Senton GmbH
Aeussere Fruehlingstrasse 45
D-94315 Straubing

Straubing, Mai 30, 2005

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

## No. 50602-050220-1 (Edition 1)

**for**

**AR6111-MX**

**Inductive TAG Reader**

| | |
|---|---|
| Applicant: | Siemens Building Technologies<br>Fire and Security Products GmbH & Co. oHG |
| Test Specifications: | FCC Code of Federal Regulations,<br>CFR 47, Part 15,<br>Sections 15.205, 15.207, 15.215 and 15.225<br><br>Industry Canada Radio Standards<br>Specification RSS-210 Issue 5,<br>Sections 6.2.2(e), 6.3 and 6.6<br>(Category I Equipment) |

**Note:**

The test data of this report is related only to the individual item which has been tested. This report shall not be reproduced except in full extent without the written approval of the testing laboratory.

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# 1 Description of the Equipment Under Test (EUT)

| General data of EUT | |
|---|---|
| Type designation[1]: | AR6111-MX |
| Parts[2]: | |
| Serial number(s): | 01 |
| Manufacturer: | Siemens Building Technologies Fire and Security Products GmbH & Co. oHG |
| Type of equipment: | Inductive TAG Reader |
| Version: | |
| FCC ID: | S4OAR6111-MX |
| Additional parts/accessories: | |

| Technical data of EUT | |
|---|---|
| Application frequency range: | 13.553 - 13.567 MHz |
| Frequency range: | |
| Operating frequency: | 13.56 MHz |
| Type of modulation: | ASK |
| Pulse train: | |
| Pulse width: | |
| Number of RF-channels: | 1 |
| Channel spacing: | |
| Designation of emissions[3]: | 10K0A1D |
| Type of antenna: | Integrated Loop Coil |
| Size/length of antenna: | 65 x 100 mm |
| Connection of antenna: | ☐ detachable ☒ not detachable |
| Type of power supply: | DC supply |
| Specifications for power supply: | nominal voltage: 12.0 V<br>minimum voltage: 9.0 V<br>maximum voltage: 15.0 V |

[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".

## 2 Administrative Data

| Application details | |
|---|---|
| Applicant (full address): | Siemens Building Technologies<br>Fire and Security Products GmbH & Co. oHG<br>Siemensalle 84<br>D-76187 Karlsruhe<br>Germany |
| Contact person: | Mr. Arthur Rihm |
| Contract identification: | EB203148 / 16483 |
| Receipt of EUT: | 27th April 2005 |
| Date(s) of test: | April - May 2005 |
| Note(s): | --- |

| Report details | |
|---|---|
| Report number: | 50602-050220-1 |
| Edition: | 1 |
| Issue date: | Mai 30, 2005 |

# 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: | IC 3050 |
| 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 15.205, 15.207, 15.215 and 15.225**<br>of the Federal Communication Commission (FCC) and the<br>**Radio Standards Specification RSS-210 Issue 5, Sections 6.2.2(e), 6.3 and 6.6 (Category I Equipment)**<br>of Industry Canada (IC). |

| Personnel involved in this report | |
|---|---|
| Laboratory Manager: | Mr. Johann Roidt |
| Responsible for testing: | Mr. Martin Steindl |
| Responsible for test report: | Mr. Martin Steindl |

# 5 Operation Mode and Configuration of EUT

| **Operation Mode(s)** |
|---|
| Reading TAG continuously |

| **Configuration(s) of EUT** |
|---|
| EUT was configured as stand-alone-device |

**List of ports and cables**

| *Port* | *Description* | *Classification*[4] | *Cable type* | *Cable length* |
|---|---|---|---|---|
| 1 | Supply line with RS 232 | dc power<br>signal/control port | Unshielded | < 3 m |

**List of devices connected to EUT**

| *Item* | *Description* | *Type Designation* | *Serial no. or ID* | *Manufacturer* |
|---|---|---|---|---|
| | Not Applicable | | | |

**List of support devices**

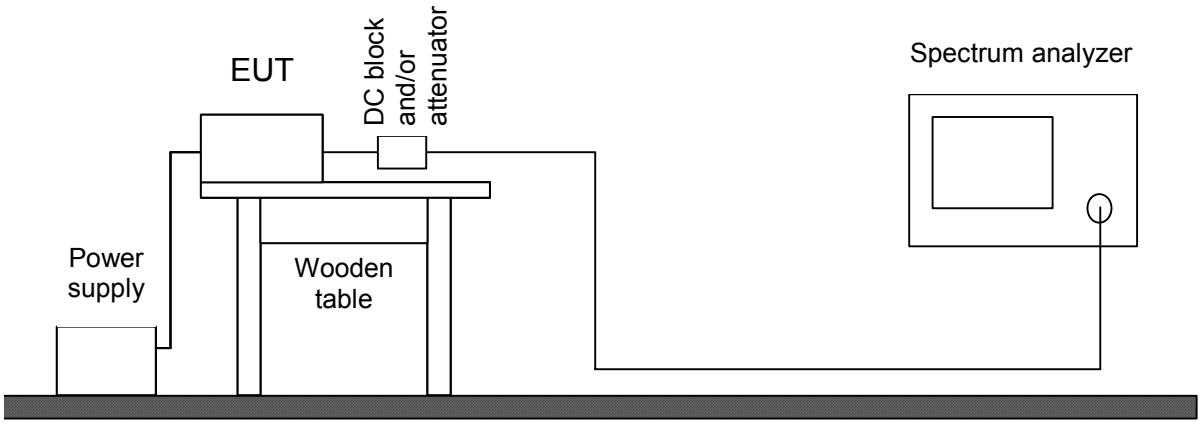
| *Item* | *Description* | *Type Designation* | *Serial no. or ID* | *Manufacturer* |
|---|---|---|---|---|
| 1 | AC/DC Adapter<br>Type FW7238/12 | AC / DC convertor | 1015040 | |

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

# 6 Measurement Procedures

## 6.1 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-210 Issue 5, section 5.9.1<br>IC RSS-210 Issue 5, section 6.1.1(c)<br>ANSI C63.4, annex H.6 |
| Guide: | ANSI C63.4 / IC RSS-210 Issue 5, section 5.9.1 |
| Measurement setup: | ☐ Conducted: See below<br>☒ Radiated: Radiated Emission Measurement 9 kHz to 30 MHz (6.3) |
| 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). | |



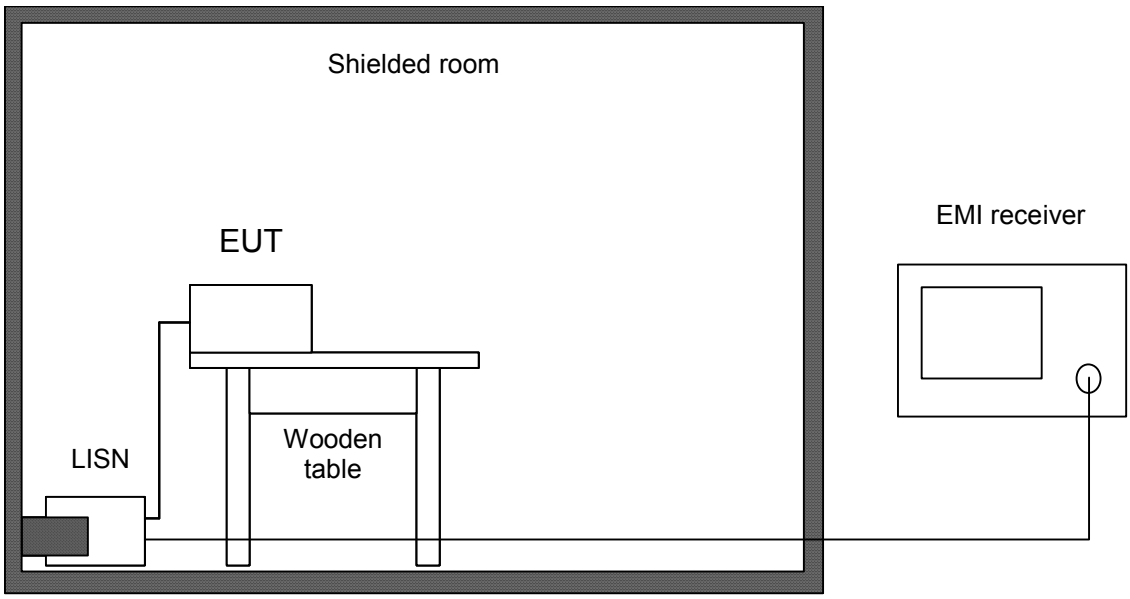
## 6.2 Conducted AC Powerline Emission

| **Measurement Procedure:** | |
|---|---|
| Rules and specifications: | CFR 47 Part 15, section 15.207<br>IC RSS-210 Issue 5, section 6.6 |
| Guide: | ANSI C63.4 / CISPR 22 |

Conducted emission tests in the frequency range 150 kHz to 30 MHz are performed using Line Impedance Stabilization Networks (LISNs). To simplify testing with quasi-peak and average detector the following procedure is used:

First the whole spectrum of emission caused by the equipment under test (EUT) is recorded with detector set to peak using CISPR bandwidth of 10 kHz. After that all emission levels having less margin than 10 dB to or exceeding the average (CFR 47 Part 15) or quasi-peak (IC RSS-210) limit are retested with detector set to quasi-peak.
If average limit is kept with quasi-peak levels no additional scan with average detector is necessary. In cases of emission levels between quasi-peak and average limit an additional scan with detector set to average is performed.

According to ANSI C63.4, section 13.1.3.1, testing of intentional radiators with detachable antenna shall be performed using a suitable dummy load connected to the antenna output terminals. Otherwise, the tests shall be made with the antenna connected and, if adjustable, fully extended.
Testing with dummy load may be necessary to distinguish (unintentional) conducted emissions on the supply lines from (intentional) emissions radiated by the antenna and coupling directly to supply lines and/or LISN. Usage of dummy load has to be stated in the appropriate test record(s) and notes should be added to clarify the test setup.



Test instruments used:

| Used | Type | Model | Serial No. or ID | Manufacturer |
|---|---|---|---|---|
| ☒ | EMI receiver | ESHS 10 | 860043/016 | Rohde & Schwarz |
| ☒ | LISN | ESH3-Z5 | 862770/021 | Rohde & Schwarz |
| ☐ | LISN | ESH3-Z5 | 830952/025 | Rohde & Schwarz |
| ☐ | Artificial mains network | ESH 2-Z5 | 842966/004 | Rohde & Schwarz |
| ☐ | Shielded room | No. 1 | 1451 | Albatross Projects |
| ☒ | Shielded room | No. 4 | 3FD-100 544 | Euroshield |

## 6.3 Radiated Emission Measurement 9 kHz to 30 MHz

| **Measurement Procedure:** | |
|---|---|
| Rules and specifications: | CFR 47 Part 15, sections 15.205, 15.215(b) and 15.225(a)-(d)<br>IC RSS-210 Issue 5, sections 6.2.1, 6.2.2(e) and 6.3 |
| Guide: | ANSI C63.4 |

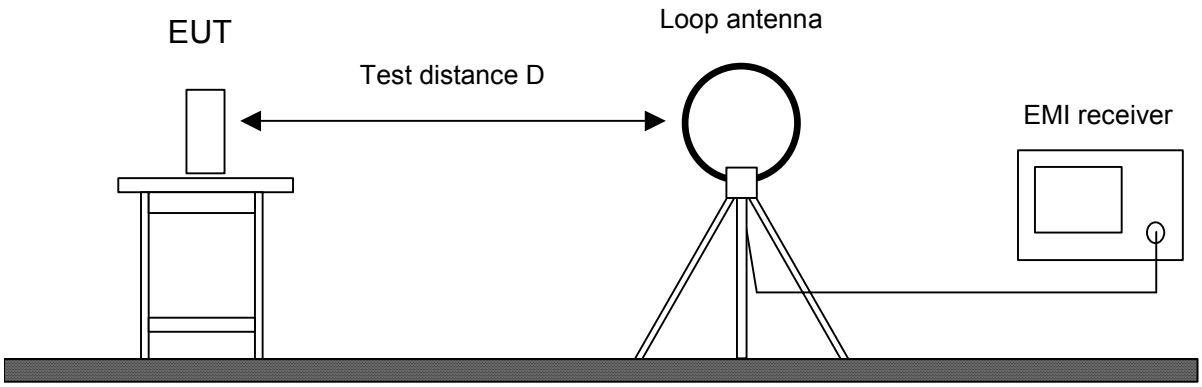
Radiated emission in the frequency range 9 kHz to 30 MHz is measured using an active loop antenna. First the whole spectrum of emission caused by the equipment is recorded at a distance of 3 meters in a fully or semi anechoic room with the detector of the spectrum analyzer or EMI receiver set to peak. 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. Due to fixed polarization of the loop antenna, if possible, the EUT is put into a position that gives the maximum levels of emissions.

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 15.205(b) and 15.225(d)<br>IC RSS-210 Issue 5, sections 6.2.2(e) and 6.3(b)-(d) |
| 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.

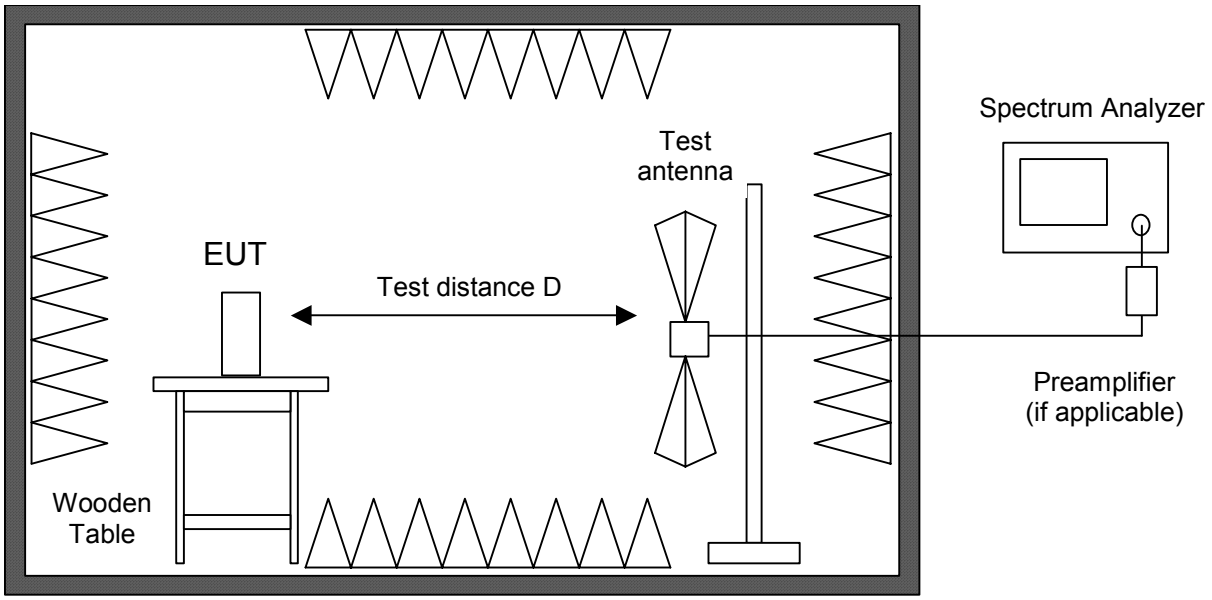
All tests below 18 GHz are performed at a test distance D of 3 meters. For higher frequencies the test distance is reduced (e.g. to 1 meter) due to the sensitivity of the measuring instrument(s) and the test results are calculated according to CFR 47 Part 15 section 15.31(f)(1) using an extrapolation 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<br>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

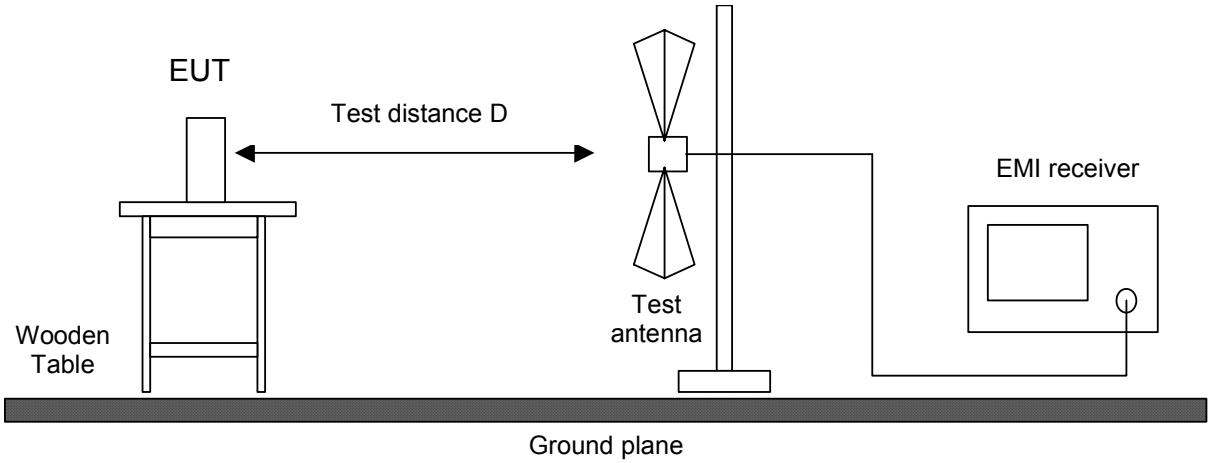
| **Measurement Procedure:** | |
|---|---|
| Rules and specifications: | CFR 47 Part 15, sections 15.205(b) and 15.225(d)<br>IC RSS-210 Issue 5, sections 6.2.2(e) and 6.3(b)-(d) |
| Guide: | ANSI C63.4 |

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 | 881414/009 | 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 |

## 6.6 Carrier Frequency Stability

| **Measurement Procedure:** | |
|---|---|
| Rules and specifications: | CFR 47 Part 15, section 15.225(e)<br>IC RSS-210 Issue 5, sections 6.2.2(e) and 6.4 |
| Guide: | ANSI C63.4 |

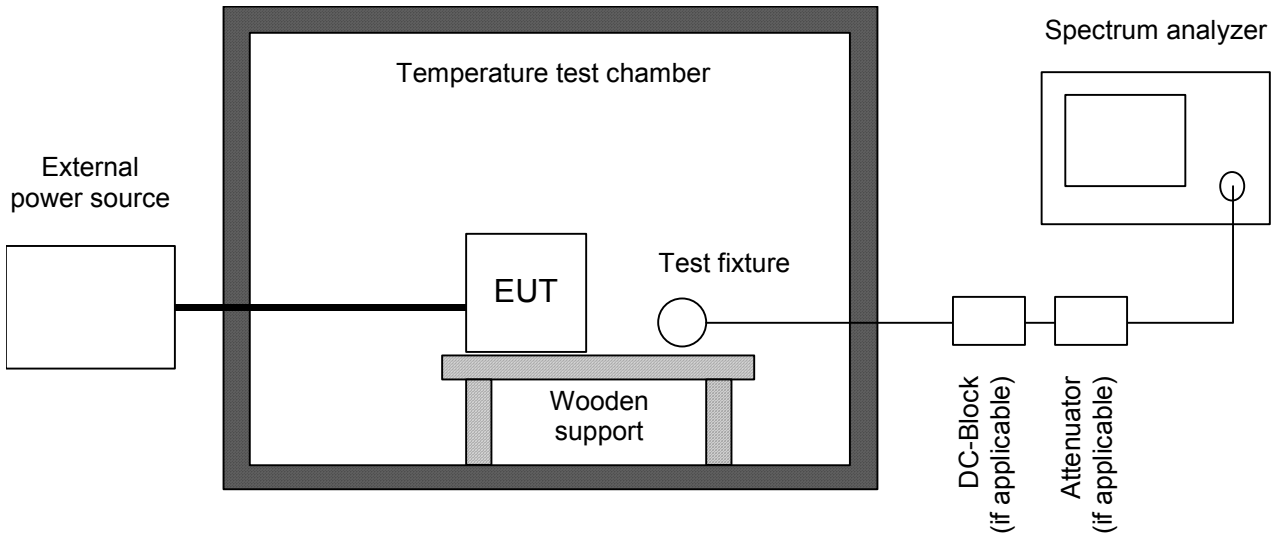
The frequency tolerance of the carrier signal is measured over a temperature variation of -20 °C to +50 °C at normal supply voltage, and for a variation in the primary supply voltage from 85% to 115% of the rated supply voltage at a temperature of 20 °C.

If the EUT provides an antenna connector the spectrum analyzer is connected to this port. 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). In cases where the EUT does not provide an antenna connector a test fixture is used.

For battery operated equipment, the test is performed using a new battery. Alternatively, an external supply voltage can be used and is at least set to:

- the maximum battery voltage as delivered by a new battery or 115% of the battery nominal voltage
- the battery nominal voltage
- 85% of the battery nominal voltage
- the battery operating end point voltage which shall be specified by the equipment manufacturer

The EUT is operating providing an unmodulated carrier. The peak detector of the spectrum analyzer is selected and resolution as well as video bandwidth are set to values appropriate to the shape of the spectrum of the EUT. The frequency counter mode of the spectrum analyzer is used to maximize the accuracy of the measured frequency tolerance.
If an unmodulated carrier is not available a significant and stable point on the spectrum is selected and the span is reduced to a value that delivers an accuracy which shall be better than 1% of the maximum frequency tolerance allowed for the carrier signal. This method may be performed as long as the margin to the frequency tolerance allowed is larger than the uncertainty of the measured frequency tolerance.



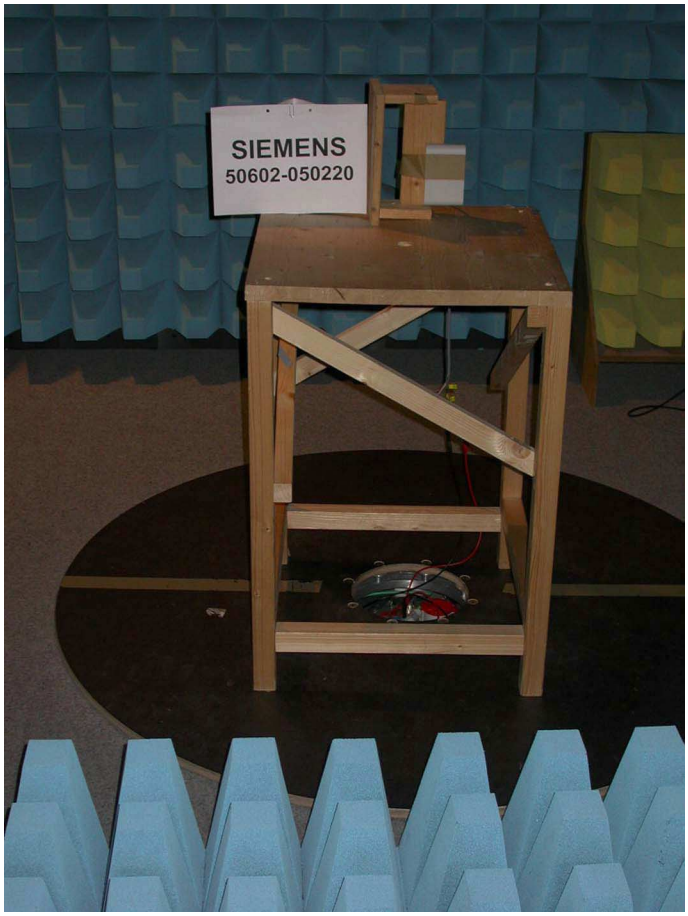
Test instruments used:

| 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 |
| ☒ | DC-block | 7006 | A2798 | Weinschel |
| ☐ | Attenuator | 4776-10 | 9412 | Narda |
| ☐ | Attenuator | 4776-20 | 9503 | Narda |
| ☒ | Test probe | TP01 | 001 | Senton |
| ☒ | DC power supply | NGSM 32/10 | 203 | Rohde & Schwarz |
| ☐ | Isolating transformer | RT 5A | 10387 | Grundig |
| ☐ | Isolating transformer | RT 5A | 10416 | Grundig |
| ☒ | Temperature test chamber | HT4010 | 07065550 | Heraeus |

# 7 Photographs Taken During Testing

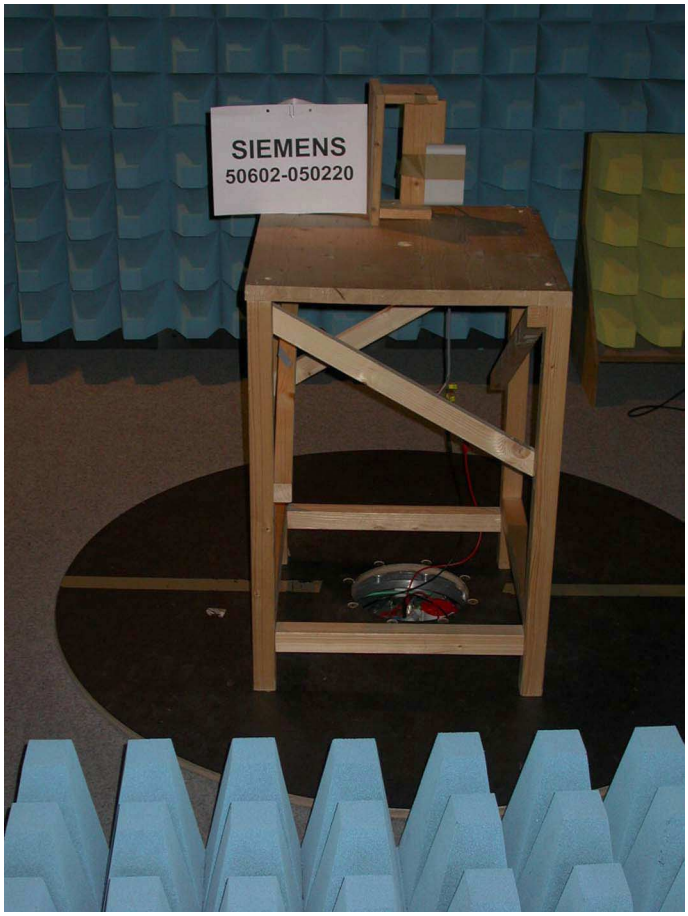
## Test setup for conducted AC powerline emission measurement

## Test setup for radiated emission measurement 9 kHz – 30 MHz



## Test setup for radiated emission measurement 9 kHz – 30 MHz
## - continued -

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



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

## Test setup for radiated emission measurement (open field test site)

# 8 Test Results

| FCC CFR 47 Parts 2 and 15 | | | |
|---|---|---|---|
| *Section(s)* | *Test* | *Page* | *Result* |
| 2.1046(a) | Conducted output power | --- | Not applicable |
| 2.202(a) | Occupied bandwidth | 27 | Recorded |
| 15.215(c) | Bandwidth of the emission | 30 | Test passed |
| 2.201, 2.202 | Class of emission | 32 | Calculated |
| 15.35(c) | Pulse train measurement for pulsed operation | --- | Not applicable |
| 15.205(a)<br>15.205(d)(7) | Restricted bands of operation | ---[5] | Test passed |
| 15.207 | Conducted AC powerline emission<br>150 kHz to 30 MHz | 33 | Test passed |
| 15.225(a)-(d) | Spectrum Mask | 35 | Test passed |
| 15.205(b)<br>15.215(b)<br>15.225(a)(d) | Radiated emission<br>9 kHz to 30 MHz | 38 | Test passed |
| 15.205(b)<br>15.225(d) | Radiated emission<br>30 MHz to 1 GHz | 40 | Test passed |
| 15.225(e) | Carrier frequency stability | 42 | Test passed |

[5] See "Spectrum Mask" for the 13.36 to 13.41 MHz band. For all other restricted bands see "Radiated Emission".

| IC RSS-210 Issue 5 | | | |
|---|---|---|---|
| *Section(s)* | *Test* | *Page* | *Result* |
| 10 | Antenna conducted output power | --- | Not applicable |
| 5.9.1 | Emission bandwidth | 30 | Recorded |
| 5.9.2 | Designation of emissions | 32 | Calculated |
| 6.5 | Pulsed operation | --- | Not applicable |
| 6.3(a) | Restricted bands and unwanted emission frequencies | ---[6] | Test passed |
| 6.6 | Transmitter AC wireline conducted emissions<br>450 kHz to 30 MHz | 33 | Test passed |
| 6.2.2(e) | Spectrum Mask | 35 | Test passed |
| 6.2.2(e)<br>6.3(b)-(d) | Field strength of emissions<br>9 kHz to 30 MHz | 38 | Test passed |
| 6.2.2(e)<br>6.3(b)-(d) | Field strength of emissions<br>30 MHz to 1 GHz | 40 | Test passed |
| 6.2.2(e)<br>6.4 | Carrier frequency stability | 42 | Test passed |
| 14 | Exposure of Humans to RF Fields | 45 | Test passed |

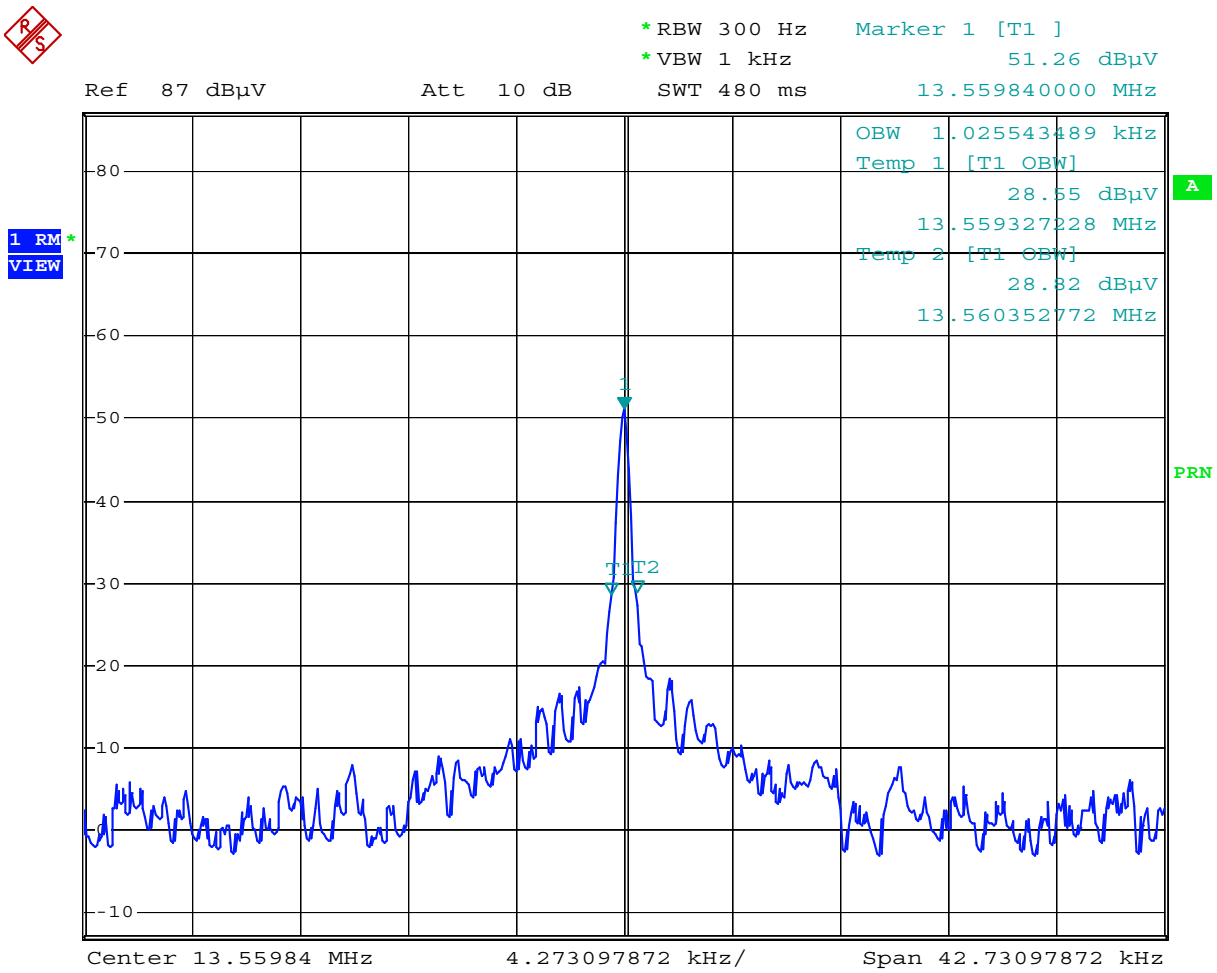
[6] See "Spectrum Mask" and "Field strength of emissions".

## 8.1 Occupied Bandwidth

| | | |
|---|---|---|
| Rules and specifications: | CFR 47 Part 2, section 2.202(a)<br>ANSI C63.4, annex H.6 | |
| Guide: | ANSI C63.4 | |
| Description: | The occupied bandwidth according to CFR 47 Part 2, section 2.202(a), is measured as the 99% emission bandwidth, i.e. below its lower and above its upper frequency limits, the mean powers radiated are each equal to 0.5% of the total mean power radiated by a given emission.<br>The occupied bandwidth according to ANSI C63.4, annex H.6; is measured as the frequency range defined by the points that are 26 dB down relative to the maximum level of the modulated carrier.<br>The resolution bandwidth of the spectrum analyzer shall be set to a value greater than 5.0% of the allowed bandwidth. If no bandwidth specifications are given, the following guidelines are used: | |
| | Fundamental frequency | Minimum resolution bandwidth |
| | 9 kHz to 30 MHz | 1 kHz |
| | 30 MHz to 1000 MHz | 10 kHz |
| | 1000 MHz to 40 GHz | 100 kHz |
| | The video bandwidth shall be at least three times greater than the resolution bandwidth. | |
| Measurement procedure: | Bandwidth Measurements (6.1) | |

| | |
|---|---|
| Comment: | |
| Date of test: | 8 June 2005 |
| Test site: | Fully anechoic room, cabin no. 2 |

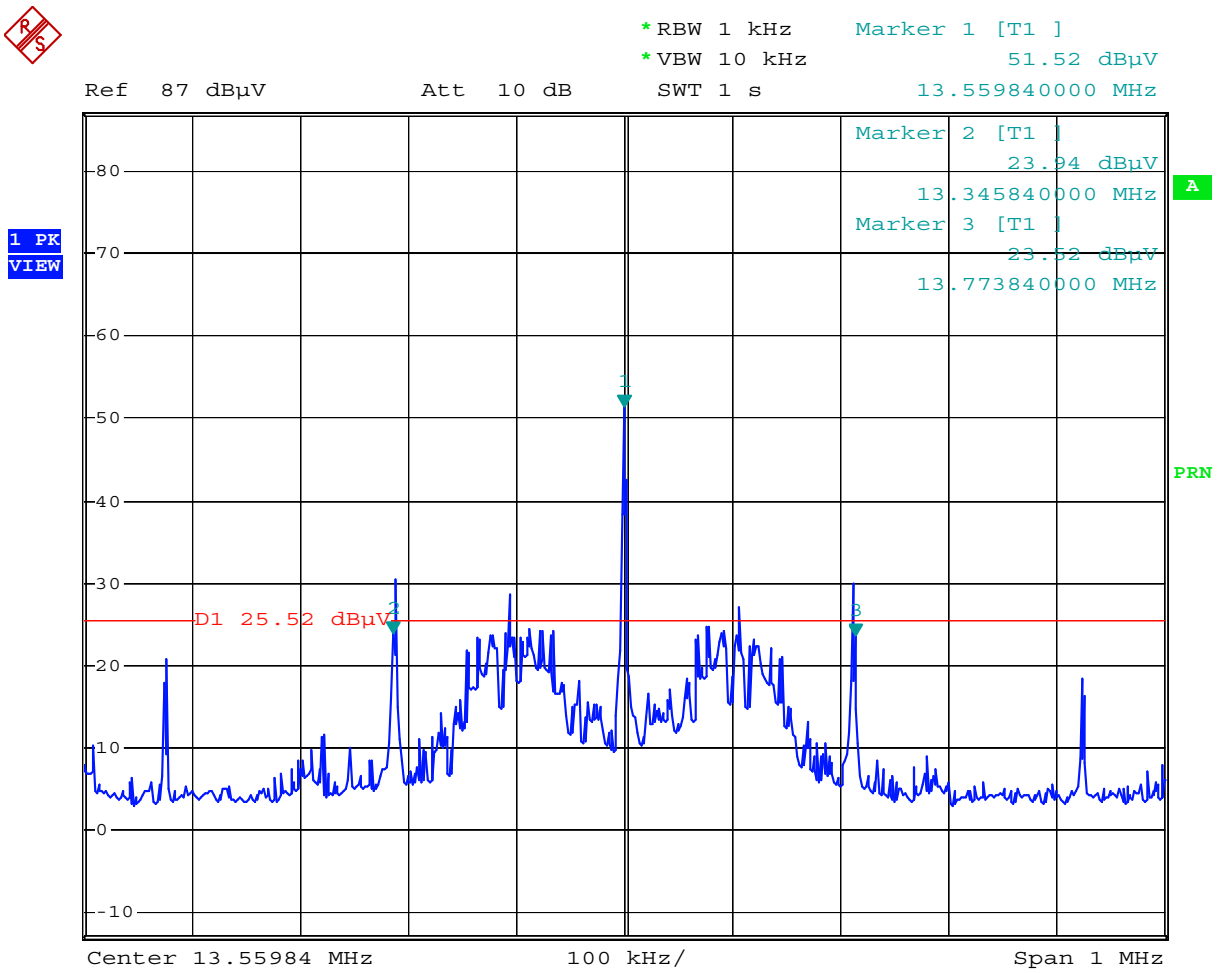
## Occupied Bandwidth (99 %):




Comment: Siemens 050220: Occupied Bandwidth
Date: 8.JUN.2005 17:03:07

| | |
|---|---|
| Occupied Bandwidth (99 %): | **1.03 kHz** |

## Occupied Bandwidth (-26 dB):



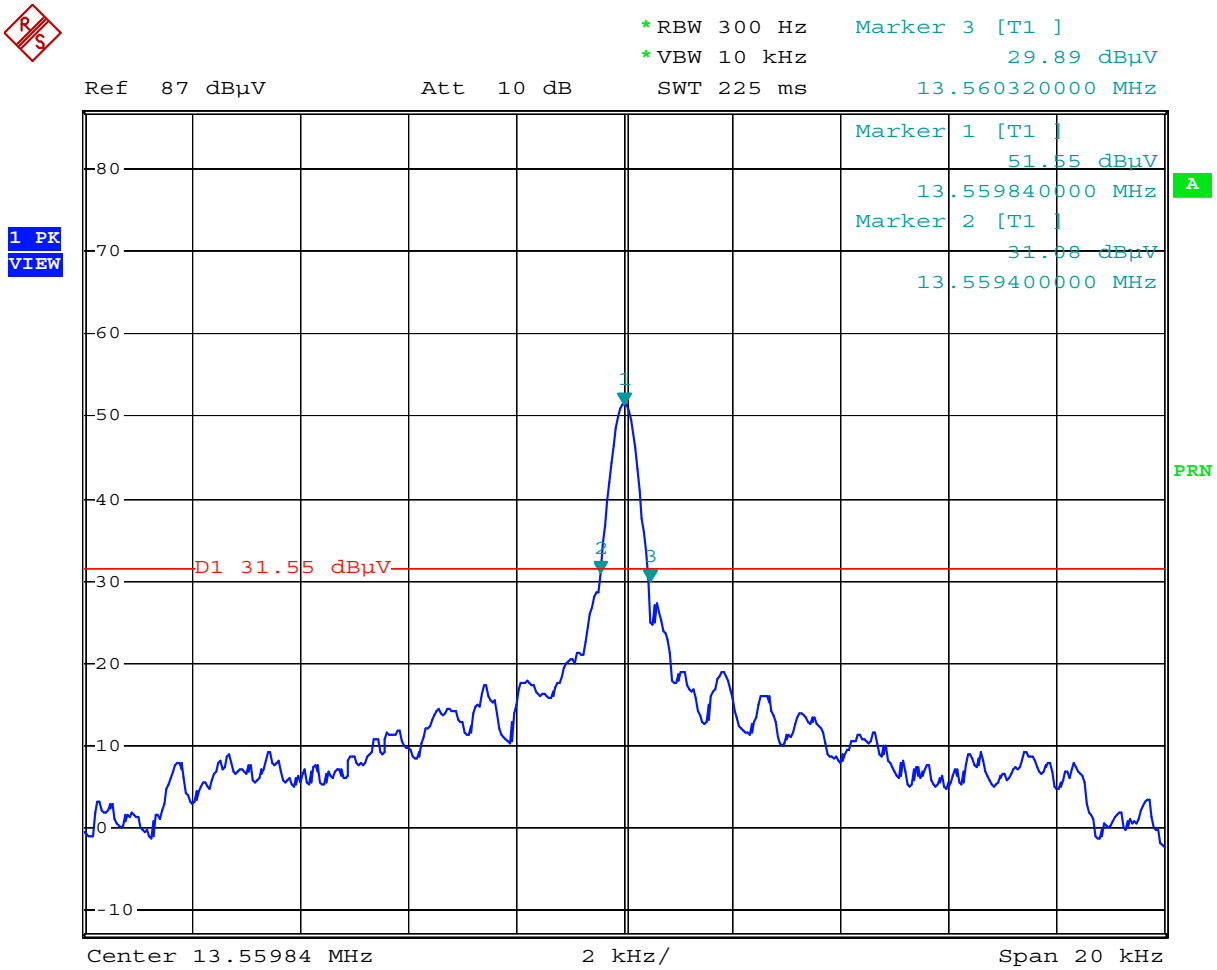

Comment: Siemens 050220: Occupied Bandwidth
Date: 8.JUN.2005 17:16:35

| | |
|---|---|
| Occupied Bandwidth (-26 dB): | **428 kHz** |

## 8.2 Emission Bandwidth

| | |
|---|---|
| Rules and specifications: | CFR 47 Part 15, section 15.215(c)<br>IC RSS-210 Issue 5, section 5.9.1 |
| Guide: | ANSI C63.4 / IC RSS-210 Issue 5, section 5.9.1 |
| Description: | The 20 dB bandwidth is measured at the points when the spectral density of the signal is 20 dB down from the inband spectral density of the modulated signal, with the transmitter modulated by a representative signal. Spectral density (power per unit bandwidth) is measured with a spectrum analyzer with resolution bandwidth set to 300 Hz or alternatively equal to approximately 1.0% of the emission bandwidth. The video bandwidth shall be at least three times greater than the resolution bandwidth. |
| Measurement procedure: | Bandwidth Measurements (6.1) |

| | |
|---|---|
| Comment: | |
| Date of test: | 8 June 2005 |
| Test site: | Fully anechoic room, cabin no. 2 |




Comment: Siemens 050220: Emission Bandwidth
Date: 8.JUN.2005 16:57:43

| | | |
|---|---|---|
| Permitted frequency band: | **13.553 - 13.567** MHz | |
| Emission frequency range:<br>Emission bandwidth: | <br>**0.92 kHz** | |
| Carrier frequency stability:<br>Maximum frequency tolerances: | ☒ **specified**<br>**+97 Hz**<br>**- 80 Hz** | ☐ **not specified** |
| Frequency range of the emission:<br>Bandwidth of the emission: | <br>**1.1 kHz** | **within permitted frequency band[7]:**<br>☐ **yes** ☐ **no** |

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

[7] If a frequency stability is not specified, it is recommended that the fundamental emission is kept within at least the central 80% of the permitted band in order to minimize the possibility of out-of-band operation.

## 8.3 Designation of Emissions

| | |
|---|---|
| Rules and specifications: | CFR 47 Part 2, sections 2.201 and 2.202<br>IC RSS-210 Issue 5, section 5.9.2 |
| Guide: | ANSI C63.4 / TRC-43 |

| | |
|---|---|
| Type of modulation: | Amplitude Modulation |

| | |
|---|---|
| $B_n$ = Necessary Bandwidth<br>B = Modulation rate<br>K = Overall numerical factor | $B_n = 2BK$<br>B = 5 kHz<br>K = 1 |
| Calculation: | $B_n = 2 \cdot (5\ kHz) \cdot 1 = 10\ kHz$ |

| | |
|---|---|
| Designation of Emissions: | **10K0A1D** |

## 8.4 Conducted Powerline Emission Measurement 150 kHz to 30 MHz

| | | | | | |
|---|---|---|---|---|---|
| Rules and specifications: | CFR 47 Part 15, section 15.207<br>IC RSS-210 Issue 5, section 6.6 | | | | |
| Guide: | ANSI C63.4 / CISPR 22 | | | | |
| Limit: | CFR 47 Part 15 | | | IC RSS-210 | |
| | Frequency of Emission (MHz) | Conducted Limit (dBµV) | | Frequency of Emission (MHz) | Conducted Limit (dBµV) |
| | | Quasi-peak | Average | | Quasi-peak |
| | 0.15 - 0.5<br>0.5 - 5<br>5 - 30 | 66 to 56<br>56<br>60 | 56 to 46<br>46<br>50 | 0.45 - 30 | 48 |
| Measurement procedure: | Conducted AC Powerline Emission (6.2) | | | | |

| | |
|---|---|
| Comment: | Transmitting continuously without TAG |
| Date of test: | 13 May 2005 |
| Test site: | Shielded room, cabin no. 4 |

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

| | |
|---|---|
| Tested on: | L1 |

| Frequency (MHz) | Detector | Reading Value (dBµV) | Correction Factor (dB) | Final Value (dBµV) | CFR 47 Part 15 | | RSS-210 | |
|---|---|---|---|---|---|---|---|---|
| | | | | | Limit (dBµV) | Margin (dB) | Limit (dBµV) | Margin (dB) |
| 13.560 | Quasi-Peak | 27.6 | 0.0 | 27.6 | 60.0 | **32.4** | 48.0 | **20.4** |

| | |
|---|---|
| Tested on: | N |

| Frequency (MHz) | Detector | Reading Value (dBµV) | Correction Factor (dB) | Final Value (dBµV) | CFR 47 Part 15 | | RSS-210 | |
|---|---|---|---|---|---|---|---|---|
| | | | | | Limit (dBµV) | Margin (dB) | Limit (dBµV) | Margin (dB) |
| 13.560 | Quasi-Peak | 31.9 | 0.0 | 31.9 | 60.0 | **28.1** | 48.0 | **16.1** |

| | |
|---|---|
| Comment: | Reading TAG continuously |
| Date of test: | 13 May 2005 |
| Test site: | Shielded room, cabin no. 4 |

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

| Tested on: | L1 |
|---|---|

| Frequency (MHz) | Detector | Reading Value (dBµV) | Correction Factor (dB) | Final Value (dBµV) | CFR 47 Part 15 | | RSS-210 | |
|---|---|---|---|---|---|---|---|---|
| | | | | | Limit (dBµV) | Margin (dB) | Limit (dBµV) | Margin (dB) |
| 13.560 | Quasi-Peak | 36.6 | 0.0 | 36.6 | 60.0 | **23.4** | 48.0 | **11.4** |

| Tested on: | N |
|---|---|

| Frequency (MHz) | Detector | Reading Value (dBµV) | Correction Factor (dB) | Final Value (dBµV) | CFR 47 Part 15 | | RSS-210 | |
|---|---|---|---|---|---|---|---|---|
| | | | | | Limit (dBµV) | Margin (dB) | Limit (dBµV) | Margin (dB) |
| 13.560 | Quasi-Peak | 40.0 | 0.0 | 40.0 | 60.0 | **20.0** | 48.0 | **8.0** |

**Sample calculation of final values:**

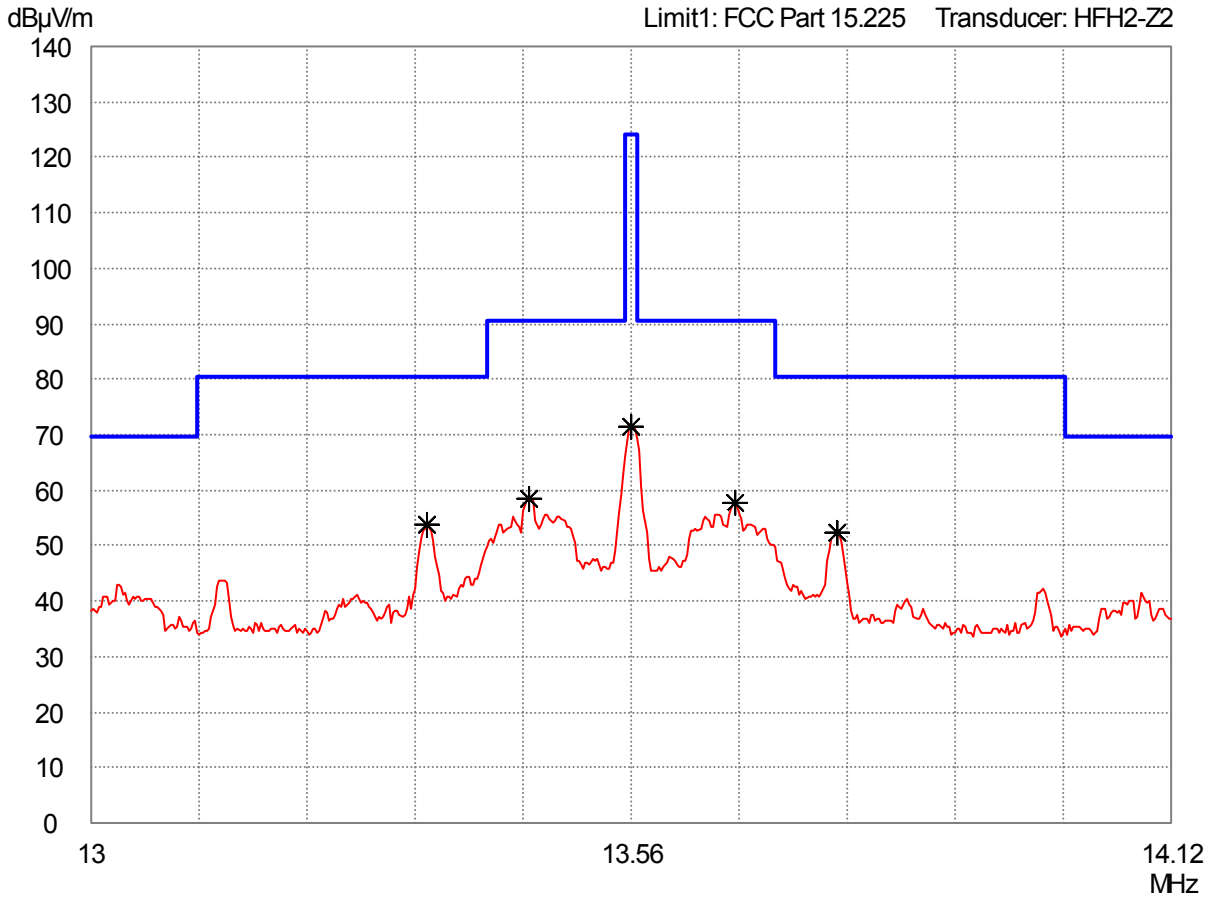
Final Value (dBµV) = Reading Value (dBµV) + Correction Factor (dB)

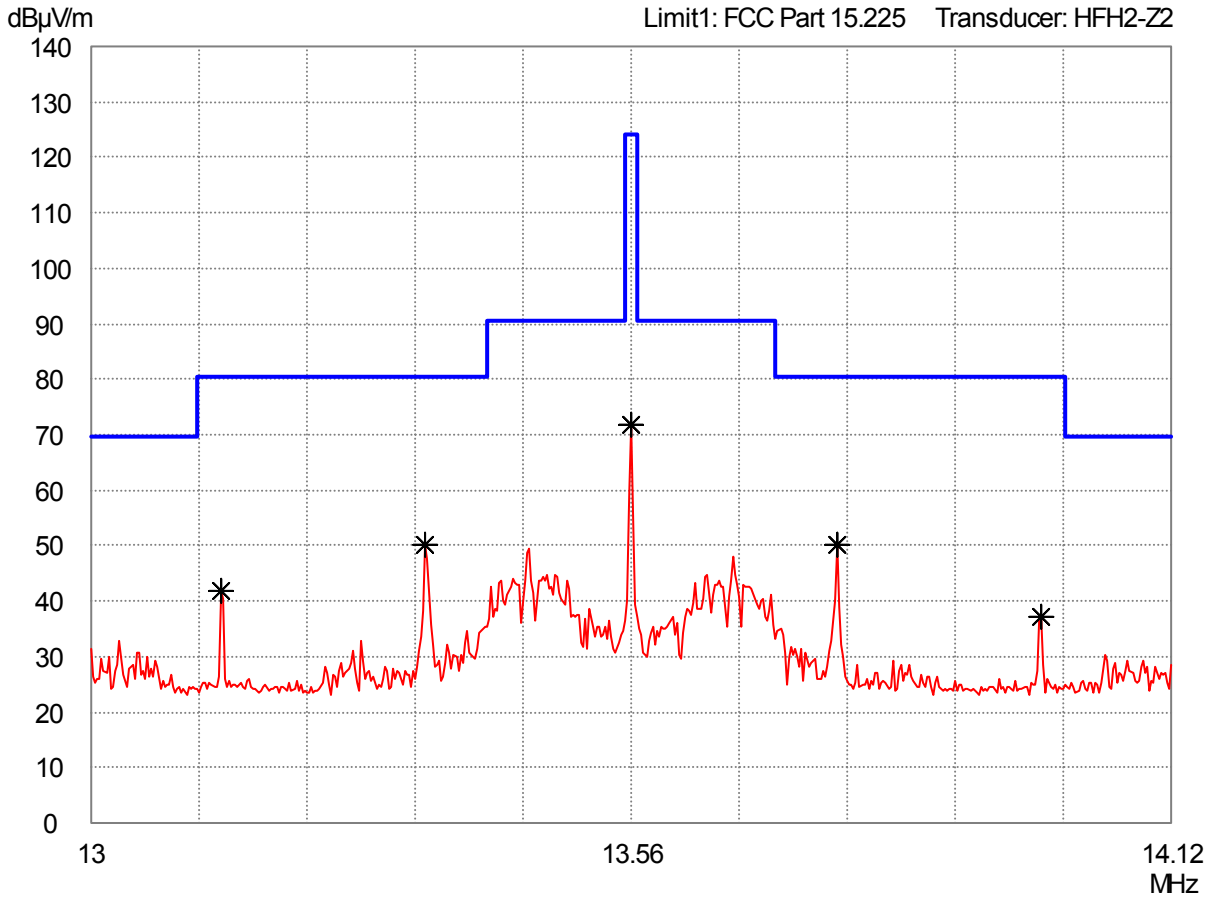
## 8.5 Spectrum Mask

| | | | | |
|---|---|---|---|---|
| Rules and specifications: | CFR 47 Part 15, section 15.225(a)-(d)<br>IC RSS-210 Issue 5, section 6.2.2(e) | | | |
| Guide: | ANSI C63.4 | | | |
| Description: | Compliance with the spectrum mask is tested using a spectrum analyzer with resolution bandwidth set to a 1 kHz for the band 13.553 to 13.567 MHz and to 10 kHz outside this band. The video bandwidth shall be at least three times greater than the resolution bandwidth. | | | |
| Limit: | Frequency of Emission (MHz) | Field Strength (µV/m) | Field Strength (dBµV/m) | Measurement Distance d (meters) |
| | 1.705 - 13.110 | 30 | 29.5 | 30 |
| | 13.110 - 13.410 | 106 | 40.5 | 30 |
| | 13.410 - 13.553 | 334 | 50.5 | 30 |
| | 13.553 - 13.567 | 15848 | 84.0 | 30 |
| | 13.567 - 13.710 | 334 | 50.5 | 30 |
| | 13.710 - 14.010 | 106 | 40.5 | 30 |
| | 14.010 - 30.000 | 30 | 29.5 | 30 |
| Measurement procedure: | Radiated Emission Measurement 9 kHz to 30 MHz (6.3) | | | |

| | |
|---|---|
| Comment:<br>Date of test:<br>Test site: | Reading TAG continuously<br>8 June 2005<br>Fully anechoic room, cabin no. 2 |
| Test distance: | 3 meters |
| Extrapolation Factor: | 40 dB/decade |

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


dBµV/m
Limit1: FCC Part 15.225
Transducer: HFH2-Z2
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
13
13.56
14.12
MHz


dBµV/m
Limit1: FCC Part 15.225
Transducer: HFH2-Z2
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
13
13.56
14.12
MHz

## 8.6 Radiated Emission Measurement 9 kHz to 30 MHz

| | | | | |
|---|---|---|---|---|
| Rules and specifications: | CFR 47 Part 15, sections 15.205 and 15.225(a)-(d)<br>IC RSS-210 Issue 5, sections 6.2.2(e) and 6.3(b)-(d) | | | |
| 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 - 13.110 | 30 | 29.5 | 30 |
| | 13.110 - 13.410 | 106 | 40.5 | 30 |
| | 13.410 - 13.553 | 334 | 50.5 | 30 |
| | 13.553 - 13.567 | 15848 | 84.0 | 30 |
| | 13.567 - 13.710 | 334 | 50.5 | 30 |
| | 13.710 - 14.010 | 106 | 40.5 | 30 |
| | 14.010 - 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: | Transmitting continuously without TAG |
| Date of test: | 8 June 2005 |
| Test site: | Open field test site |

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

| Frequency (MHz) | Detector | Distance $d_1$ (m) | Distance $d_2$ (m) | Reading Value $d_1$ (dBµV) | Reading Value $d_2$ (dBµV) | Correction Factor (dB/m) | Extrapolation Factor (dB/dec) | Extrapolation Factor (dB) | Pulse Train Correction (dB) | Final Value (dBµV/m) | Limit (dBµV/m) | Margin (dB) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 13.560 | QP | 3 | 10 | 51.3 | 35.7 | 20.0 | -29.8 | -14.2 | | 41.4 | 84.0 | **42.6** |

| | |
|---|---|
| Comment: | Reading TAG continuously |
| Date of test: | 29 April 2005 / 23 May 2005 |
| Test site: | Open field test site |

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

| Frequency (MHz) | Detector | Distance $d_1$ (m) | Distance $d_2$ (m) | Reading Value $d_1$ (dBµV) | Reading Value $d_2$ (dBµV) | Correction Factor (dB/m) | Extrapolation Factor (dB/dec) | Extrapolation Factor (dB) | Pulse Train Correction (dB) | Final Value (dBµV/m) | Limit (dBµV/m) | Margin (dB) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 13.560 | QP | 3 | 10 | 51.7 | 35.4 | 20.0 | -31.2 | -14.9 | | 40.5 | 84.0 | **43.5** |

**Sample calculation of final values:**

$$\text{Extrapolation Factor (dB/decade)} = \begin{cases} -40 \text{ (dB/decade)} & \text{if } d_1 = d_2 \\ \dfrac{\text{Reading Value } d_2 \text{ (dBµV)} - \text{Reading Value } d_1 \text{ (dBµV)}}{\text{Log}(d_2) - \text{Log}(d_1)} & \text{if } d_1 \neq d_2 \end{cases}$$

$$\text{Extrapolation Factor (dB)} = (\text{Log}(d) - \text{Log}(d_2)) \cdot \text{Extrapolation Factor (dB/decade)}$$

$$\text{Final Value (dBµV/m)} = \text{Reading Value } d_2 \text{ (dBµV)} + \text{Correction Factor (dB/m)} + \text{Extrapolation Factor (dB)} + \text{Pulse Train Correction (dB)}$$

## 8.7 Radiated Emission Measurement 30 MHz to 1 GHz

| | | | |
|---|---|---|---|
| Rules and specifications: | CFR 47 Part 15, sections 15.205(b) and 15.225(d)<br>IC RSS-210 Issue 5, sections 6.2.2(e) and 6.3(b)-(d) | | |
| 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) | | |

| | |
|---|---|
| Comment: | Transmitting continuously without TAG |
| Date of test: | 8 June 2005 |
| 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) | Antenna Polarization | Detector | Receiver Reading (dBµV) | Correction Factor (dB/m) | Pulse Train Correction (dB) | Final Value (dBµV/m) | Limit (dBµV/m) | Margin (dB) |
|---|---|---|---|---|---|---|---|---|
| 189.800 | vertical | Quasi-Peak | 19.8 | 16.3 | | 36.1 | 43.5 | **7.4** |
| 216.960 | vertical | Quasi-Peak | 14.7 | 17.5 | | 32.2 | 46.0 | 13.8 |
| 393.240 | vertical | Quasi-Peak | 16.9 | 18.3 | | 35.2 | 46.0 | 10.8 |
| 420.350 | vertical | Quasi-Peak | 13.5 | 19.0 | | 32.5 | 46.0 | 13.5 |

| | |
|---|---|
| Comment: | Reading TAG continuously |
| Date of test: | 23 May 2005 |
| 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) | Antenna Polarization | Detector | Receiver Reading (dBµV) | Correction Factor (dB/m) | Pulse Train Correction (dB) | Final Value (dBµV/m) | Limit (dBµV/m) | Margin (dB) |
|---|---|---|---|---|---|---|---|---|
| 162.700 | vertical | Quasi-Peak | 12.3 | 14.0 | | 26.3 | 43.5 | 17.2 |
| 189.840 | vertical | Quasi-Peak | 19.5 | 16.3 | | 35.8 | 43.5 | **7.7** |
| 244.080 | vertical | Quasi-Peak | 11.6 | 17.6 | | 29.2 | 46.0 | 16.8 |
| 393.240 | vertical | Quasi-Peak | 17.8 | 18.3 | | 36.1 | 46.0 | 9.9 |
| 420.360 | vertical | Quasi-Peak | 14.2 | 19.0 | | 33.2 | 46.0 | 12.8 |

**Sample calculation of final values:**

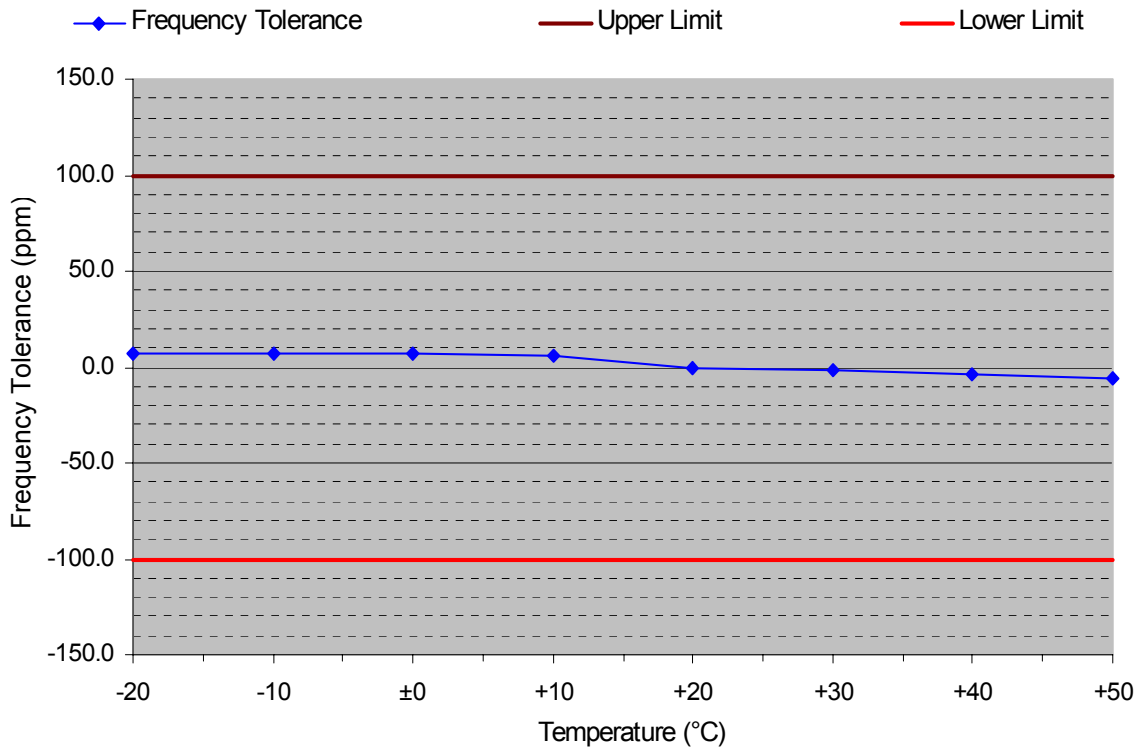
Final Value (dBµV/m) = Reading Value (dBµV) + Correction Factor (dB/m) + Pulse Train Correction (dB)

## 8.8 Carrier Frequency Stability

| | |
|---|---|
| Rules and specifications: | CFR 47 Part 15, section 15.225(e)<br>IC RSS-210 Issue 5, sections 6.2.2(e) and 6.4 |
| Guide: | ANSI C63.4 |
| Limit: | The frequency tolerance of the carrier signal shall be maintained within ±0.01 % (±100 ppm) of the carrier frequency under nominal conditions. |
| Temperature range:<br>Voltage range: | -20°C to +50°C (at normal supply voltage)<br>85% to 115% of the rated supply voltage (at a temperature of +20 °C) |
| Measurement procedure: | Carrier Frequency Stability (6.6) |

| | |
|---|---|
| Comment:<br>Date of test: | <br>23 May 2005 |

## 8.8.1 Carrier Frequency Stability vs. Temperature

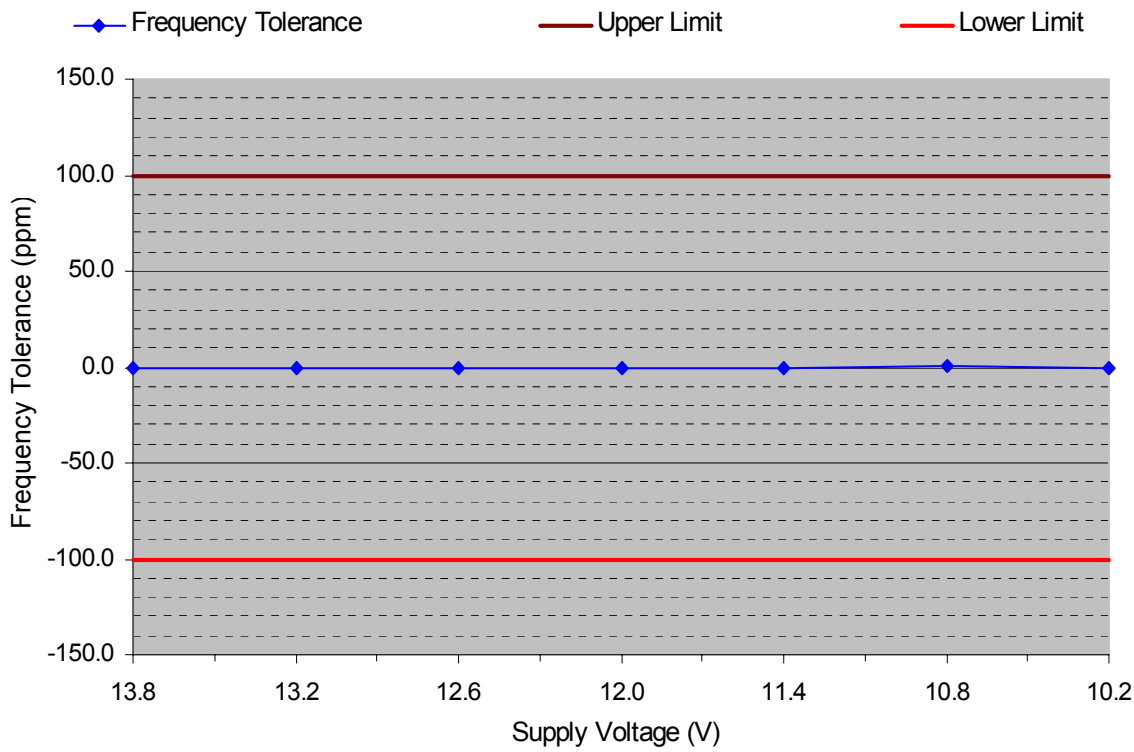



Supply voltage: 12 V Nominal frequency: 13.560032 MHz

| Temperature (°C) | Frequency (MHz) | Frequency Tolerance (Hz) | Frequency Tolerance (ppm) | Upper Limit (ppm) | Lower Limit (ppm) | Margin (ppm) |
|---|---|---|---|---|---|---|
| -20 | 13.560129 | 97 | 7.2 | +100.0 | -100.0 | **92.8** |
| -10 | 13.560127 | 95 | 7.0 | +100.0 | -100.0 | 93.0 |
| ±0 | 13.560121 | 89 | 6.6 | +100.0 | -100.0 | 93.4 |
| +10 | 13.560111 | 79 | 5.8 | +100.0 | -100.0 | 94.2 |
| +20 | 13.560032 | 0 | 0.0 | +100.0 | -100.0 | 100.0 |
| +30 | 13.560013 | -19 | -1.4 | +100.0 | -100.0 | 98.6 |
| +40 | 13.559979 | -53 | -3.9 | +100.0 | -100.0 | 96.1 |
| +50 | 13.559952 | -80 | -5.9 | +100.0 | -100.0 | 94.1 |

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

## 8.8.2 Carrier Frequency Stability vs. Supply Voltage




Temperature: +20 °C Battery End Point: Not applicable
Nominal frequency: 13.560032 MHz

| Supply Voltage (V) | Frequency (MHz) | Frequency Tolerance (Hz) | Frequency Tolerance (ppm) | Upper Limit (ppm) | Lower Limit (ppm) | Margin (ppm) |
|---|---|---|---|---|---|---|
| 13.8 | 13.560032 | 0 | 0.0 | +100.0 | -100.0 | 100.0 |
| 13.2 | 13.560031 | -1 | -0.1 | +100.0 | -100.0 | 99.9 |
| 12.6 | 13.560031 | -1 | -0.1 | +100.0 | -100.0 | 99.9 |
| 12.0 | 13.560032 | 0 | 0.0 | +100.0 | -100.0 | 100.0 |
| 11.4 | 13.560032 | 0 | 0.0 | +100.0 | -100.0 | 100.0 |
| 10.8 | 13.560033 | 1 | 0.1 | +100.0 | -100.0 | **99.9** |
| 10.2 | 13.560032 | 0 | 0.0 | +100.0 | -100.0 | 100.0 |

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

## 8.9 Exposure of Humans to RF Fields

| | |
|---|---|
| Rules and specifications: | IC RSS-210 Issue 5, section 14 |
| Guide: | IC RSS-102 Issue 1, section 4.1 |

| Exposure of Humans to RF Fields | Applicable | Declared by applicant | Measured | Exemption |
|---|---|---|---|---|
| The transmitter is for | | | | |
| ☒ fixed use ☐ mobile use ☐ portable use | | ☒ | | ☒ |
| The antenna is | | | | |
| ☐ detachable | | | | |
| The output power (TP in watts) is measured at the antenna connector: $TP$ = **..... W** | | | ☐ | |
| Numerical gain of the antenna: $G$ = **.....** | | ☐ | | |
| ☒ not detachable | | | | |
| A field strength measurement is used to determine the output power (TP in watts) given by[8]: $TP = \frac{(FS \cdot D)^2}{30 \cdot G} \Rightarrow TP$ = **1.228 µW** | | | | |
| with: | | | | |
| Field strength[9] in V/m: $FS$ = **0.607 mV/m** | | | ☒ | |
| Distance between the two antennas in m: $D$ = **10 m** | | | ☒ | |
| Numerical gain of the antenna: $G$ = **1** | | ☒ | | |
| SAR and RF evaluation | | | | |
| $EIRP = G \cdot TP \Rightarrow EIRP$ = **1.228 µW** | | | | |
| ☒ Transmitter is operating at frequencies below 1.0 GHz with an output power TP equal to or less than 200 milliwatts (mW). | | | | ☒ |
| ☐ Transmitter is operating at frequencies between 1.0 and 2.2 GHz with an output power TP equal to or less than 100 milliwatts (mW). | | | | ☐ |
| ☐ Transmitter is for mobile use and operating frequency is below 1.5 GHz with effective radiated power (ERP) of 1.5 watts or less (i.e. EIRP of 2.5 watts or less). | | | | ☐ |
| ☐ Transmitter is for mobile use and operating frequency is above 1.5 GHz with ERP of 3 watts or less (i.e. EIRP of 5 watts or less). | | | | ☐ |
| ☐ SAR and/or RF evaluation is documented in test report no. ..... | | | | |

[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.
[9] 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.

# 9 Referenced Regulations

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

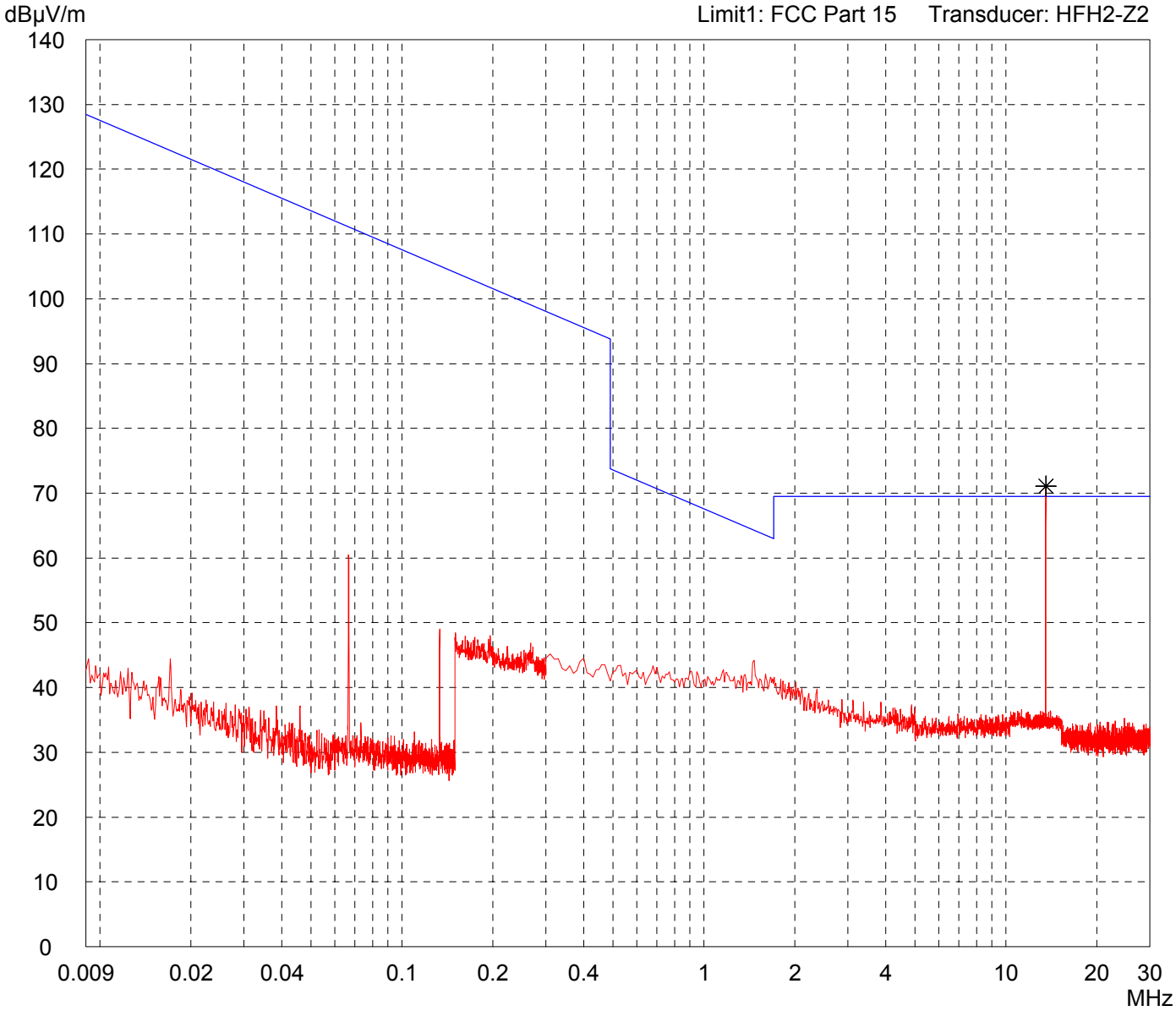
| | | | |
|---|---|---|---|
| ☒ | CFR 47 Part 2 | Code of Federal Regulations Part 2 (Frequency allocation and radio treaty matters; General rules and regulations) of the Federal Communication Commission (FCC) | October 10, 2004 |
| ☒ | CFR 47 Part 15 | Code of Federal Regulations Part 15 (Radio Frequency Devices) of the Federal Communication Commission (FCC) | April 5, 2005 |
| ☒ | 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-210 | Radio Standards Specification RSS-210 Issue 5 for Low Power Licence-Exempt Radiocommunication Devices (All Frequency Bands), published by Industry Canada | November 2001 |
| ☒ | RSS-102 | Radio Standards Specification RSS-102 Issue 1: Evaluation Procedure for Mobile and Portable Radio Transmitters with respect to Health Canada's Safety Code 6 for Exposure of Humans to Radio Frequency Fields, published by Industry Canada | September 1999 |
| ☐ | ICES-003 | Interference-Causing Equipment Standard ICES-003 Issue 4 for Digital Apparatus, published by Industry Canada | February 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 |

# 10 Charts taken during testing

# Radiated Emission Test 9 kHz - 30 MHz
# acc. to FCC Part 15 (Fully Anechoic Chamber)

| | |
|---|---|
| Model: AR 6111-MX | Comment: - AC 115 V power supply DC 12 V power supply - transmitting continiously |
| Serial no.: --- | |
| Applicant: Siemens Building Technologies GmbH & Co. oHG | |
| Test site: Fully anechoic room, cabin no. 2 | |
| Tested on: Test distance 3 metres | |
| Date of test: 06/08/2005 — Operator: M. Steindl | |
| Test performed: by hand — File name: default.emi | |

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

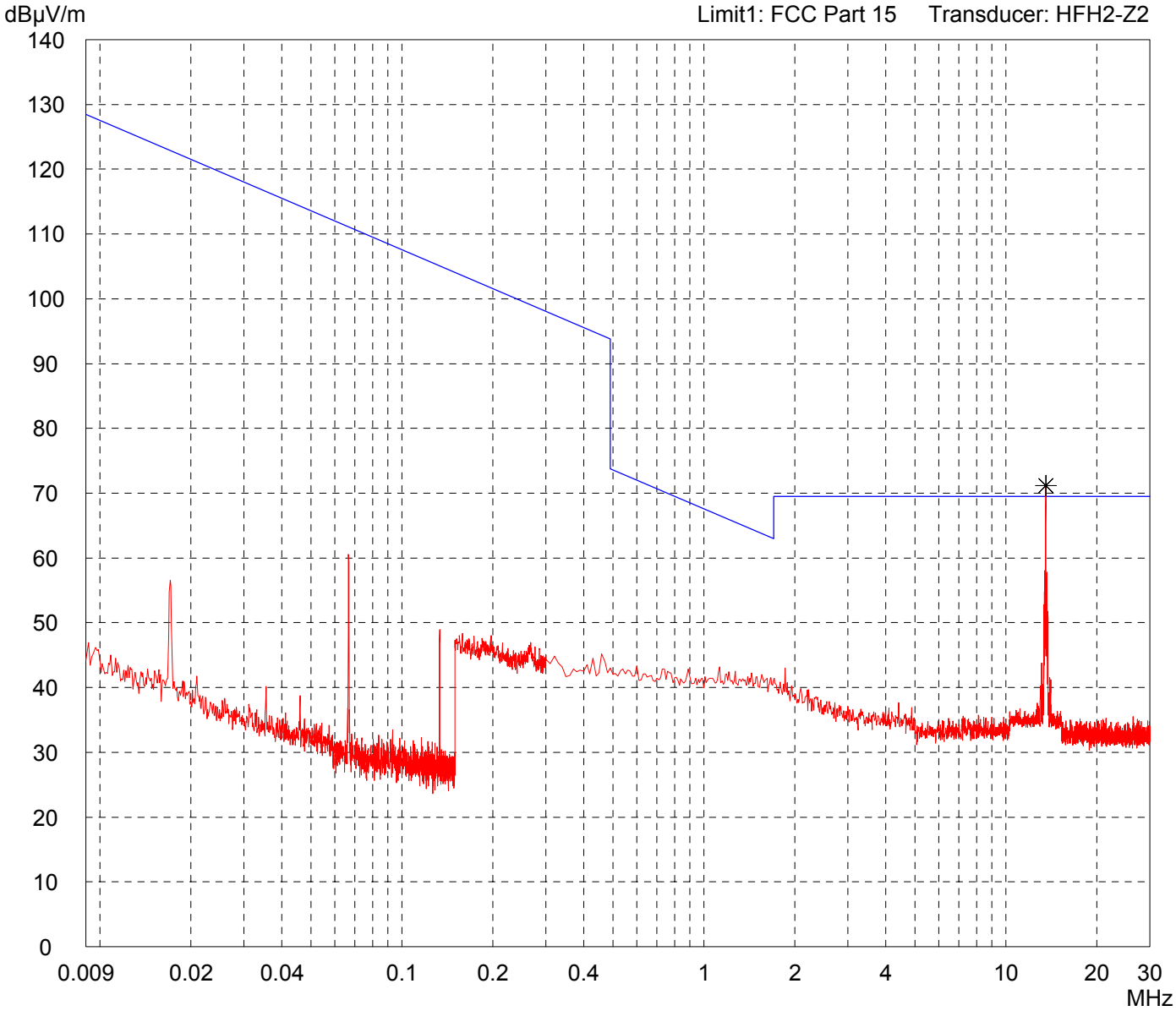



| | |
|---|---|
| Result: Prescan | Project file: 50602-50220 — Page of Pages |

# Radiated Emission Test 9 kHz - 30 MHz
# acc. to FCC Part 15 (Fully Anechoic Chamber)

| | |
|---|---|
| Model: AR 6111-MX | Comment: - AC 115 V power supply DC 12 V power supply - reading TAG continiously |
| Serial no.: --- | |
| Applicant: Siemens Building Technologies GmbH & Co. oHG | |
| Test site: Fully anechoic room, cabin no. 2 | |
| Tested on: Test distance 3 metres | |
| Date of test: 06/08/2005 — Operator: M. Steindl | |
| Test performed: by hand — File name: default.emi | |

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

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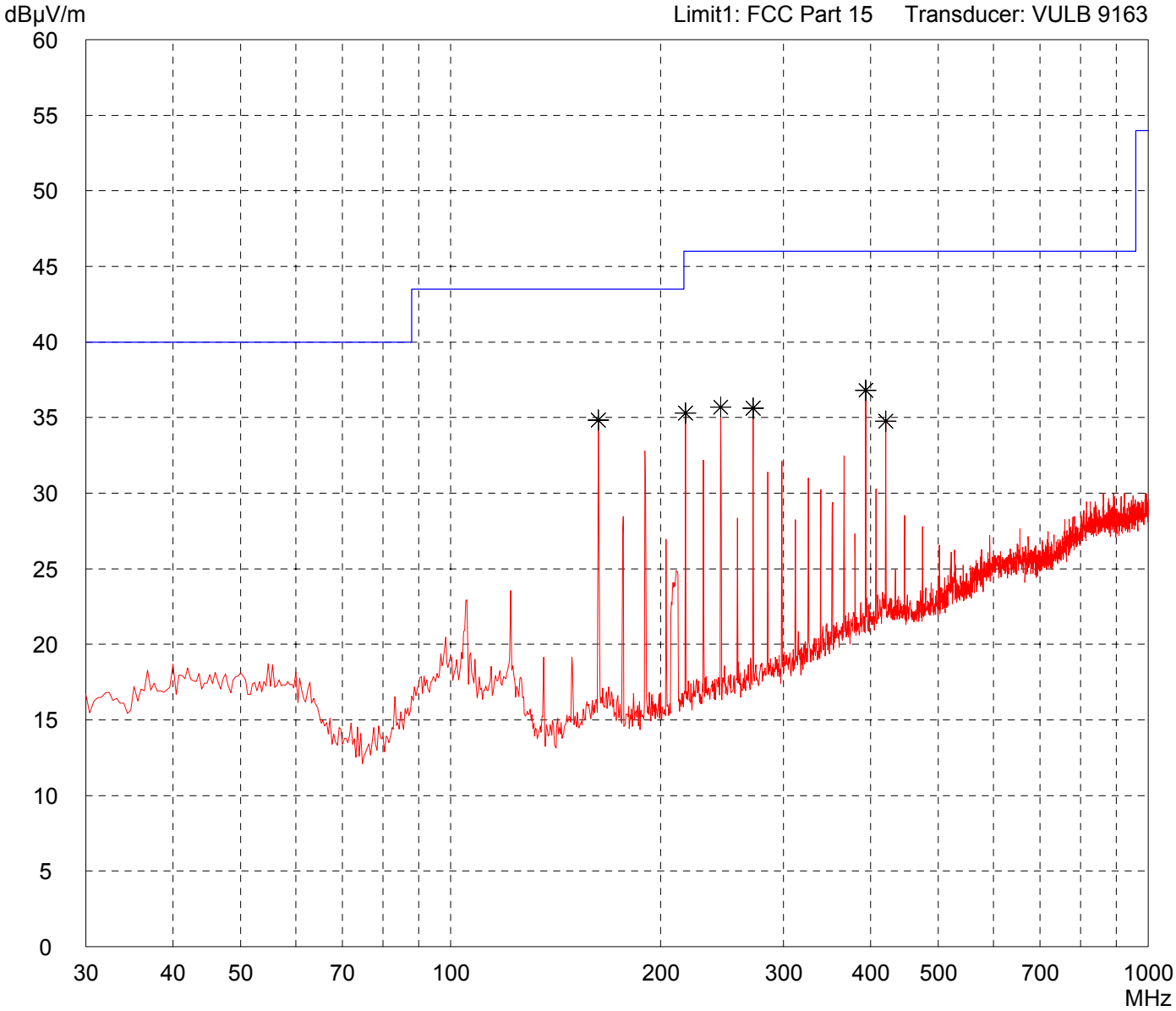
| Result: Prescan | Project file: 50602-50220 — Page of Pages |

# Radiated Emission Test 30 MHz - 1 GHz
# acc. to FCC Part 15 (Fully Anechoic Chamber)

| | |
|---|---|
| Model: AR 6111-MX | Comment: - AC 115 V power supply DC 12 V power supply - transmitting continiously |
| Serial no.: --- | |
| Applicant: Siemens Building Technologies GmbH & Co. oHG | |
| Test site: Fully anechoic room, cabin no. 2 | |
| Tested on: Test distance 3 metres Horizontal Polarization | |
| Date of test: 06/08/2005 — Operator: M. Steindl | |
| Test performed: automatically — File name: default.emi | |
| Detector: Peak | List of values: Selected by hand |

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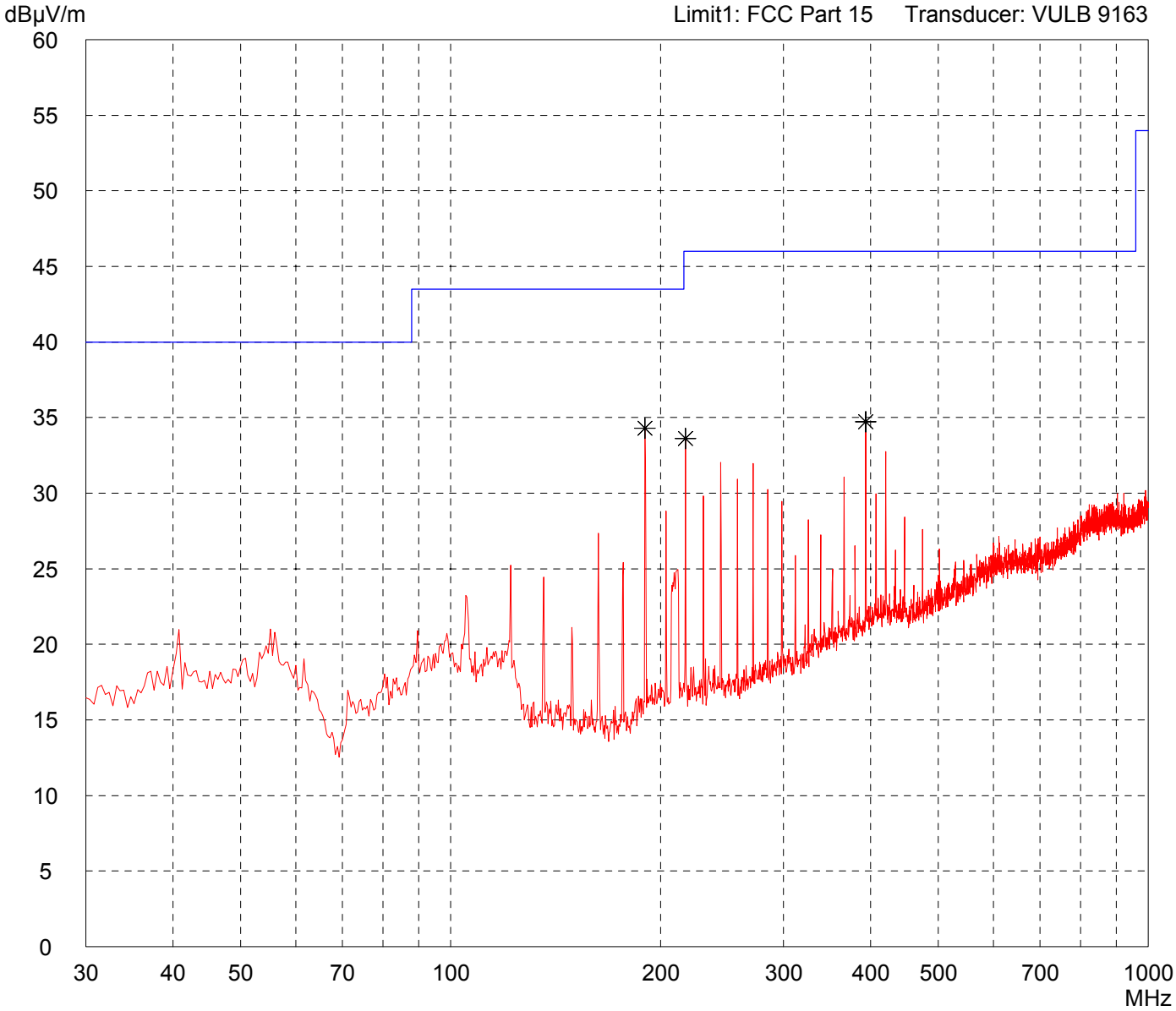
| Result: Prescan | Project file: 50602-50220 Page of Pages |

# Radiated Emission Test 30 MHz - 1 GHz
# acc. to FCC Part 15 (Fully Anechoic Chamber)

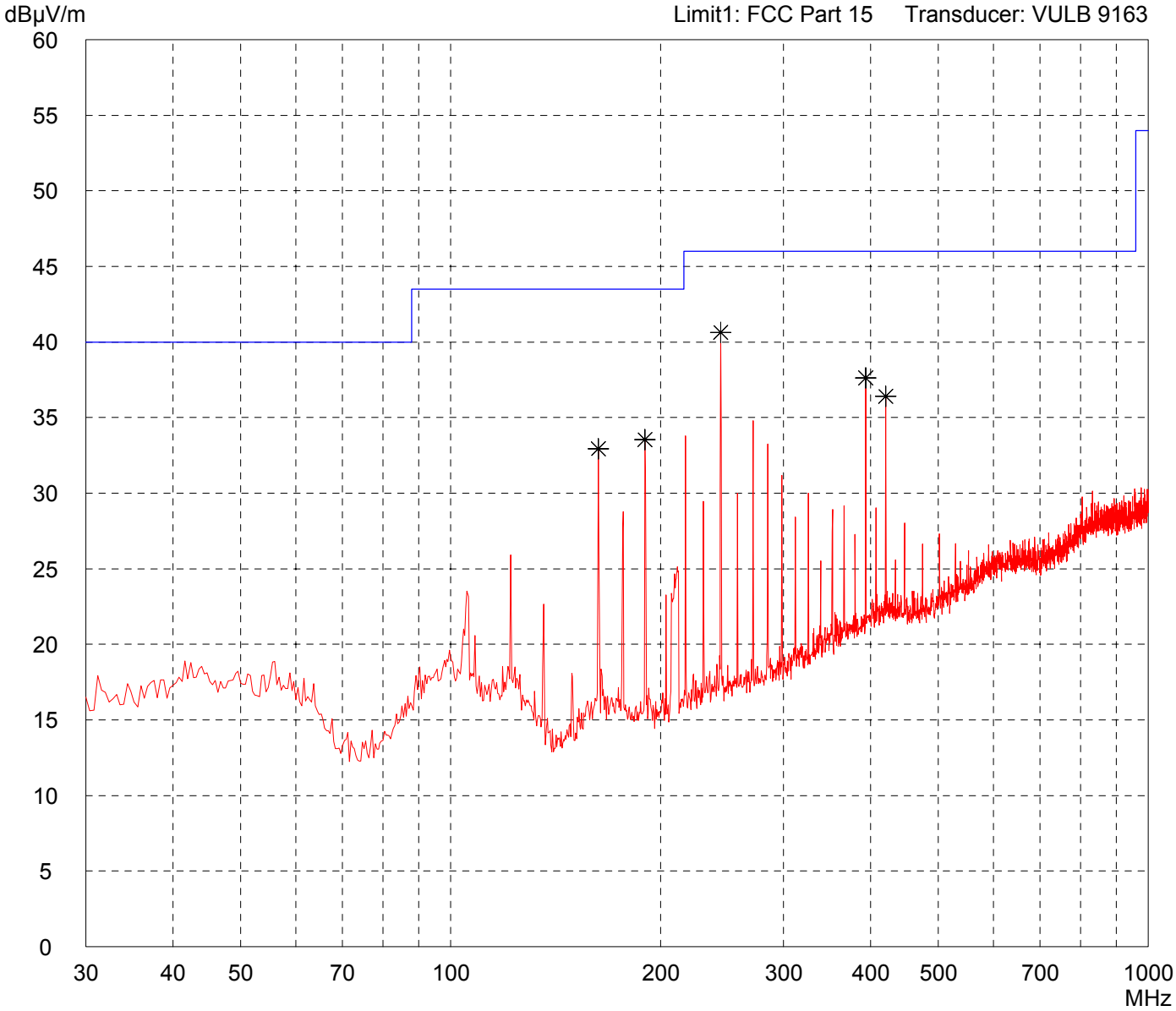
| | |
|---|---|
| Model: AR 6111-MX | Comment: - AC 115 V power supply DC 12 V power supply - transmitting continiously |
| Serial no.: --- | |
| Applicant: Siemens Building Technologies GmbH & Co. oHG | |
| Test site: Fully anechoic room, cabin no. 2 | |
| Tested on: Test distance 3 metres Vertical Polarization | |
| Date of test: 06/08/2005 — Operator: M. Steindl | |
| Test performed: automatically — File name: default.emi | |
| Detector: Peak | List of values: Selected by hand |




| | |
|---|---|
| Result: Prescan | Project file: 50602-50220 Page of Pages |

# Radiated Emission Test 30 MHz - 1 GHz
# acc. to FCC Part 15 (Fully Anechoic Chamber)

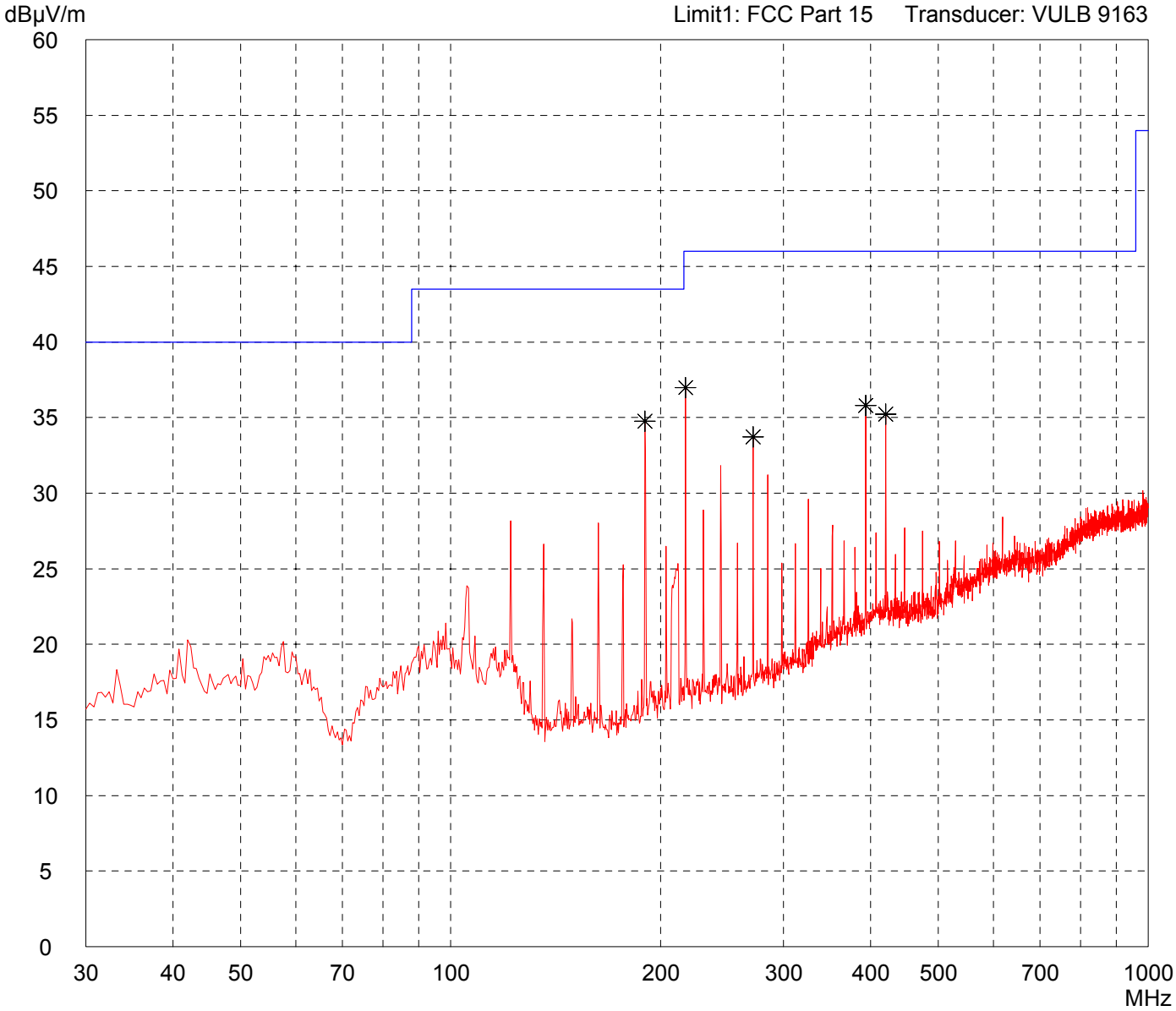
| | |
|---|---|
| Model: AR 6111-MX | Comment: - AC 115 V power supply DC 12 V power supply - reading TAG continiously |
| Serial no.: --- | |
| Applicant: Siemens Building Technologies GmbH & Co. oHG | |
| Test site: Fully anechoic room, cabin no. 2 | |
| Tested on: Test distance 3 metres Horizontal Polarization | |
| Date of test: 06/08/2005 — Operator: M. Steindl | |
| Test performed: automatically — File name: default.emi | |
| Detector: Peak | List of values: Selected by hand |




| | |
|---|---|
| Result: Prescan | Project file: 50602-50220 Page of Pages |

# Radiated Emission Test 30 MHz - 1 GHz
# acc. to FCC Part 15 (Fully Anechoic Chamber)

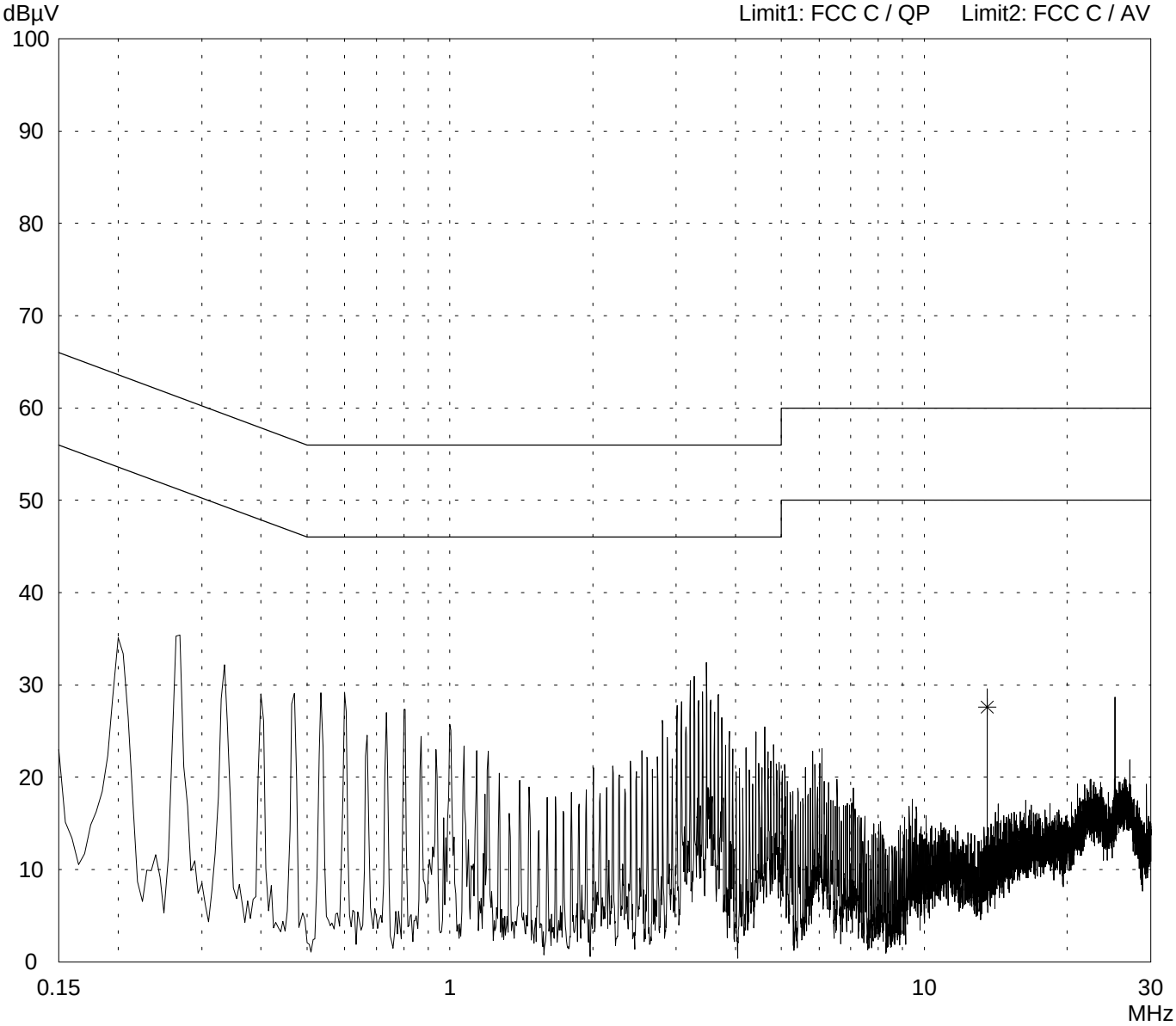
| | |
|---|---|
| Model: AR 6111-MX | Comment: - AC 115 V power supply DC 12 V power supply - reading TAG continiously |
| Serial no.: --- | |
| Applicant: Siemens Building Technologies GmbH & Co. oHG | |
| Test site: Fully anechoic room, cabin no. 2 | |
| Tested on: Test distance 3 metres Vertical Polarization | |
| Date of test: 06/08/2005 — Operator: M. Steindl | |
| Test performed: automatically — File name: default.emi | |
| Detector: Peak | List of values: Selected by hand |




| | |
|---|---|
| Result: Prescan | Project file: 50602-50220 Page of Pages |

# Conducted Emission Test 150 kHz - 30 MHz
# according to FCC Part 15 Subpart C

| | |
|---|---|
| Model: AR 6111-MX | Mode: - AC 115 V power supply<br>- transmitting continiously (unmodulated) |
| Serial no.: --- | |
| Applicant: Siemens Building Technologies GmbH & Co. oHG | |
| Test site: Shielded room, cabin no. 4 | |
| Tested on: Linecord<br>Phase L1 | |
| Date of test: 05/13/2005 — Operator: | |
| Test performed: semi automatically — File name: | |
| Detector: Peak / Final Results: QP | Final results: Selected by hand |

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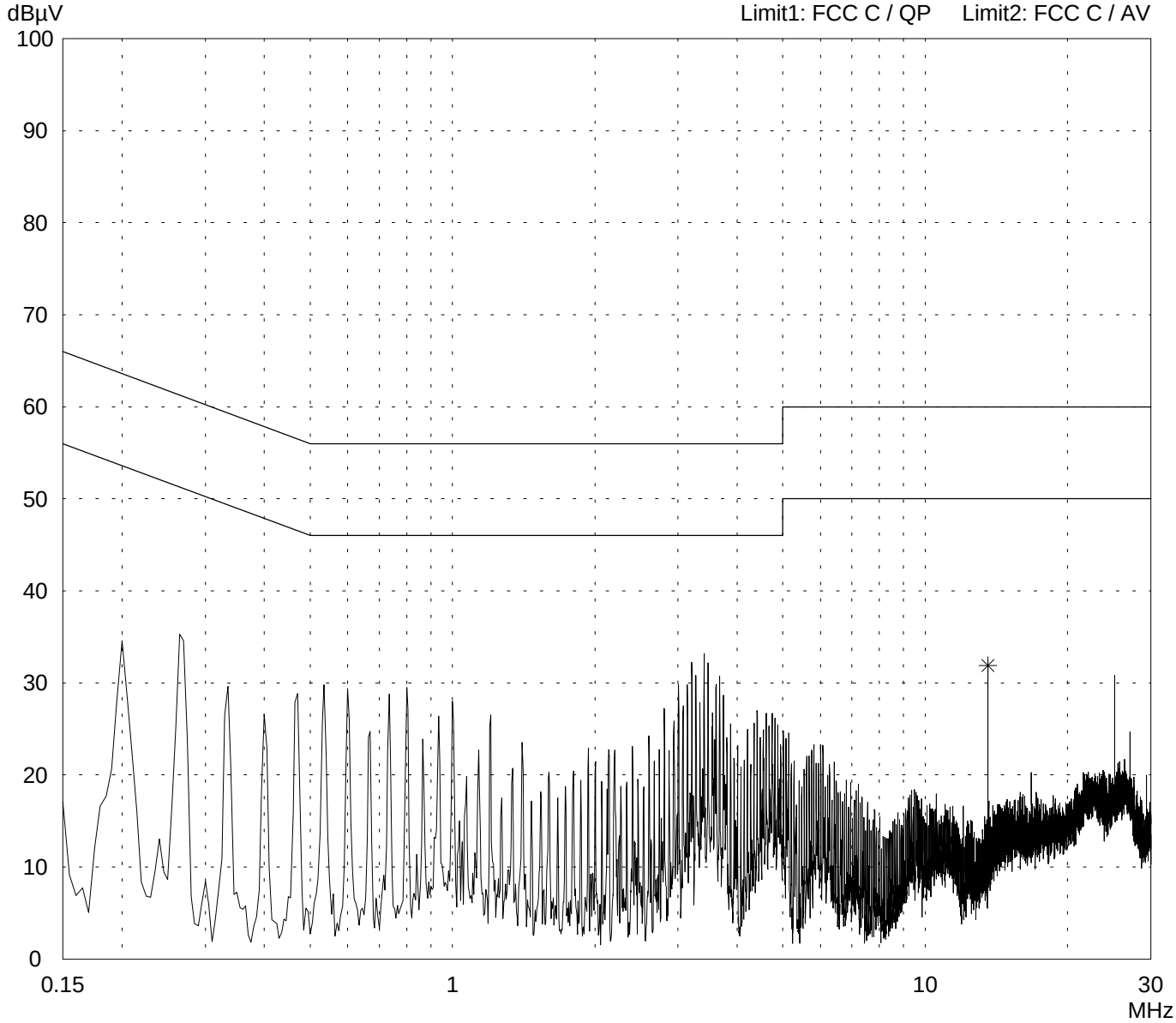
| Result: Limit kept | Project file: 50602-50220 Page of Pages |

# Conducted Emission Test 150 kHz - 30 MHz
# according to FCC Part 15 Subpart C

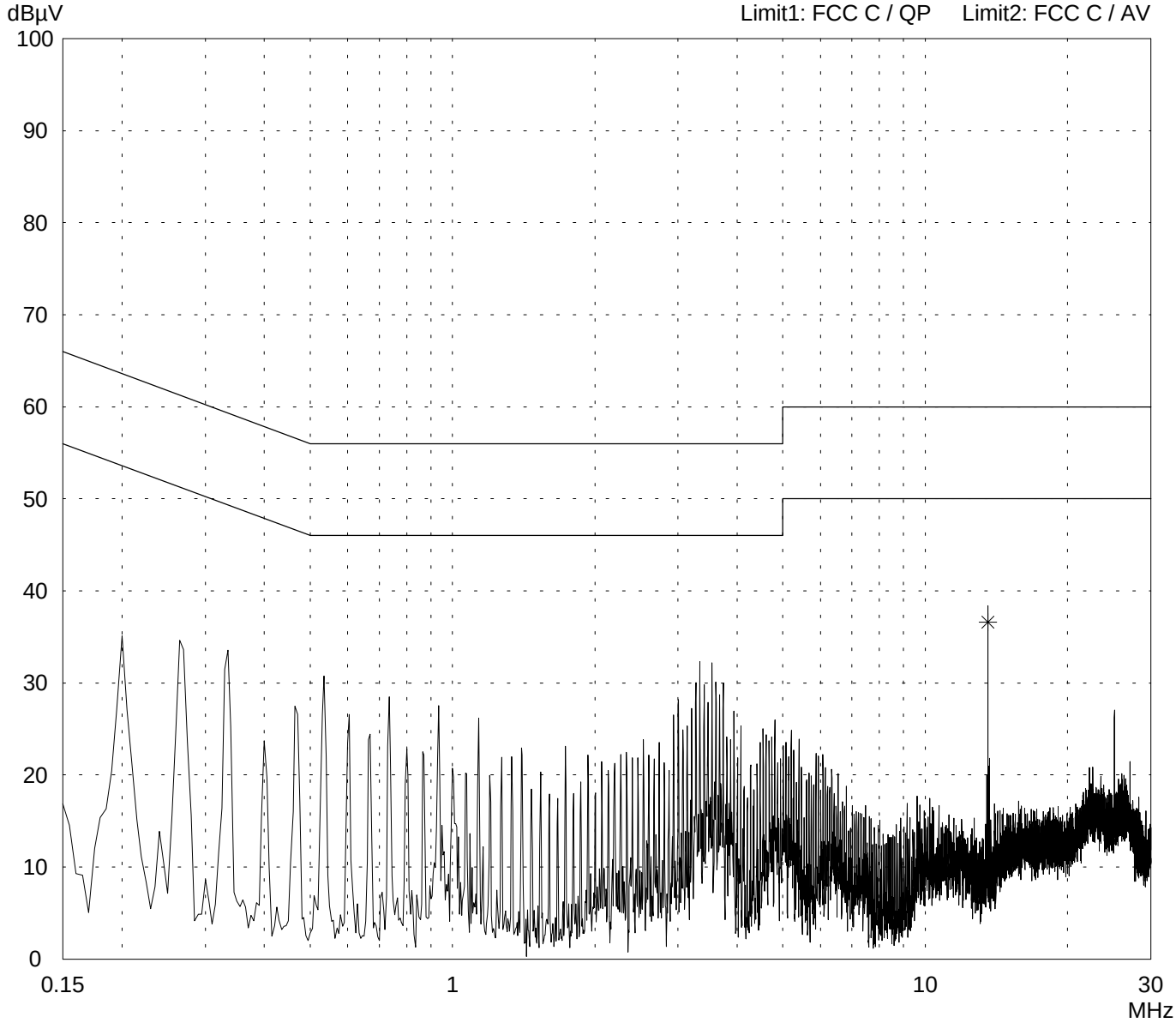
| | |
|---|---|
| Model: AR 6111-MX | Mode: - AC 115 V power supply<br>- transmitting continiously (unmodulated) |
| Serial no.: --- | |
| Applicant: Siemens Building Technologies GmbH & Co. oHG | |
| Test site: Shielded room, cabin no. 4 | |
| Tested on: Linecord<br>Phase N | |
| Date of test: 05/13/2005 — Operator: | |
| Test performed: semi automatically — File name: | |
| Detector: Peak / Final Results: QP | Final results: Selected by hand |




| | |
|---|---|
| Result: Limit kept | Project file: 50602-50220 Page of Pages |

# Conducted Emission Test 150 kHz - 30 MHz
# according to FCC Part 15 Subpart C

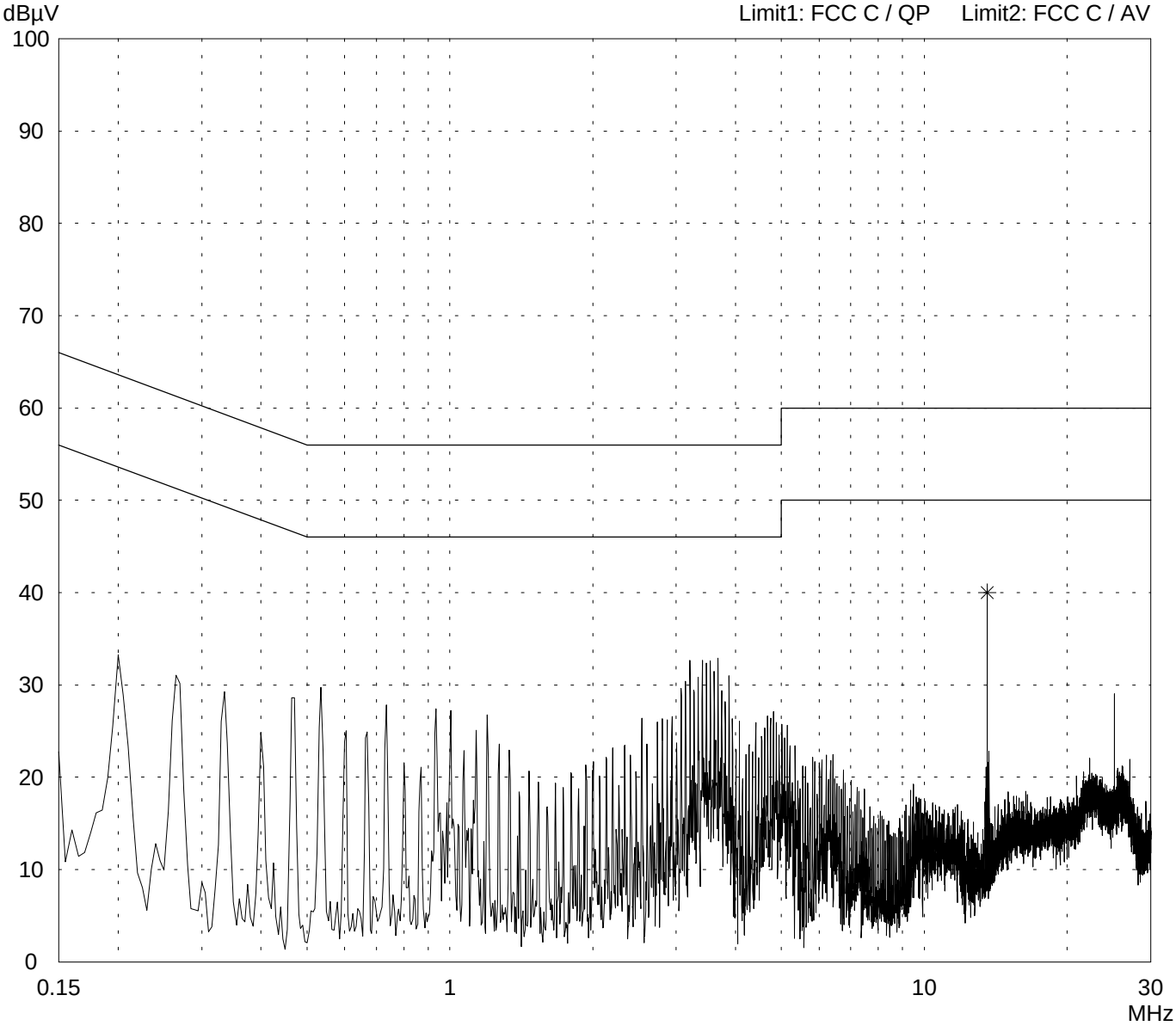
| | |
|---|---|
| Model: AR 6111-MX | Mode: - AC 115 V power supply<br>- reading TAG (modulated) |
| Serial no.: --- | |
| Applicant: Siemens Building Technologies GmbH & Co. oHG | |
| Test site: Shielded room, cabin no. 4 | |
| Tested on: Linecord<br>Phase L1 | |
| Date of test: 05/13/2005 — Operator: | |
| Test performed: semi automatically — File name: | |
| Detector: Peak / Final Results: QP | Final results: Selected by hand |




| | |
|---|---|
| Result: Limit kept | Project file: 50602-50220 Page of Pages |

# Conducted Emission Test 150 kHz - 30 MHz
# according to FCC Part 15 Subpart C

| | |
|---|---|
| Model: AR 6111-MX | Mode: - AC 115 V power supply<br>- reading TAG (modulated) |
| Serial no.: --- | |
| Applicant: Siemens Building Technologies GmbH & Co. oHG | |
| Test site: Shielded room, cabin no. 4 | |
| Tested on: Linecord<br>Phase N | |
| Date of test: 05/13/2005 — Operator: | |
| Test performed: semi automatically — File name: | |
| Detector: Peak / Final Results: QP | Final results: 20 dB Margin — 25 Subranges |

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|---|---|
| Result: Limit kept | Project file: 50602-50220 — Page of Pages |