

Straubing, June 4, 2008

**T E S T - R E P O R T**

**No. 51802-060526 (Edition 2)**

**for**

**RWD022**

**RFID Reader 125 kHz**

**Applicant:** RABUS GmbH

**Test Specifications:** FCC Code of Federal Regulations,  
CFR 47, Part 15,  
Sections 15.205, 15.207 and 15.209

Industry Canada Radio Standards  
Specifications  
RSS-Gen Issue 1, Section 7.2.2 and  
RSS-210 Issue 6, Sections 2.2, 2.6  
(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)

<b>General data of EUT</b>	
Type designation <sup>1</sup> :	RWD022
Parts <sup>2</sup> :	1
Serial number(s):	0001
Manufacturer:	RABUS GmbH
Type of equipment:	RF-Reader 125 kHz
Version:	As delivered
FCC ID:	---
Additional parts/accessories:	---

<b>Technical data of EUT</b>	
Application frequency range:	119 - 127 kHz
Frequency range:	119 - 127 kHz
Operating frequency:	125 kHz
Type of modulation:	ASK
Pulse train:	Not applicable
Pulse width:	Not applicable
Number of RF-channels:	1
Channel spacing:	Not applicable
Designation of emissions <sup>3</sup> :	10K0A1D
Type of antenna:	Inductive Loop Coil
Size/length of antenna:	Ø 16 mm
Connection of antenna:	<input type="checkbox"/> detachable <input checked="" type="checkbox"/> not detachable
Type of power supply:	DC supply
Specifications for power supply:	nominal voltage: 5.00 V minimum voltage: 4.50 V maximum voltage: 5.50 V

<sup>1</sup> Type designation of the system if EUT consists of more than one part.

<sup>2</sup> Type designations of the parts of the system, if applicable.

<sup>3</sup> Also known as "Class of Emission".

## 2 Administrative Data

<b>Application details</b>	
Applicant (full address):	RABUS GmbH Alleestraße 13 69514 Laudenbach
Contact person:	Herr Mark Rabus
Contract identification:	---
Receipt of EUT:	16 June 2006
Date(s) of test:	June 2006
Note(s):	---

<b>Report details</b>	
Report number:	51802-060526
Edition:	2
Issue date:	June 4, 2008

### 3 Identification of the Test Laboratory

<b>Details of the Test Laboratory</b>	
Company name:	Senton GmbH EMI/EMC Test Center
Address:	Aeussere Fruehlingstrasse 45 D-94315 Straubing 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
	Phone: (+49) (0)9421 5522-0 Fax: (+49) (0)9421 5522-99

## 4 Summary

### Summary of test results

The tested sample complies with the requirements set forth in the  
**Code of Federal Regulations CFR 47, Part 15, Sections 15.205, 15.207 and 15.209**  
of the Federal Communication Commission (FCC) and the  
**Radio Standards Specifications**  
**RSS-Gen Issue 1, Section 7.2.2 and**  
**RSS-210 Issue 6, Sections 2.2, 2.6 (Category I Equipment)**  
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

Tests were performed in two operation modes:

- Transmitting continuously without tag
- Reading tag continuously

### Configuration of EUT

The EUT was configured as stand alone equipment.

### List of ports and cables

Port	Description	Classification <sup>4</sup>	Cable type	Cable length
1	DC supply 5 V	dc power	Unshielded	1 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
	Not Applicable			

<sup>4</sup> Ports shall be classified as ac power, dc power or signal/control port

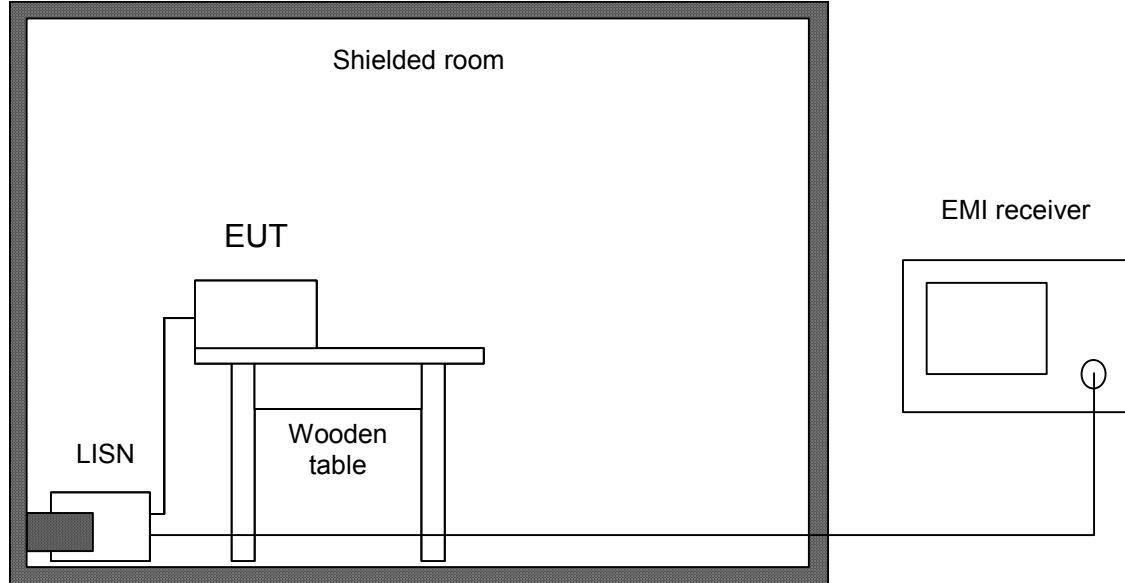
## 6 Measurement Procedures

### 6.1 Bandwidth Measurements

<b>Measurement Procedure:</b>	
Rules and specifications:	CFR 47 Part 2, section 2.202(a) CFR 47 Part 15, section 15.215(c) IC RSS-Gen Issue 1, sections 4.4.1 and 4.4.2 IC RSS-210 Issue 6, section A1.1.3 ANSI C63.4, annex H.6
Guide:	ANSI C63.4 / IC RSS-Gen Issue 1, sections 4.4.1 and 4.4.2
Measurement setup:	<input type="checkbox"/> Conducted: See below <input checked="" type="checkbox"/> Radiated: Radiated Emission Measurement 9 kHz to 30 MHz (6.3)
<p>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.</p> <p>If radiated measurements are performed the same test setups and instruments are used as with radiated emission measurements for the appropriate frequency range.</p> <p>The analyzer settings are specified by the test description of the appropriate test record(s).</p>	

## 6.2 Conducted AC Powerline Emission

<b>Measurement Procedure:</b>	
Rules and specifications:	CFR 47 Part 15, section 15.207 IC RSS-Gen Issue 1, section 7.2.2
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 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.	

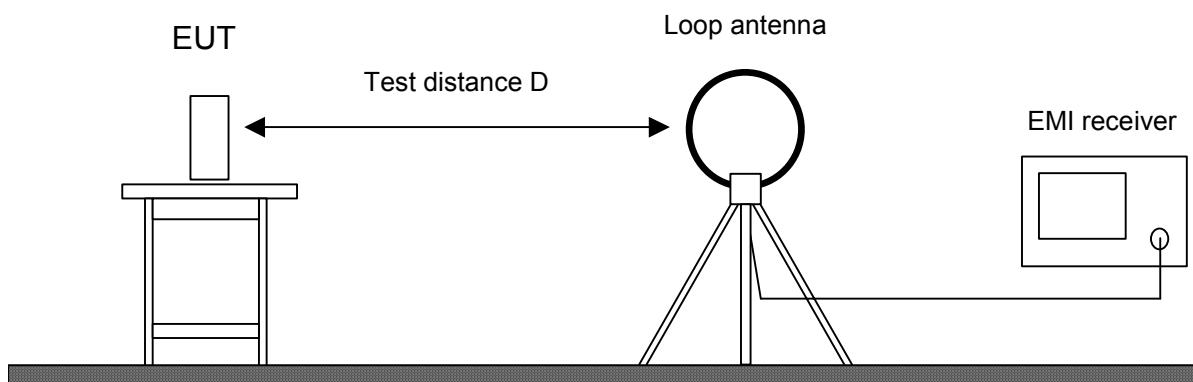


Test instruments used:

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

### 6.3 Radiated Emission Measurement 9 kHz to 30 MHz

<b>Measurement Procedure:</b>	
Rules and specifications:	CFR 47 Part 15, sections 15.205 and 15.209 IC RSS-210 Issue 6, sections 2.2 and 2.6
Guide:	ANSI C63.4
<p>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.</p> <p>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.</p> <p>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).</p> <p>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.</p> <p>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.</p>	

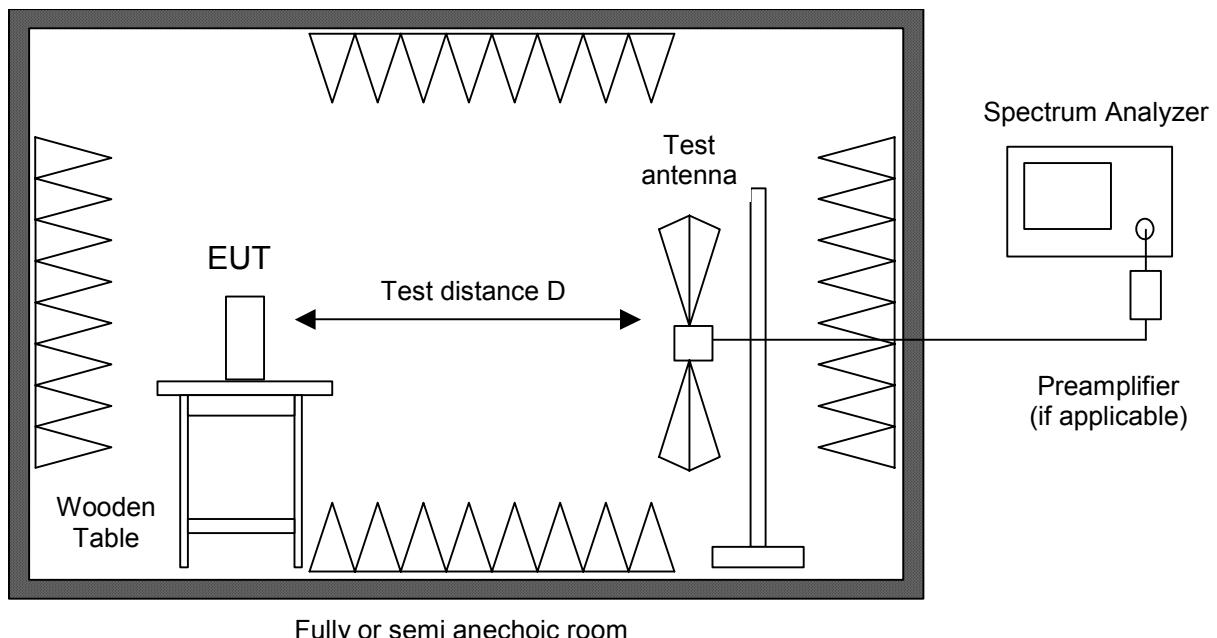


Test instruments used:

Used	Type	Model	Serial No. or ID	Manufacturer
<input checked="" type="checkbox"/>	Spectrum Analyzer	FSP 30	100063	Rohde & Schwarz
<input type="checkbox"/>	EMI test receiver	ESMI	839379/013 839587/006	Rohde & Schwarz
<input checked="" type="checkbox"/>	Test receiver	ESHS 10	860043/016	Rohde & Schwarz
<input checked="" type="checkbox"/>	Preamplifier	CPA9231A	3393	Schaffner
<input checked="" type="checkbox"/>	Loop antenna	HFH2-Z2	882964/1	Rohde & Schwarz
<input checked="" type="checkbox"/>	Fully anechoic room	No. 2	1452	Albatross Projects
<input type="checkbox"/>	Semi-anechoic room	No. 3	1453	Siemens
<input checked="" type="checkbox"/>	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, section 15.209 IC RSS-210 Issue 6, section 2.6
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.	

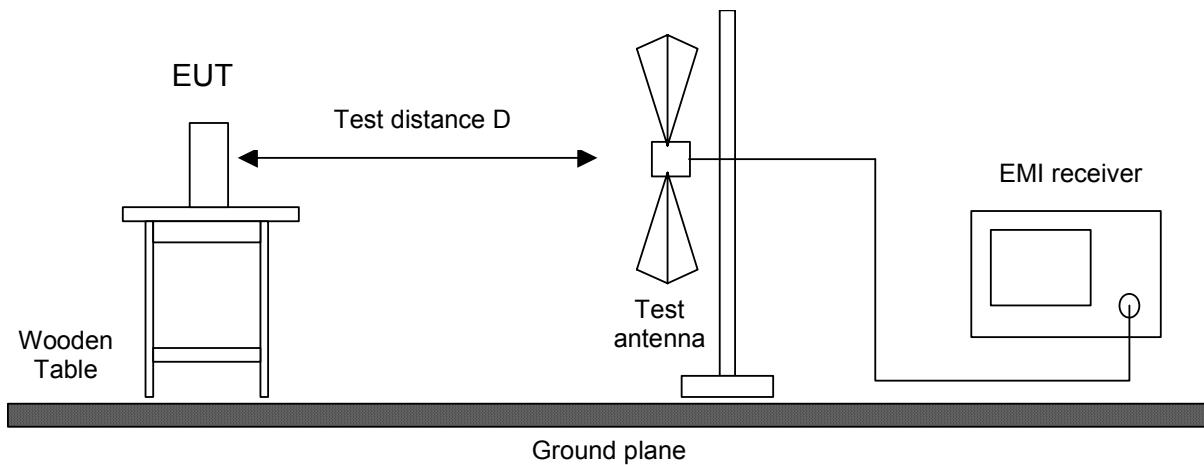


Test instruments used:

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

## 6.5 Radiated Emission at Open Field Test Site

<b>Measurement Procedure:</b>	
Rules and specifications:	CFR 47 Part 15, section 15.209 IC RSS-210 Issue 6, section 2.6
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.	

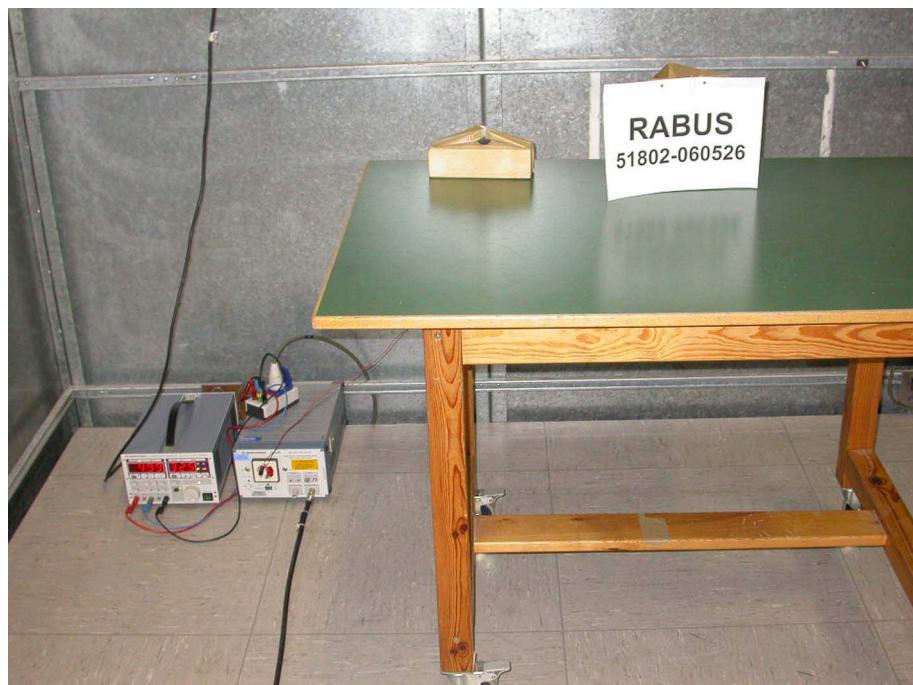
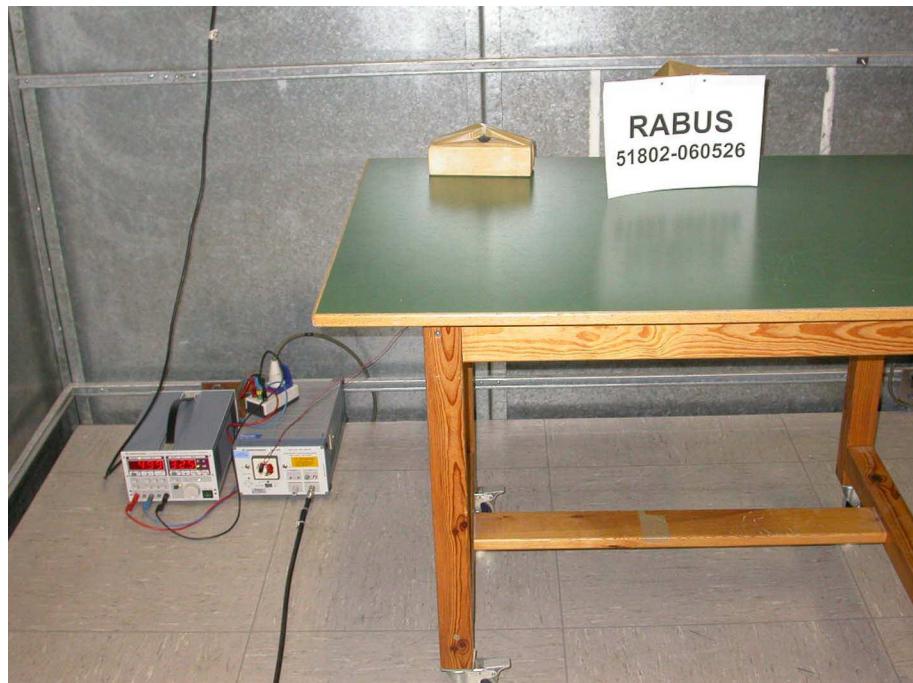


Test instruments used:

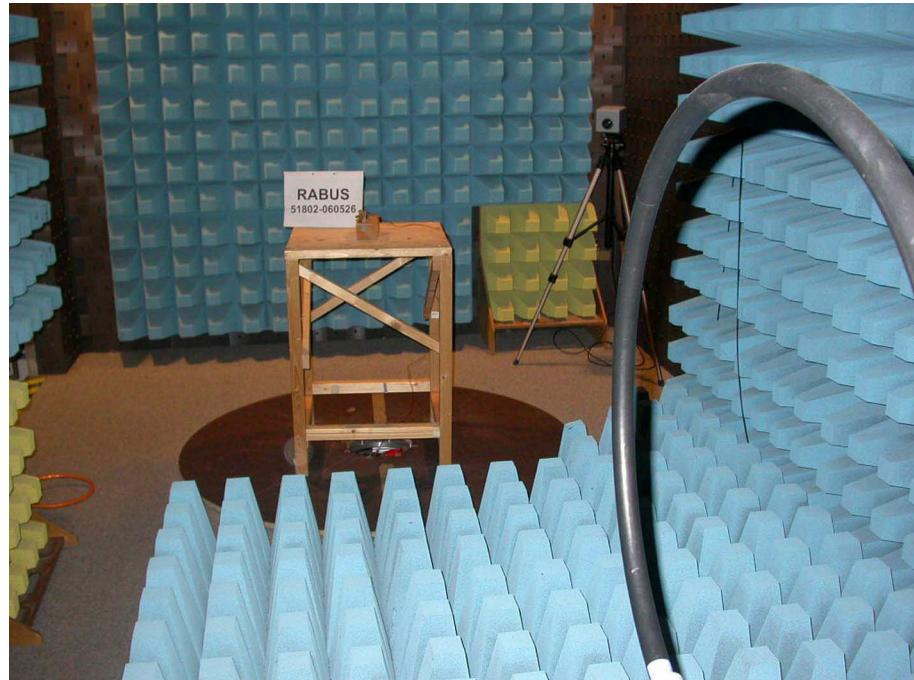
Used	Type	Model	Serial No. or ID	Manufacturer
<input checked="" type="checkbox"/>	EMI receiver	ESVP	881120/024	Rohde & Schwarz
<input checked="" type="checkbox"/>	Biconical antenna	EG 1	HK 116	Rohde & Schwarz
<input checked="" type="checkbox"/>	Log. per. antenna	EG 1	HL 223	Rohde & Schwarz
<input checked="" type="checkbox"/>	Open field test site	EG 1	1450	Senton

**7      Photographs Taken During Testing**

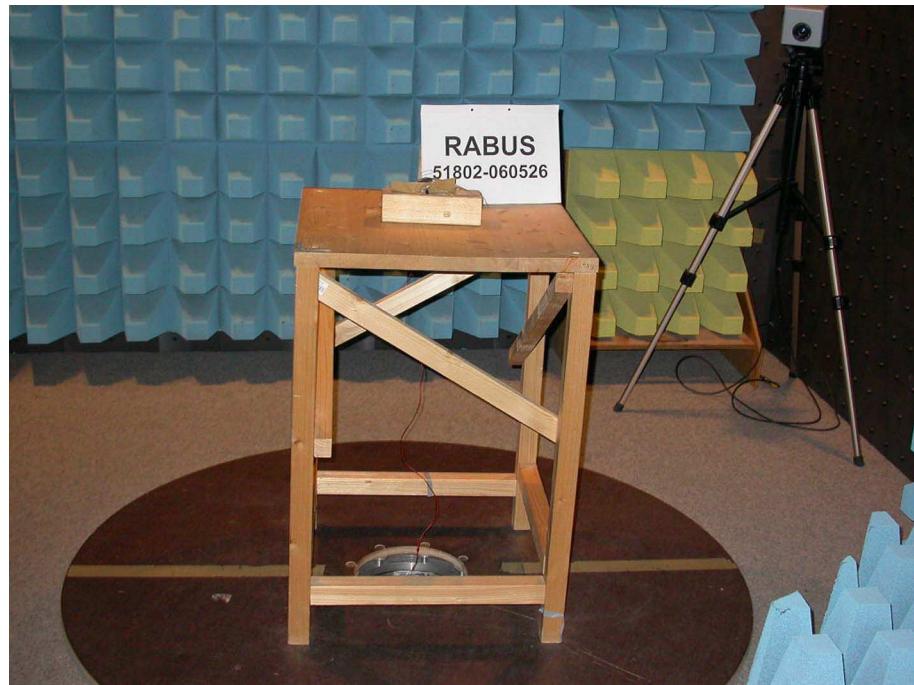
**Test setup for conducted DC powerline emission measurement**



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



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



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



**Test setup for radiated emission measurement  
(open field test site) - continued -**



## 8 Test Results

<b>FCC CFR 47 Parts 2 and 15</b>			
<b>Section(s)</b>	<b>Test</b>	<b>Page</b>	<b>Result</b>
2.1046(a)	Conducted output power	---	Not applicable
2.202(a)	Occupied bandwidth	24	Recorded
2.201, 2.202	Class of emission	29	Calculated
15.35(c)	Pulse train measurement for pulsed operation	---	Not applicable
15.205(a)	Restricted bands of operation	30	Test passed
15.207	Conducted AC powerline emission 150 kHz to 30 MHz	32	Test passed
15.205(b) 15.209	Radiated emission 9 kHz to 30 MHz	37	Test passed
15.205(b) 15.209	Radiated emission 30 MHz to 1 GHz	40	Test passed

<b>IC RSS-Gen Issue 1</b>			
<i>Section(s)</i>	<i>Test</i>	<i>Page</i>	<i>Result</i>
4.6	Transmitter output power (conducted)	---	Not applicable
4.4.1	Occupied Bandwidth	24	Recorded
3.2(h), 8	Designation of emissions	29	Calculated
4.3	Pulsed operation	---	Not applicable
7.2.2	Transmitter AC power lines conducted emissions 150 kHz to 30 MHz	32	Test passed
5.5	Exposure of Humans to RF Fields	42	Exempted from SAR and RF evaluation

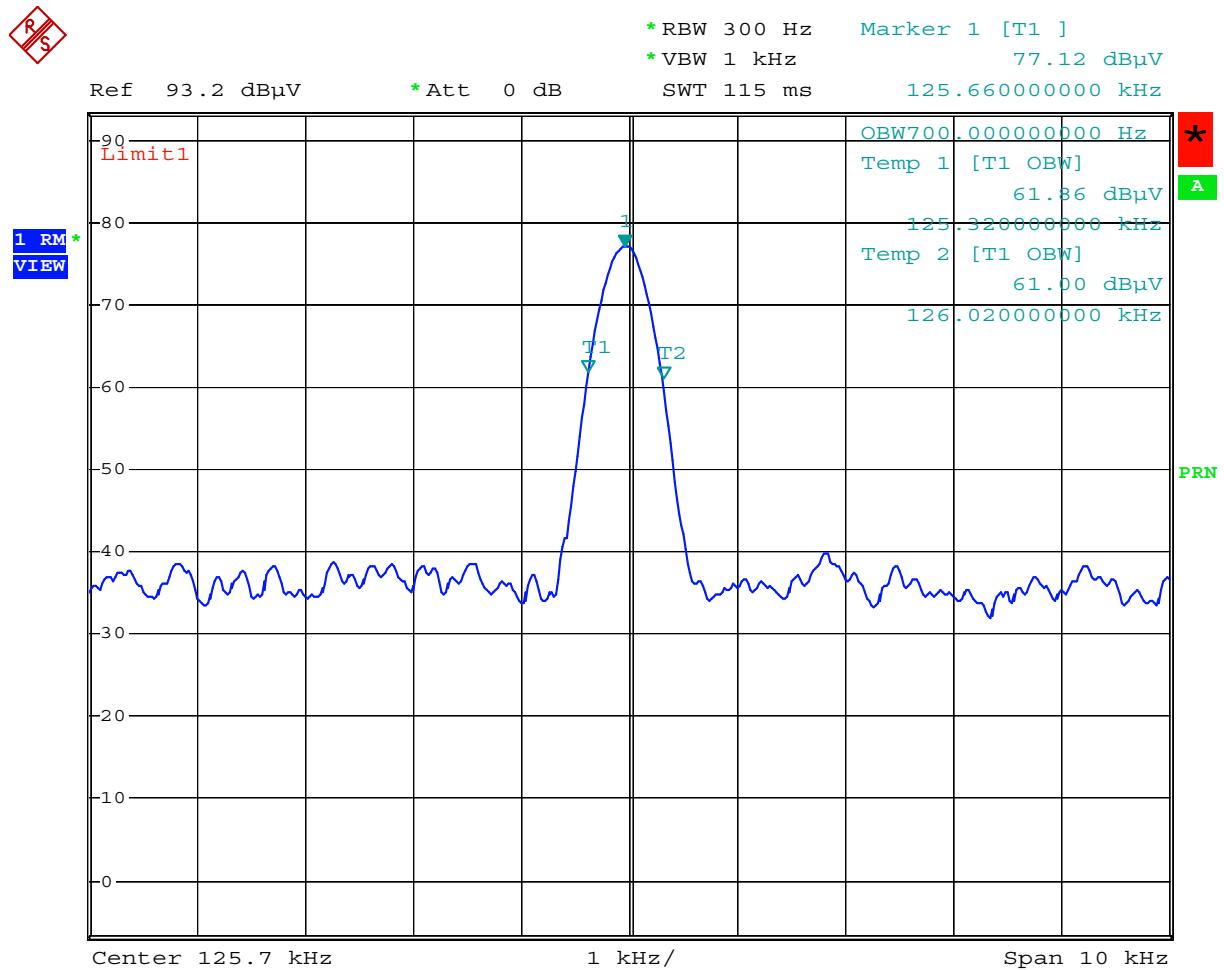
<b>IC RSS-210 Issue 6</b>			
<i>Section(s)</i>	<i>Test</i>	<i>Page</i>	<i>Result</i>
2.2(a)	Restricted bands and unwanted emission frequencies	30	Test passed
2.2(b)(c) 2.6	Unwanted emissions 9 kHz to 30 MHz	37	Test passed
2.2(b)(c) 2.6	Unwanted emissions 30 MHz to 1 GHz	40	Test passed

## 8.1 Occupied Bandwidth

Rules and specifications:	CFR 47 Part 2, section 2.202(a) ANSI C63.4, annex H.6								
Guide:	ANSI C63.4								
Description:	<p>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.</p> <p>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.</p> <p>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:</p> <table border="1"><thead><tr><th>Fundamental frequency</th><th>Minimum resolution bandwidth</th></tr></thead><tbody><tr><td>9 kHz to 30 MHz</td><td>1 kHz</td></tr><tr><td>30 MHz to 1000 MHz</td><td>10 kHz</td></tr><tr><td>1000 MHz to 40 GHz</td><td>100 kHz</td></tr></tbody></table> <p>The video bandwidth shall be at least three times greater than the resolution bandwidth.</p>	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
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								
Measurement procedure:	Bandwidth Measurements (6.1)								

Comment:	
Date of test:	27 June 2006
Test site:	Fully anechoic room, cabin no. 2

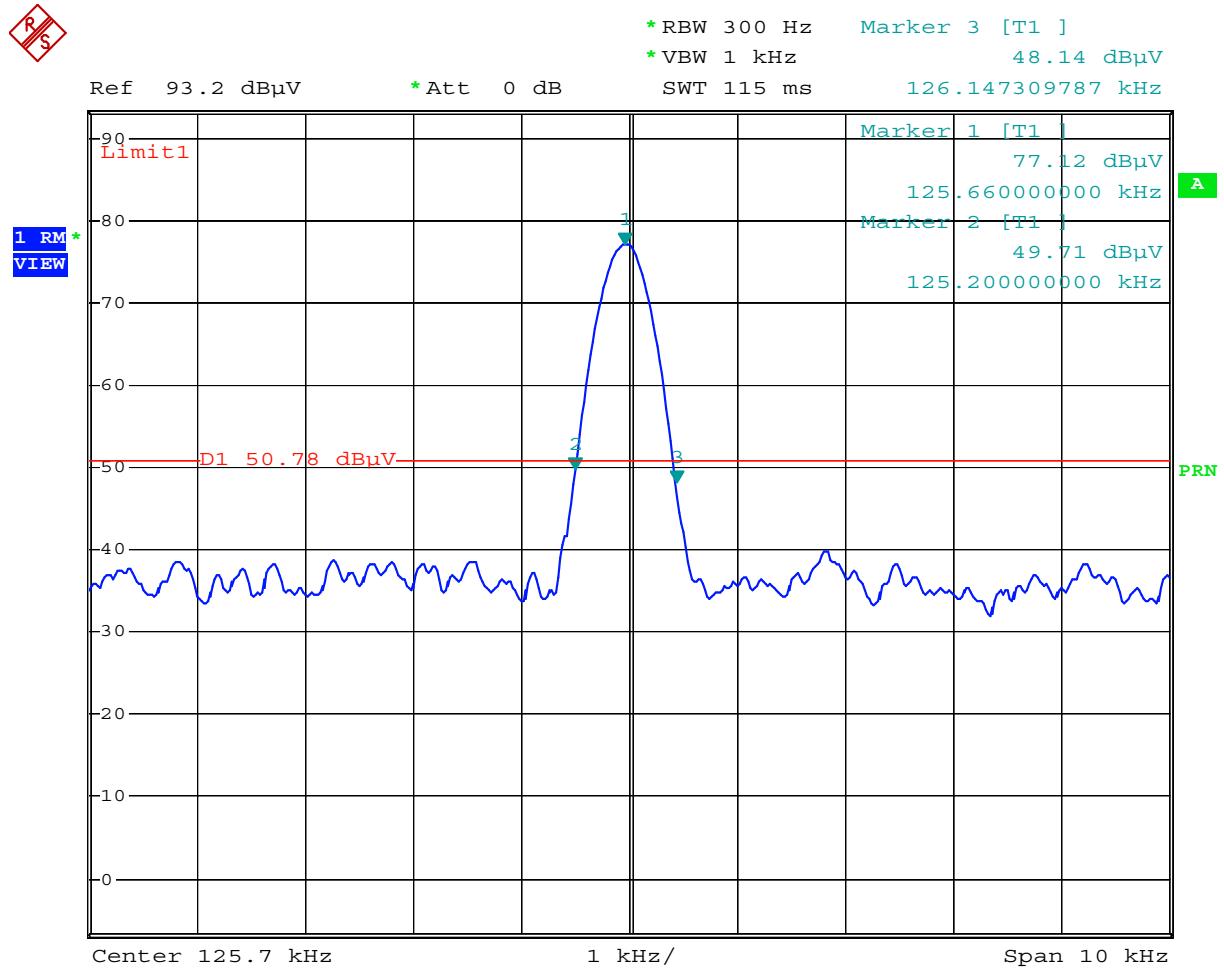
**Occupied Bandwidth (99 %):**



Comment: Rabus 060526: Occupied Bandwidth  
Date: 27.JUN.2006 16:32:22

Occupied Bandwidth (99 %): **0.70 kHz**

**Occupied Bandwidth (-26 dB):**



Comment: Rabus 060526: Occupied Bandwidth  
Date: 27.JUN.2006 16:32:05

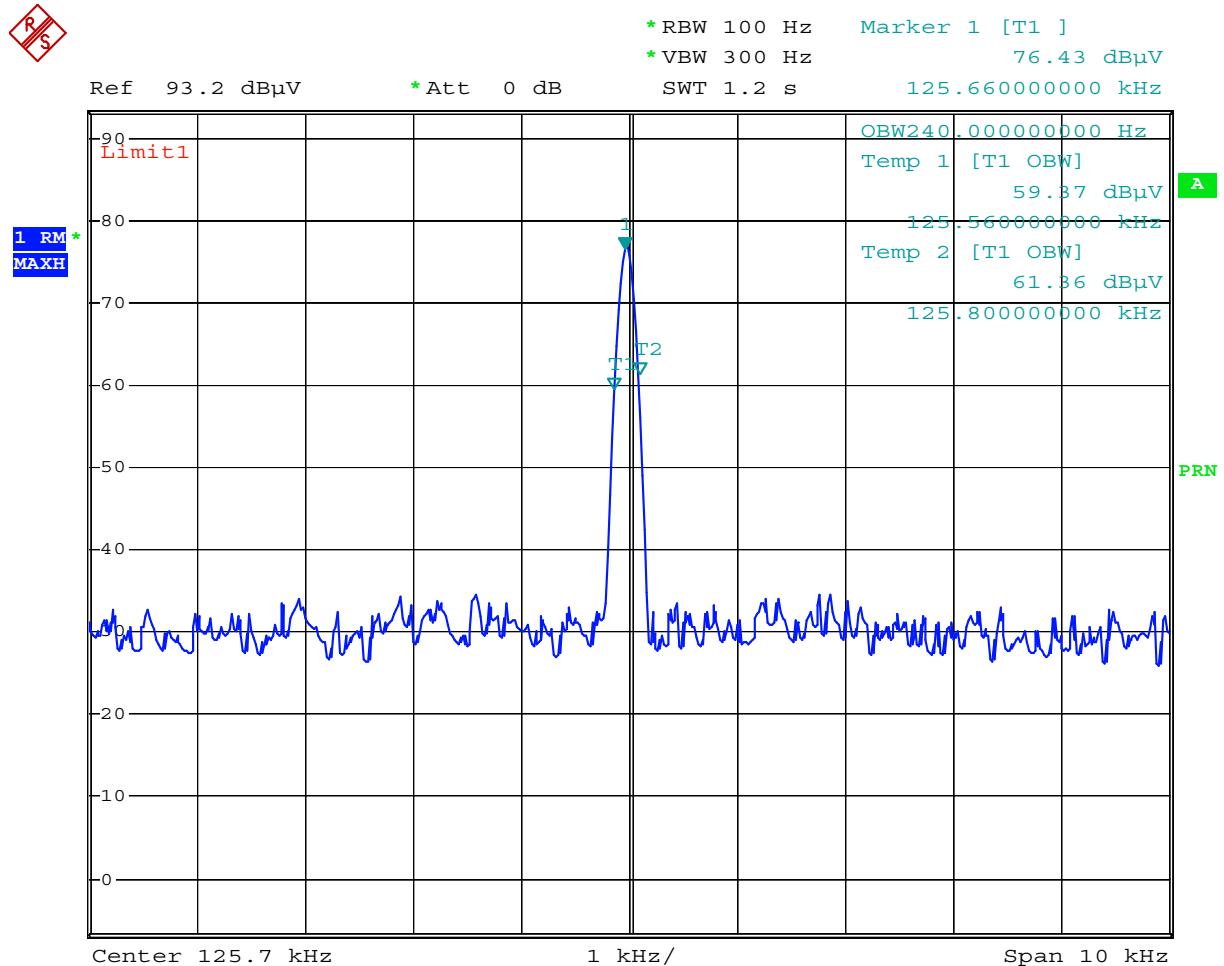
Occupied Bandwidth (-26 dB): **0.95 kHz**

## Occupied Bandwidth (continued)

Rules and specifications:	IC RSS-Gen Issue 1, section 4.4.1
Guide:	IC RSS-Gen Issue 1, section 4.4.1
Description:	<p>If not specified in the applicable RSS the occupied bandwidth is measured as the 99% emission bandwidth.</p> <p>The span of the analyzer shall be set to capture all products of the modulation process, including the emission skirts. The resolution bandwidth shall be set to as close to 1% of the selected span as is possible without being below 1%. The video bandwidth shall be set to 3 times the resolution bandwidth.</p> <p>The trace data points are recovered and are directly summed in linear terms. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5% of the total is reached and that frequency recorded. The process is repeated for the highest frequency data points. This frequency is also recorded. The span between the two recorded frequencies is the occupied bandwidth.</p>
Measurement procedure:	Bandwidth Measurements (6.1)

Comment:	
Date of test:	27 June 2006
Test site:	Fully anechoic room, cabin no. 2

**Occupied Bandwidth (99 %):**



Comment: Rabus 060526: Occupied Bandwidth  
Date: 27.JUN.2006 16:33:11

Occupied Bandwidth (99 %): **0.24 kHz**

## 8.2 Designation of Emissions

Rules and specifications:	CFR 47 Part 2, sections 2.201 and 2.202 IC RSS-Gen Issue 1, sections 3.2(h) and 8
Guide:	ANSI C63.4 / TRC-43

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

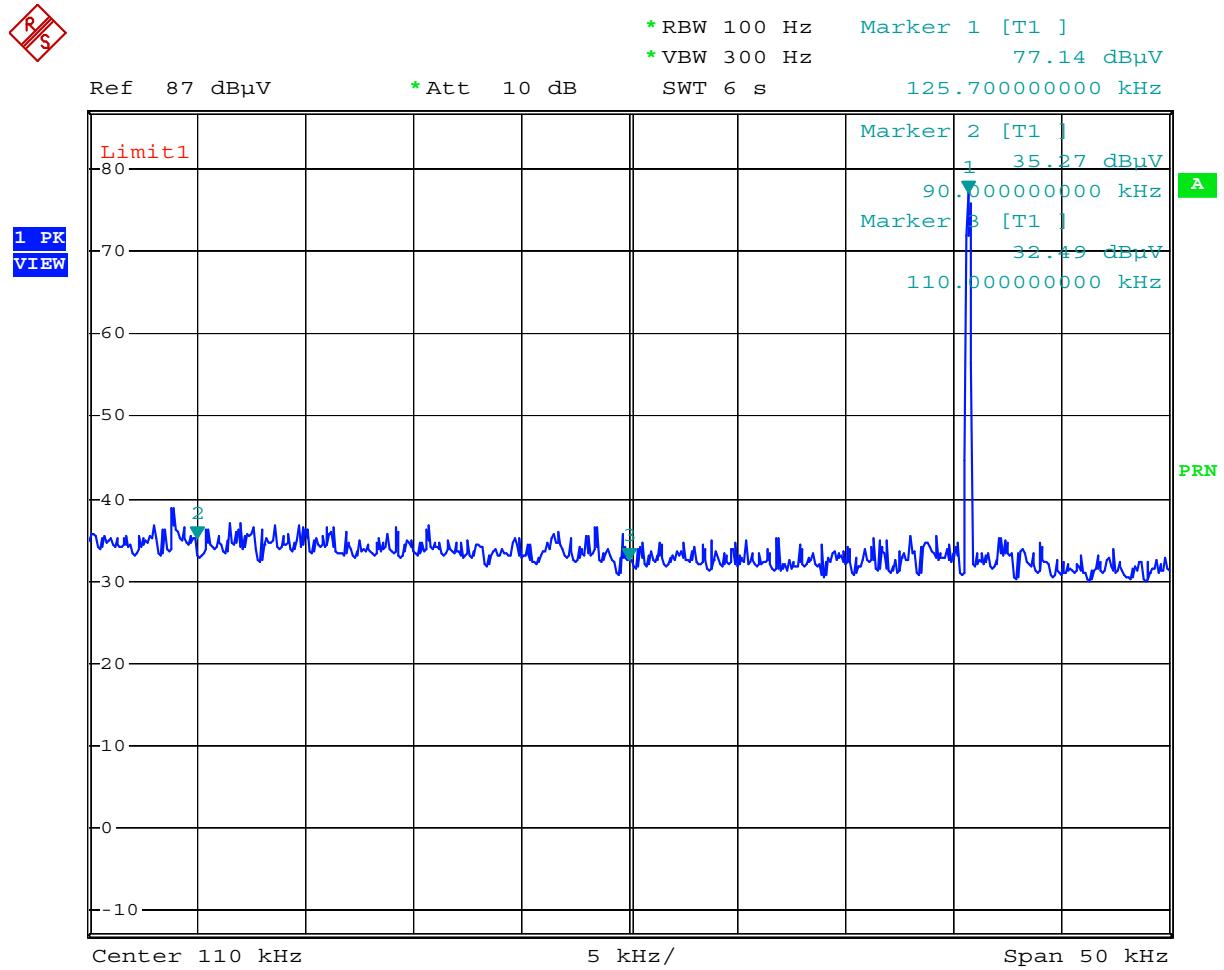
$B_n$ = Necessary Bandwidth	$B_n = 2BK$
$B$ = Modulation rate	$B = 5 \text{ kHz}$
$K$ = Overall numerical factor	$K = 1$
Calculation:	$B_n = 2 \cdot (5 \text{ kHz}) \cdot 1 = 10 \text{ kHz}$

Designation of Emissions:	<b>10K0A1D</b>
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### 8.3 Restricted Bands of Operation

Rules and specifications:	CFR 47 Part 15, section 15.205(a) IC RSS-210 Issue 6, 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 6, section 2.2(a).
Measurement procedure:	Radiated Emission Measurement 9 kHz to 30 MHz (6.3)

Comment:	
Date of test:	27 June 2006
Test site:	Fully anechoic room, cabin no. 2
Test distance:	3 meters



Comment: Rabus 060526: Restricted Bands of Operation  
Date: 27.JUN.2006 16:25:45

Test Result:

Test passed

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

Rules and specifications:	CFR 47 Part 15, section 15.207 IC RSS-Gen Issue 1, section 7.2.2		
Guide:	ANSI C63.4 / CISPR 22		
Limit:	Frequency of Emission (MHz)	Conducted Limit (dB $\mu$ V)	
		Quasi-peak	Average
	0.15 - 0.5	66 to 56	56 to 46
	0.5 - 5	56	46
	5 - 30	60	50
Measurement procedure:	Conducted AC Powerline Emission (6.2)		
Comment:	Test was performed as "Conducted DC Powerline Emissions"		

Test Result:	Test passed
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Mode:	Transmitting continuously without tag
Date of test:	28 June 2006
Test site:	Shielded room, cabin no. 4

Test Result:	Test passed
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Tested on:	plus
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Frequency (MHz)	Detector	Reading Value (dB $\mu$ V)	Correction Factor (dB)	Final Value (dB $\mu$ V)	Limit (dB $\mu$ V)	Margin (dB)
0.150	Quasi-Peak	31.9	0.0	31.9	66.0	34.1
0.170	Average	37.3	0.0	37.3	55.0	17.7
0.215	Quasi-Peak	42.3	0.0	42.3	63.0	20.7
0.215	Average	41.9	0.0	41.9	53.0	11.1
0.250	Quasi-Peak	54.2	0.0	54.2	61.8	7.6
0.260	Average	35.8	0.0	35.8	51.4	15.6
0.285	Quasi-Peak	25.2	0.0	25.2	60.7	35.5
0.300	Average	38.4	0.0	38.4	50.2	11.8
0.370	Quasi-Peak	21.8	0.0	21.8	58.5	36.7
0.385	Average	34.8	0.0	34.8	48.2	13.4
0.475	Average	33.0	0.0	33.0	46.4	13.4
0.504	Quasi-Peak	42.0	0.0	42.0	56.0	14.0
0.560	Average	31.3	0.0	31.3	46.0	14.7
0.630	Quasi-Peak	26.9	0.0	26.9	56.0	29.1
0.690	Average	28.3	0.0	28.3	46.0	17.7
0.755	Quasi-Peak	36.4	0.0	36.4	56.0	19.6
0.920	Average	37.1	0.0	37.1	46.0	8.9
1.005	Quasi-Peak	32.5	0.0	32.5	56.0	23.5
1.135	Quasi-Peak	24.8	0.0	24.8	56.0	31.2
1.510	Quasi-Peak	29.1	0.0	29.1	56.0	26.9
1.845	Average	31.8	0.0	31.8	46.0	14.2
1.885	Quasi-Peak	26.8	0.0	26.8	56.0	29.2
2.010	Quasi-Peak	29.8	0.0	29.8	56.0	26.2
2.390	Quasi-Peak	25.6	0.0	25.6	56.0	30.4
11.060	Average	34.6	0.0	34.6	50.0	15.4
22.120	Average	32.2	0.0	32.2	50.0	17.8

**Sample calculation of final values:**

$$\text{Final Value (dB}\mu\text{V)} = \text{Reading Value (dB}\mu\text{V)} + \text{Correction Factor (dB)}$$

Tested on:	minus
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Frequency (MHz)	Detector	Reading Value (dB $\mu$ V)	Correction Factor (dB)	Final Value (dB $\mu$ V)	Limit (dB $\mu$ V)	Margin (dB)
0.150	Quasi-Peak	31.8	0.0	31.8	66.0	34.2
0.170	Average	37.5	0.0	37.5	55.0	17.5
0.210	Quasi-Peak	33.5	0.0	33.5	63.2	29.7
0.215	Average	42.0	0.0	42.0	53.0	11.0
0.250	Quasi-Peak	49.8	0.0	49.8	61.8	12.0
0.260	Average	36.3	0.0	36.3	51.4	15.1
0.300	Average	38.4	0.0	38.4	50.2	11.8
0.320	Quasi-Peak	22.6	0.0	22.6	59.7	37.1
0.390	Average	35.2	0.0	35.2	48.1	12.9
0.400	Quasi-Peak	21.3	0.0	21.3	57.9	36.6
0.475	Average	33.4	0.0	33.4	46.4	13.0
0.500	Quasi-Peak	37.7	0.0	37.7	56.0	18.3
0.560	Average	31.6	0.0	31.6	46.0	14.4
0.625	Quasi-Peak	22.8	0.0	22.8	56.0	33.2
0.690	Average	28.6	0.0	28.6	46.0	17.4
0.755	Quasi-Peak	31.7	0.0	31.7	56.0	24.3
0.920	Average	37.1	0.0	37.1	46.0	8.9
1.005	Quasi-Peak	28.7	0.0	28.7	56.0	27.3
1.130	Quasi-Peak	23.7	0.0	23.7	56.0	32.3
1.260	Quasi-Peak	26.2	0.0	26.2	56.0	29.8
1.760	Quasi-Peak	25.5	0.0	25.5	56.0	30.5
1.845	Average	31.7	0.0	31.7	46.0	14.3
2.265	Quasi-Peak	24.7	0.0	24.7	56.0	31.3
2.515	Quasi-Peak	21.9	0.0	21.9	56.0	34.1
3.140	Quasi-Peak	19.2	0.0	19.2	56.0	36.8
11.060	Average	36.5	0.0	36.5	50.0	13.5
22.120	Average	35.5	0.0	35.5	50.0	14.5

**Sample calculation of final values:**

$$\text{Final Value (dB}\mu\text{V)} = \text{Reading Value (dB}\mu\text{V)} + \text{Correction Factor (dB)}$$

Mode:	Reading tag continuously
Date of test:	28 June 2006
Test site:	Shielded room, cabin no. 4

Test Result:	Test passed
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Tested on:	plus
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Frequency (MHz)	Detector	Reading Value (dB $\mu$ V)	Correction Factor (dB)	Final Value (dB $\mu$ V)	Limit (dB $\mu$ V)	Margin (dB)
0.150	Quasi-Peak	31.4	0.0	31.4	66.0	34.6
0.170	Average	37.5	0.0	37.5	55.0	17.5
0.195	Quasi-Peak	27.6	0.0	27.6	63.8	36.2
0.215	Average	42.0	0.0	42.0	53.0	11.0
0.252	Quasi-Peak	50.5	0.0	50.5	61.7	11.2
0.260	Average	36.3	0.0	36.3	51.4	15.1
0.300	Average	38.6	0.0	38.6	50.2	11.6
0.305	Quasi-Peak	37.2	0.0	37.2	60.1	22.9
0.390	Quasi-Peak	35.7	0.0	35.7	58.1	22.4
0.390	Average	35.2	0.0	35.2	48.1	12.9
0.475	Average	33.4	0.0	33.4	46.4	13.0
0.505	Quasi-Peak	38.0	0.0	38.0	56.0	18.0
0.535	Quasi-Peak	18.1	0.0	18.1	56.0	37.9
0.560	Average	31.7	0.0	31.7	46.0	14.3
0.690	Average	28.8	0.0	28.8	46.0	17.2
0.750	Quasi-Peak	30.1	0.0	30.1	56.0	25.9
0.920	Average	37.1	0.0	37.1	46.0	8.9
1.010	Quasi-Peak	26.7	0.0	26.7	56.0	29.3
1.130	Quasi-Peak	24.6	0.0	24.6	56.0	31.4
1.260	Quasi-Peak	26.1	0.0	26.1	56.0	29.9
1.760	Quasi-Peak	26.2	0.0	26.2	56.0	29.8
1.845	Average	31.7	0.0	31.7	46.0	14.3
2.015	Quasi-Peak	24.5	0.0	24.5	56.0	31.5
2.390	Quasi-Peak	22.9	0.0	22.9	56.0	33.1
3.140	Quasi-Peak	20.9	0.0	20.9	56.0	35.1
11.060	Average	34.5	0.0	34.5	50.0	15.5
22.115	Average	32.0	0.0	32.0	50.0	18.0

**Sample calculation of final values:**

$$\text{Final Value (dB}\mu\text{V)} = \text{Reading Value (dB}\mu\text{V)} + \text{Correction Factor (dB)}$$

Tested on:	minus
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Frequency (MHz)	Detector	Reading Value (dB $\mu$ V)	Correction Factor (dB)	Final Value (dB $\mu$ V)	Limit (dB $\mu$ V)	Margin (dB)
0.150	Quasi-Peak	31.4	0.0	31.4	66.0	34.6
0.170	Average	37.5	0.0	37.5	55.0	17.5
0.210	Quasi-Peak	33.8	0.0	33.8	63.2	29.4
0.215	Average	42.0	0.0	42.0	53.0	11.0
0.250	Quasi-Peak	50.3	0.0	50.3	61.8	11.5
0.260	Average	36.3	0.0	36.3	51.4	15.1
0.300	Quasi-Peak	39.0	0.0	39.0	60.2	21.2
0.300	Average	38.4	0.0	38.4	50.2	11.8
0.390	Average	35.2	0.0	35.2	48.1	12.9
0.475	Average	33.4	0.0	33.4	46.4	13.0
0.505	Quasi-Peak	38.3	0.0	38.3	56.0	17.7
0.560	Average	31.6	0.0	31.6	46.0	14.4
0.625	Quasi-Peak	22.2	0.0	22.2	56.0	33.8
0.690	Average	28.7	0.0	28.7	46.0	17.3
0.755	Quasi-Peak	32.7	0.0	32.7	56.0	23.3
0.880	Quasi-Peak	25.2	0.0	25.2	56.0	30.8
0.920	Average	37.1	0.0	37.1	46.0	8.9
1.130	Quasi-Peak	23.8	0.0	23.8	56.0	32.2
1.260	Quasi-Peak	25.8	0.0	25.8	56.0	30.2
1.760	Quasi-Peak	25.8	0.0	25.8	56.0	30.2
1.845	Average	31.7	0.0	31.7	46.0	14.3
2.265	Quasi-Peak	24.7	0.0	24.7	56.0	31.3
2.385	Quasi-Peak	21.6	0.0	21.6	56.0	34.4
3.140	Quasi-Peak	19.2	0.0	19.2	56.0	36.8
11.060	Average	36.5	0.0	36.5	50.0	13.5
22.120	Average	35.6	0.0	35.6	50.0	14.4

**Sample calculation of final values:**

$$\text{Final Value (dB}\mu\text{V)} = \text{Reading Value (dB}\mu\text{V)} + \text{Correction Factor (dB)}$$

## 8.5 Radiated Emission Measurement 9 kHz to 30 MHz

Rules and specifications:	CFR 47 Part 15, sections 15.205 and 15.209 IC RSS-210 Issue 6, sections 2.2 and 2.6			
Guide:	ANSI C63.4			
Limit:	Frequency of Emission (MHz)	Field Strength ( $\mu$ V/m)	Field Strength (dB $\mu$ V/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)			

Test Result:	Test passed
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Mode:	Transmitting continuously without tag		
Date of test:	30 June 2006		
Test site:	Open field test site		

Test Result:	Test passed		
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Frequency (MHz)	Detector	Distance			Reading Value		Correction Factor (dB/m)	Extrapolation Factor (dB/dec)	Pulse Train Correction (dB)	Final Value (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)
		d1 (m)	d2 (m)	d (m)	d1 (dB $\mu$ V)	d2 (dB $\mu$ V)						
0.12565	QP	3	10	300	49.5	24.7	20.0	-47.4	-70.1	-25.4	25.6	51.0

**Sample calculation of final values:**

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

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

$$\begin{aligned} \text{Final Value (dB}\mu\text{V/m)} &= \text{Reading Value } d_2 \text{ (dB}\mu\text{V)} + \text{Correction Factor (dB/m)} \\ &\quad + \text{Extrapolation Factor (dB)} + \text{Pulse Train Correction (dB)} \end{aligned}$$

Note: Extrapolation factor (dB) and final value (dB $\mu$ V/m) are relating to distance d.

Mode:	Reading tag continuously
Date of test:	30 June 2006
Test site:	Open field test site

Test Result:	Test passed
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Frequency (MHz)	Detector	Distance			Reading Value		Correction Factor (dB/m)	Extrapolation Factor (dB/dec)	Pulse Train Correction (dB)	Final Value (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)
		d1 (m)	d2 (m)	d (m)	d1 (dB $\mu$ V)	d2 (dB $\mu$ V)						
0.12565	QP	3	10	300	49.3	24.6	20.0	-47.2	-69.8	-25.2	25.6	50.8

**Sample calculation of final values:**

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

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

$$\begin{aligned} \text{Final Value (dB}\mu\text{V/m)} &= \text{Reading Value } d_2 \text{ (dB}\mu\text{V)} + \text{Correction Factor (dB/m)} \\ &\quad + \text{Extrapolation Factor (dB)} + \text{Pulse Train Correction (dB)} \end{aligned}$$

Note: Extrapolation factor (dB) and final value (dB $\mu$ V/m) are relating to distance d.

## 8.6 Radiated Emission Measurement 30 MHz to 1 GHz

Rules and specifications:	CFR 47 Part 15, section 15.209 IC RSS-210 Issue 6, section 2.6		
Guide:	ANSI C63.4		
Limit:	Frequency of Emission (MHz)	Field Strength ( $\mu$ V/m)	Field Strength (dB $\mu$ V/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) Radiated Emission at Open Field Test Site (6.5)		

Mode:	Transmitting continuously without tag
Comment:	Final measurement performed for worst case only
Date of test:	28 June 2006
Test site:	Frequencies $\leq$ 1 GHz: Open field test site Frequencies $>$ 1 GHz: Fully anechoic room, cabin no. 2
Test distance:	3 meters

Test Result:	Test passed
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Frequency (MHz)	Antenna Polarization	Detector	Receiver Reading (dB $\mu$ V)	Correction Factor (dB/m)	Pulse Train Correction (dB)	Final Value (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)
40.090	horizontal	Quasi-Peak	17.6	11.9		29.5	40.0	10.5
40.340	horizontal	Quasi-Peak	17.7	11.8		29.5	40.0	10.5
66.350	horizontal	Quasi-Peak	19.8	9.6		29.4	40.0	10.6
142.510	horizontal	Quasi-Peak	7.4	13.7		21.1	43.5	22.4
144.390	horizontal	Quasi-Peak	7.5	13.7		21.2	43.5	22.3
146.530	horizontal	Quasi-Peak	7.4	13.7		21.1	43.5	22.4
148.420	horizontal	Quasi-Peak	9.2	13.8		23.0	43.5	20.5
149.300	horizontal	Quasi-Peak	9.5	13.9		23.4	43.5	20.1
149.550	horizontal	Quasi-Peak	8.0	13.9		21.9	43.5	21.6
150.550	horizontal	Quasi-Peak	8.2	14.0		22.2	43.5	21.3
151.430	horizontal	Quasi-Peak	8.9	14.1		23.0	43.5	20.5
221.180	horizontal	Quasi-Peak	13.0	17.0		30.0	46.0	16.0
233.996	horizontal	Quasi-Peak	10.7	17.2		27.9	46.0	18.1
235.000	horizontal	Quasi-Peak	10.8	17.2		28.0	46.0	18.0
236.760	horizontal	Quasi-Peak	10.4	17.2		27.6	46.0	18.4
237.760	horizontal	Quasi-Peak	13.1	17.3		30.4	46.0	15.6
243.300	horizontal	Quasi-Peak	14.2	17.5		31.7	46.0	14.3

**Sample calculation of final values:**

Final Value (dB $\mu$ V/m) = Reading Value (dB $\mu$ V) + Correction Factor (dB/m)  
+ Pulse Train Correction (dB)

## 8.7 Exposure of Humans to RF Fields

Rules and specifications:	IC RSS-Gen Issue 2, section 3
Guide:	IC RSS-102 Issue 2, section 2.5

Exposure of Humans to RF Fields		Applicable	Declared by applicant	Measured	Exemption
The antenna is					
<input type="checkbox"/> detachable					
The conducted output power (CP in watts) is measured at the antenna connector: $CP = \dots \text{W}$					<input type="checkbox"/>
The effective isotropic radiated power (EIRP in watts) is calculated using <input type="checkbox"/> the numerical antenna gain: $G = \dots$ $EIRP = G \cdot CP \Rightarrow EIRP = \dots \text{W}$			<input type="checkbox"/>		
<input type="checkbox"/> the field strength <sup>5</sup> in V/m: $FS = \dots \text{V/m}$ $EIRP = \frac{(FS \cdot D)^2}{30} \Rightarrow EIRP = \dots \text{W}$				<input type="checkbox"/>	
with: Distance between the antennas in m: $D = \dots \text{m}$ <input type="checkbox"/>					
<input checked="" type="checkbox"/> not detachable					
A field strength measurement is used to determine the effective isotropic radiated power (EIRP in watts) given by <sup>5</sup> : $EIRP = \frac{(FS \cdot D)^2}{30} \Rightarrow EIRP = \dots \text{W}$					
with: Field strength in V/m: $FS = 171.8 \mu\text{V/m}$ <input checked="" type="checkbox"/> Distance between the two antennas in m: $D = 10 \text{ m}$ <input checked="" type="checkbox"/>					
Selection of output power					
The output power TP is the higher of the conducted or effective isotropic radiated power (e.i.r.p.): $TP = 98.4 \text{ nW}$					

<sup>5</sup> 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					
<input type="checkbox"/> less than or equal to 20 cm <input checked="" type="checkbox"/> greater than 20 cm			<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Transmitting device is					
<input type="checkbox"/> in the vicinity of the human head <input type="checkbox"/> body-worn			<input checked="" type="checkbox"/>	<input type="checkbox"/>	
SAR evaluation					
SAR evaluation is required if the separation distance between the user and the device is less than or equal to 20 cm.					
<input type="checkbox"/> 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.					<input type="checkbox"/>
<input type="checkbox"/> 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.					<input type="checkbox"/>
<input type="checkbox"/> 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.					<input type="checkbox"/>
<input type="checkbox"/> 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.					<input type="checkbox"/>
<input type="checkbox"/> 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.					
<input checked="" type="checkbox"/> The device operates below 1.5 GHz and its e.i.r.p. is equal to or less than 2.5 W.				<input checked="" type="checkbox"/>	
<input type="checkbox"/> 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.				<input type="checkbox"/>	
<input type="checkbox"/> RF exposure evaluation is documented in test report no. .....					

## 9 Referenced Regulations

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

<input checked="" type="checkbox"/>	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, 2007
<input checked="" type="checkbox"/>	CFR 47 Part 15	Code of Federal Regulations Part 15 (Radio Frequency Devices) of the Federal Communication Commission (FCC)	September 20, 2007
<input checked="" type="checkbox"/>	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)
<input checked="" type="checkbox"/>	RSS-Gen	Radio Standards Specification RSS-Gen Issue 2 containing General Requirements and Information for the Certification of Radiocommunication Equipment, published by Industry Canada	June 2007
<input checked="" type="checkbox"/>	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
<input type="checkbox"/>	RSS-310	Radio Standards Specification RSS-310 Issue 1 for Low Power Licence-Exempt Radiocommunication Devices (All Frequency Bands): Category II Equipment, published by Industry Canada	September 2005
<input checked="" type="checkbox"/>	RSS-102	Radio Standards Specification RSS-102 Issue 2: Radio Frequency Exposure Compliance of Radiocommunication Apparatus (All Frequency Bands)	November 2005
<input type="checkbox"/>	ICES-003	Interference-Causing Equipment Standard ICES-003 Issue 4 for Digital Apparatus, published by Industry Canada	February 7, 2004
<input checked="" type="checkbox"/>	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
<input type="checkbox"/>	CAN/CSA-CEI/IEC CISPR 22	Limits and Methods of Measurement of Radio Disturbance Characteristics of Information Technology Equipment	2002
<input checked="" type="checkbox"/>	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 Revision History

Revision	Date	Issued by	Note
000	June 06	M. Steindl	First Edition
001	June 4, 2008	C. Jäger	Edition 2 Issued for FCC-Certification Page 44 "Referenced Regulations" updated. Modification of model destination to "RWD022" (not RF-Reader 125 kHz)
Aktuelle Revision:	001		

## 11 Charts taken during testing

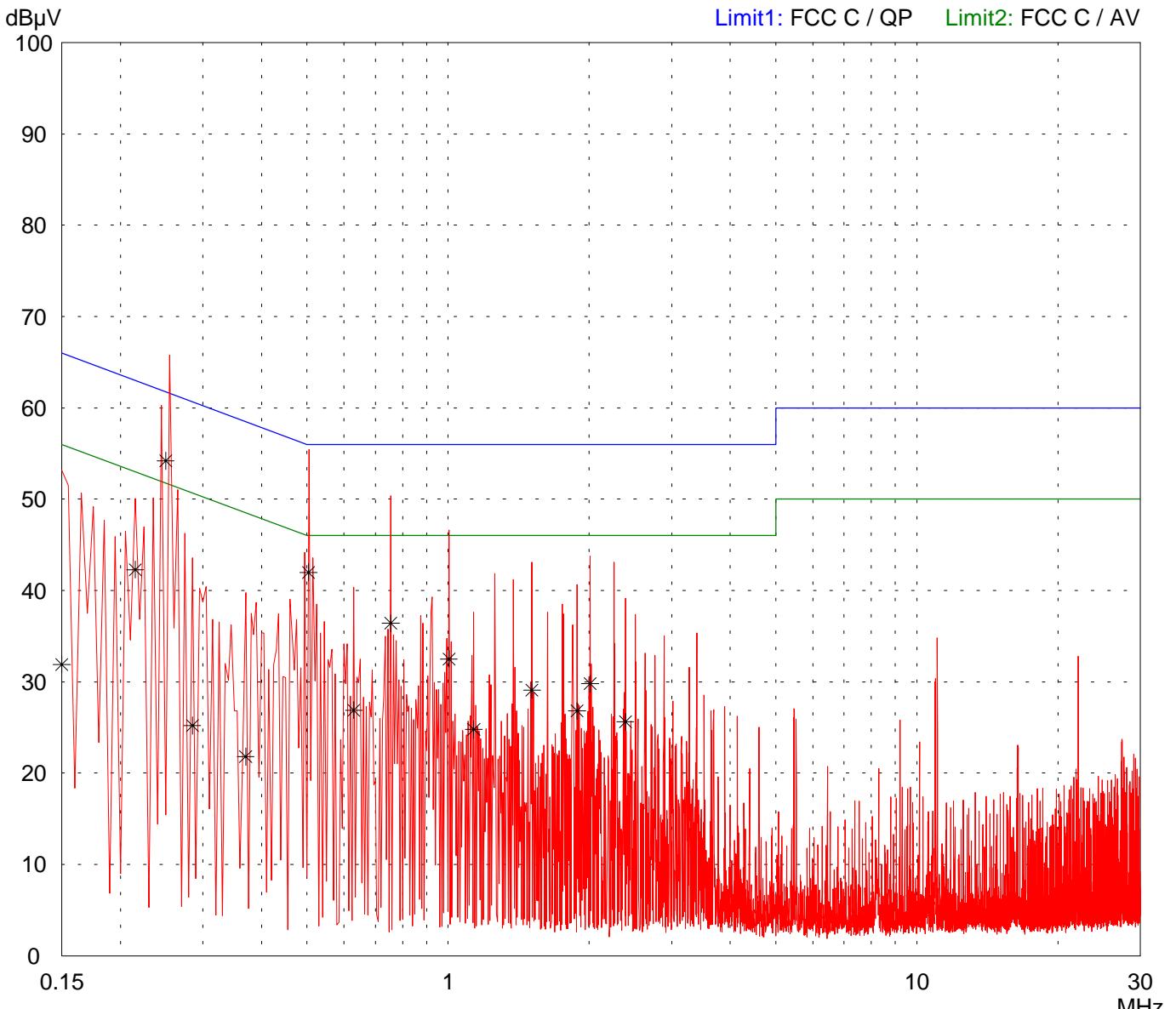
# Conducted Emission Test 150 kHz - 30 MHz according to FCC Part 15 Subpart C

Model: Reader Module	
Serial no.:	---
Applicant: RABUS GmbH	
Test site: Shielded room, cabin no. 4	
Tested on: Linecord plus	
Date of test: 06/28/2006	Operator: M. Steindl
Test performed: semi automatically	File name:

Mode:	
- DC 5 V power supply	
- transmitting continuously without tag	

Detector: Peak / Final Results: QP	
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Final results:	
20 dB Margin	25 Subranges



Result: Limit kept
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Project file: 51802-060526
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## Conducted Emission Test 150 kHz - 30 MHz according to FCC Part 15 Subpart C

Model:  
**Reader Module**

---

Serial no.:  
---

---

Applicant:  
**RABUS GmbH**

---

Test site:  
**Shielded room, cabin no. 4**

---

Tested on:  
**Linecord  
plus**

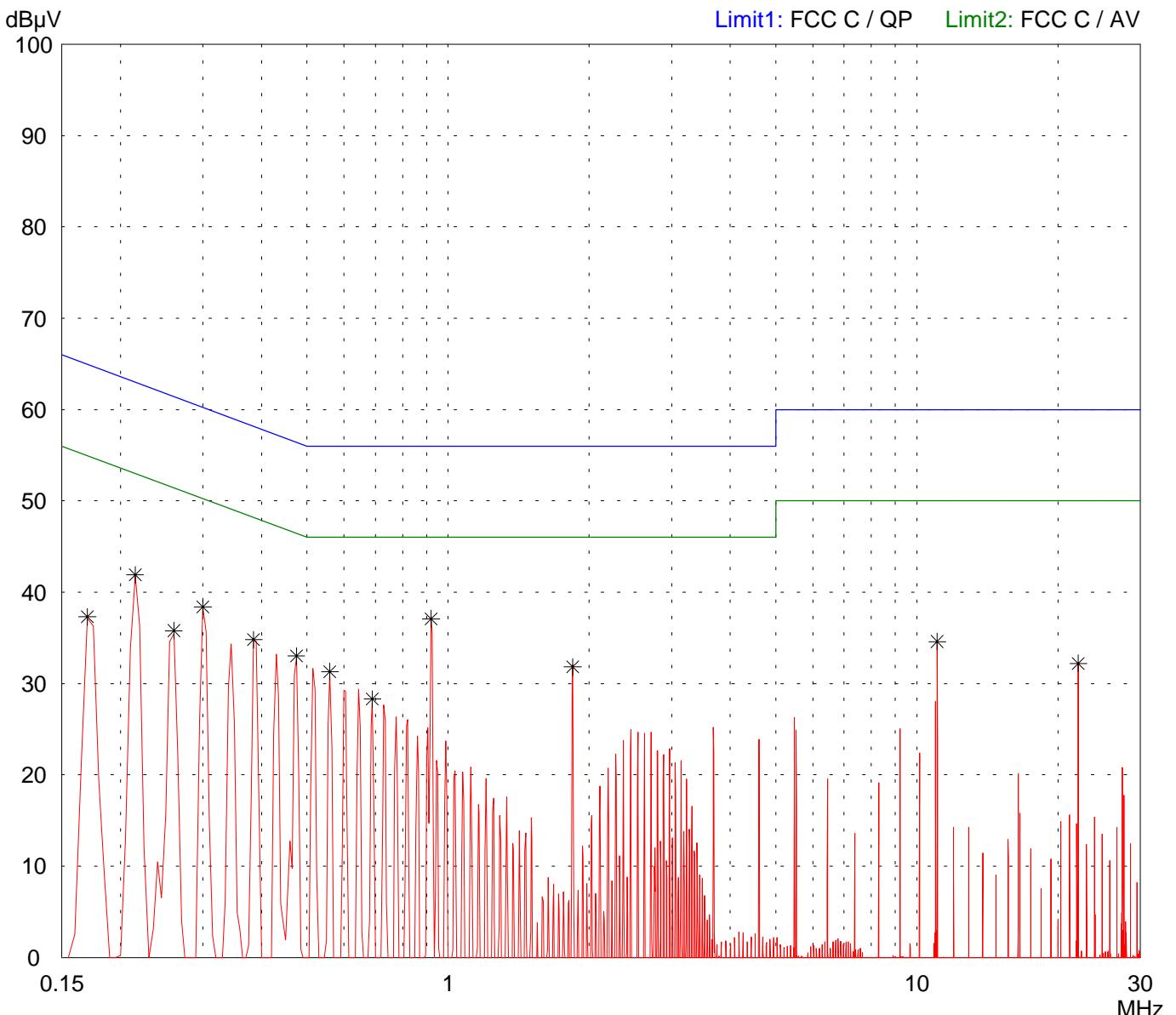
---

Date of test: <b>06/28/2006</b>	Operator: <b>M. Steindl</b>
Test performed: <b>semi automatically</b>	File name:

- Mode:
  - DC 5 V power supply
  - transmitting continuously without tag

Detector:  
Average / Final Results: AV

Final results:  
20 dB Margin                    25 Subranges



Result:  
Limit kept

Project file:  
51802-060526

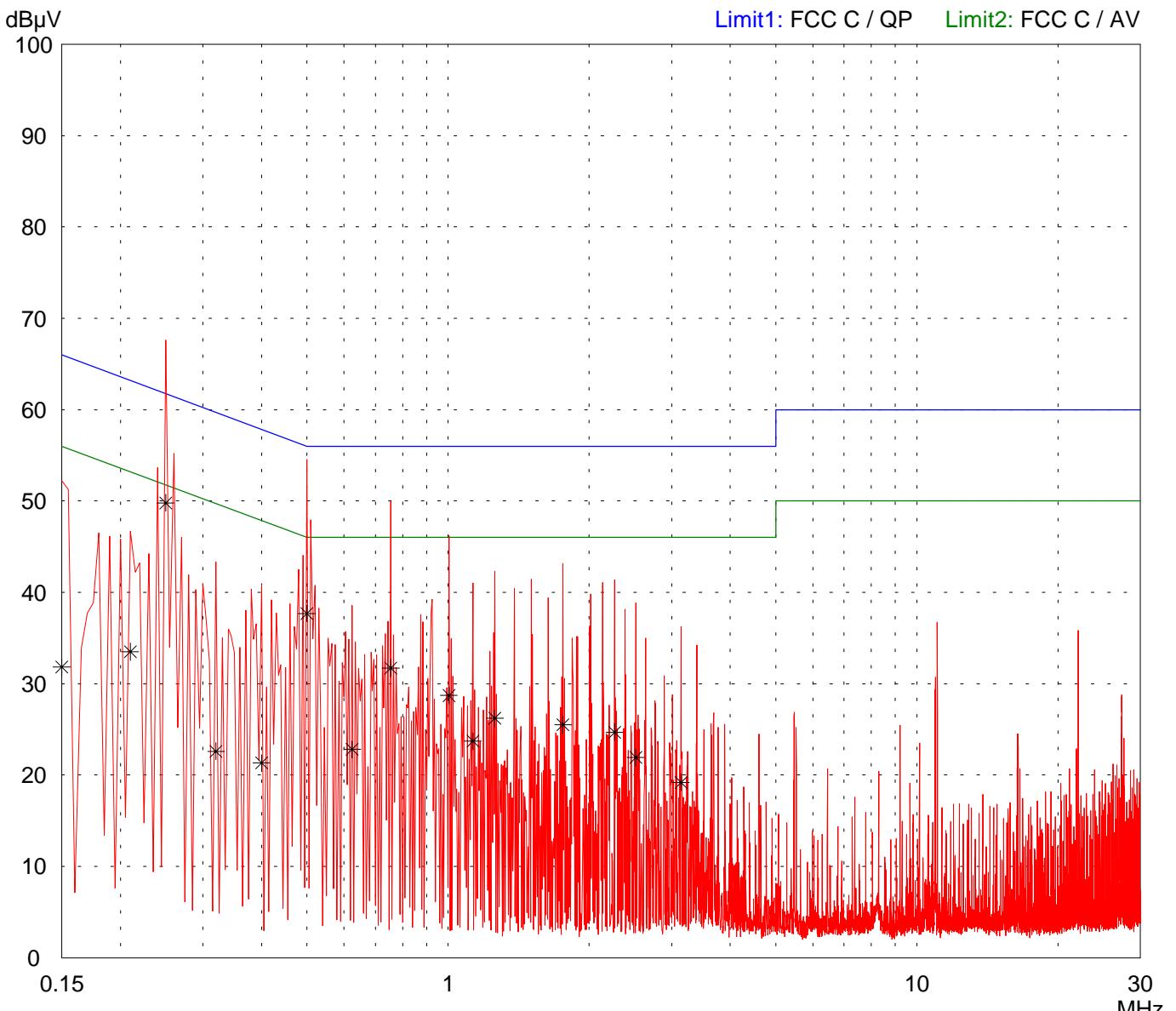
# Conducted Emission Test 150 kHz - 30 MHz according to FCC Part 15 Subpart C

Model: Reader Module	
Serial no.:	---
Applicant: RABUS GmbH	
Test site: Shielded room, cabin no. 4	
Tested on: Linecord minus	
Date of test: 06/28/2006	Operator: M. Steindl
Test performed: semi automatically	File name:

Mode:	
- DC 5 V power supply	
- transmitting continuously without tag	

Detector: Peak / Final Results: QP	
---------------------------------------	--

Final results:	
20 dB Margin	25 Subranges



Result: Limit kept
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Project file: 51802-060526
-------------------------------

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

Model:  
**Reader Module**

---

Serial no.:  
---

---

Applicant:  
**RABUS GmbH**

---

Test site:  
**Shielded room, cabin no. 4**

---

Tested on:  
**Linecord  
minus**

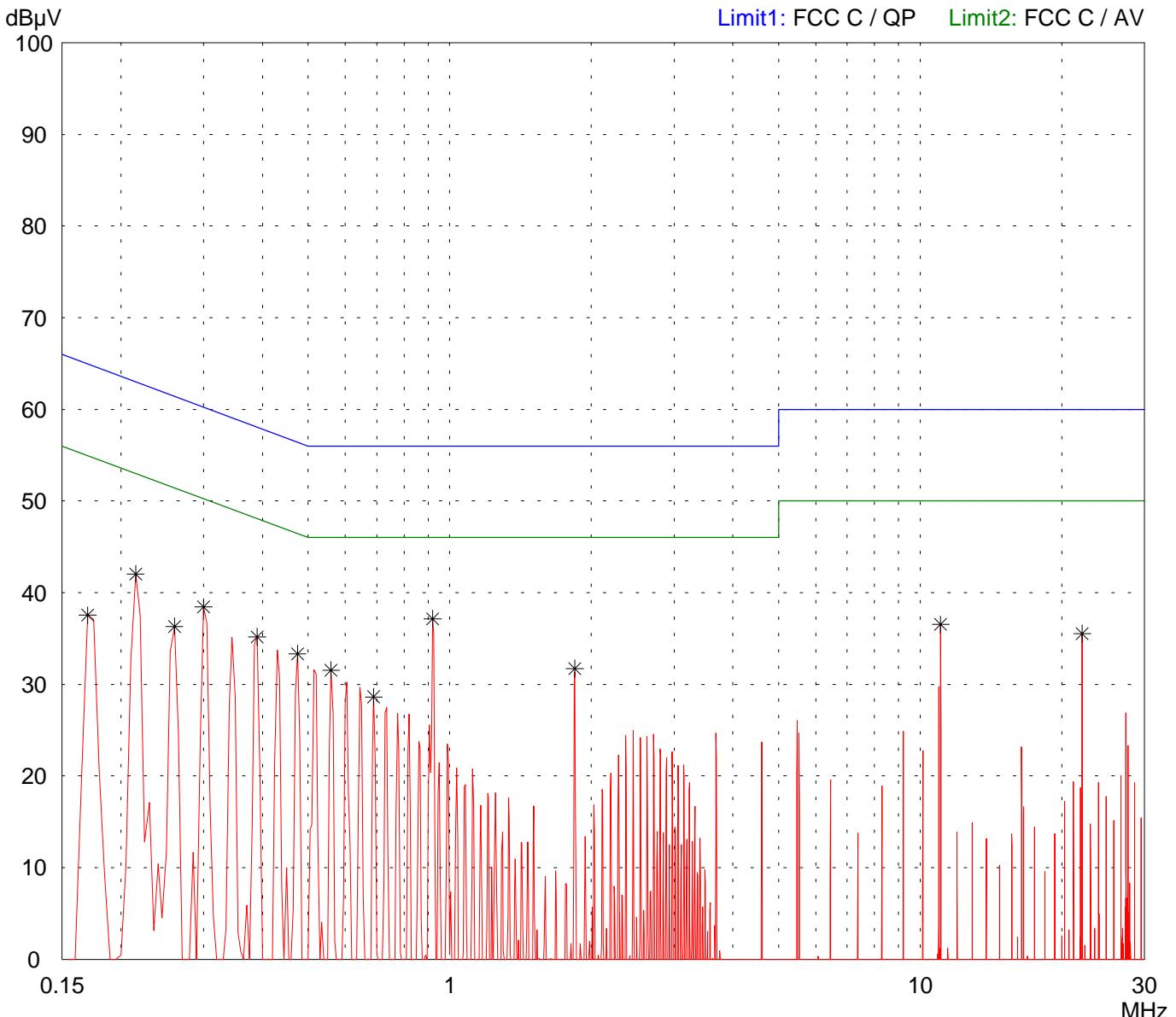
---

Date of test: <b>06/28/2006</b>	Operator: <b>M. Steindl</b>
Test performed: <b>automatically</b>	File name:

- Mode:
  - DC 5 V power supply
  - transmitting continuously without tag

Detector:  
Average / Final Results: AV

Final results:  
20 dB Margin                    25 Subranges



Result:  
Limit kept

Project file:  
51802-060526

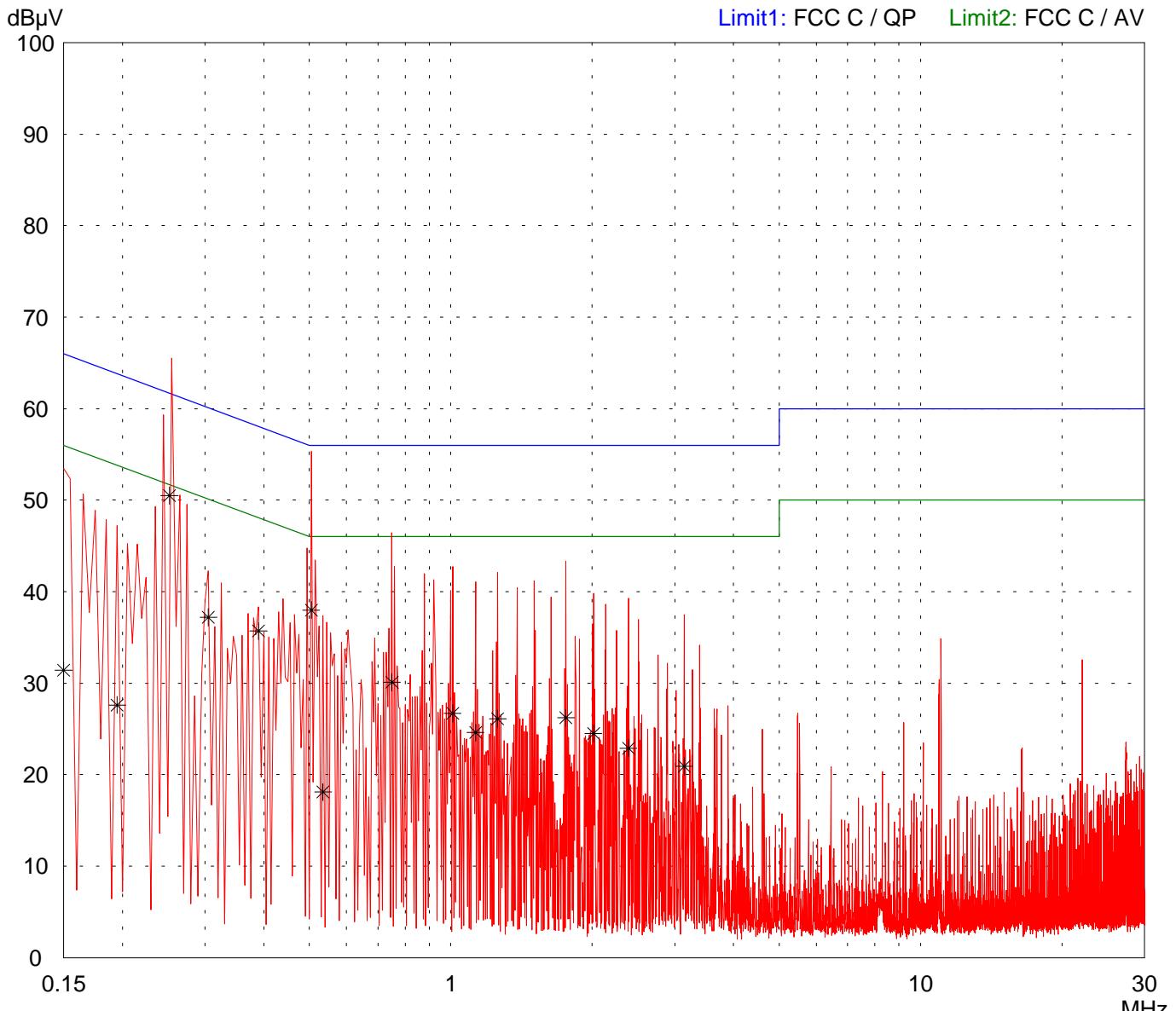
# Conducted Emission Test 150 kHz - 30 MHz according to FCC Part 15 Subpart C

Model: Reader Module  
 Serial no.: ---  
 Applicant: RABUS GmbH  
 Test site: Shielded room, cabin no. 4  
 Tested on: Linecord plus  
 Date of test: 06/28/2006 Operator: M. Steindl  
 Test performed: semi automatically

Mode:  
 - DC 5 V power supply  
 - reading tag continuously

Detector: Peak / Final Results: QP

Final results:  
 20 dB Margin      25 Subranges



Result:  
 Limit kept

Project file:  
 51802-060526

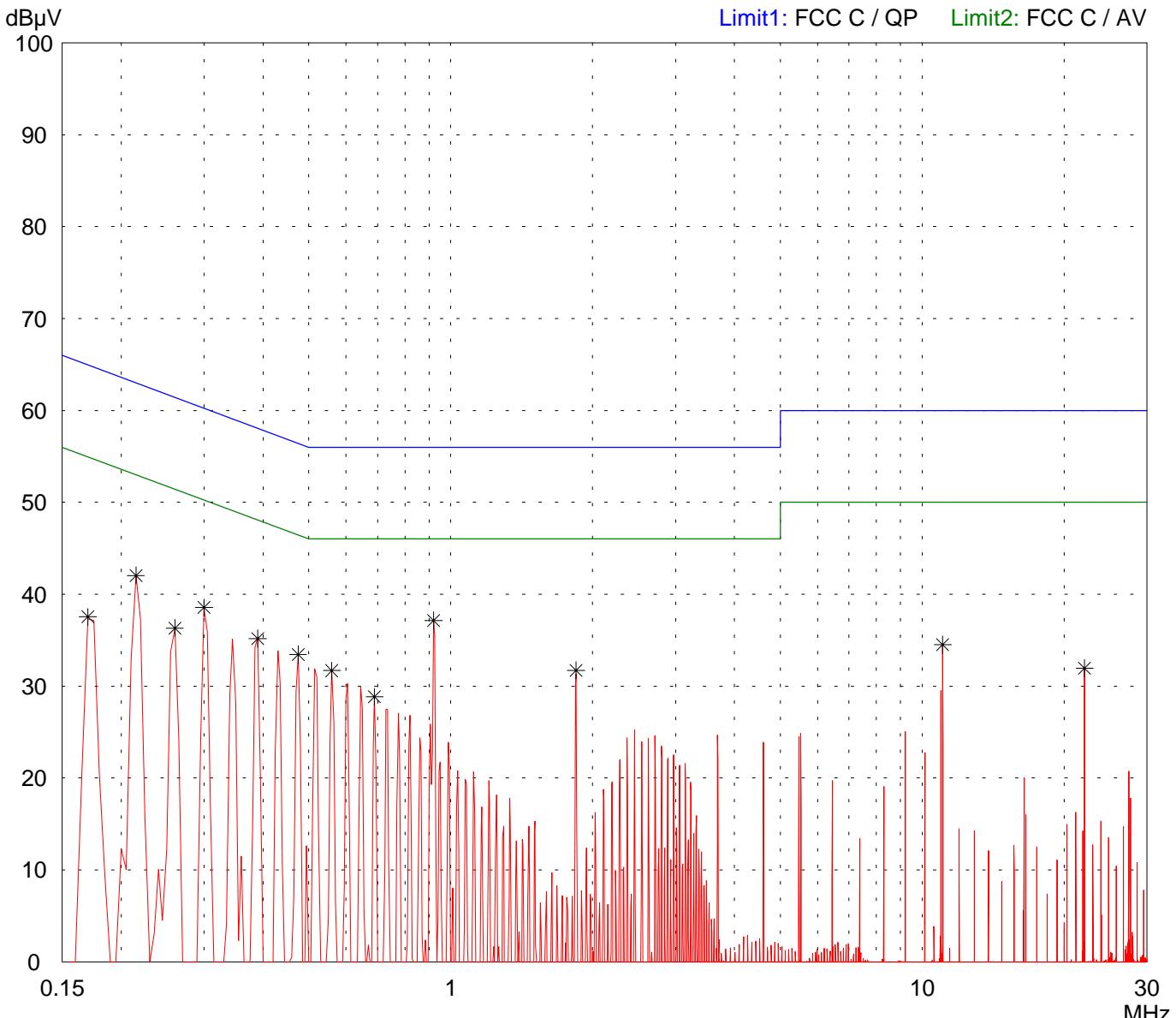
# Conducted Emission Test 150 kHz - 30 MHz according to FCC Part 15 Subpart C

Model: Reader Module	
Serial no.:	---
Applicant: RABUS GmbH	
Test site: Shielded room, cabin no. 4	
Tested on: Linecord plus	
Date of test: 06/28/2006	Operator: M. Steindl
Test performed: automatically	File name:

Mode:	
- DC 5 V power supply	
- reading tag continuously	

Detector: Average / Final Results: AV	
--	--

Final results:	
20 dB Margin	25 Subranges



Result: Limit kept
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Project file: 51802-060526
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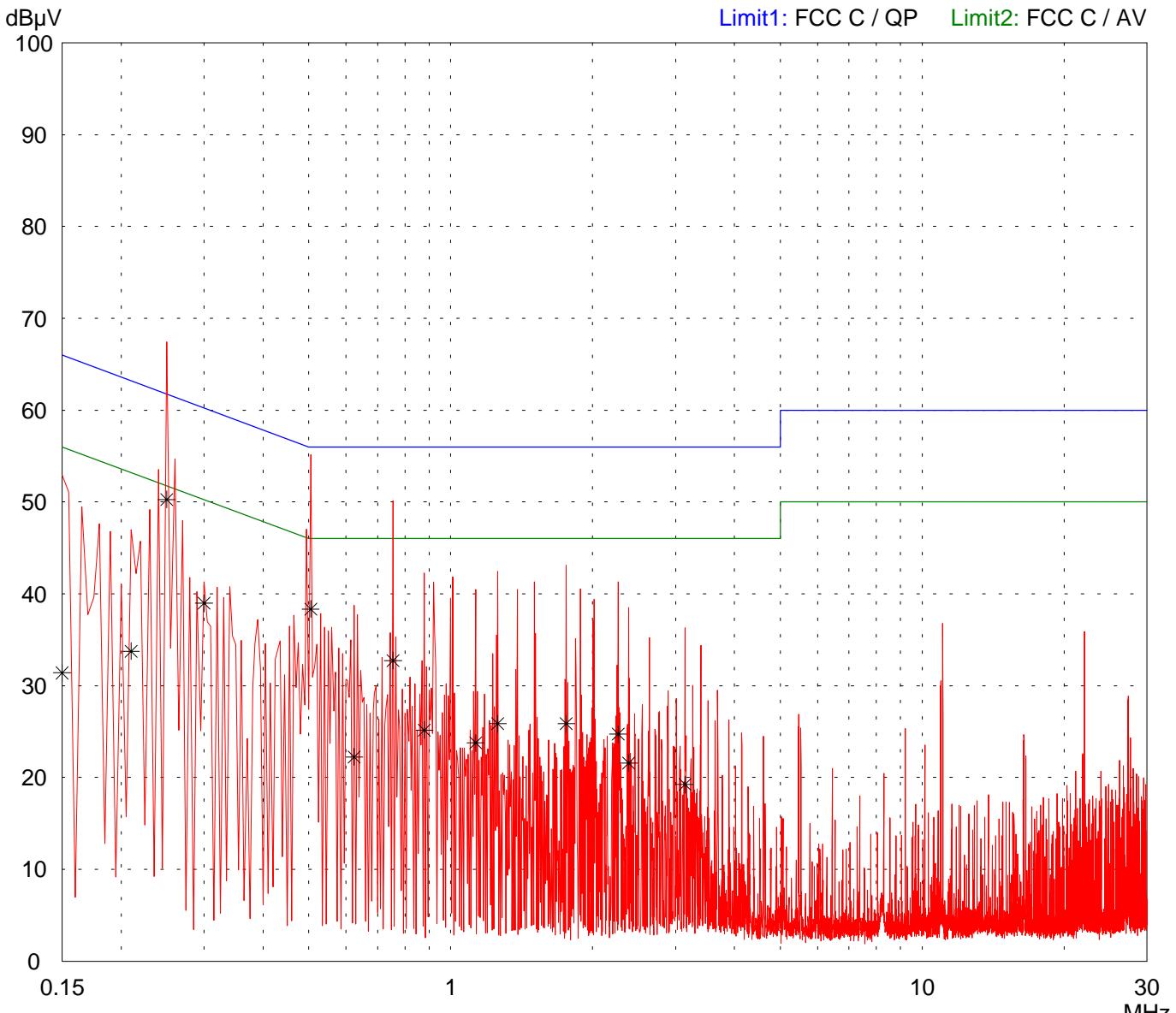
# Conducted Emission Test 150 kHz - 30 MHz according to FCC Part 15 Subpart C

Model: Reader Module	
Serial no.:	---
Applicant: RABUS GmbH	
Test site: Shielded room, cabin no. 4	
Tested on: Linecord minus	
Date of test: 06/28/2006	Operator: M. Steindl
Test performed: semi automatically	File name:

Mode:	
- DC 5 V power supply	
- reading tag continuously	

Detector: Peak / Final Results: QP	
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Final results:	
20 dB Margin	25 Subranges



Result: Limit kept	
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Project file: 51802-060526	
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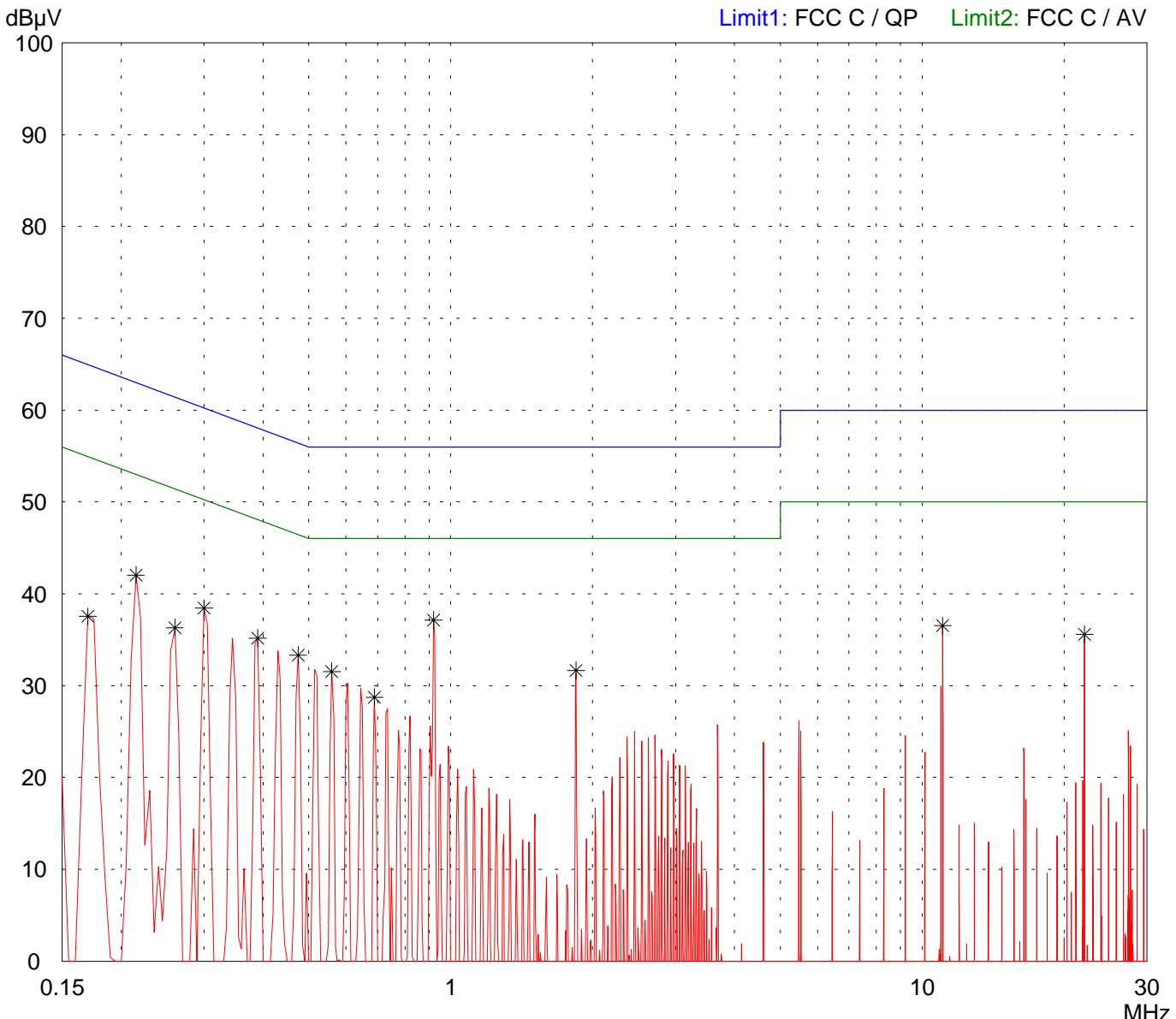
# Conducted Emission Test 150 kHz - 30 MHz according to FCC Part 15 Subpart C

Model: Reader Module	
Serial no.:	---
Applicant: RABUS GmbH	
Test site: Shielded room, cabin no. 4	
Tested on: Linecord minus	
Date of test: 06/28/2006	Operator: M. Steindl
Test performed: automatically	File name:

Mode:	
- DC 5 V power supply	
- reading tag continuously	

Detector: Average / Final Results: AV	
--	--

Final results:	
20 dB Margin	25 Subranges



Result: Limit kept
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Project file: 51802-060526
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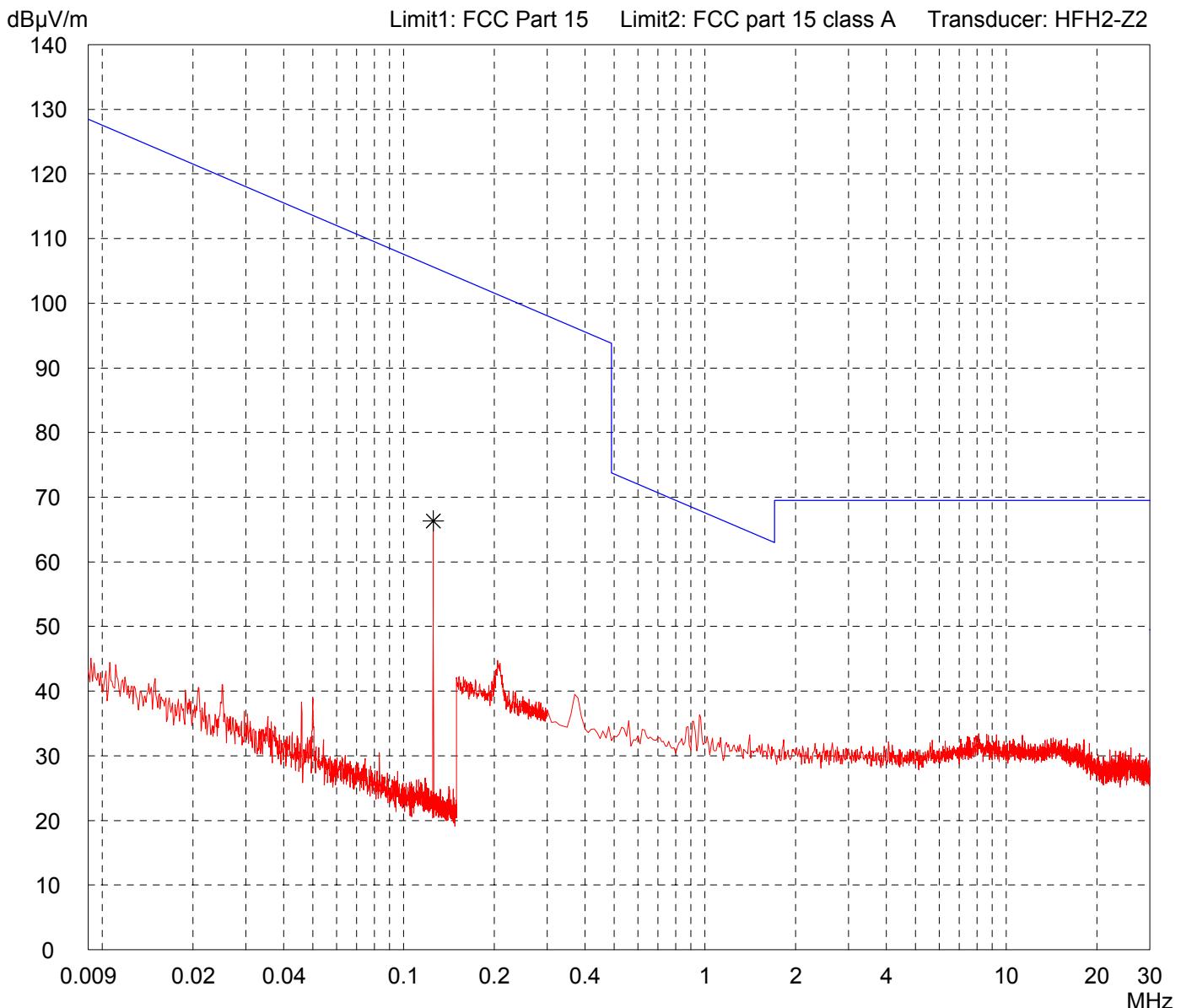
# Radiated Emission Test 9 kHz - 30 MHz acc. to FCC Part 15 (Fully Anechoic Chamber)

Model: Reader Module	
Serial no.:	---
Applicant: RABUS GmbH	
Test site: Fully anechoic room, cabin no. 2	
Tested on: Test distance 3 metres	
Date of test: 06/27/2006	Operator: M. Steindl
Test performed: by hand	File name: default.emi

Comment:	
- DC 5 V power supply	
- transmitting continuously without tag	

Detector: Peak	
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List of values:	
Selected by hand	



Result: Prescan	
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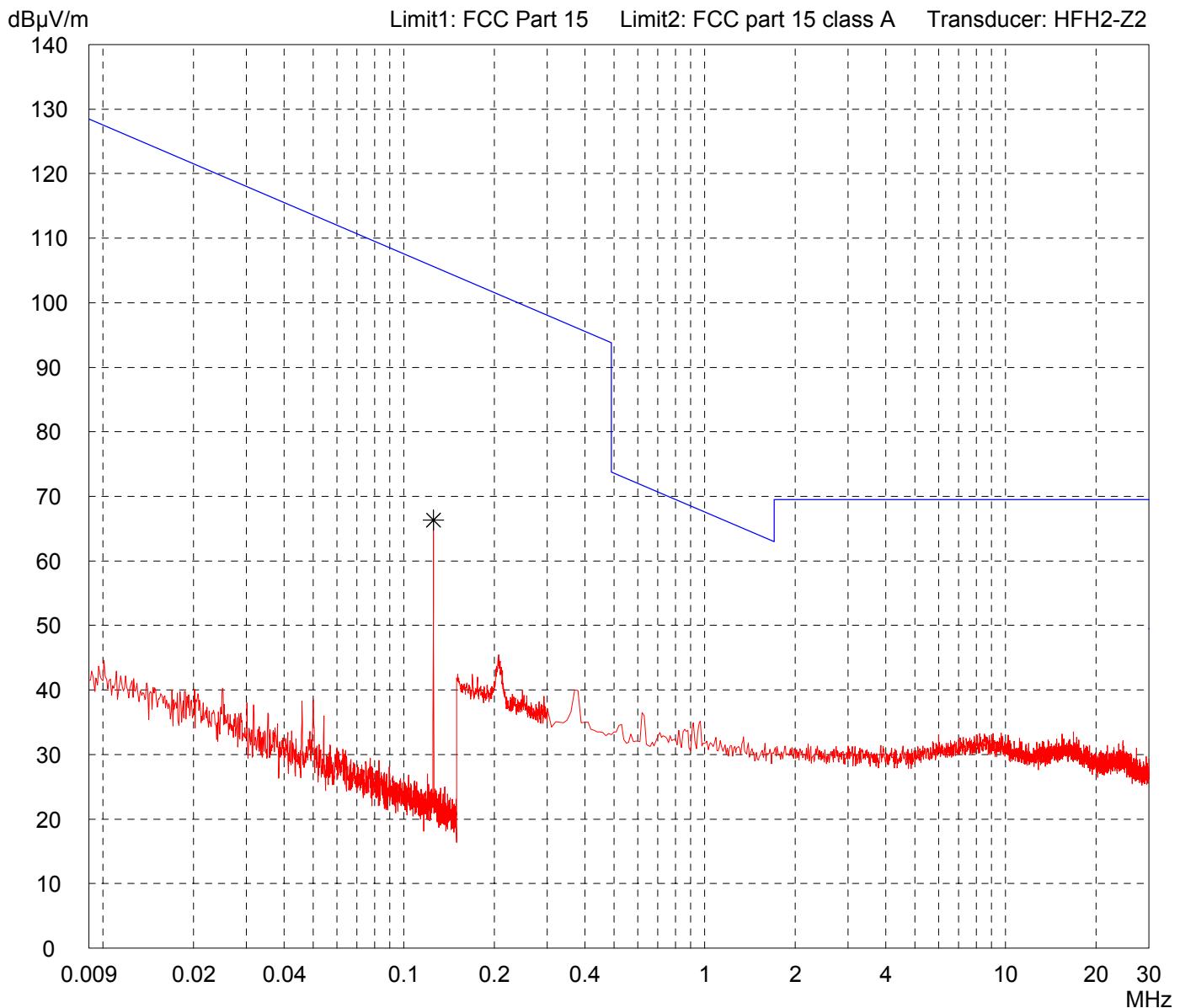
Project file: 51802-60526	
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# Radiated Emission Test 9 kHz - 30 MHz acc. to FCC Part 15 (Fully Anechoic Chamber)

Model: Reader Module	Comment:
Serial no.: ---	- DC 5 V power supply
Applicant: RABUS GmbH	- reading tag continuously
Test site: Fully anechoic room, cabin no. 2	
Tested on: Test distance 3 metres	
Date of test: 06/27/2006	Operator: M. Steindl
Test performed: by hand	File name: default.emi

Detector: Peak
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List of values: Selected by hand
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Result: Prescan
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Project file: 51802-60526
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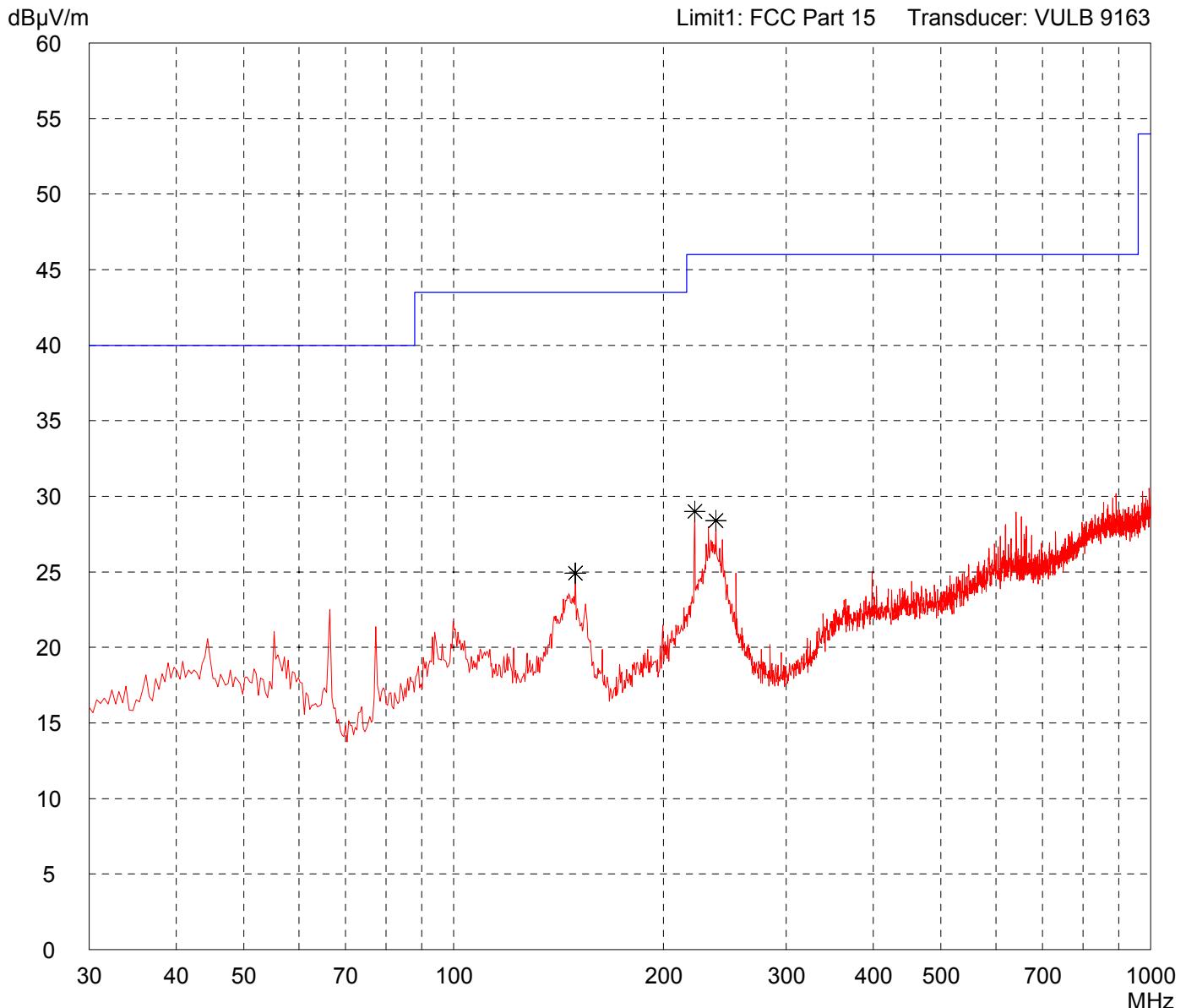
# Radiated Emission Test 30 MHz - 1 GHz acc. to FCC Part 15 (Fully Anechoic Chamber)

Model: Reader Module	Comment:
Serial no.: ---	- DC 5 V power supply
Applicant: RABUS GmbH	- transmitting continuously without tag
Test site: Fully anechoic room, cabin no. 2	
Tested on: Test distance 3 metres Horizontal Polarization	
Date of test: 06/27/2006	Operator: M. Steindl
Test performed: automatically	File name: default.emi

Detector: Peak
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Comment:
- DC 5 V power supply

List of values: Selected by hand
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Result: Prescan
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Project file: 51802-60526
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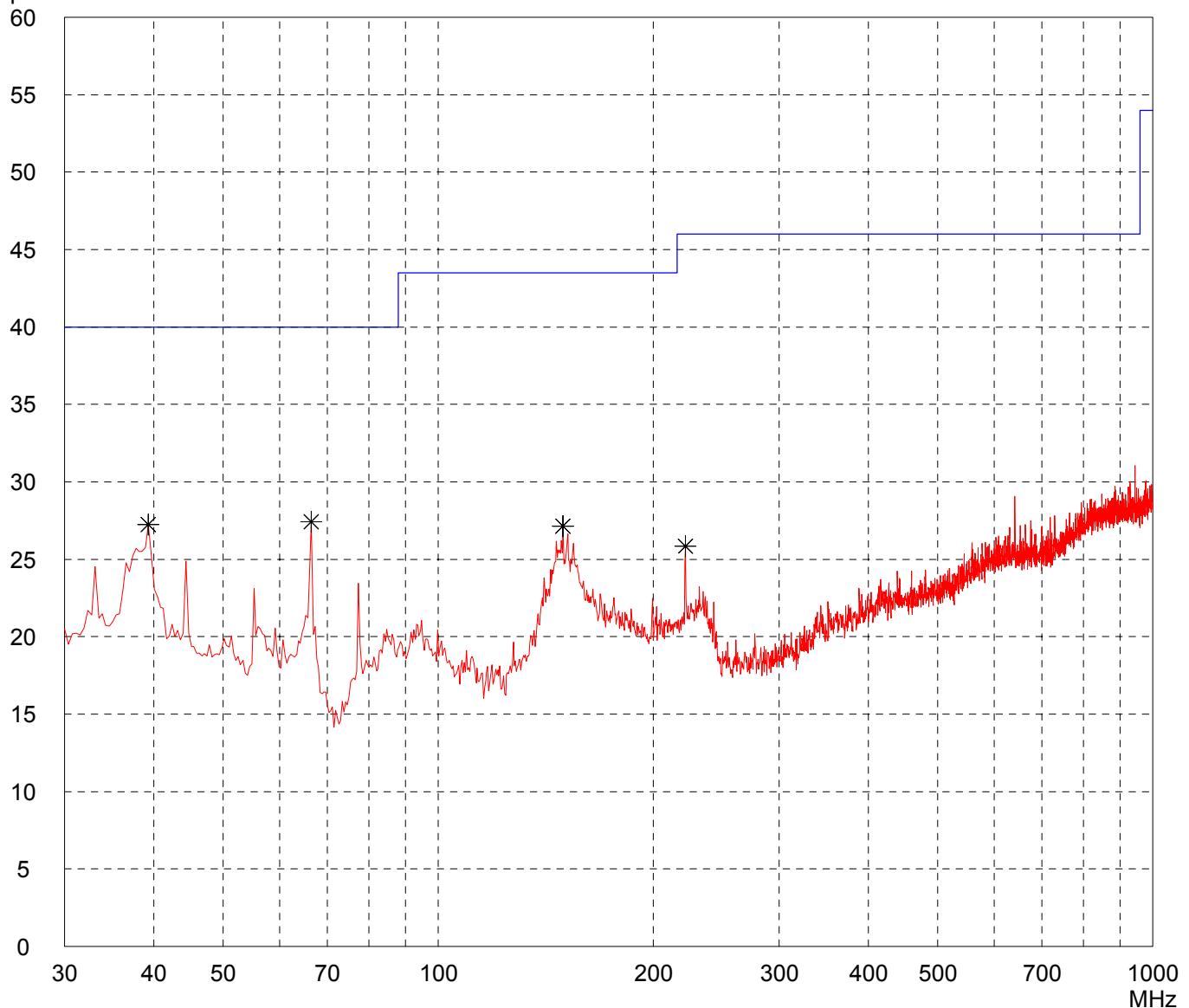
# Radiated Emission Test 30 MHz - 1 GHz acc. to FCC Part 15 (Fully Anechoic Chamber)

Model: Reader Module	Comment:
Serial no.: ---	- DC 5 V power supply
Applicant: RABUS GmbH	- transmitting continuously without tag
Test site: Fully anechoic room, cabin no. 2	
Tested on: Test distance 3 metres Vertical Polarization	
Date of test: 06/27/2006	Operator: M. Steindl
Test performed: automatically	File name: default.emi

Detector: Peak	List of values: Selected by hand
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dB $\mu$ V/m

Limit1: FCC Part 15 Transducer: VULB 9163



Result:

Prescan

Project file:

51802-60526

# Radiated Emission Test 30 MHz - 1 GHz

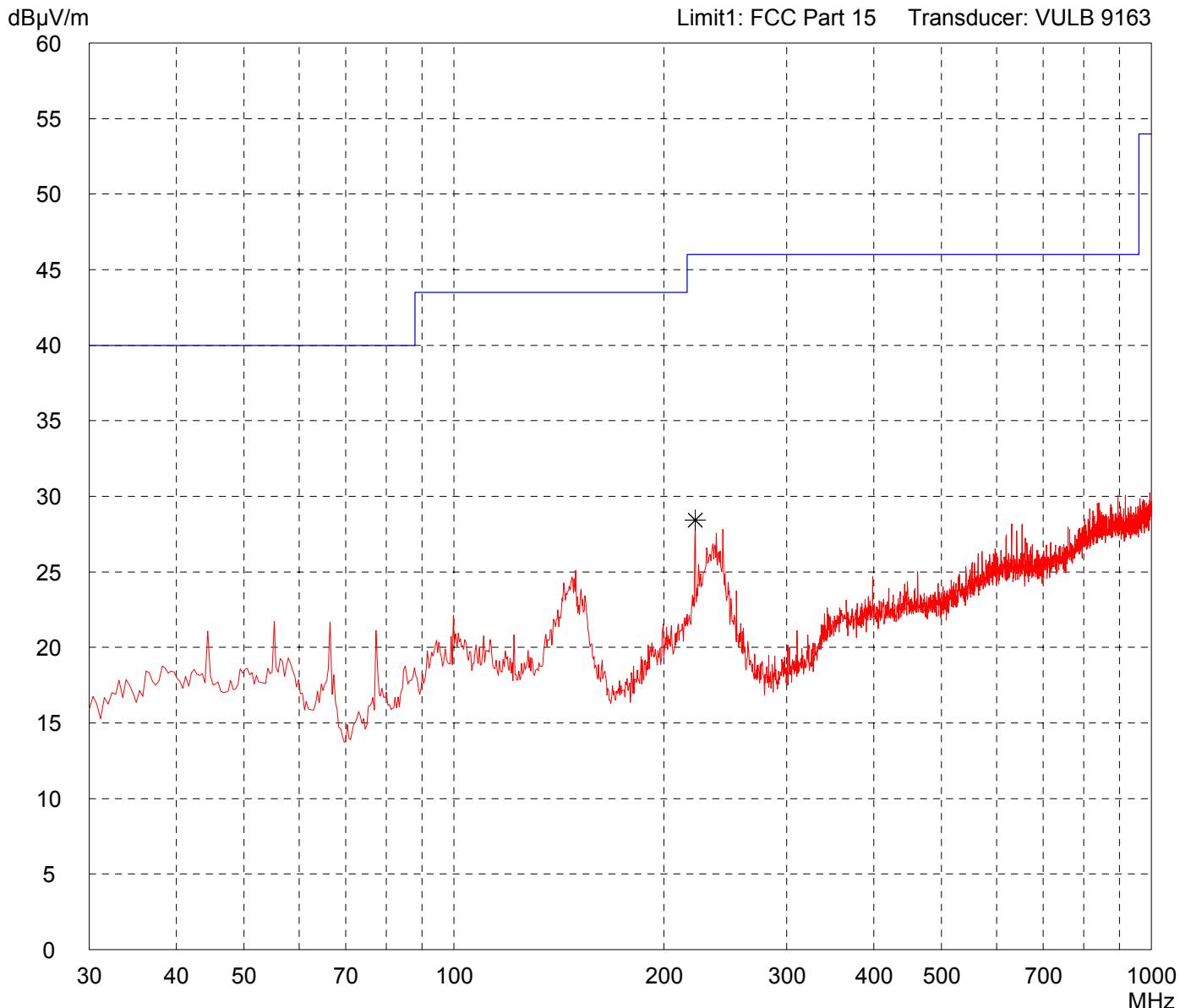
## acc. to FCC Part 15 (Fully Anechoic Chamber)

Model:	Reader Module
Serial no.:	---
Applicant:	RABUS GmbH
Test site:	Fully anechoic room, cabin no. 2
Tested on:	Test distance 3 metres Horizontal Polarization
Date of test:	Operator:
06/27/2006	M. Steindl
Test performed:	File name:
automatically	default.emi

Comment:	
- DC 5 V power supply	
- reading tag continuously	

Detector:	Peak
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List of values:	
Selected by hand	



Result:	Prescan
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Project file:	51802-60526
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# Radiated Emission Test 30 MHz - 1 GHz

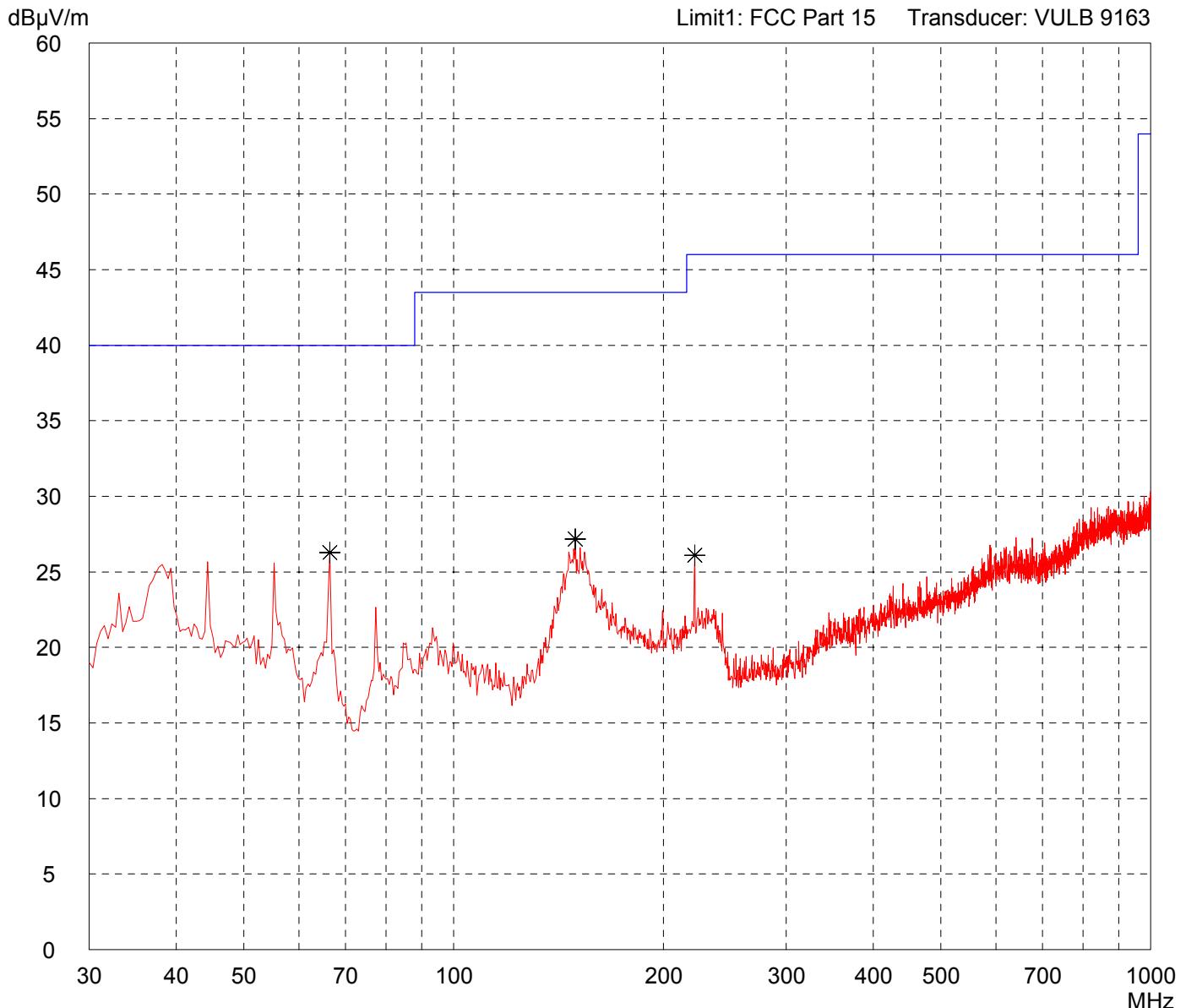
## acc. to FCC Part 15 (Fully Anechoic Chamber)

Model: Reader Module	
Serial no.:	---
Applicant: RABUS GmbH	
Test site: Fully anechoic room, cabin no. 2	
Tested on: Test distance 3 metres Vertical Polarization	
Date of test: 06/27/2006	Operator: M. Steindl
Test performed: automatically	File name: default.emi

Comment:
- DC 5 V power supply
- reading tag continuously

Detector: Peak
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List of values: Selected by hand
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Result: Prescan
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Project file: 51802-60526
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