- DC 5 V power supply<br>- TX mode:<br>- Highest channel channel (2476 MHz)<br>- without modulation<br>- Antenna: Maxrad MYP24014PTNF |
| Serial no.: Test Sample 1 | |
| Applicant: City Theatrical, Inc. | |
| Test site: Fully anechoic room, cabin no. 2 | |
| Tested on: Test distance 1 metre Horizontal Polarization | |
| Date of test: 06/20/2008 / Operator: J. Roidt | |
| Test performed: automatically / File name: default.emi | |

| | |
|---|---|
| Detector: Peak | List of values: 10 dB Margin / 50 Subranges |



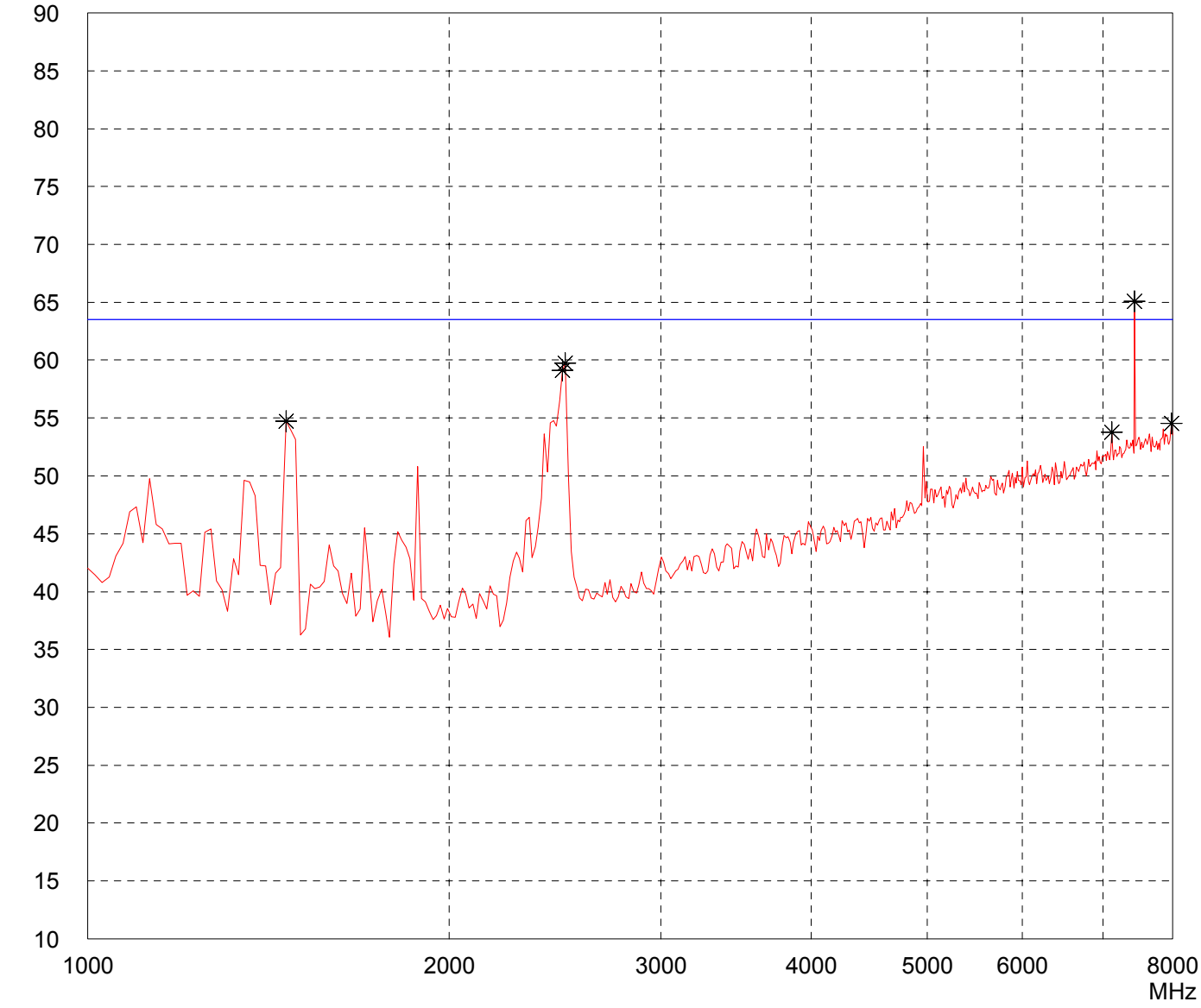

| | |
|---|---|
| Result: Limit kept | Project file: 56113-80538 |

# Radiated Emission Test 1 GHz - 8 GHz
# acc. to FCC Part 15 Subpart C (FAR)

| | |
|---|---|
| Model: #5691 SHoW DMX Transceiver | Comment: - with module on test board controlled by DELL laptop PC<br>- DC 5 V power supply<br>- TX mode:<br>- Highest channel channel (2476 MHz)<br>- without modulation<br>- Antenna: Maxrad MYP24014PTNF<br>- |
| Serial no.: Test Sample 1 | |
| Applicant: City Theatrical, Inc. | |
| Test site: Fully anechoic room, cabin no. 2 | |
| Tested on: Test distance 1 metre<br>Vertical Polarization | |
| Date of test: 06/20/2008 / Operator: J. Roidt | |
| Test performed: automatically / File name: default.emi | |

| | |
|---|---|
| Detector: Peak | List of values: 10 dB Margin / 50 Subranges |

dBµV/m — Limit1: FCC 15.209 (1 m) — Transducer: EMCO 3115

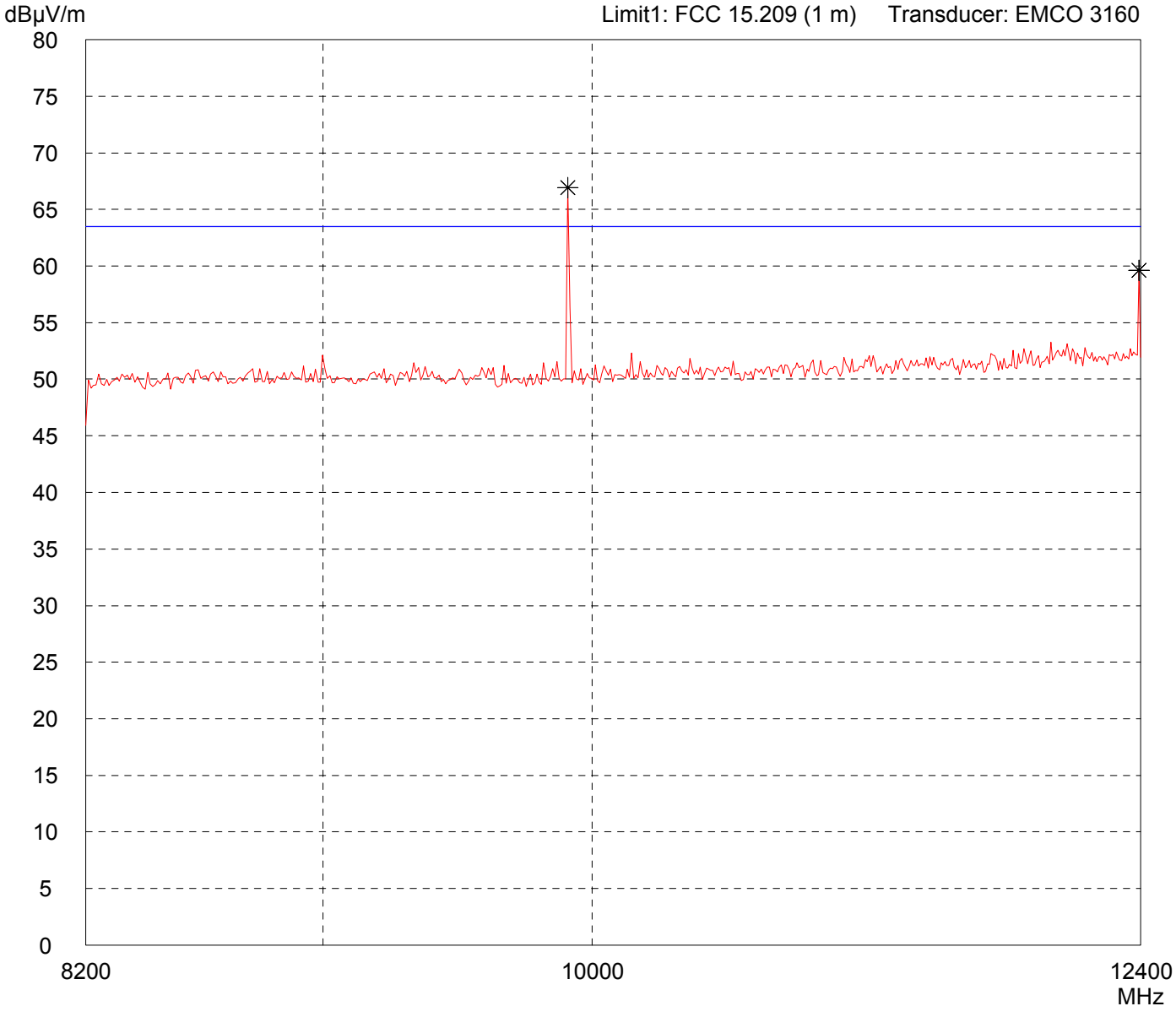



| | |
|---|---|
| Result: Limit kept | Project file: 56113-80538 |

# Radiated Emission Test 8.2 GHz - 12.4 GHz
# acc. to FCC Part 15 Subpart C (FAR)

| | |
|---|---|
| Model: #5691 SHoW DMX Transceiver | Comment: |
| Serial no.: Test Sample 1 | - with module on test board controlled by DELL laptop PC<br>- DC 5 V power supply<br>- TX mode:<br>- Highest channel channel (2476 MHz)<br>- without modulation<br>- Antenna: Maxrad MYP24014PTNF<br>- |
| Applicant: City Theatrical, Inc. | |
| Test site: Fully anechoic room, cabin no. 2 | |
| Tested on: Test distance 1 meter Horizontal Polarization | |
| Date of test: 06/20/2008 / Operator: J. Roidt | |
| Test performed: automatically / File name: default.emi | |

| | |
|---|---|
| Detector: Peak | List of values: 10 dB Margin / 50 Subranges |

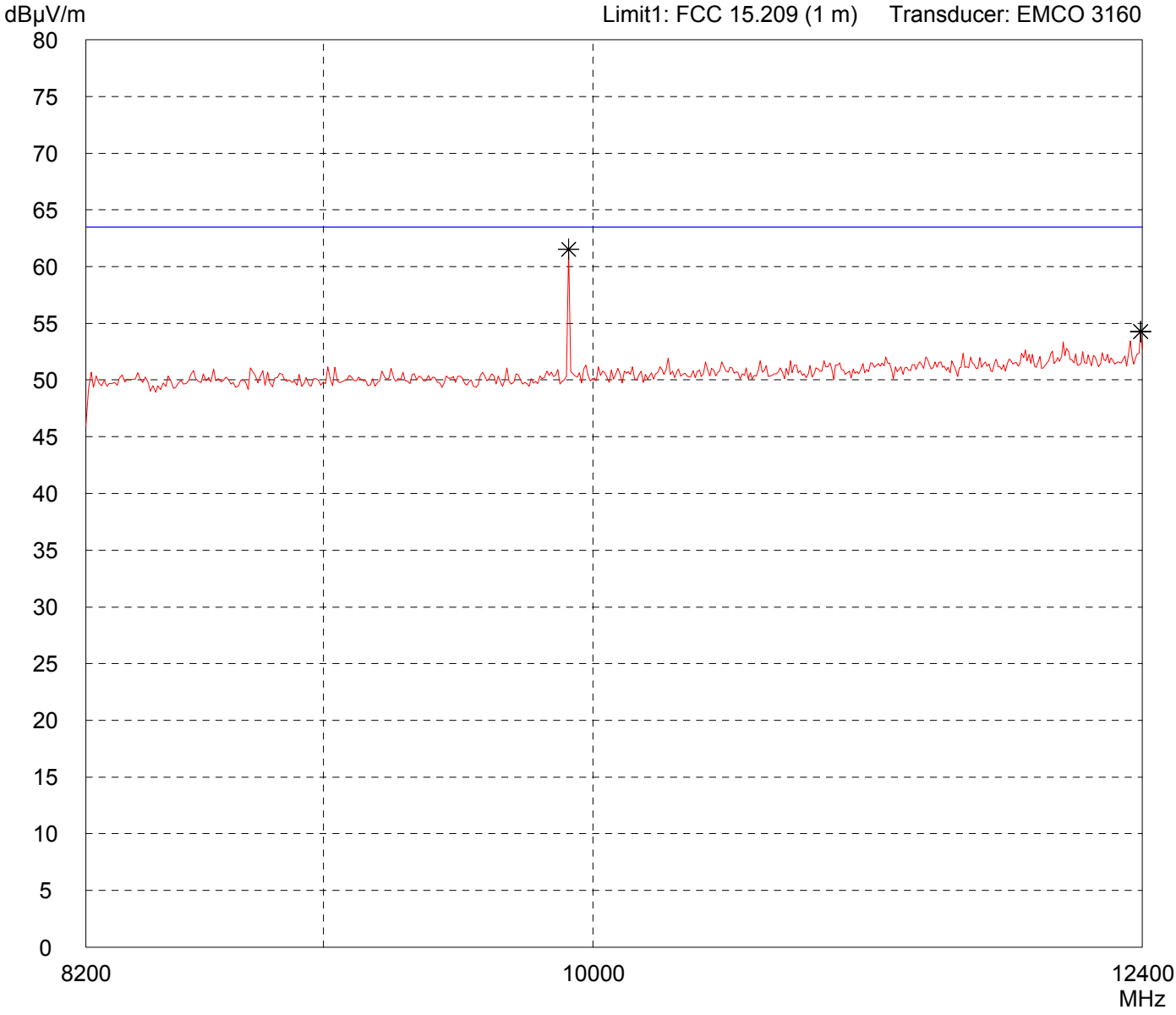



| | |
|---|---|
| Result: Limit kept | Project file: 56113-80538 |

# Radiated Emission Test 8.2 GHz - 12.4 GHz
# acc. to FCC Part 15 Subpart C (FAR)

| | |
|---|---|
| Model: #5691 SHoW DMX Transceiver | Comment: |
| Serial no.: Test Sample 1 | - with module on test board controlled by DELL laptop PC<br>- DC 5 V power supply<br>- TX mode:<br>- Highest channel channel (2476 MHz)<br>- without modulation<br>- Antenna: Maxrad MYP24014PTNF<br>- |
| Applicant: City Theatrical, Inc. | |
| Test site: Fully anechoic room, cabin no. 2 | |
| Tested on: Test distance 1 meter Vertical Polarization | |
| Date of test: 06/20/2008 / Operator: J. Roidt | |
| Test performed: automatically / File name: default.emi | |

| | |
|---|---|
| Detector: Peak | List of values: 10 dB Margin / 50 Subranges |




| | |
|---|---|
| Result: Limit kept | Project file: 56113-80538 |

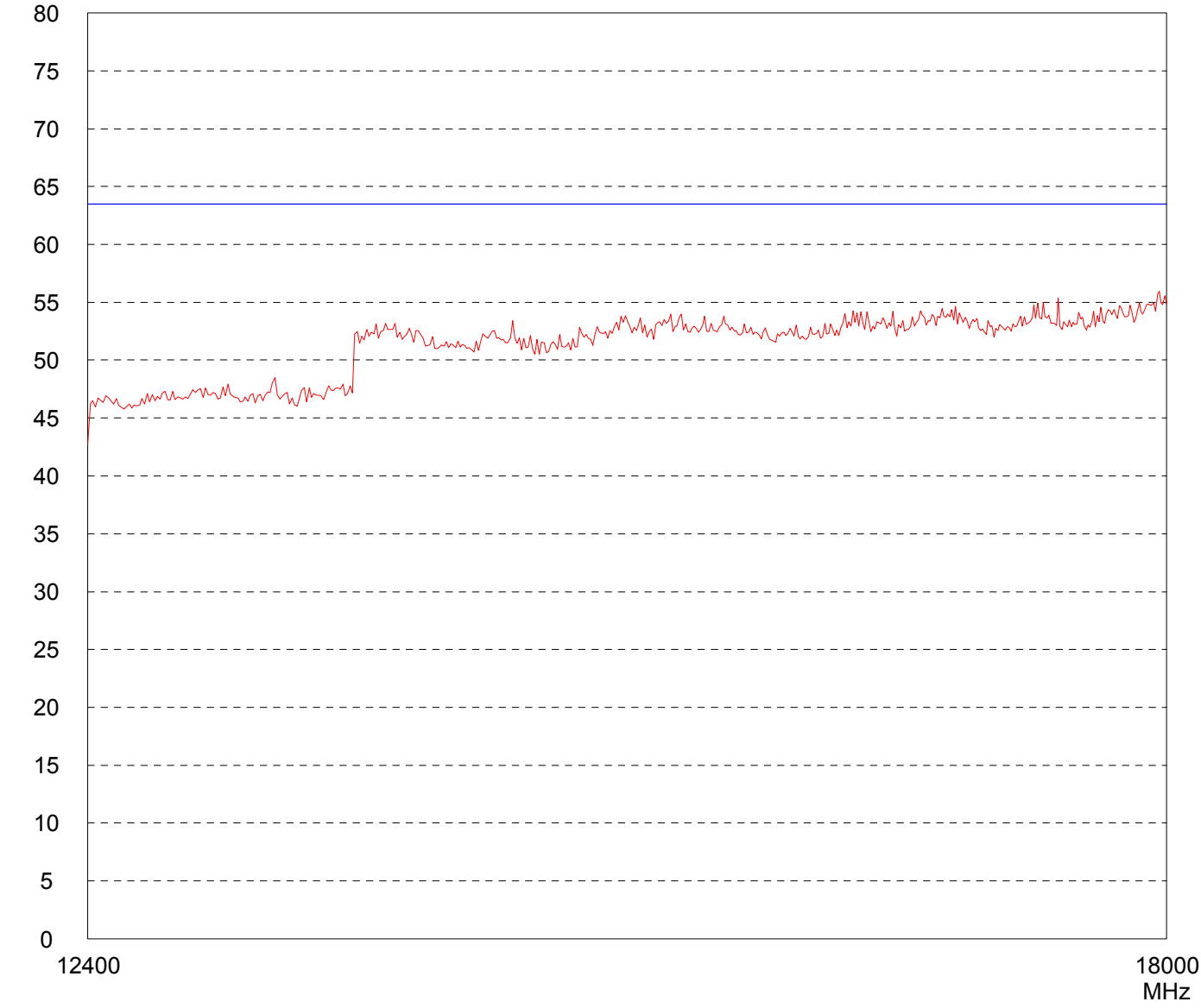
# Radiated Emission Test 12.4 GHz - 18 GHz
# acc. to FCC Part 15 Subpart C (FAR)

| | |
|---|---|
| Model: #5691 SHoW DMX Transceiver | Comment: - with module on test board controlled by DELL laptop PC<br>- DC 5 V power supply<br>- TX mode:<br>- Highest channel channel (2440 MHz)<br>- without modulation<br>- Antenna: Maxrad MYP24014PTNF<br>- |
| Serial no.: Test Sample 1 | |
| Applicant: City Theatrical, Inc. | |
| Test site: Fully anechoic room, cabin no. 2 | |
| Tested on: Test distance 1 meter Horizontal Polarization | |
| Date of test: 06/20/2008 / Operator: J. Roidt | |
| Test performed: by hand / File name: default.emi | |

| | |
|---|---|
| Detector: Peak | List of values: Selected by hand |

dBµV/m

Limit1: FCC 15.209 (1 m) Transducer: EMCO 3160




| | |
|---|---|
| Result: Limit kept | Project file: 56113-80538 |

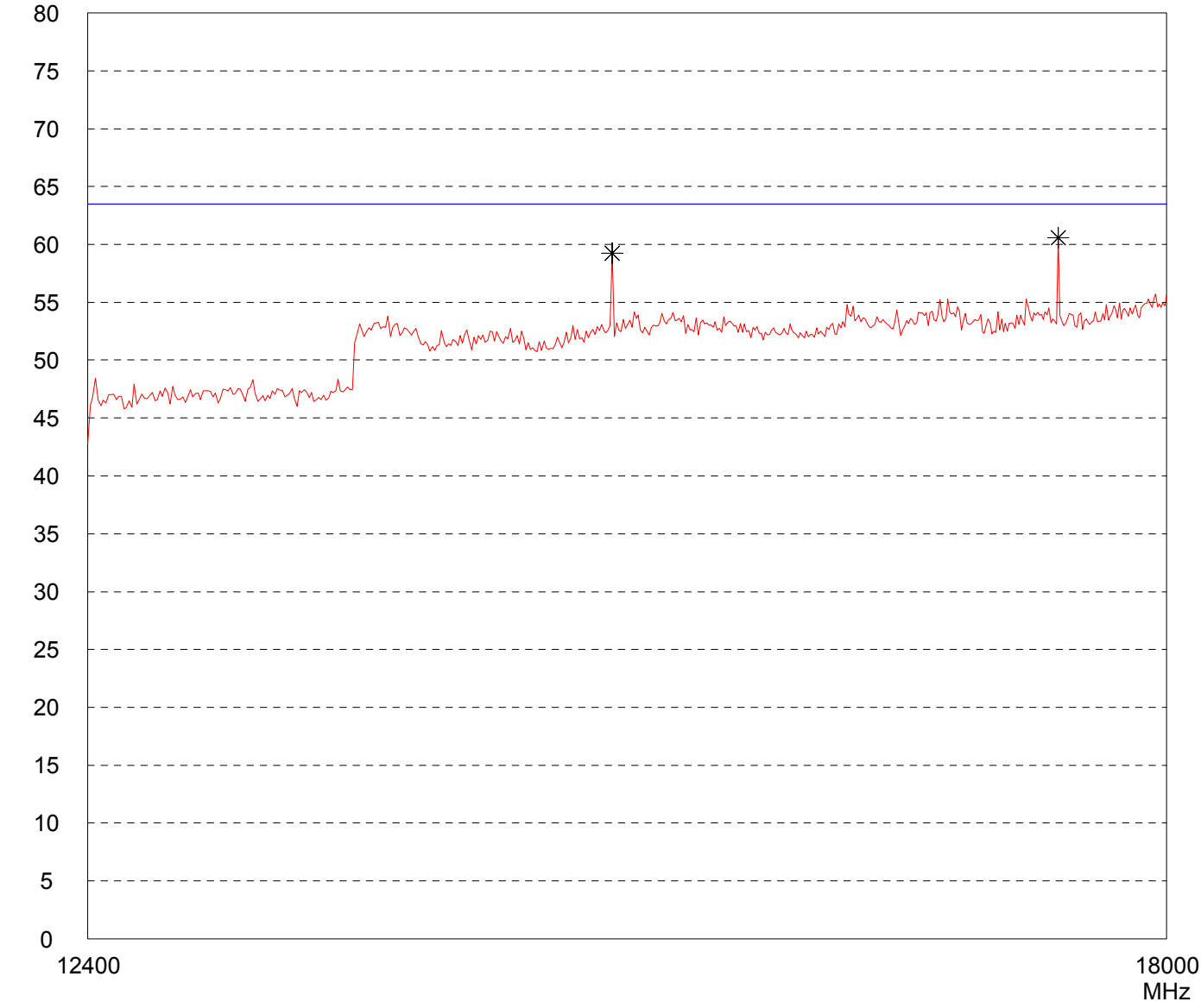
# Radiated Emission Test 12.4 GHz - 18 GHz
# acc. to FCC Part 15 Subpart C (FAR)

| | |
|---|---|
| Model: #5691 SHoW DMX Transceiver | Comment: - with module on test board controlled by DELL laptop PC<br>- DC 5 V power supply<br>- TX mode:<br>- Highest channel channel (2440 MHz)<br>- without modulation<br>- Antenna: Maxrad MYP24014PTNF<br>- |
| Serial no.: Test Sample 1 | |
| Applicant: City Theatrical, Inc. | |
| Test site: Fully anechoic room, cabin no. 2 | |
| Tested on: Test distance 1 meter<br>Vertical Polarization | |
| Date of test: 06/20/2008 / Operator: J. Roidt | |
| Test performed: by hand / File name: default.emi | |

| | |
|---|---|
| Detector: Peak | List of values: Selected by hand |

dBµV/m

Limit1: FCC 15.209 (1 m) Transducer: EMCO 3160

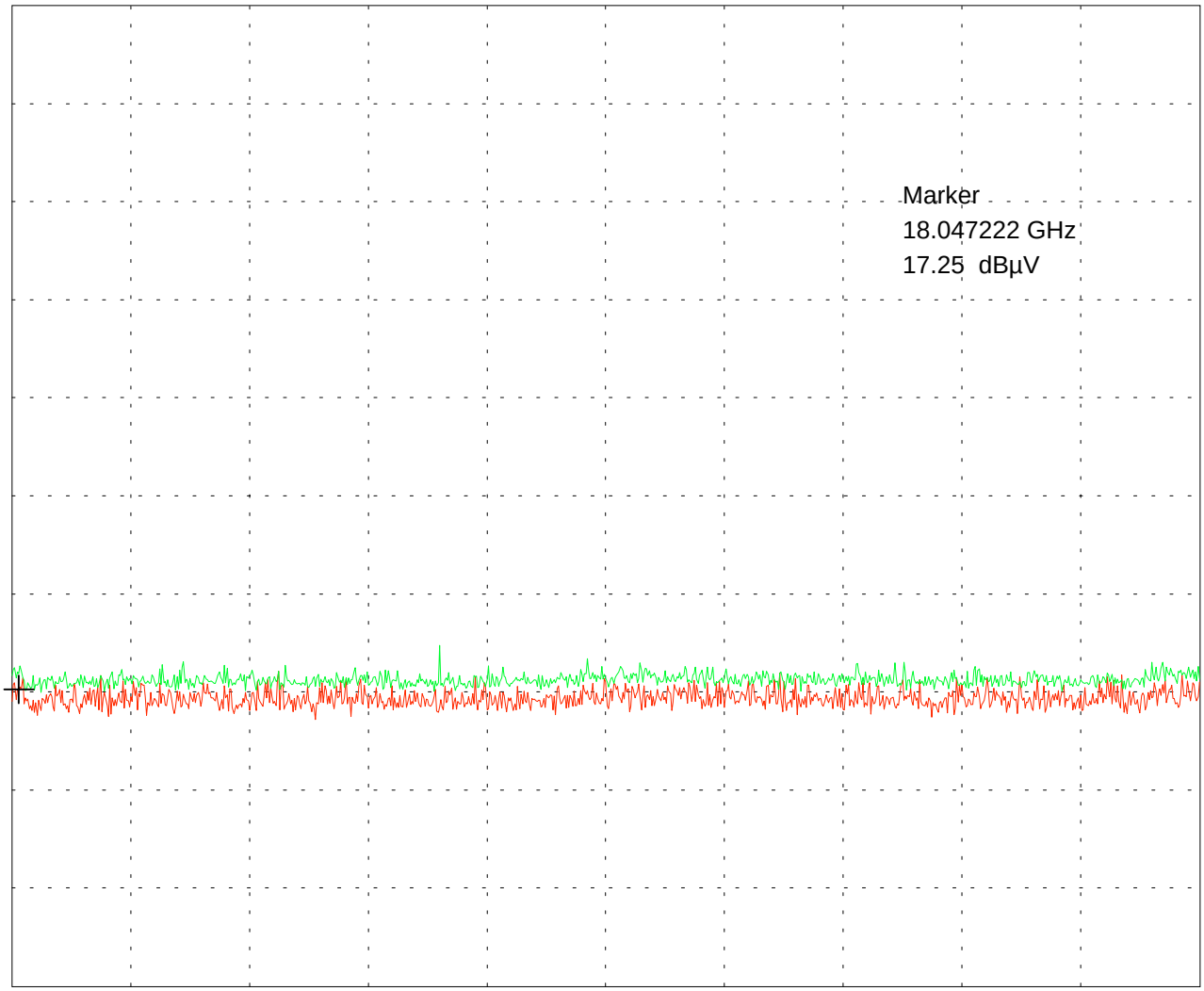



| | |
|---|---|
| Result: Limit kept | Project file: 56113-80538 |

# Spurious emissions according to FCC Rules

| | |
|---|---|
| Model: | Mode: |
| Serial No.: | - with module on test board, controlled by DELL laptop PC<br>- DC 5 V power supply<br>- TX mode:<br>- Highest channel (2476 MHz)<br>- no modulation<br>- Antenna:<br>Maxrad MYP24014TNF<br><br>Test distance 1 m , reading without antenna correction |
| Applicant:<br>City Theatrical, Inc. | |
| | |
| | |
| | |
| | |

Ref.Level 87 dBµV ATT 0 dB
10 dB/Div.



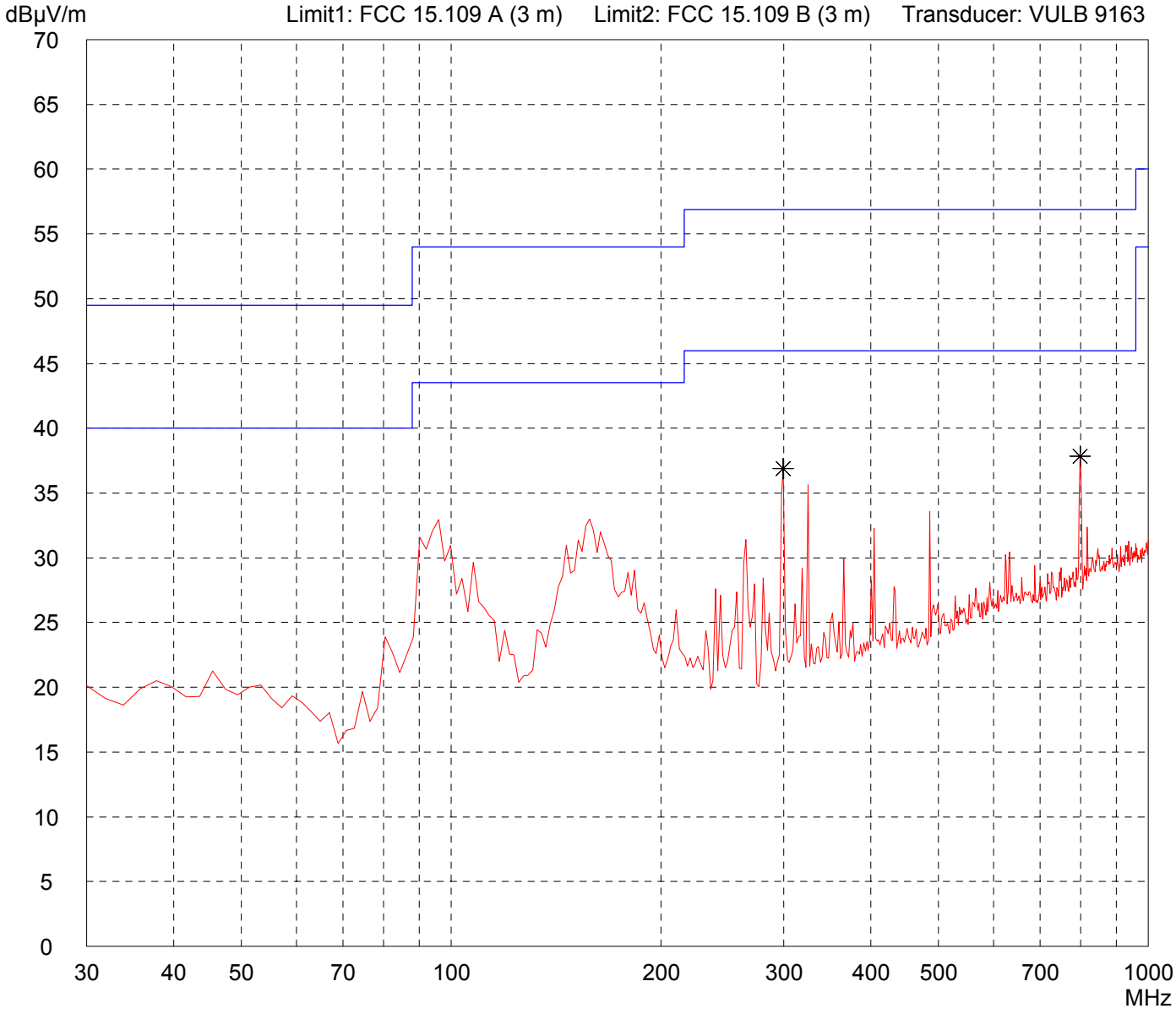

Start 18.000 GHz Stop 26.500 GHz
RBW 100 kHz VBW 100 kHz SWP 2.60 s

| | |
|---|---|
| Tested by:<br>Johann Roidt | Project-No.:<br>56113-080538 |
| Date:<br>20 June 2008 | |

# Radiated Emission Test 30 MHz - 1 GHz
# acc. to FCC Part 15 Subpart B (FAR)

| | |
|---|---|
| Model: #5691 SHoW DMX Radio Transceiver | Comment: - Antenna Maxrad MP24012CPLXFPTNF<br>- Receive Mode<br>- Middle RF channel |
| Serial no.: | |
| Applicant: City Theatrical, Inc. | |
| Test site: Fully anechoic room, cabin no. 2 | |
| Tested on: Test distance 3 metres<br>Horizontal Polarization | |
| Date of test: 06/20/2008 / Operator: J. Roidt | |
| Test performed: automatically / File name: default.emi | |

| | |
|---|---|
| Detector: Peak | List of values: 10 dB Margin / 50 Subranges |

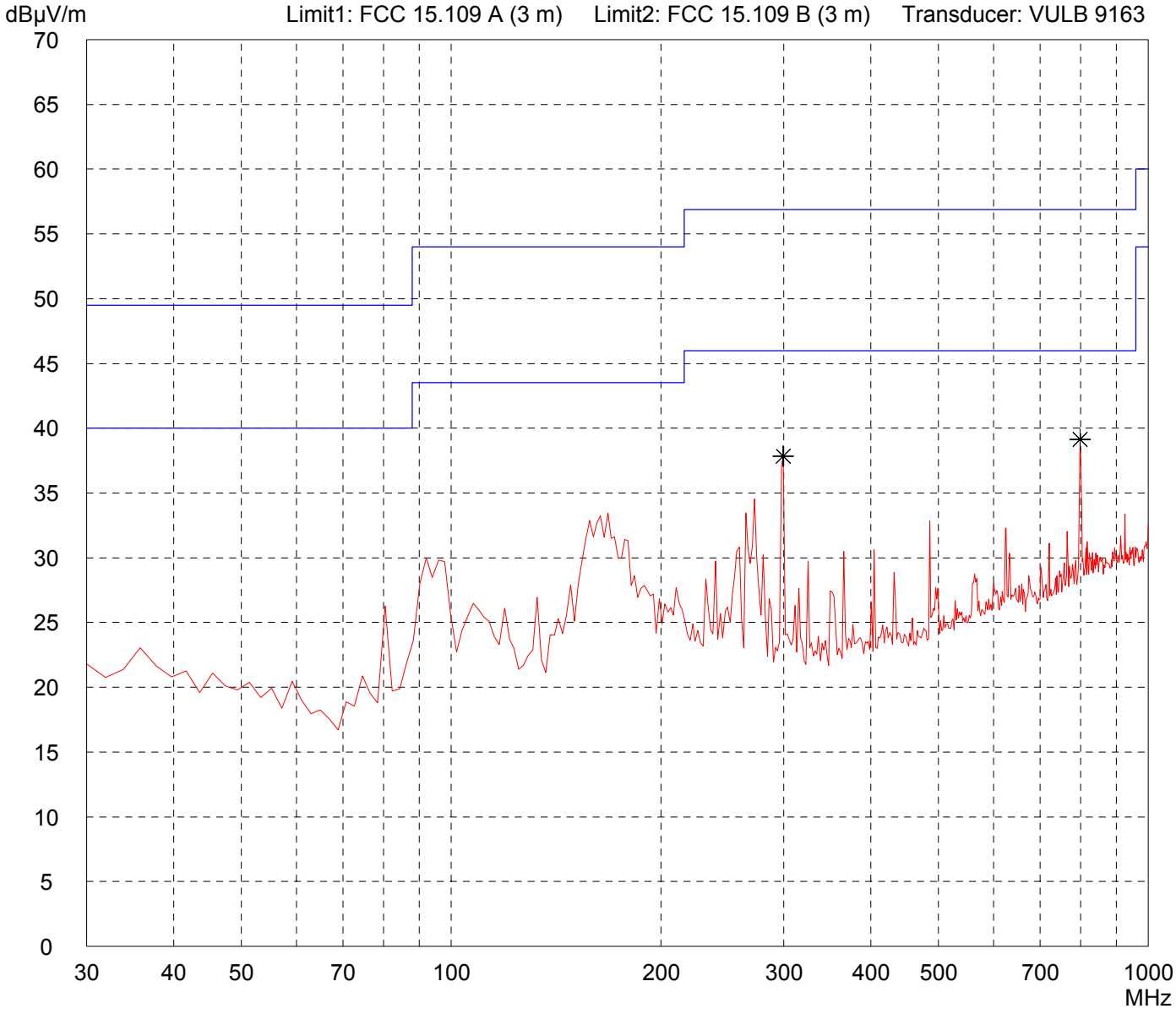



| | |
|---|---|
| Result: Limit kept | Project file: 56113-80538 |

# Radiated Emission Test 30 MHz - 1 GHz
# acc. to FCC Part 15 Subpart B (FAR)

| | |
|---|---|
| Model: #5691 SHoW DMX Radio Transceiver | Comment: - Antenna Maxrad MP24012CPLXFPTNF<br>- Receive Mode<br>- Middle RF channel |
| Serial no.: | |
| Applicant: City Theatrical, Inc. | |
| Test site: Fully anechoic room, cabin no. 2 | |
| Tested on: Test distance 3 metres<br>Vertical Polarization | |
| Date of test: 06/20/2008 / Operator: J. Roidt | |
| Test performed: automatically / File name: default.emi | |

| | |
|---|---|
| Detector: Peak | List of values: 10 dB Margin / 50 Subranges |

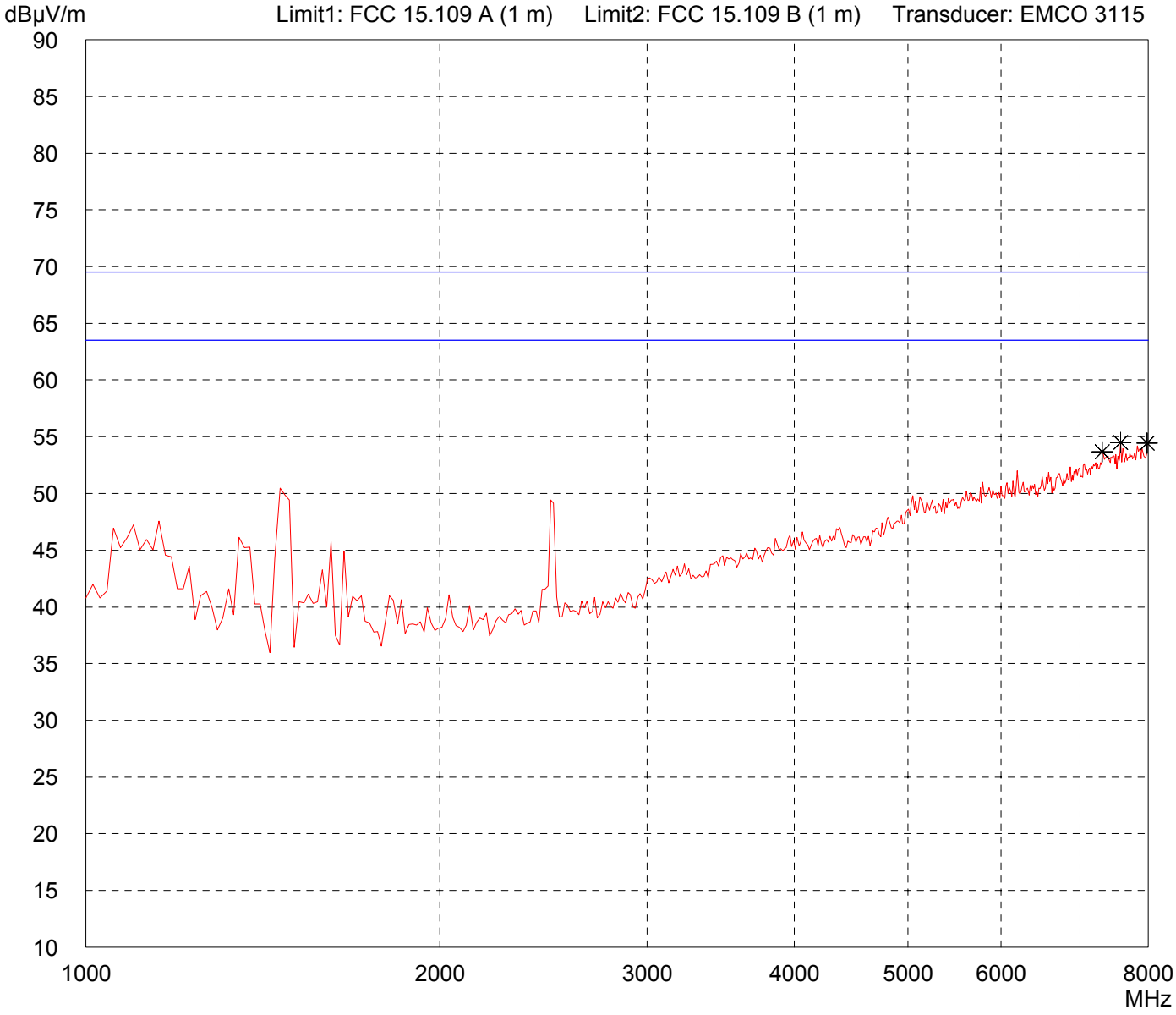



| | |
|---|---|
| Result: Limit kept | Project file: 56113-80538 |

# Radiated Emission Test 1 GHz - 8 GHz
# acc. to FCC Part 15 Subpart B (FAR)

| | |
|---|---|
| Model: #5691 SHoW DMX Radio Transceiver | Comment: - Antenna Maxrad MP24012CPLXFPTNF<br>- Receive Mode<br>- Middle RF channel |
| Serial no.: | |
| Applicant: City Theatrical, Inc. | |
| Test site: Fully anechoic room, cabin no. 2 | |
| Tested on: Test distance 1 metre<br>Horizontal Polarization | |
| Date of test: 06/20/2008 / Operator: J. Roidt | |
| Test performed: automatically / File name: default.emi | |

| | |
|---|---|
| Detector: Peak | List of values: 10 dB Margin / 50 Subranges |

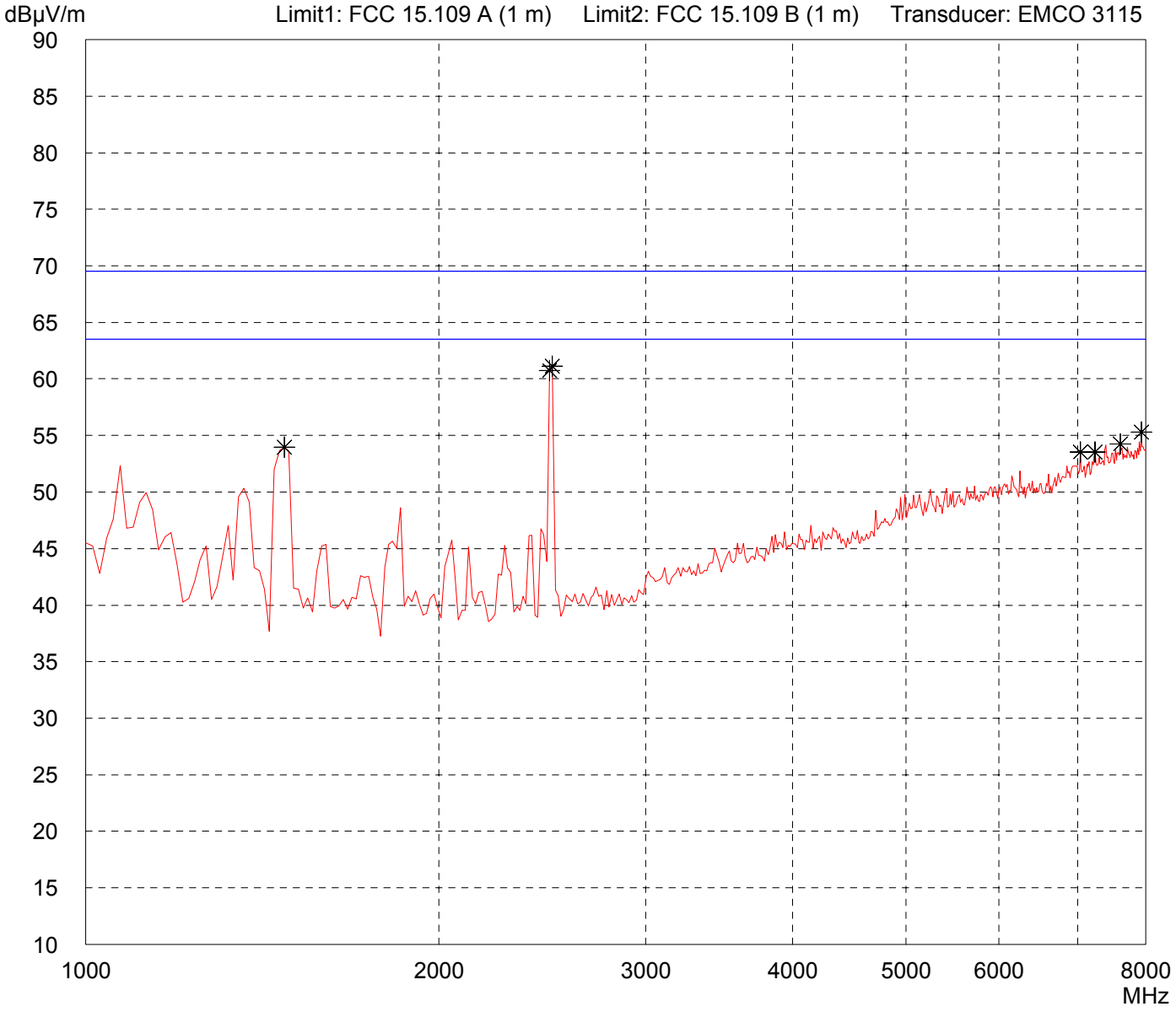



| | |
|---|---|
| Result: Limit kept | Project file: 56113-80538 |

# Radiated Emission Test 1 GHz - 8 GHz
# acc. to FCC Part 15 Subpart B (FAR)

| | |
|---|---|
| Model: #5691 SHoW DMX Radio Transceiver | Comment: - Antenna Maxrad MP24012CPLXFPTNF<br>- Receive Mode<br>- Middle RF channel |
| Serial no.: | |
| Applicant: City Theatrical, Inc. | |
| Test site: Fully anechoic room, cabin no. 2 | |
| Tested on: Test distance 1 metre<br>Vertical Polarization | |
| Date of test: 06/20/2008 / Operator: J. Roidt | |
| Test performed: automatically / File name: default.emi | |

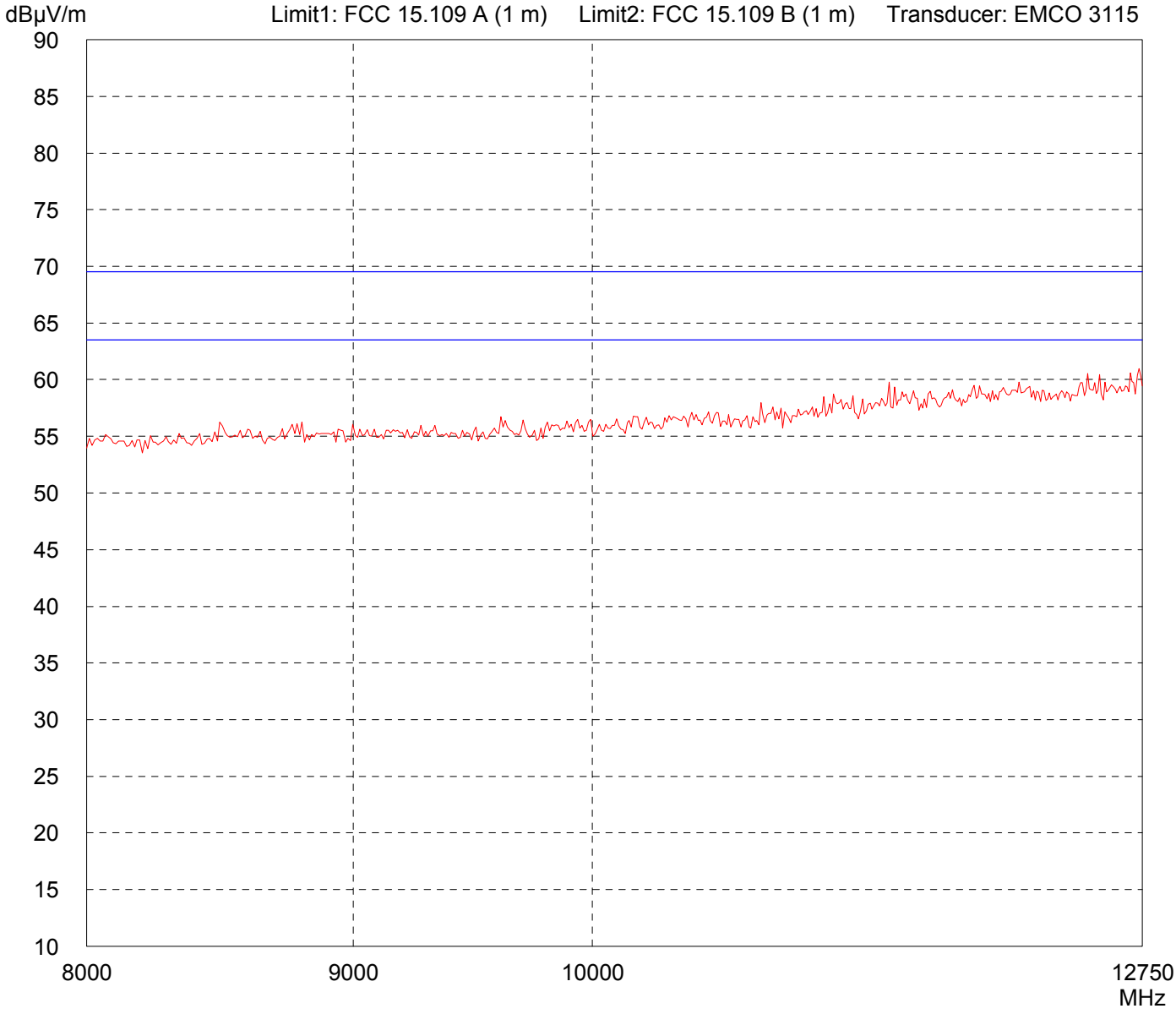
| | |
|---|---|
| Detector: Peak | List of values: 10 dB Margin / 50 Subranges |




| | |
|---|---|
| Result: Limit kept | Project file: 56113-80538 |

# Radiated Emission Test 8 GHz - 12.75 GHz
# acc. to FCC Part 15 Subpart B (FAR)

| | |
|---|---|
| Model: #5691 SHoW DMX Radio Transceiver | Comment: - Antenna Maxrad MP24012CPLXFPTNF<br>- Receive Mode<br>- Middle RF channel |
| Serial no.: | |
| Applicant: City Theatrical, Inc. | |
| Test site: Fully anechoic room, cabin no. 2 | |
| Tested on: Test distance 1 metre<br>Horizontal Polarization | |
| Date of test: 06/20/2008 / Operator: J. Roidt | |
| Test performed: automatically / File name: default.emi | |
| Detector: Peak | List of values: Selected by hand |

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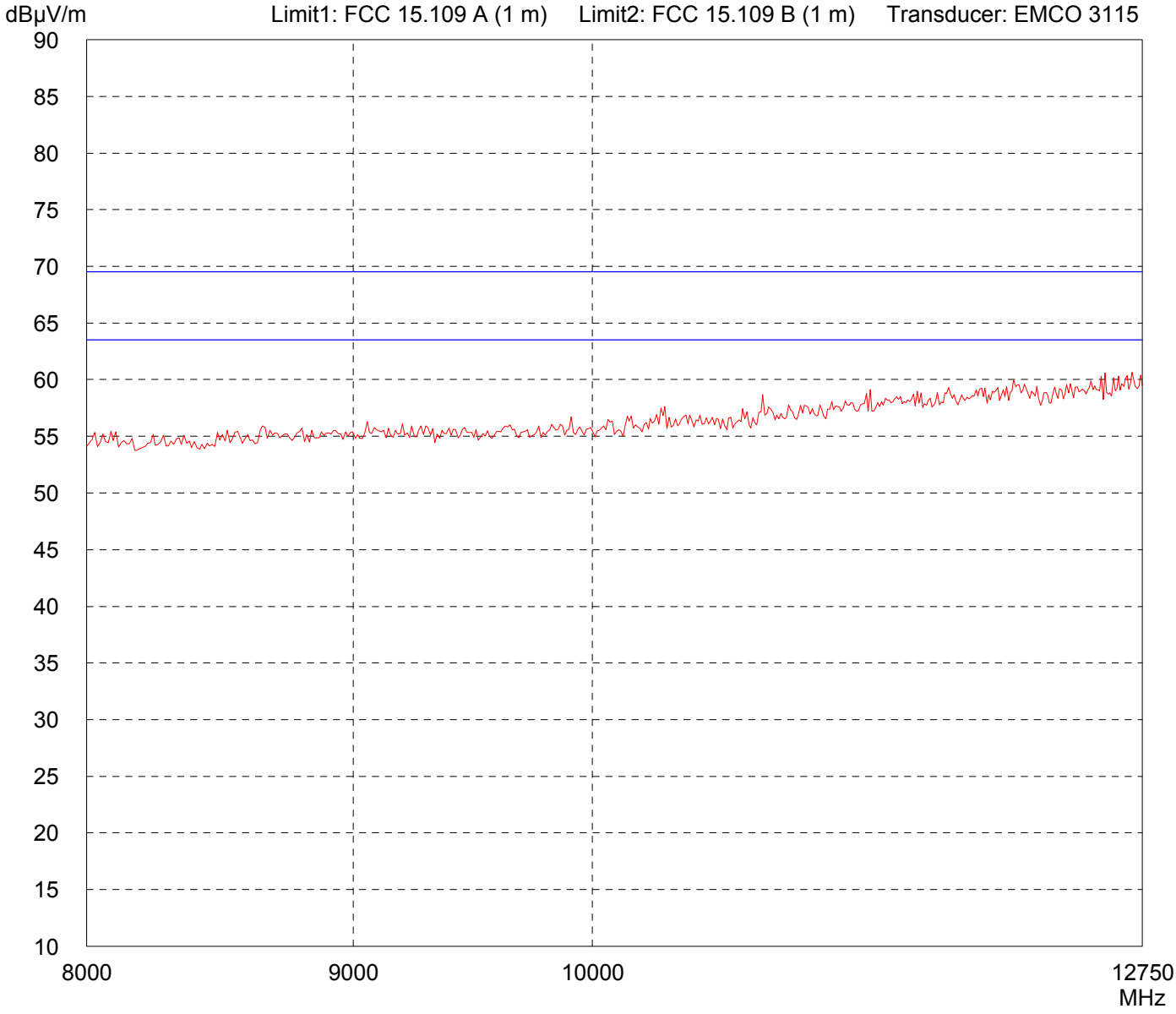
|---|---|
| Result: Limit kept | Project file: 56113-80538 |

# Radiated Emission Test 8 GHz - 12.75 GHz
# acc. to FCC Part 15 Subpart B (FAR)

| | |
|---|---|
| Model: #5691 SHoW DMX Radio Transceiver | Comment: - Antenna Maxrad MP24012CPLXFPTNF<br>- Receive Mode<br>- Middle RF channel |
| Serial no.: | |
| Applicant: City Theatrical, Inc. | |
| Test site: Fully anechoic room, cabin no. 2 | |
| Tested on: Test distance 1 metre<br>Vertical Polarization | |
| Date of test: 06/20/2008 / Operator: J. Roidt | |
| Test performed: automatically / File name: default.emi | |
| Detector: Peak | List of values: Selected by hand |

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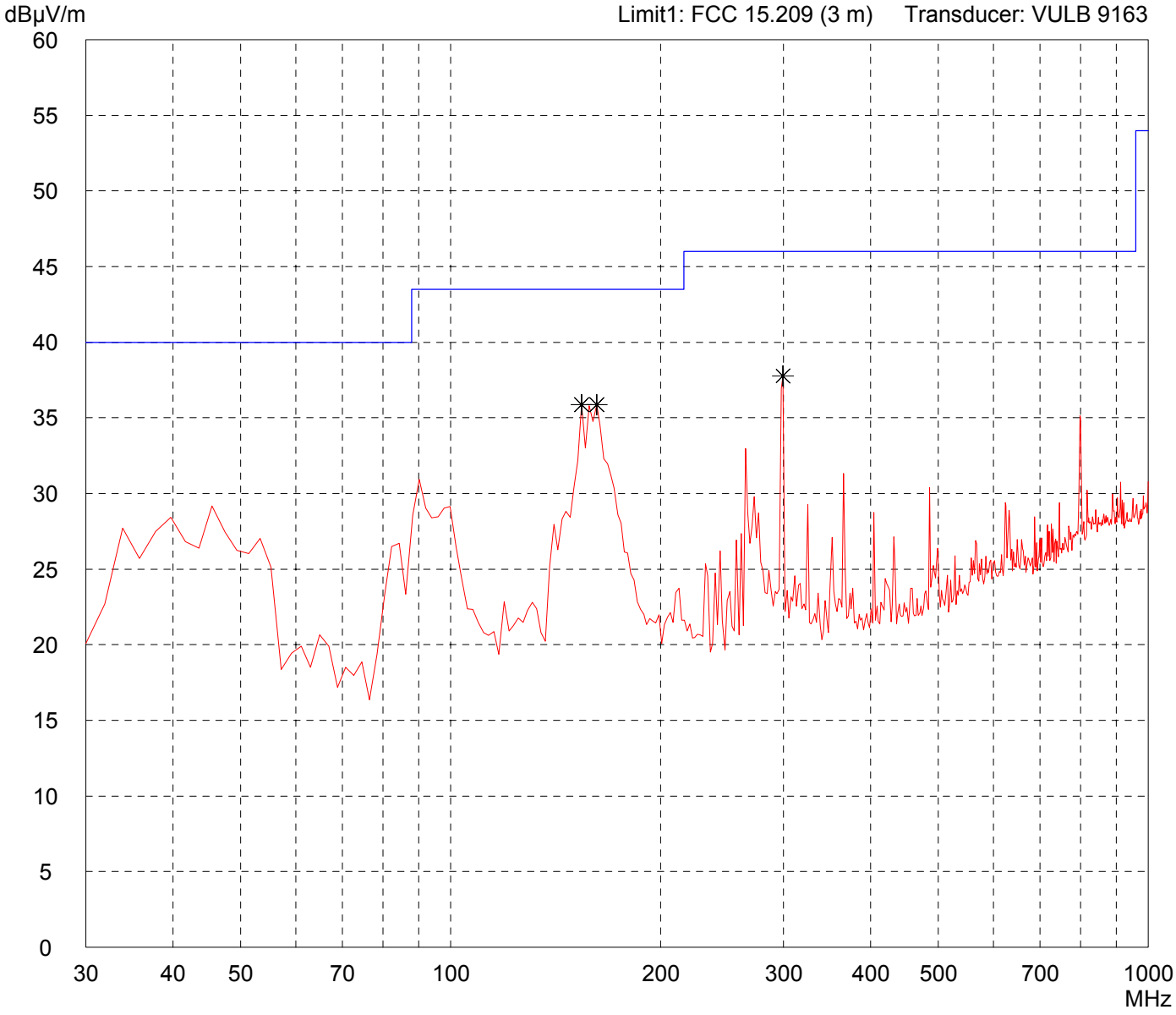
|---|---|
| Result: Limit kept | Project file: 56113-80538 |

# Radiated Emission Test 30 MHz - 1 GHz
# acc. to FCC Part 15 Subpart C (FAR)

| | |
|---|---|
| Model: #5691 SHoW DMX Transceiver | Comment: - with module on test board controlled by DELL laptop PC<br>- DC 5 V power supply<br>- RX mode:<br>- Middle Channel (2440 MHz)<br>- no modulation<br>- Antenna:<br>Maxrad MYP24014TPTNF |
| Serial no.: Test Sample 1 | |
| Applicant: City Theatrical, Inc. | |
| Test site: Fully anechoic room, cabin no. 2 | |
| Tested on: Test distance 3 metres<br>Horizontal Polarization | |
| Date of test: 06/20/2008 / Operator: J. Roidt | |
| Test performed: automatically / File name: default.emi | |

| | |
|---|---|
| Detector: Peak | List of values: 10 dB Margin / 50 Subranges |

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| Result: Limit kept | Project file: 56113-80538 Page of Pages |

# Radiated Emission Test 30 MHz - 1 GHz
# acc. to FCC Part 15 Subpart C (FAR)

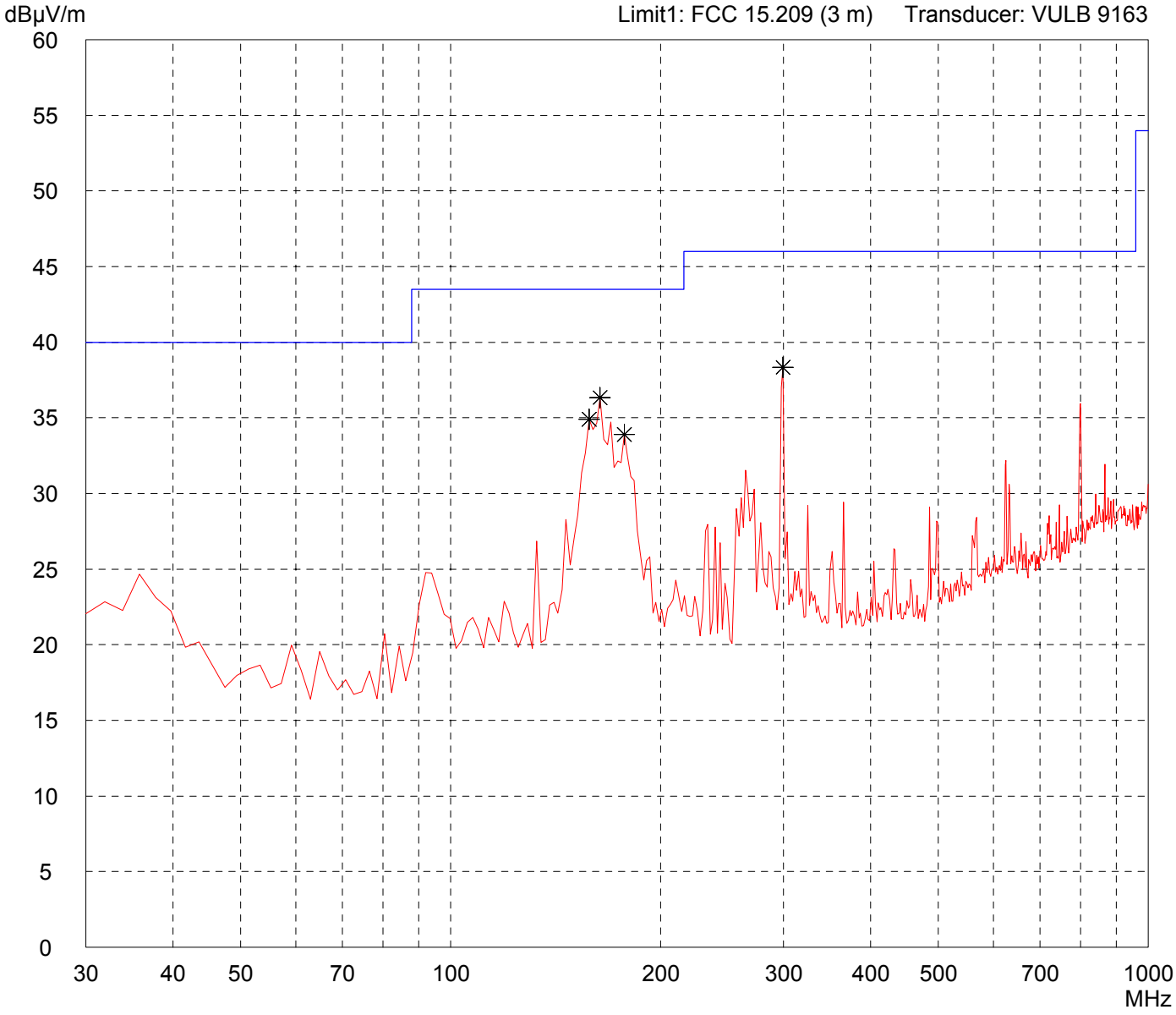
| | |
|---|---|
| Model: | #5691 SHoW DMX Transceiver |
| Serial no.: | Test Sample 1 |
| Applicant: | City Theatrical, Inc. |
| Test site: | Fully anechoic room, cabin no. 2 |
| Tested on: | Test distance 3 metres<br>Vertical Polarization |
| Date of test: | 06/20/2008 |
| Operator: | J. Roidt |
| Test performed: | automatically |
| File name: | default.emi |

Comment:

- with module on test board controlled by DELL laptop PC
- DC 5 V power supply
- RX mode:
- Middle Channel (2440 MHz)
- no modulation
- Antenna: Maxrad MYP24014TPTNF

Detector: Peak

List of values: 10 dB Margin 50 Subranges




Result: Limit kept

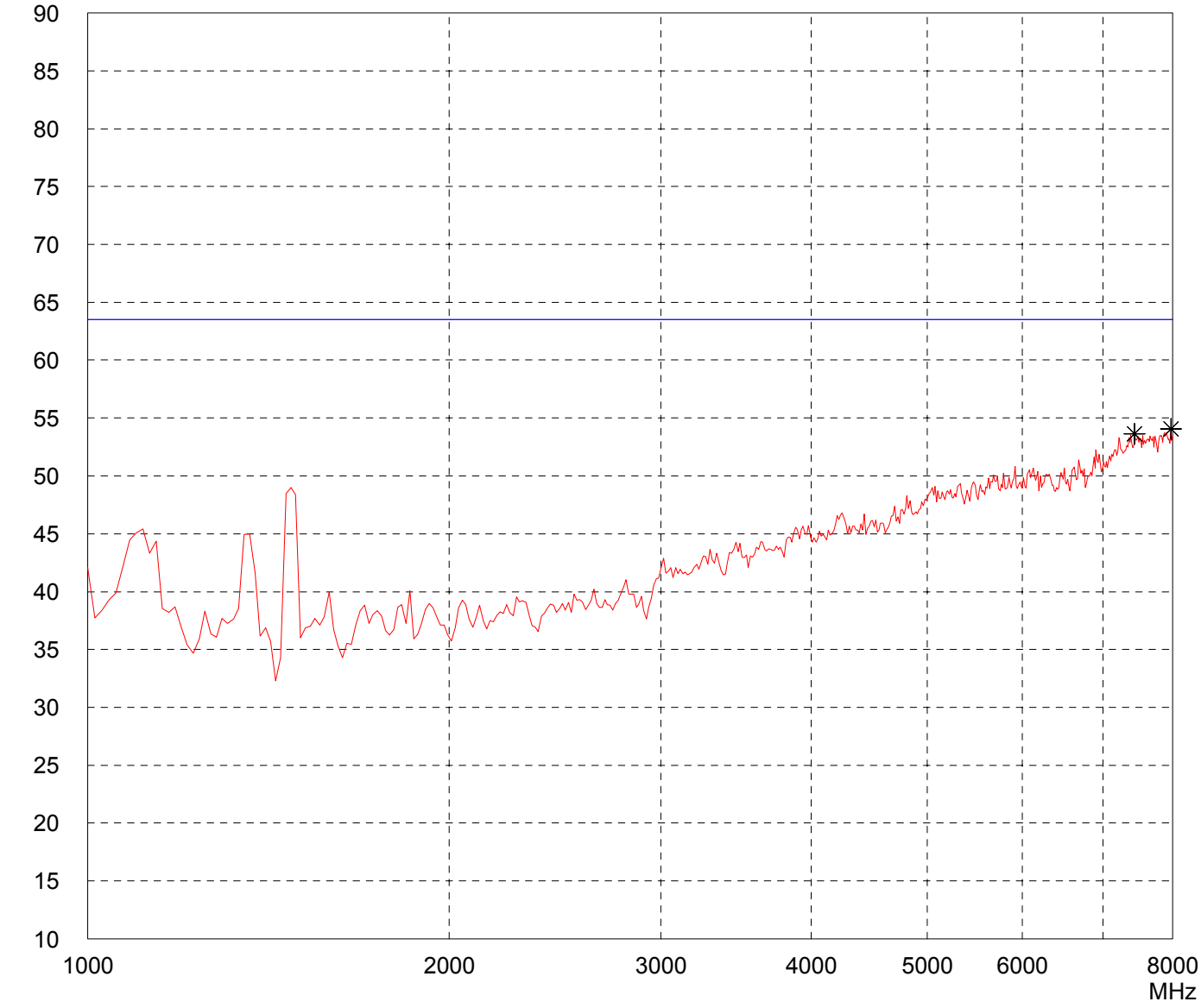
Project file: 56113-80538 Page of Pages

# Radiated Emission Test 1 GHz - 8 GHz
# acc. to FCC Part 15 Subpart C (FAR)

| | |
|---|---|
| Model: #5691 SHoW DMX Transceiver | Comment: - with module on test board controlled by DELL laptop PC<br>- DC 5 V power supply<br>- RX mode:<br>- Middle Channel (2440 MHz)<br>- no modulation<br>- Antenna:<br>Maxrad MYP24014TPTNF |
| Serial no.: Test Sample 1 | |
| Applicant: City Theatrical, Inc. | |
| Test site: Fully anechoic room, cabin no. 2 | |
| Tested on: Test distance 1 metre<br>Horizontal Polarization | |
| Date of test: 06/20/2008 / Operator: J. Roidt | |
| Test performed: automatically / File name: default.emi | |

| | |
|---|---|
| Detector: Peak | List of values: 10 dB Margin / 50 Subranges |

dBµV/m — Limit1: FCC 15.209 (1 m) — Transducer: EMCO 3115

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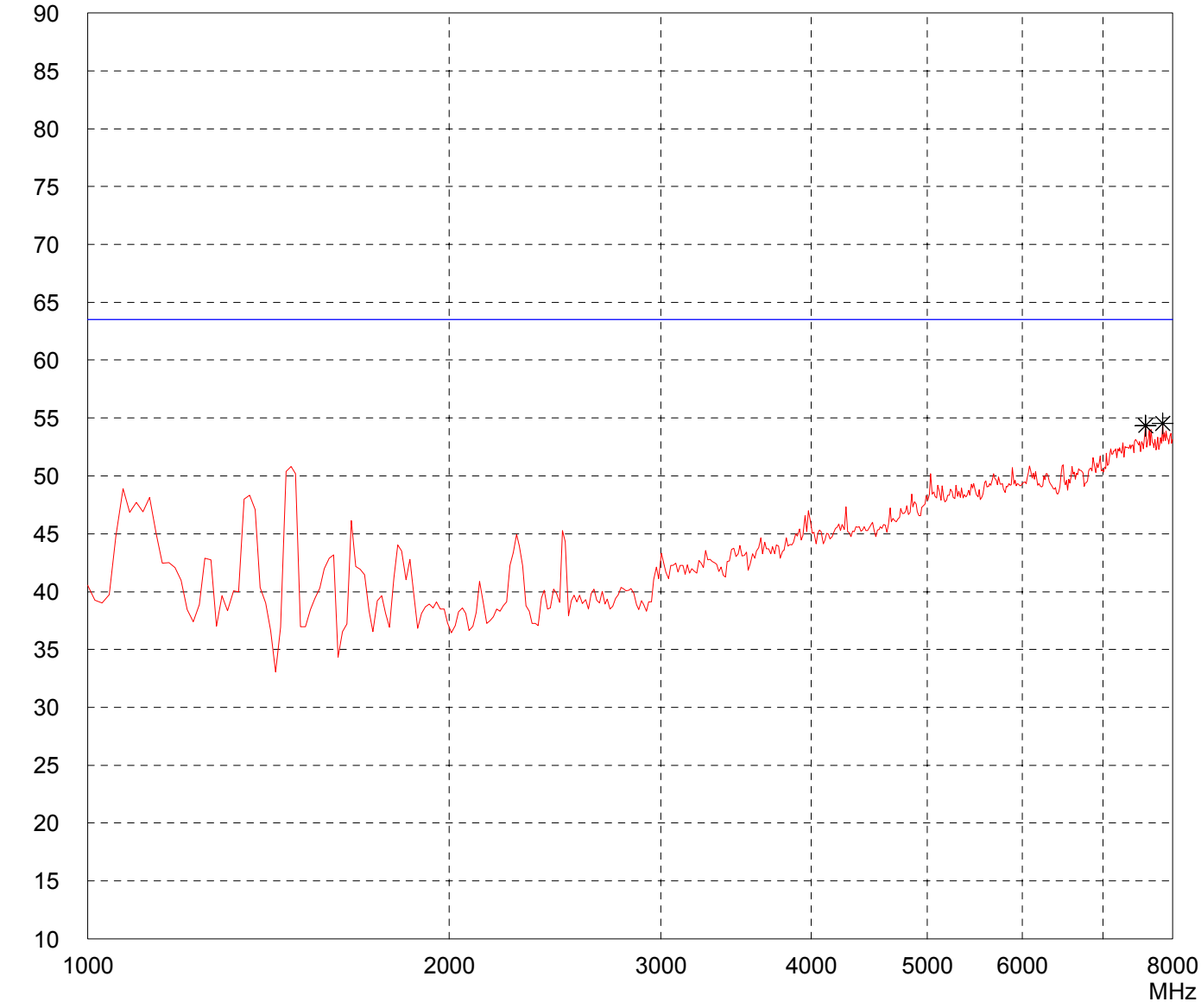
| Result: Limit kept | Project file: 56113-80538 Page of Pages |

# Radiated Emission Test 1 GHz - 8 GHz
# acc. to FCC Part 15 Subpart C (FAR)

| | |
|---|---|
| Model: #5691 SHoW DMX Transceiver | Comment: - with module on test board controlled by DELL laptop PC<br>- DC 5 V power supply<br>- RX mode:<br>- Middle Channel (2440 MHz)<br>- no modulation<br>- Antenna:<br>Maxrad MYP24014TPTNF |
| Serial no.: Test Sample 1 | |
| Applicant: City Theatrical, Inc. | |
| Test site: Fully anechoic room, cabin no. 2 | |
| Tested on: Test distance 1 metre<br>Vertical Polarization | |
| Date of test: 06/20/2008 / Operator: J. Roidt | |
| Test performed: automatically / File name: default.emi | |

| | |
|---|---|
| Detector: Peak | List of values: 10 dB Margin / 50 Subranges |

dBµV/m — Limit1: FCC 15.209 (1 m) — Transducer: EMCO 3115

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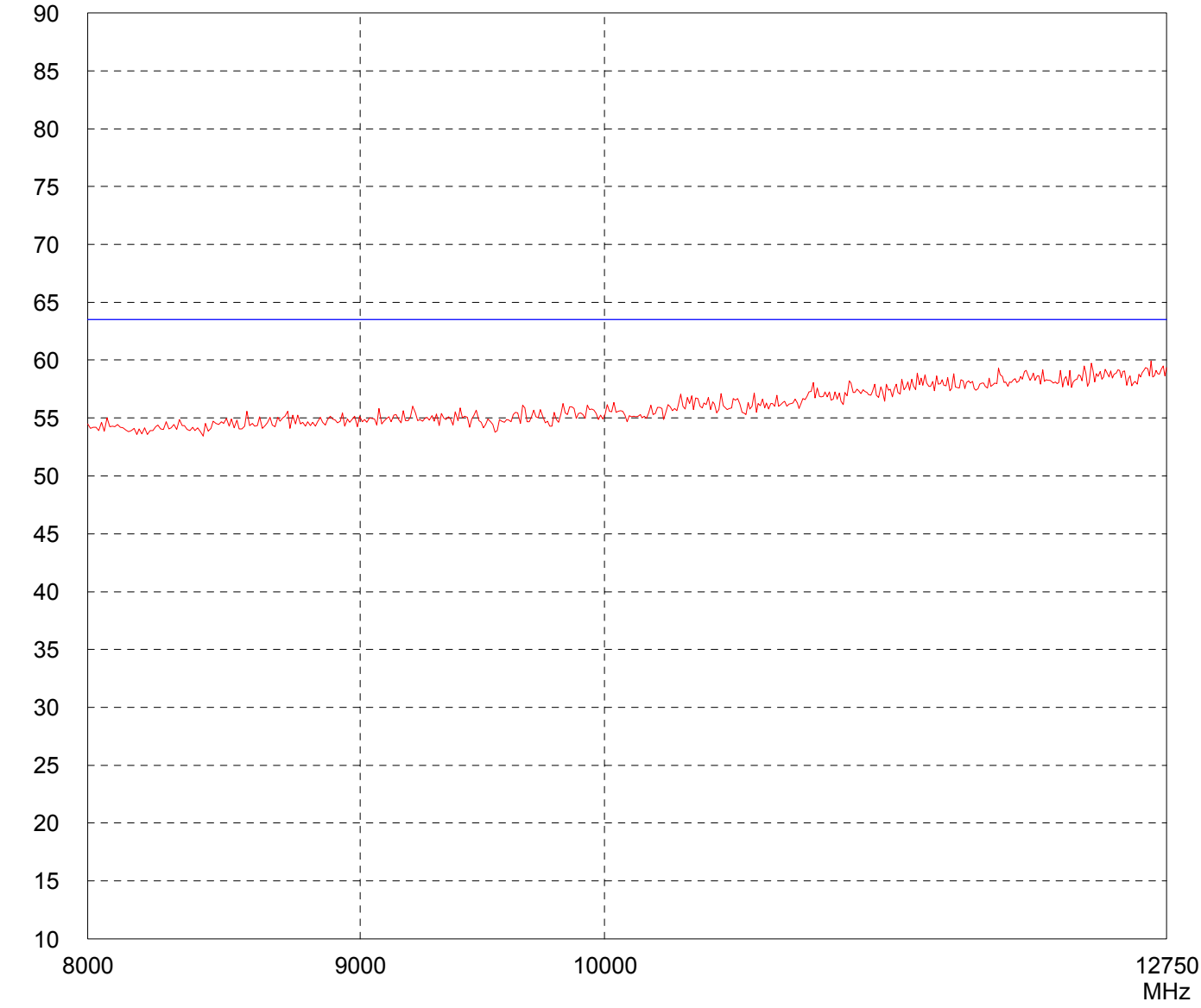
| Result: Limit kept | Project file: 56113-80538 Page of Pages |

# Radiated Emission Test 8 GHz - 12.75 GHz
# acc. to FCC Part 15 Subpart C (FAR)

| | |
|---|---|
| Model: #5691 SHoW DMX Transceiver | Comment: - with module on test board controlled by DELL laptop PC<br>- DC 5 V power supply<br>- RX mode:<br>- Middle Channel (2440 MHz)<br>- no modulation<br>- Antenna:<br>Maxrad MYP24014TPTNF |
| Serial no.: Test Sample 1 | |
| Applicant: City Theatrical, Inc. | |
| Test site: Fully anechoic room, cabin no. 2 | |
| Tested on: Test distance 1 metre<br>Horizontal Polarization | |
| Date of test: 06/20/2008 / Operator: J. Roidt | |
| Test performed: automatically / File name: default.emi | |

| | |
|---|---|
| Detector: Peak | List of values: Selected by hand |

dBµV/m  Limit1: FCC 15.209 (1 m)  Transducer: EMCO 3115




| | |
|---|---|
| Result: Limit kept | Project file: 56113-80538 Page of Pages |

# Radiated Emission Test 8 GHz - 12.75 GHz
# acc. to FCC Part 15 Subpart C (FAR)

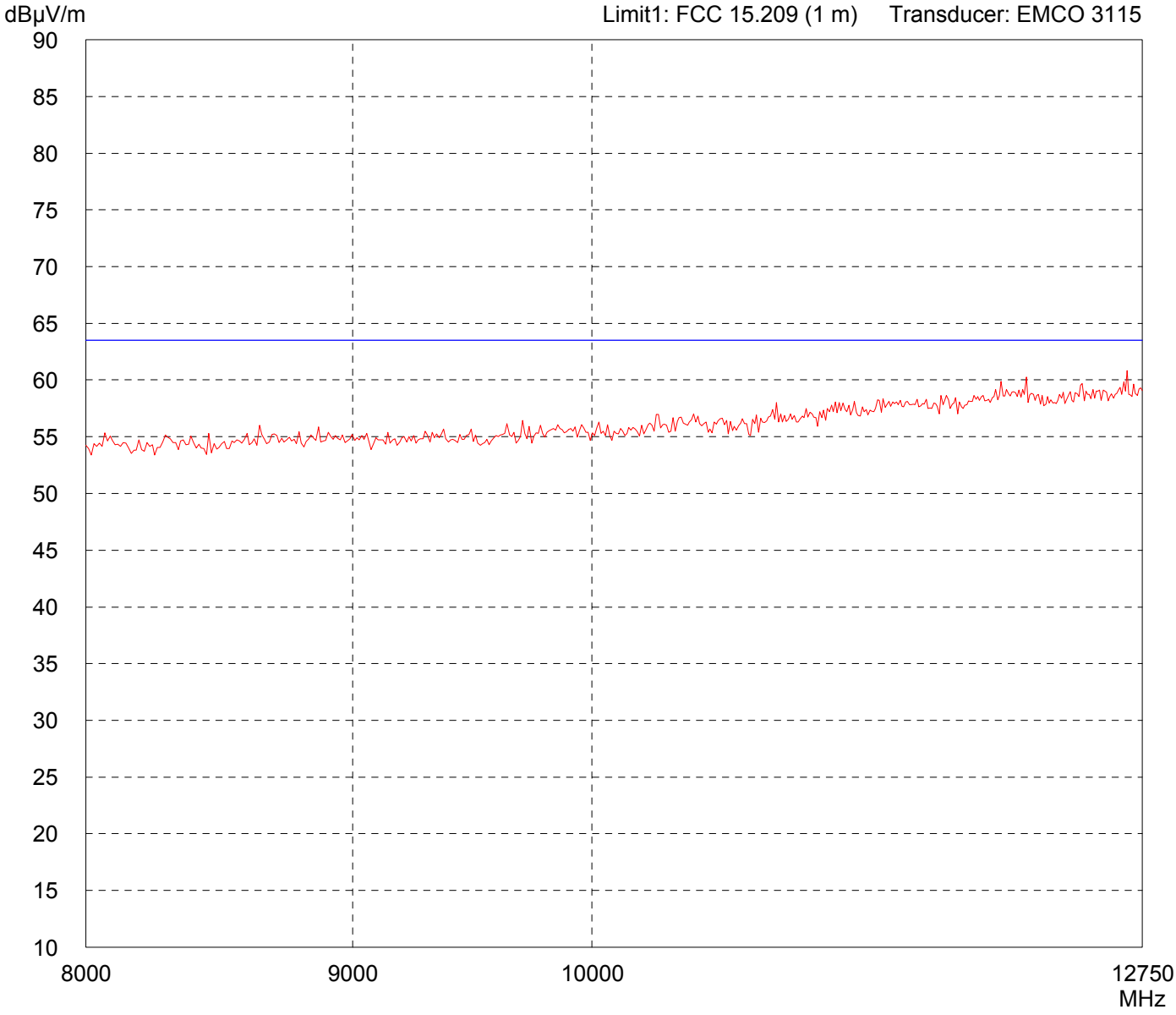
| | |
|---|---|
| Model: | #5691 SHoW DMX Transceiver |
| Serial no.: | Test Sample 1 |
| Applicant: | City Theatrical, Inc. |
| Test site: | Fully anechoic room, cabin no. 2 |
| Tested on: | Test distance 1 metre<br>Vertical Polarization |
| Date of test: | 06/20/2008 |
| Operator: | J. Roidt |
| Test performed: | automatically |
| File name: | default.emi |

Comment:

- with module on test board controlled by DELL laptop PC
- DC 5 V power supply
- RX mode:
- Middle Channel (2440 MHz)
- no modulation
- Antenna: Maxrad MYP24014TPTNF

Detector: Peak

List of values: Selected by hand




Result: Limit kept

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