

Straubing, 18 October 2005

**TEST - REPORT**

**No. 50104-050463 (Edition 2)**

**for**

**Model 1500**

**Audio Transmitter & Receiver**

**Applicant:** Amphony (Deutschland) GmbH

**Test Specifications:** FCC Code of Federal Regulations,  
CFR 47, Part 15,  
Sections 15.107, 15.109, 15.205, 15.207,  
15.215 and 15.249

**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 <sup>1</sup> :	Model 1500
Parts <sup>2</sup> :	
Serial number(s):	Prototype
Manufacturer:	Amphony (Deutschland) GmbH
Type of equipment:	Audio Transmitter & Receiver
Version:	
FCC ID:	N/A
Additional parts/accessories:	AC Adaptors for Transmitter & Receiver

Technical data of EUT	
Application frequency range:	5725 – 5875 MHz
Frequency range:	
Operating frequency:	5800 MHz
Type of modulation:	FM
Pulse train:	
Pulse width:	
Number of RF-channels:	1
Channel spacing:	N.A.
Designation of emissions <sup>3</sup> :	20M0F3D
Type of antenna:	Integrated
Size/length of antenna:	N/A
Connection of antenna:	<input type="checkbox"/> detachable <input checked="" type="checkbox"/> not detachable
Type of power supply:	AC supply
Specifications for power supply:	nominal voltage: 115 V minimum voltage: N/A V maximum voltage: N/A V  nominal frequency: 60 Hz

<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

Application details	
Applicant (full address):	Amphony (Deutschland) Gmbh Annenstraße 26 D- 10179 Berlin
Contact person:	Jens Kurrat
Contract identification:	---
Receipt of EUT:	29 July 2005
Date(s) of test:	August to October 2005
Note(s):	

Report details	
Report number:	50104-050463
Edition:	2
Issue date:	18 October 2005

### 3 Identification of the Test Laboratory

Details of the Test Laboratory	
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 15.107, 15.109, 15.205, 15.207, 15.215 and 15.249**

of the Federal Communication Commission (FCC).

### Personnel involved in this report

Laboratory Manager:



Mr. Johann Roidt

Responsible for testing:

Mr. Johann Roidt

Responsible for test report:

Mr. Johann Roidt

## 5 Operation Mode and Configuration of EUT

### Operation Mode(s)

Audio signal 100 mV / 1 kHz at Transmitter input

### Configuration(s) of EUT

Stand alone

### List of ports and cables

<i>Port</i>	<i>Description</i>	<i>Classification<sup>4</sup></i>	<i>Cable type</i>	<i>Cable length</i>
1	AC power input (via AC adaptor)	ac power	Unshielded	N/A
2	Audio input	signal/control port	Shielded	N/A
3	Audio output	signal/control port	Shielded	

### List of devices connected to EUT

<i>Item</i>	<i>Description</i>	<i>Type Designation</i>	<i>Serial no. or ID</i>	<i>Manufacturer</i>
1	Not applicable			

### List of support devices

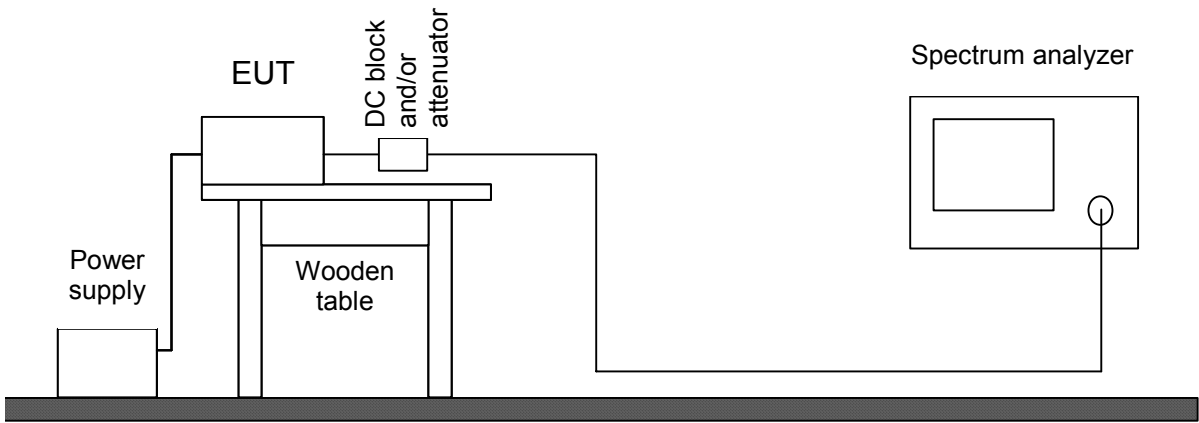
<i>Item</i>	<i>Description</i>	<i>Type Designation</i>	<i>Serial no. or ID</i>	<i>Manufacturer</i>
1	Audio generator			

<sup>4</sup> 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) CFR 47 Part 15, section 15.215(c) ANSI C63.4, annex H.6
Guide:	ANSI C63.4
Measurement setup:	<input type="checkbox"/> Conducted: See below <input checked="" type="checkbox"/> Radiated: Radiated Emission in Fully or Semi Anechoic Room (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>	



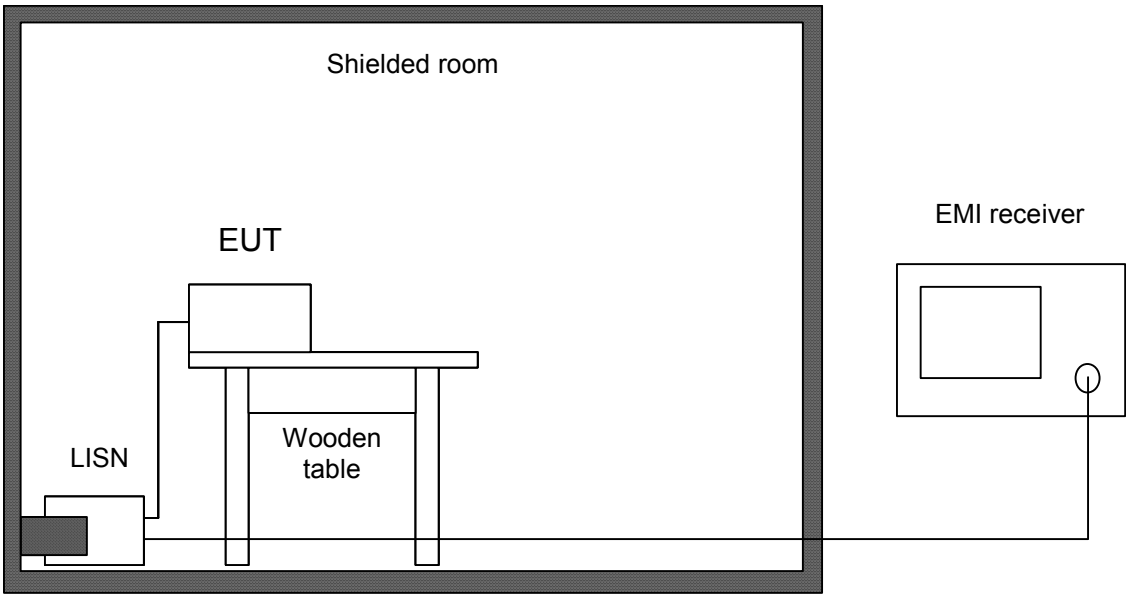


Test instruments used for conducted measurements:

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	ESPI7	836914/0002	Rohde & Schwarz
<input type="checkbox"/>	EMI test receiver	ESMI	839379/013 839587/006	Rohde & Schwarz
<input type="checkbox"/>	Power meter	NRVS	836856/015	Rohde & Schwarz
<input type="checkbox"/>	Peak power sensor	NRV-Z31	8579604.03	Rohde & Schwarz
<input type="checkbox"/>	Power sensor	NRV-Z52	837901/030	Rohde & Schwarz
<input type="checkbox"/>	Power sensor	NRV-Z4	863828/015	Rohde & Schwarz
<input type="checkbox"/>	DC-block	7006	A2798	Weinschel
<input type="checkbox"/>	Attenuator	4776-10	9412	Narda
<input type="checkbox"/>	Attenuator	4776-20	9503	Narda

6.2 Conducted AC Powerline Emission

Measurement Procedure:	
Rules and specifications:	CFR 47 Part 15, sections 15.107 and 15.207
Guide:	ANSI C63.4 (CISPR 22)
<p>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:</p> <p>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.</p> <p>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.</p> <p>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.</p> <p>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.</p>	

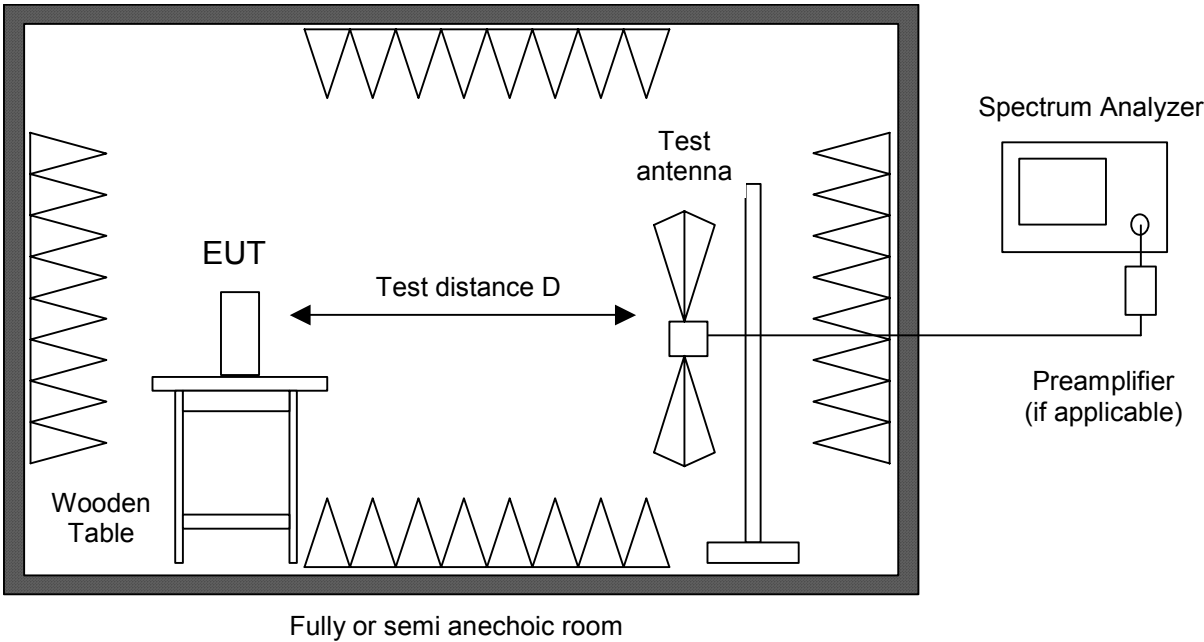


Test instruments used:

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 in Fully or Semi Anechoic Room

Measurement Procedure:	
Rules and specifications:	CFR 47 Part 15, sections 15.109, 15.215(b) and 15.249
Guide:	ANSI C63.4
<p>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.</p> <p>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).</p> <p>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.</p> <p>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.</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> <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.</p> <p>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.</p> <p>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.</p>	

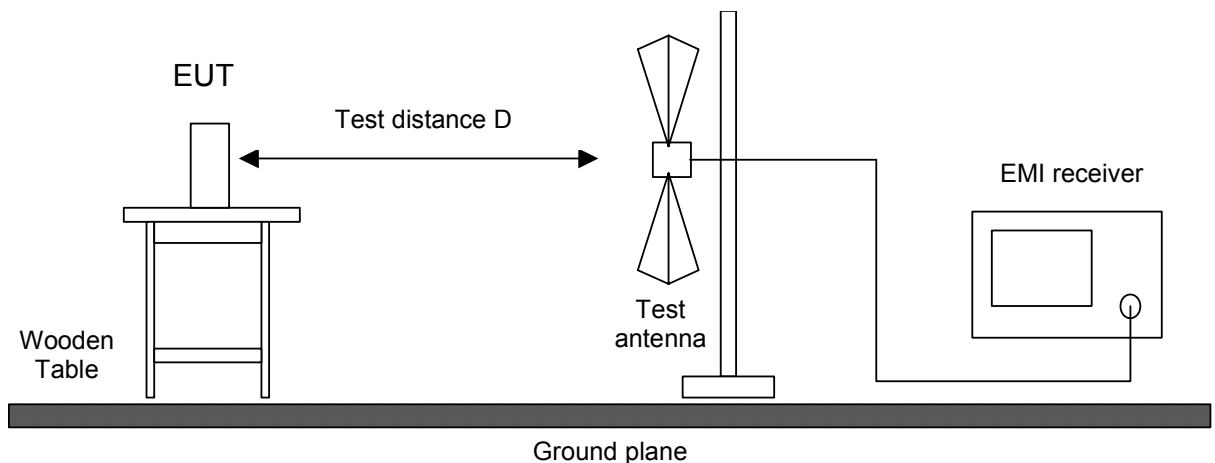


Test instruments used:

Used	Type	Model	Serial No. or ID	Manufacturer
<input checked="" type="checkbox"/>	Spectrum Analyzer	FSP 30	100063	Rohde & Schwarz
<input type="checkbox"/>	Spectrum analyzer	R 3271	05050023	Advantest
<input checked="" 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 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 type="checkbox"/>	Fully anechoic room	No. 2	1452	Albatross Projects
<input type="checkbox"/>	Semi-anechoic room	No. 3	1453	Siemens

## 6.4 Radiated Emission at Open Field Test Site

Measurement Procedure:	
Rules and specifications:	CFR 47 Part 15, sections 15.109, 15.215(b) and 15.249
Guide:	ANSI C63.4
<p>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.</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> <p>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.</p> <p>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.</p>	

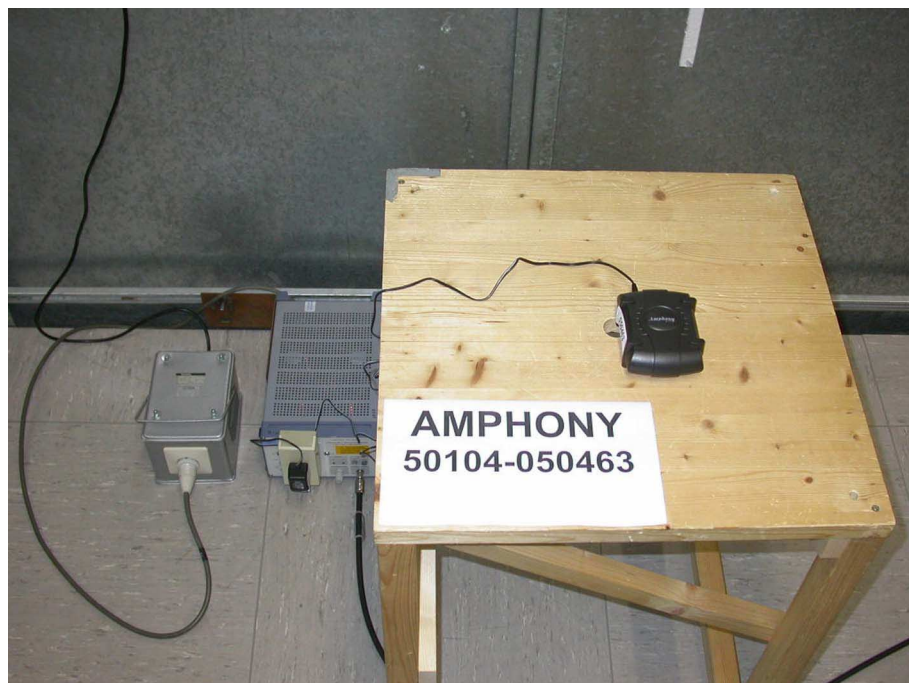


Test instruments used:

Used	Type		Model	Serial No. or ID	Manufacturer
<input checked="" type="checkbox"/>	EMI receiver		ESVP	881414/009	Rohde & Schwarz
<input checked="" type="checkbox"/>	Biconical antenna	EG 1	HK 116	842204/001	Rohde & Schwarz
<input checked="" type="checkbox"/>	Log. per. antenna	EG 1	HL 223	841516/023	Rohde & Schwarz
<input checked="" type="checkbox"/>	Open field test site		EG 1	1450	Senton

## **7      Photographs Taken During Testing**

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





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



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



## 8 Test Results for Transmitter

FCC CFR 47 Parts 2 and 15			
<i>Section(s)</i>	<i>Test</i>	<i>Page</i>	<i>Result</i>
2.1046(a)	Conducted output power	---	Not applicable
2.202(a)	Occupied bandwidth	20	Recorded
15.215(c)	Bandwidth of the emission	---	Not applicable
2.201, 2.202	Class of emission	---	Calculated
15.35(c)	Pulse train measurement for pulsed operation	---	Not applicable
15.205(a)	Restricted bands of operation	22	Test passed
15.207	Conducted AC powerline emission 150 kHz to 30 MHz	23	Test passed
15.205(b) 15.249	Radiated emission 9 kHz to 30 MHz	---	Not applicable according to CFR 47 Part 15, section 15.33(a)
15.205(b) 15.215(b) 15.249	Radiated emission 6 MHz to 40 GHz	24	Test passed

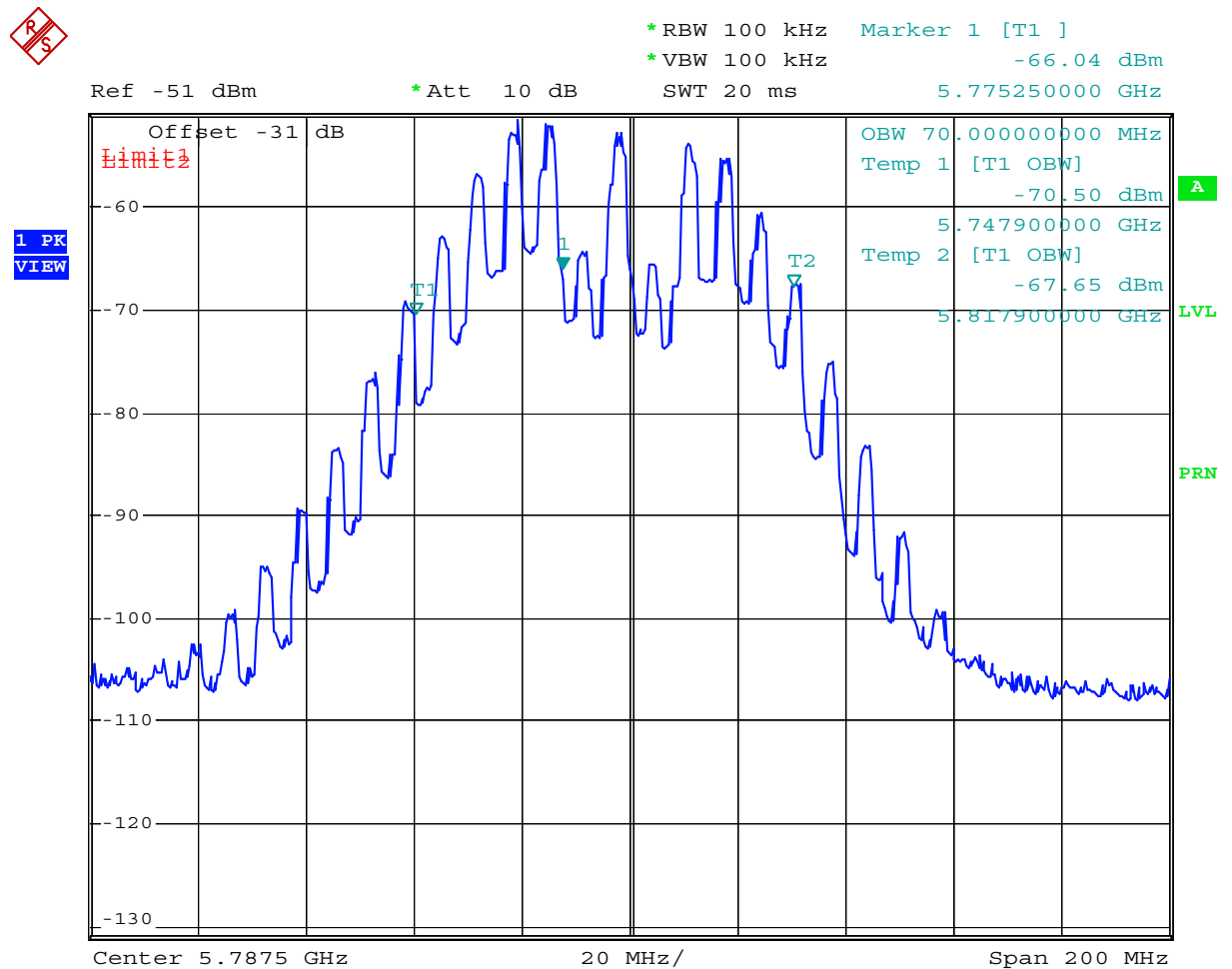
## 8.1 Occupied Bandwidth

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><tr><td>Fundamental frequency</td><td>Minimum resolution bandwidth</td></tr><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></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:	25 October 2005
Test site:	Fully anechoic room, cabin no. 2



**Occupied Bandwidth (99 %):**



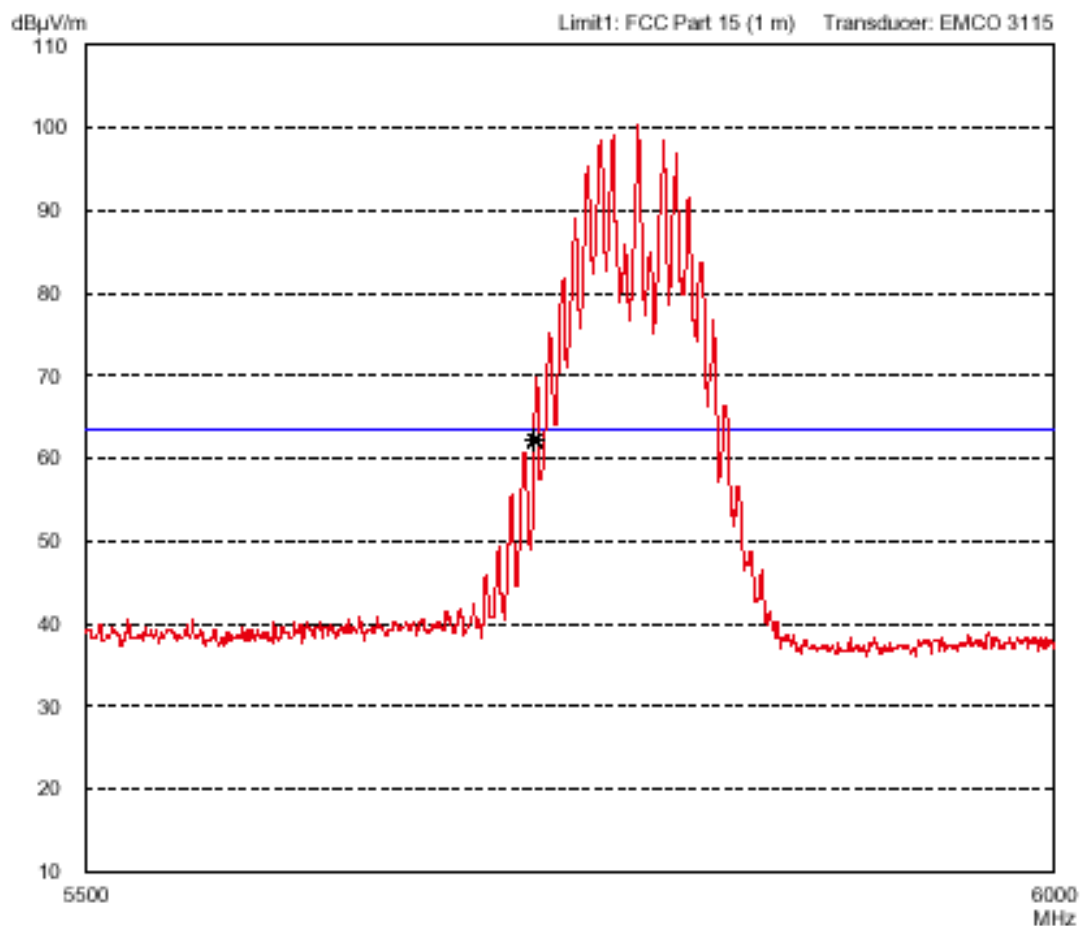
Comment: AMP050463: Occupied Bandwidth  
Date: 25.OCT.2005 16:02:28

Occupied Bandwidth (99 %): **70 MHz**

## 8.2 Restricted Bands of Operation

Rules and specifications:	CFR 47 Part 15, section 15.205(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 5, section 6.3(a).
Measurement procedure:	Radiated Emission in Fully or Semi Anechoic Room (6.3)

Comment:	
Date of test:	11 August 2005
Test site:	Fully anechoic room, cabin no. 2
Test distance:	1 meter



Test Result:	Test passed
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### 8.3 Conducted Powerline Emission Measurement 150 kHz to 30 MHz

Rules and specifications:	CFR 47 Part 15, section 15.207				
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	66 to 56	56 to 46	0.45 - 30	48
	0.5 - 5	56	46		
	5 - 30	60	50		
Measurement procedure:	Conducted AC Powerline Emission (6.2)				

Comment:	
Date of test:	18 October 2005
Test site:	Shielded room, cabin no. 1

Test Result:	Test passed
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Tested on:	Linecord / Live wire
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Frequency (MHz)	Detector	Reading Value (dBµV)	Correction Factor (dB)	Final Value (dBµV)	CFR 47 Part 15 Limit (dBµV)	Margin (dB)	RSS-210 Limit (dBµV)	Margin (dB)
0.310	Quasi-Peak	32.1	0.0	32.1	60.0	<b>27.9</b>		
0.370	Quasi-Peak	29.9	0.0	29.9	58.5	28.6		

Tested on:	Linecord / Neutral wire
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Frequency (MHz)	Detector	Reading Value (dBµV)	Correction Factor (dB)	Final Value (dBµV)	CFR 47 Part 15 Limit (dBµV)	Margin (dB)	RSS-210 Limit (dBµV)	Margin (dB)
0.320	Quasi-Peak	30.5	0.0	30.5	59.7	<b>29.2</b>		

#### Sample calculation of final values:

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

## 8.4 Radiated Emission Measurement 6 MHz to 40 GHz

Rules and specifications:	CFR 47 Part 15, sections 15.215(b) and 15.249		
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 (6.3) Radiated Emission at Open Field Test Site (6.4)		

Comment:	11 August 2005 Frequencies ≤ 1 GHz: Open field test site Frequencies > 1 GHz: Fully anechoic room, cabin no. 2
Date of test:	
Test site:	
Test distance:	3 meters, 1meter (> 4 GHz)

Test Result:	Test passed
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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)
2896.000	vertical	Peak	9.5	37.8		47.3	54.0	6.7
2902.000	horizontal	Peak	10.1	37.8		48.0	54.0	6.1
5722.000	horizontal	Average	18.4	42.9		61.3	63.5	2.2
5787.500	vertical	Peak	58.4	43.1		101.5	103.5	2.0
5872.000	horizontal	Peak	7.7	43.1		50.8	63.5	12.7
8636.800	vertical	Peak	12.4	43.5		55.9	63.5	7.6
8695.600	vertical	Peak	12.2	43.5		55.7	63.5	7.8
11509.600	vertical	Peak	13.5	45.5		59.0	63.5	4.5
11526.400	vertical	Peak	17.5	45.6		63.1	63.5	<b>0.4</b>
11610.400	vertical	Peak	11.8	45.6		57.4	63.5	6.1
12290.800	horizontal	Peak	7.9	46.2		54.1	63.5	9.4
12383.200	horizontal	Peak	7.4	46.2		53.6	63.5	9.9
12400.000	vertical	Peak	7.5	46.2		53.7	63.5	9.8

### Sample calculation of final values:

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



## 9 Test Results for Receiver

FCC CFR 47 Part 15			
Section(s)	Test	Page	Result
15.107	Conducted AC powerline emission 150 kHz to 30 MHz	26	Test passed
15.109	Radiated emission 30 MHz to 40 GHz	27	Test passed
15.111(a)	Antenna power conduction emission of receivers 9 kHz to 40 GHz	---	Not applicable

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

Rules and specifications:	CFR 47 Part 15, section 15.107				
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	66 to 56	56 to 46	0.45 - 30	48
	0.5 - 5	56	46		
	5 - 30	60	50		
Measurement procedure:	Conducted AC Powerline Emission (6.2)				

Comment:	
Date of test:	18 October 2005
Test site:	Shielded room, cabin no. 1

Test Result:	Test passed
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Tested on:	Linecord / Live wire
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Frequency (MHz)	Detector	Reading Value (dBµV)	Correction Factor (dB)	Final Value (dBµV)	CFR 47 Part 15 Limit (dBµV)	Margin (dB)	RSS-210 Limit (dBµV)	Margin (dB)
0.295	Quasi-Peak	31.6	31.6	60.4				

Tested on:	Linecord / Neutral wire
------------	-------------------------

No emissions above noise level detected

### Sample calculation of final values:

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

## 9.2 Radiated Emission Measurement 30 MHz to 40 GHz

Rules and specifications:	CFR 47 Part 15, section 15.109 (Class B)		
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
Measurement procedures:	Radiated Emission in Fully or Semi Anechoic Room (6.3) Radiated Emission at Open Field Test Site (6.4)		

Comment:	11 August 2005 Frequencies ≤ 1 GHz: Open field test site Frequencies > 1 GHz: Fully anechoic room, cabin no. 2
Date of test:	
Test site:	
Test distance:	3 meters

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

Frequency (MHz)	Antenna Polarization	Detector	Receiver Reading (dBµV)	Correction Factor (dB/m)	Final Value (dBµV/m)	Limit (dBµV/m)	Margin (dB)
12013.600	horizontal	Peak	7.7	46.0	53.6	63.5	9.9
12181.600	vertical	Peak	8.0	46.1	54.1	63.5	<b>9.4</b>
12358.000	horizontal	Peak	7.7	46.2	53.9	63.5	9.6

### Sample calculation of field final values:

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

## 10 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 10, 2004
<input checked="" type="checkbox"/>	CFR 47 Part 15	Code of Federal Regulations Part 15 (Radio Frequency Devices) of the Federal Communication Commission (FCC)	September 19, 2005
<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-210	Radio Standards Specification RSS-210 Issue 5 for Low Power Licence-Exempt Radiocommunication Devices (All Frequency Bands), published by Industry Canada	November 2001
<input checked="" type="checkbox"/>	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
<input type="checkbox"/>	ICES-003	Interference-Causing Equipment Standard ICES-003 Issue 4 for Digital Apparatus, published by Industry Canada	February 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

## **11 Charts taken during testing**

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

Model:  
H 1500

Serial no.:  
Transmitter

Applicant:  
Amphony Deutschland GmbH

Test site:  
Shielded room, cabin no. 1

Tested on:  
Linecord

Date of test:  
10/18/2005

Operator:  
J. Roidt

Test performed:  
automatically

File name:

Mode:

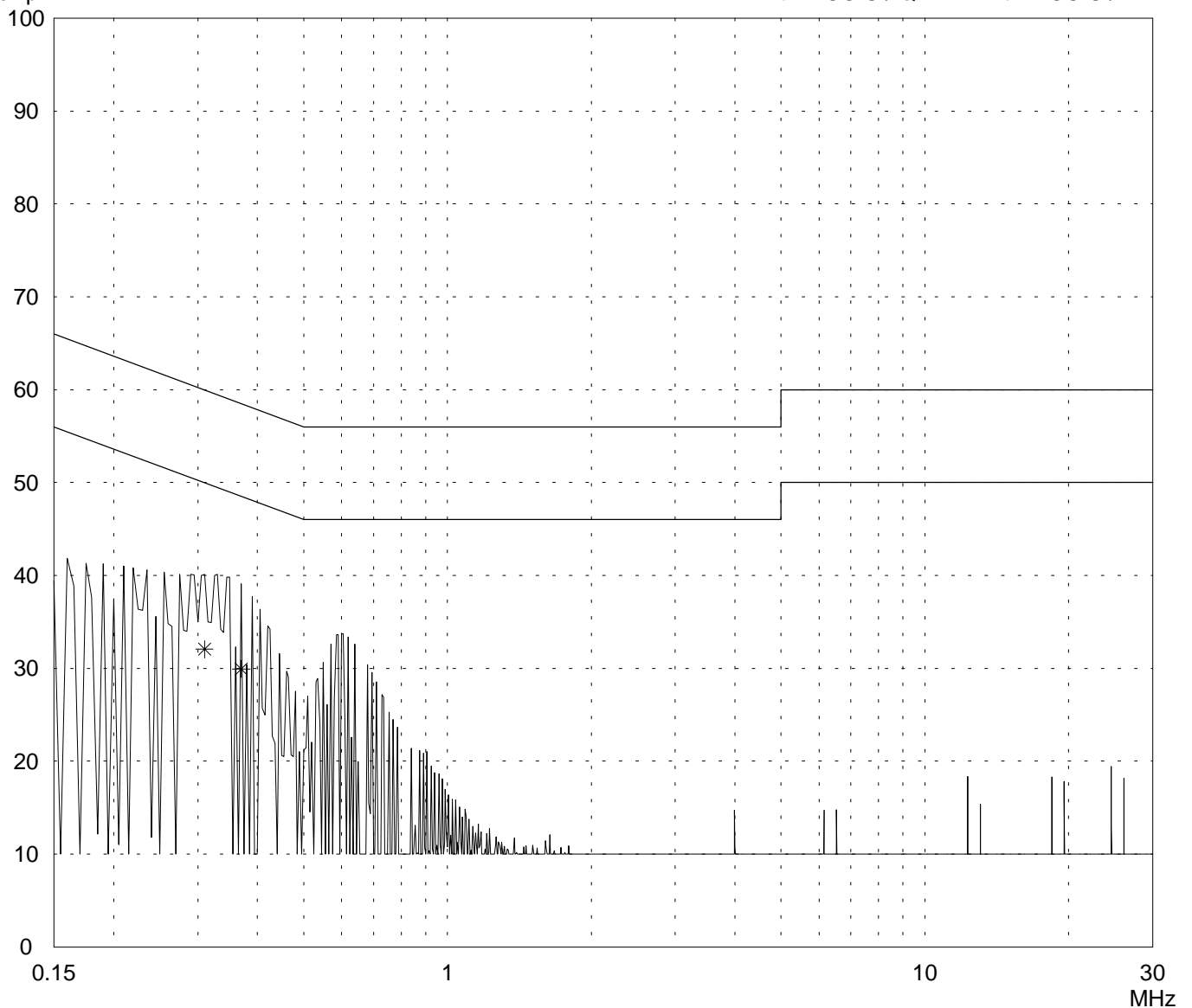
Detector:  
Peak / Final Results: QP

Final results:  
20 dB Margin

25 Subranges

dB $\mu$ V

Limit1: FCC C / QP    Limit2: FCC C / AV



Result:  
Limit kept

Project file:  
50104-50463-1

Page    of    Pages

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

Model:  
H 1500

Serial no.:  
Transmitter

Applicant:  
Amphony Deutschland GmbH

Test site:  
Shielded room, cabin no. 1

Tested on:  
Linecord  
Neutral Wire

Date of test: 10/18/2005      Operator: J. Roidt

Test performed: automatically      File name:

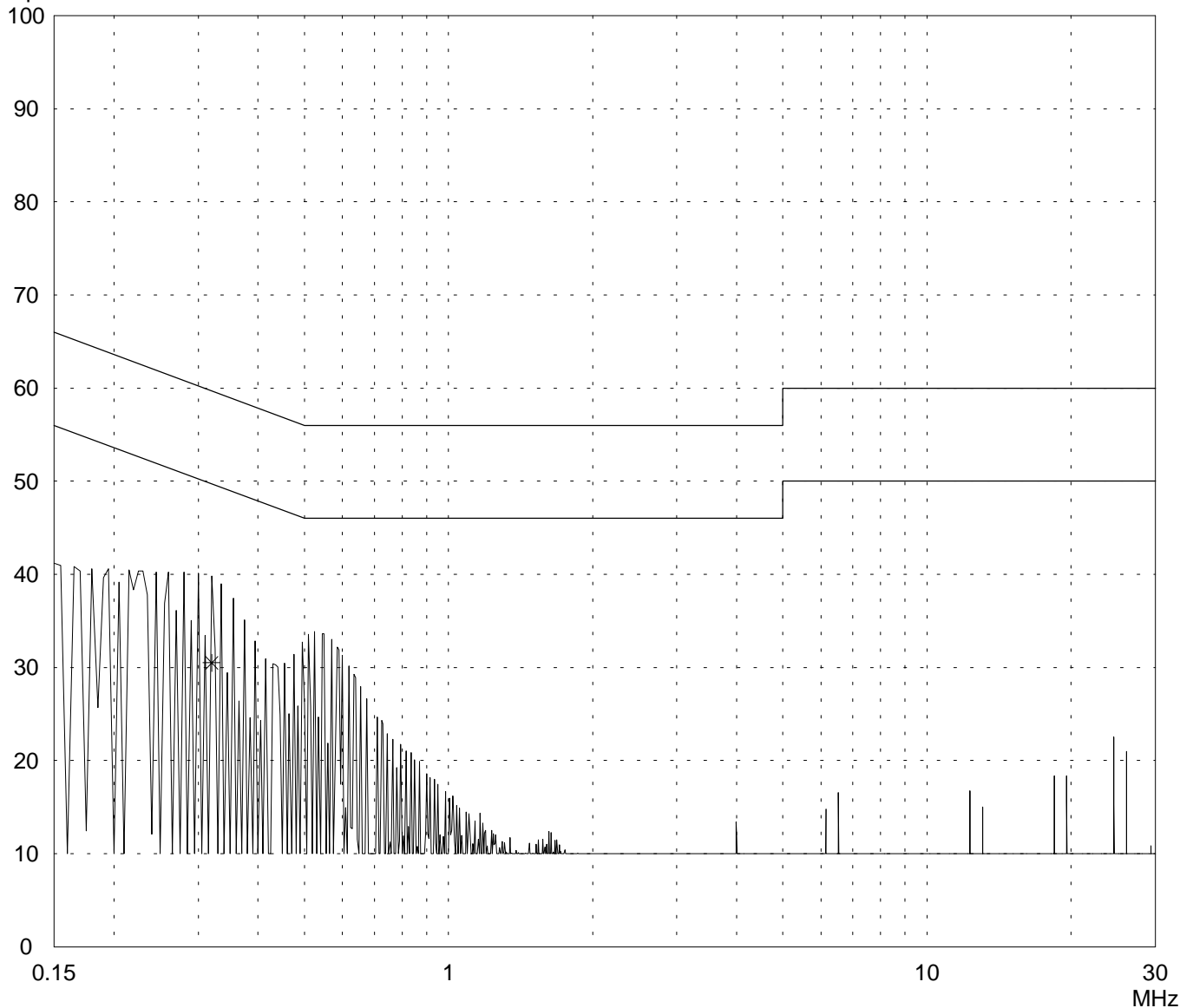
Mode:

Detector:  
Peak / Final Results: QP

Final results:  
20 dB Margin      25 Subranges

dB $\mu$ V

Limit1: FCC C / QP      Limit2: FCC C / AV



Result:  
Limit kept

Project file:  
50104-50463-1

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# Radiated Emission Test 6 MHz - 30 MHz according to FCC Part 15 Subpart C

Model:  
Model 1500

Serial no.:  
Prototype

Applicant:  
Amphony Deutschland GmbH

Test site:  
Shielded room, cabin no. 1

Tested on:  
Test distance 3 metres

Date of test: 11/18/2005  
Operator: J. Roidt

Test performed: automatically  
File name:

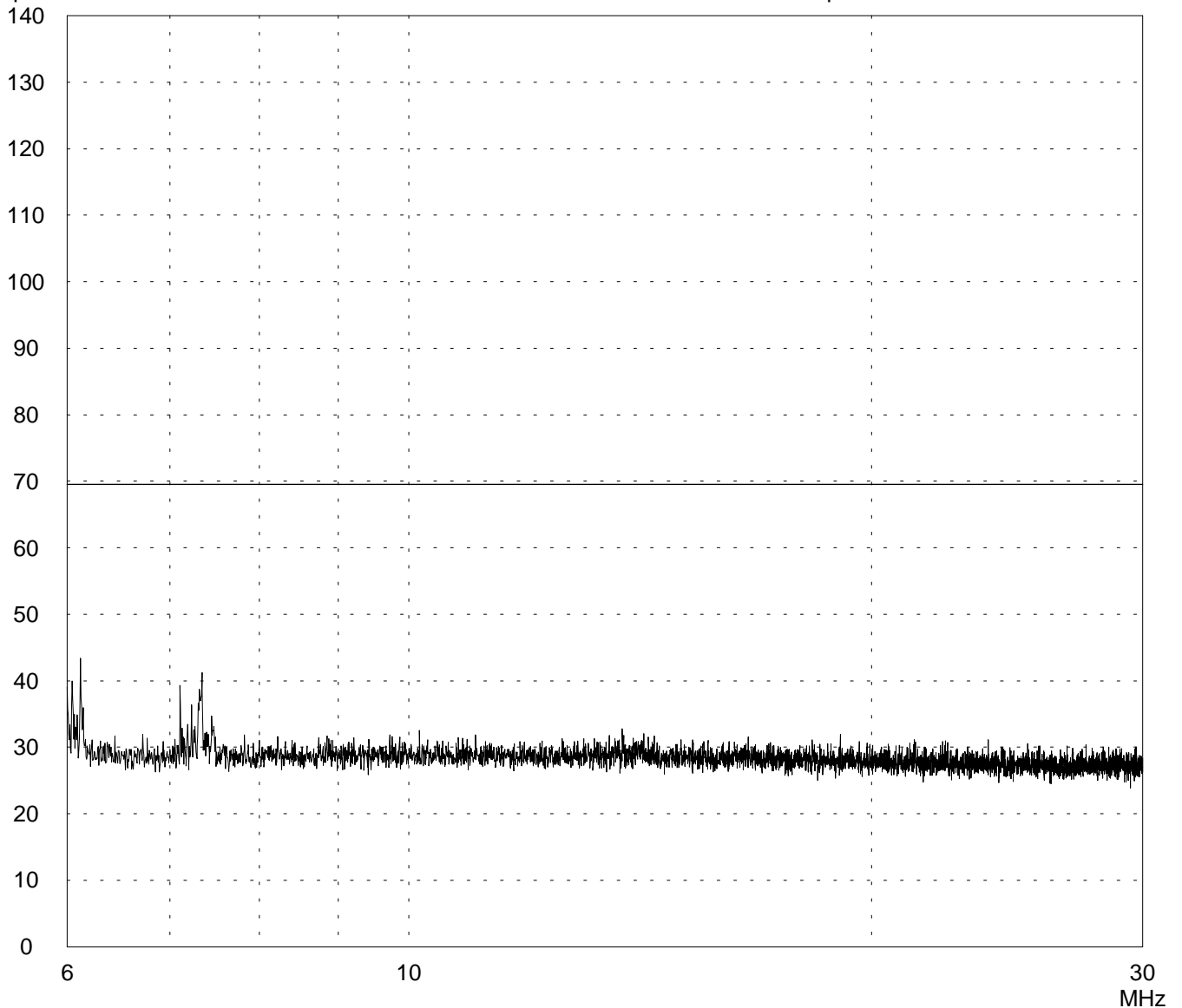
Mode:  
TX + RX under Test

Detector:  
Peak / Final Results: QP

Final results:  
20 dB Margin 25 Subranges

dB $\mu$ V/m

Limit1: FCC Subpart C Transducer: HFH2-Z2



Result:  
Limit kept

Project file:  
50104-05043-1

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

Model: Model 1500 Audio TX & RX	
Serial no.: Transmitter	
Applicant: Amphony Deutschland GmbH	
Test site: Fully anechoic room, cabin no. 2	
Tested on: Test distance 3 metres Horizontal Polarization	
Date of test: 08/11/2005	Operator: J. Roidt
Test performed: automatically	File name: default.emi

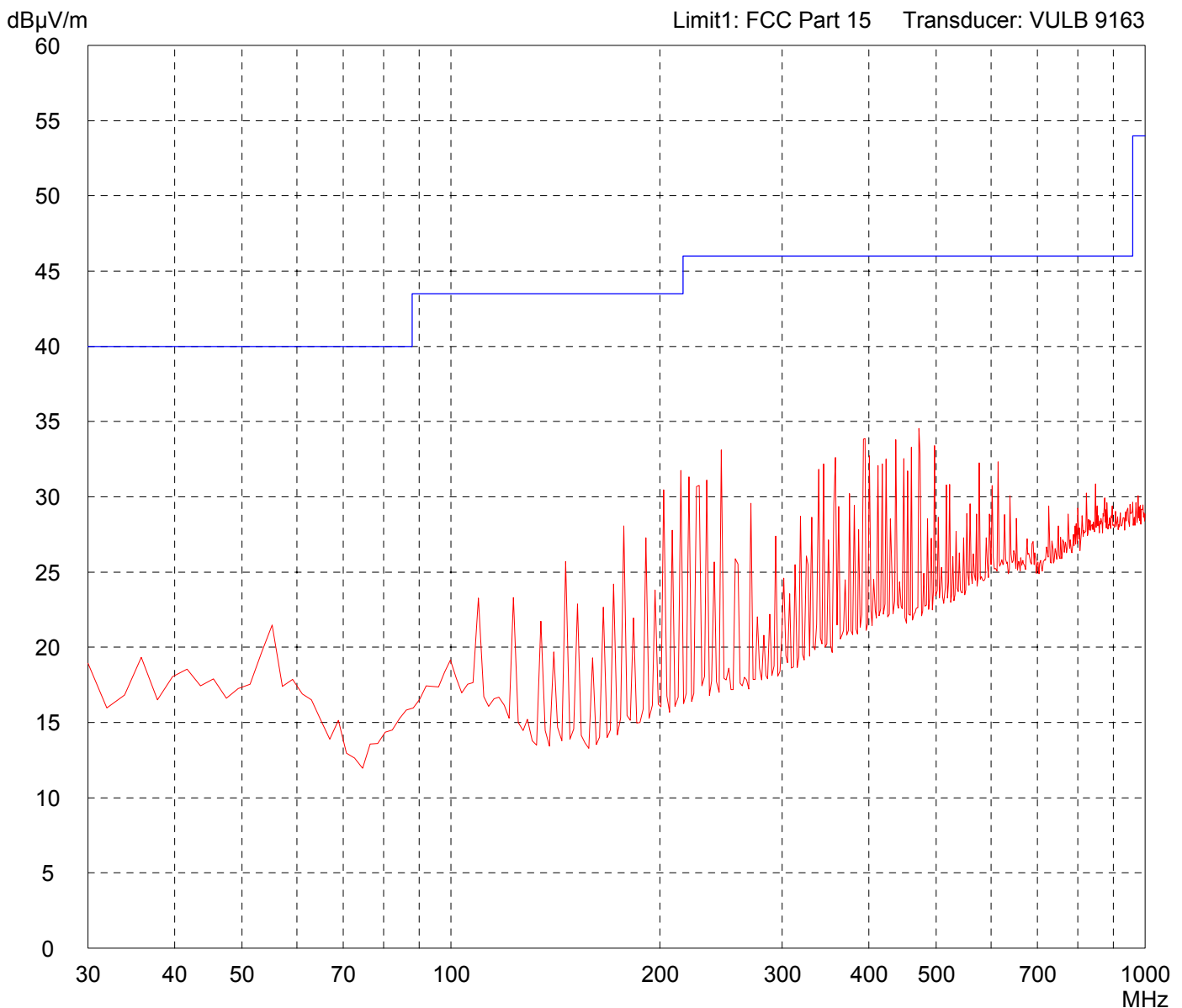
Comment:

Detector: Peak
-------------------

List of values:

10 dB Margin

50 Subranges



Result: Limit kept
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Project file:

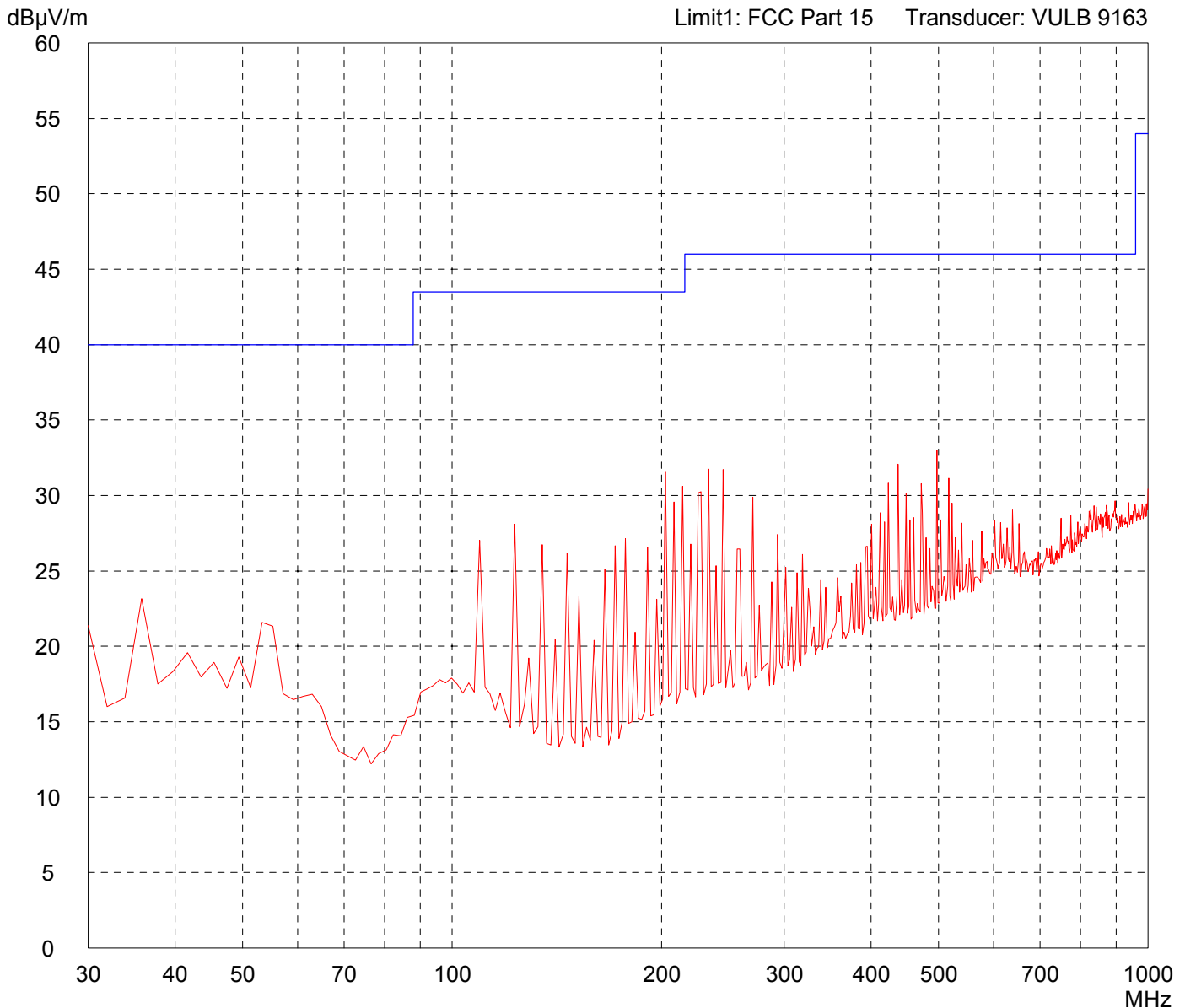
50104-50463-1

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

Model: <b>Model 1500 Audio TX &amp; RX</b>	Comment:
Serial no.: <b>Transmitter</b>	
Applicant: <b>Amphony Deutschland GmbH</b>	
Test site: <b>Fully anechoic room, cabin no. 2</b>	
Tested on: <b>Test distance 3 metres Vertical Polarization</b>	
Date of test: <b>08/11/2005</b>	Operator: <b>J. Roidt</b>
Test performed: <b>automatically</b>	File name: <b>default.emi</b>

Detector: <b>Peak</b>	List of values: <div style="display: flex; justify-content: space-between;"> <span><b>10 dB Margin</b></span> <span><b>50 Subranges</b></span> </div>
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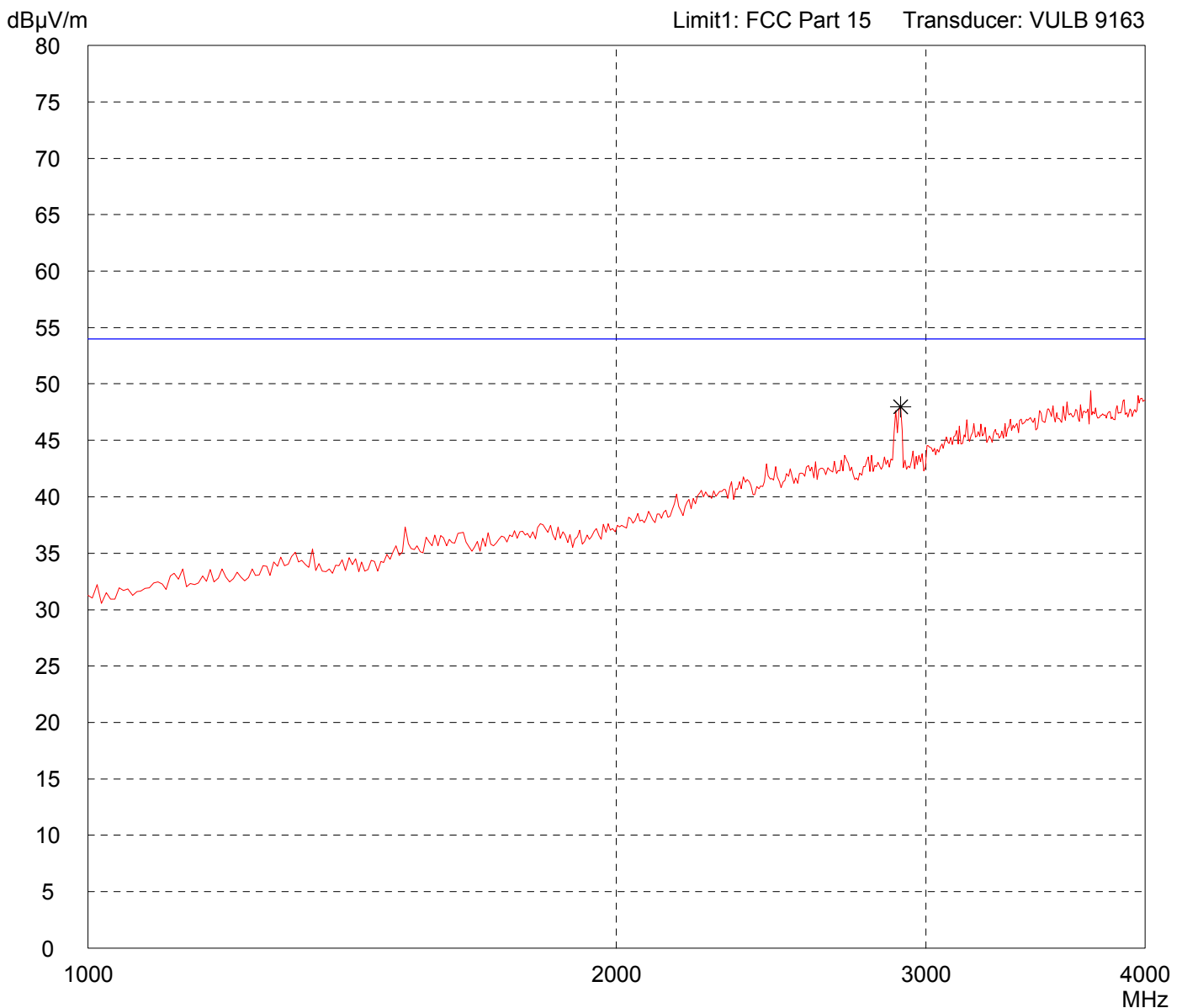
Result: <b>Limit kept</b>	Project file: <b>50104-50463-1</b>
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# Radiated Emission Test 1 GHz - 4 GHz acc. to FCC Part 15 (Fully Anechoic Chamber)

Model: <b>Model 1500 Audio TX &amp; RX</b>	Comment:
Serial no.: <b>Transmitter</b>	
Applicant: <b>Amphony Deutschland GmbH</b>	
Test site: <b>Fully anechoic room, cabin no. 2</b>	
Tested on: <b>Test distance 3 metres Horizontal Polarization</b>	
Date of test: <b>08/11/2005</b>	Operator: <b>J. Roidt</b>
Test performed: <b>automatically</b>	File name: <b>default.emi</b>

Detector: <b>Peak</b>	List of values: <b>Selected by hand</b>
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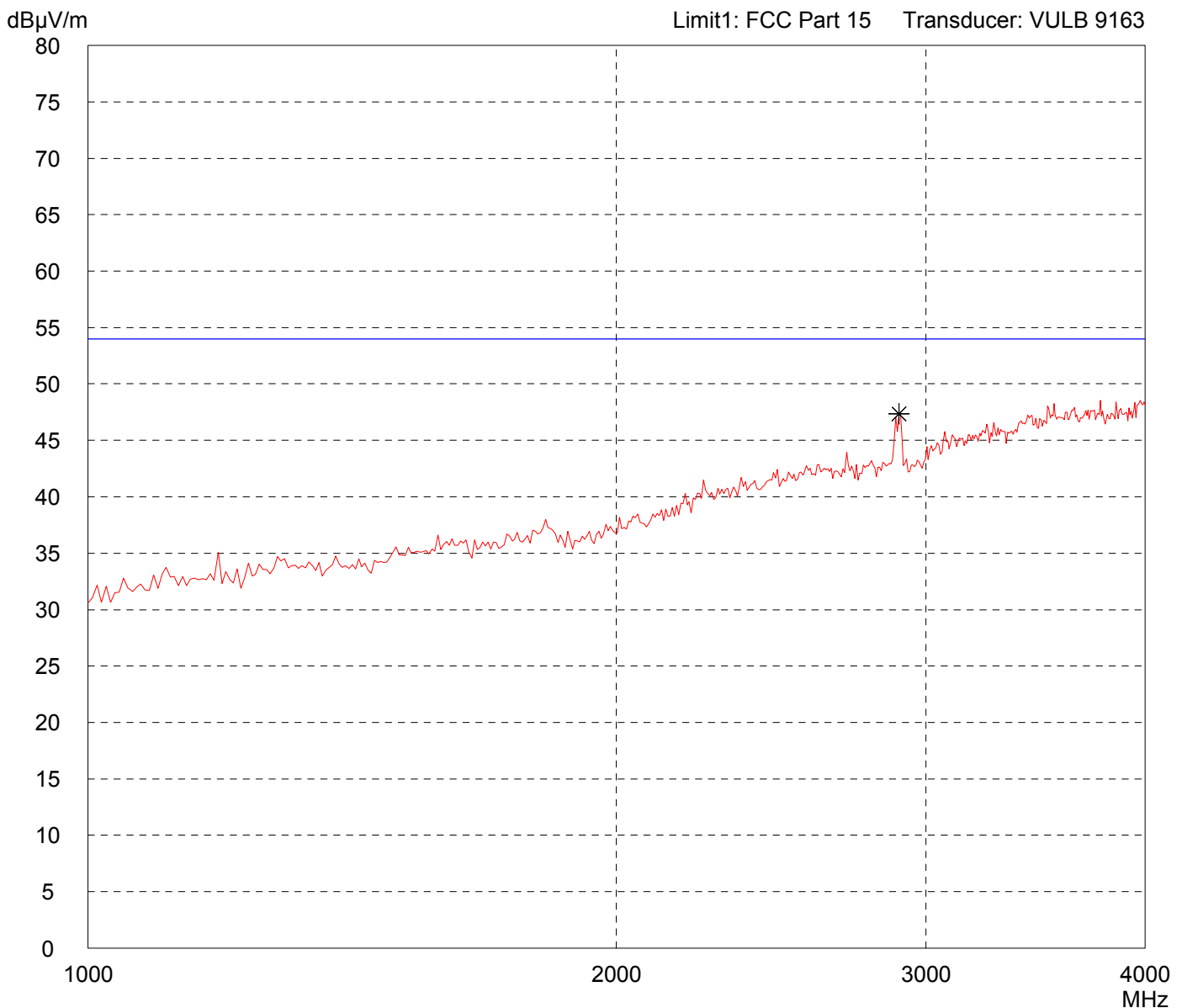
Result: <b>Limit kept</b>	Project file: <b>50104-50463-1</b>
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# Radiated Emission Test 1 GHz - 4 GHz acc. to FCC Part 15 (Fully Anechoic Chamber)

Model: <b>Model 1500 Audio TX &amp; RX</b>	Comment:
Serial no.: <b>Transmitter</b>	
Applicant: <b>Amphony Deutschland GmbH</b>	
Test site: <b>Fully anechoic room, cabin no. 2</b>	
Tested on: <b>Test distance 3 metres Vertical Polarization</b>	
Date of test: <b>08/11/2005</b>	Operator: <b>J. Roidt</b>
Test performed: <b>automatically</b>	File name: <b>default.emi</b>

Detector: <b>Peak</b>	List of values: <b>Selected by hand</b>
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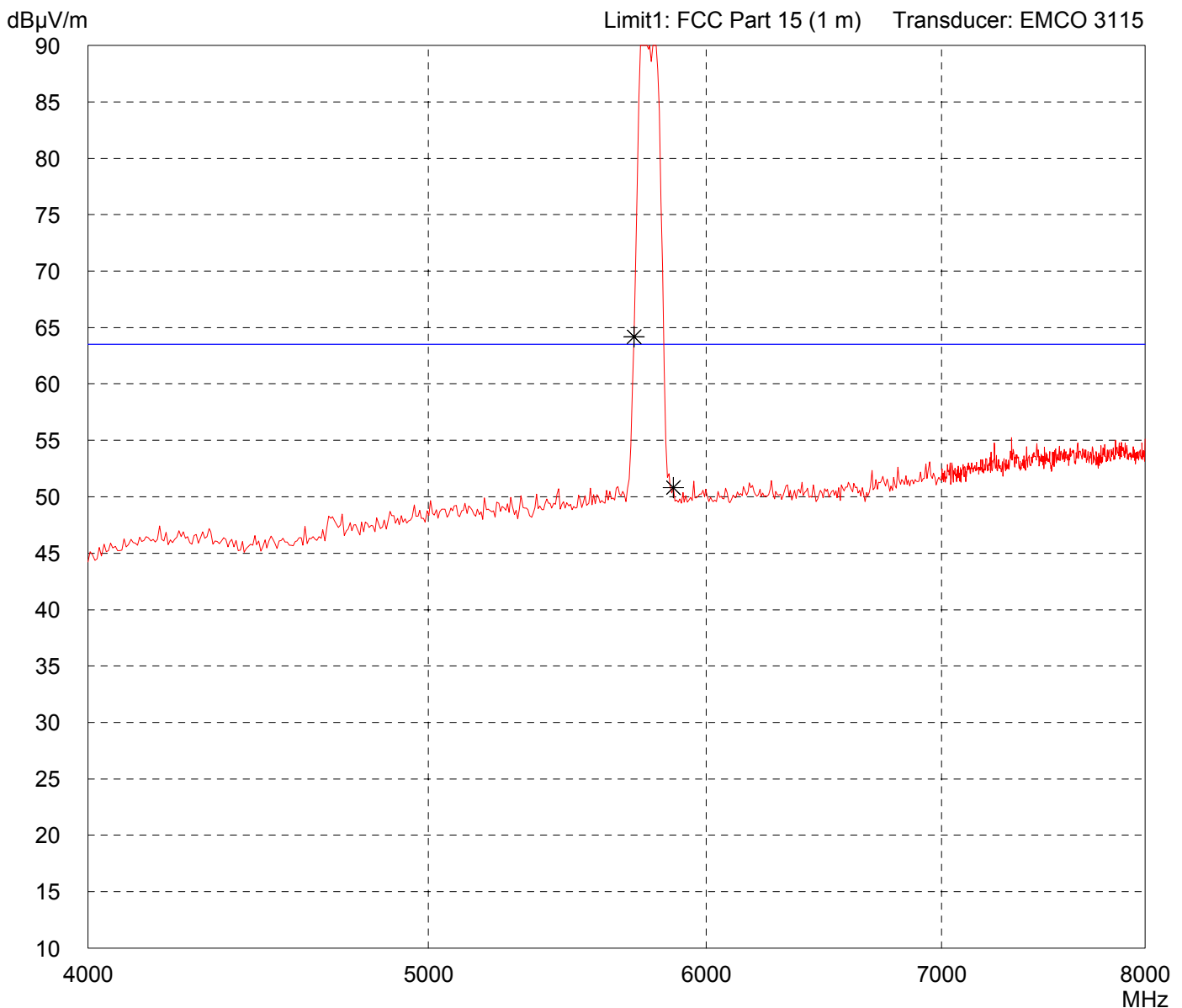
Result: <b>Limit kept</b>	Project file: <b>50104-50463-1</b>
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# Radiated Emission Test 4 GHz - 8 GHz acc. to FCC Part 15 (Fully Anechoic Chamber)

Model: <b>Model 1500 Audio TX &amp; RX</b>	Comment:
Serial no.: <b>Transmitter</b>	
Applicant: <b>Amphony Deutschland GmbH</b>	
Test site: <b>Fully anechoic room, cabin no. 2</b>	
Tested on: <b>Test distance 1 metre Horizontal Polarization</b>	
Date of test: <b>08/11/2005</b>	Operator: <b>J. Roidt</b>
Test performed: <b>automatically</b>	File name: <b>default.emi</b>

Detector: <b>Peak</b>	List of values: <b>Selected by hand</b>
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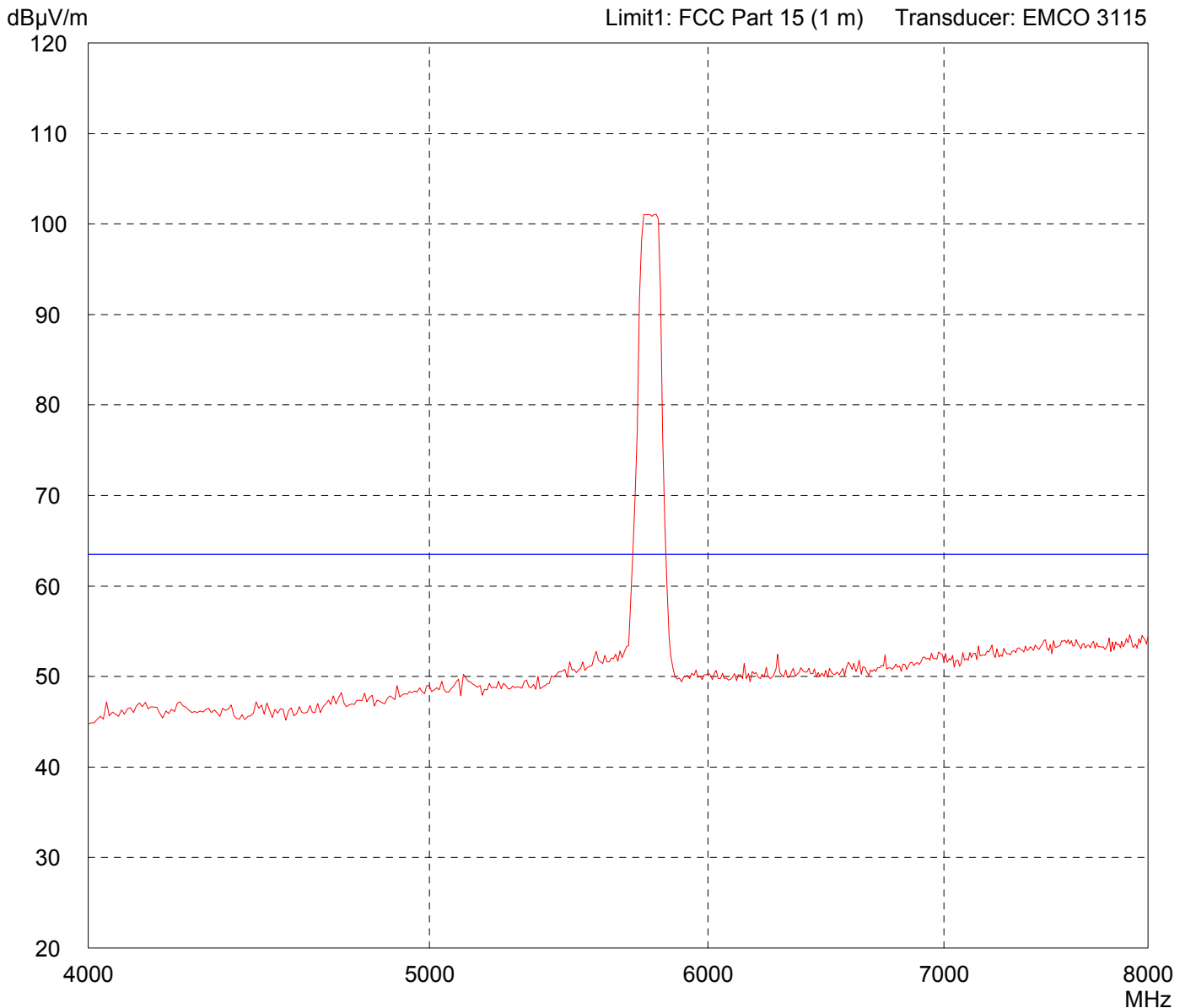


Result: <b>Limit kept</b>	Project file: <b>50104-50463-1</b>
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# Radiated Emission Test 4 GHz - 8 GHz acc. to FCC Part 15 (Fully Anechoic Chamber)

Model: <b>Model 1500 Audio TX &amp; RX</b>	Comment:
Serial no.: <b>Transmitter</b>	
Applicant: <b>Amphony Deutschland GmbH</b>	
Test site: <b>Fully anechoic room, cabin no. 2</b>	
Tested on: <b>Test distance 1 metre Vertical Polarization</b>	
Date of test: <b>08/11/2005</b>	Operator: <b>J. Roidt</b>
Test performed: <b>automatically</b>	File name: <b>default.emi</b>

Detector: <b>Peak</b>	List of values: <b>Selected by hand</b>
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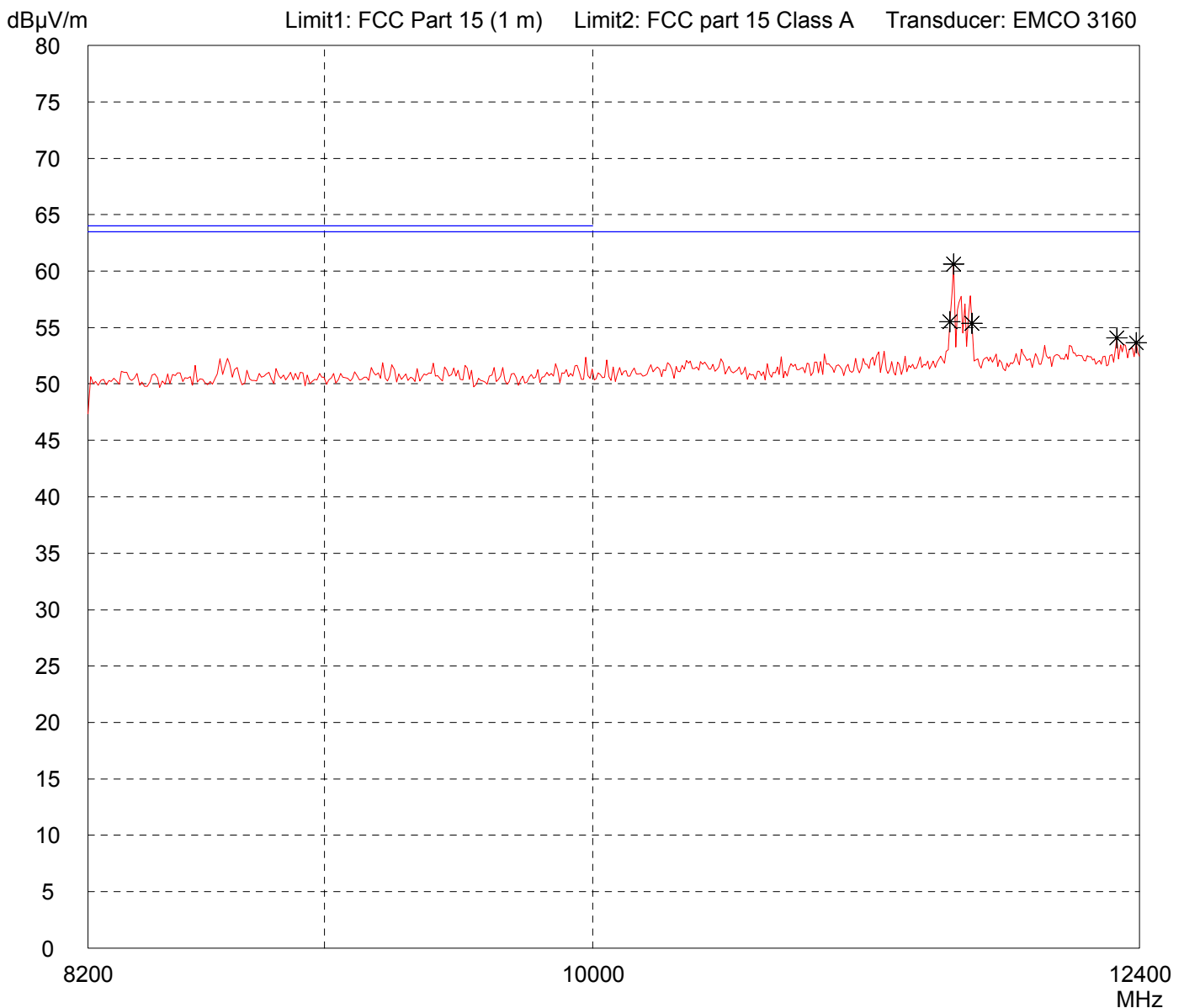
Result: <b>Limit kept</b>	Project file: <b>50104-50463-1</b>
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# Radiated Emission Test 8.2 GHz - 12.4 GHz acc. to FCC Part 15 (EMCO 3160)

Model: <b>Model 1500 Audio TX &amp; RX</b>	Comment:
Serial no.: <b>Transmitter</b>	
Applicant: <b>Amphony Deutschland GmbH</b>	
Test site: <b>Fully anechoic room, cabin no. 2</b>	
Tested on: <b>Test distance 1 meter Horizontal Polarization</b>	
Date of test: <b>08/11/2005</b>	
Operator: <b>J. Roidt</b>	
Test performed: <b>automatically</b>	
File name: <b>default.emi</b>	

Detector: <b>Peak</b>	List of values: <div style="display: flex; justify-content: space-between;"> <span><b>10 dB Margin</b></span> <span><b>50 Subranges</b></span> </div>
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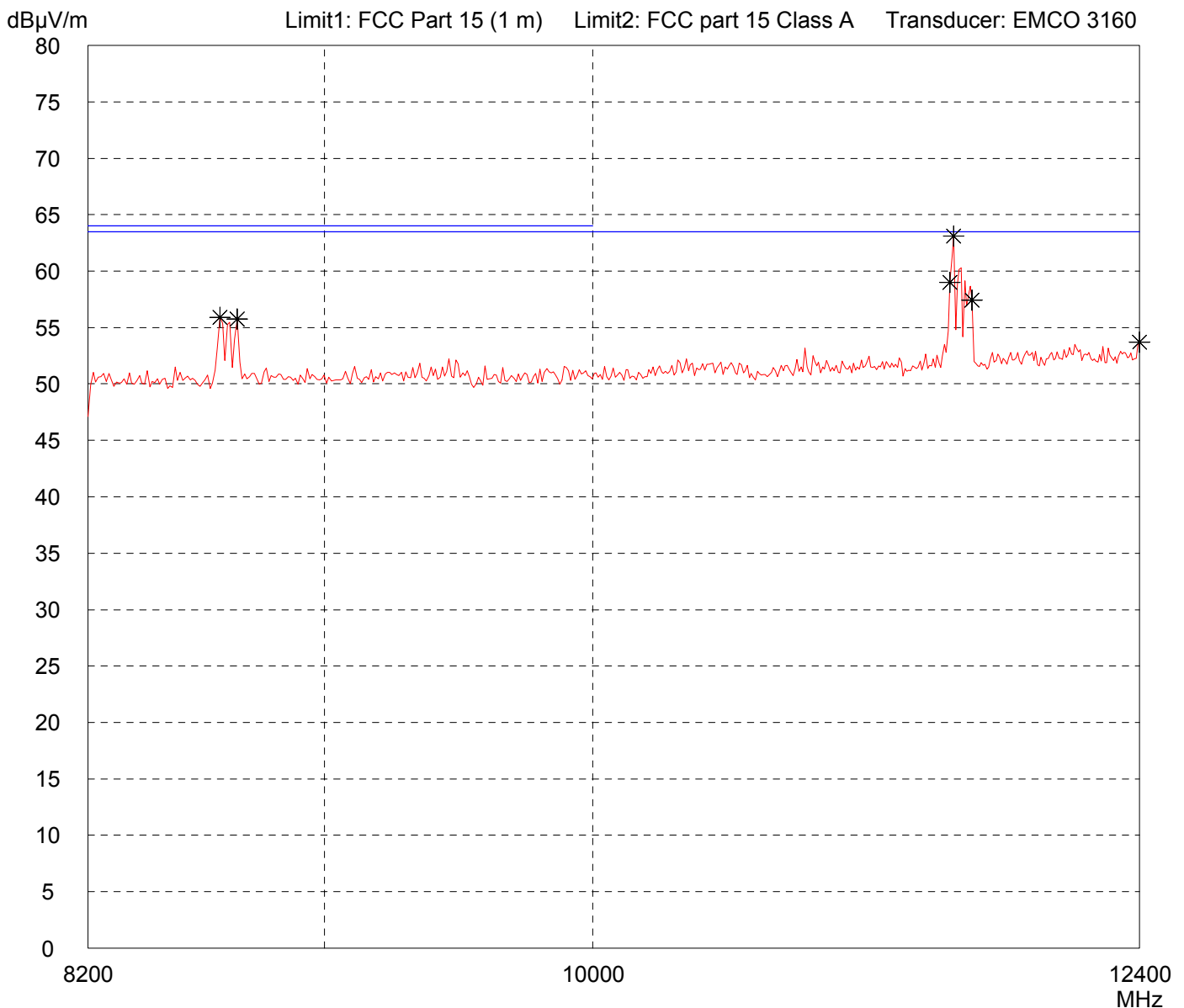


Result: <b>Limit kept</b>	Project file: <b>50104-50463-1</b>
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# Radiated Emission Test 8.2 GHz - 12.4 GHz acc. to FCC Part 15 (EMCO 3160)

Model: <b>Model 1500 Audio TX &amp; RX</b>	Comment:
Serial no.: <b>Transmitter</b>	
Applicant: <b>Amphony Deutschland GmbH</b>	
Test site: <b>Fully anechoic room, cabin no. 2</b>	
Tested on: <b>Test distance 1 meter Vertical Polarization</b>	
Date of test: <b>08/11/2005</b>	
Operator: <b>J. Roidt</b>	
Test performed: <b>automatically</b>	
File name: <b>default.emi</b>	

Detector: <b>Peak</b>	List of values: <div style="display: flex; justify-content: space-between;"> <span><b>10 dB Margin</b></span> <span><b>50 Subranges</b></span> </div>
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Result: <b>Limit kept</b>	Project file: <b>50104-50463-1</b>
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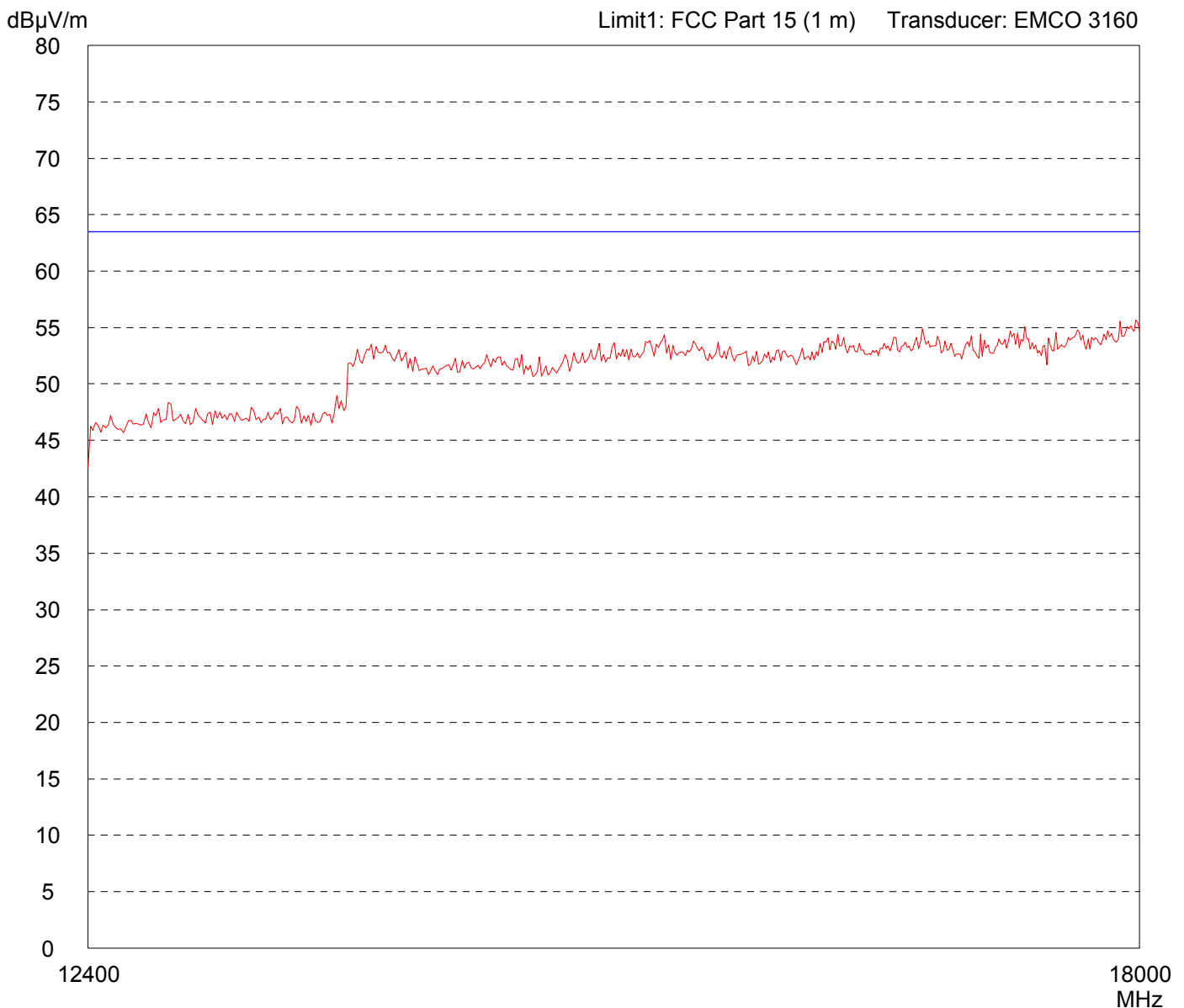


# Radiated Emission Test 12.4 GHz - 18 GHz acc. to FCC Part 15 (EMCO 3160)

Model: <b>Model 1500 Audio TX &amp; RX</b>	Comment:
Serial no.: <b>Transmitter</b>	
Applicant: <b>Amphony Deutschland GmbH</b>	
Test site: <b>Fully anechoic room, cabin no. 2</b>	
Tested on: <b>Test distance 1 meter Horizontal Polarization</b>	
Date of test: <b>08/11/2005</b> Operator: <b>J. Roidt</b>	
Test performed: <b>by hand</b>	File name: <b>default.emi</b>

Detector: <b>Peak</b>	List of values: <b>Selected by hand</b>
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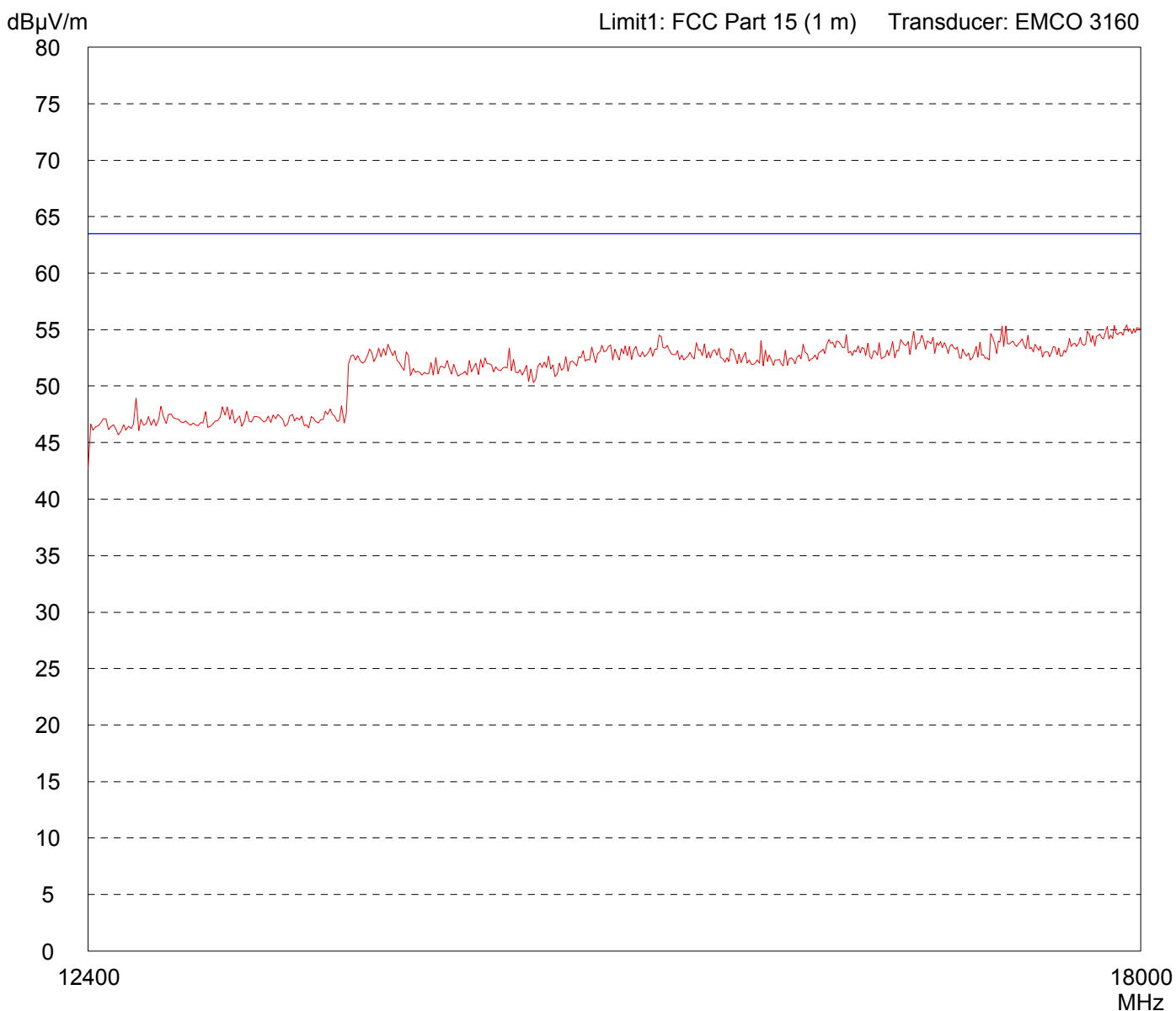
Result: <b>Limit kept</b>	Project file: <b>50104-50463-1</b>
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# Radiated Emission Test 12.4 GHz - 18 GHz acc. to FCC Part 15 (EMCO 3160)

Model: <b>Model 1500 Audio TX &amp; RX</b>	Comment:
Serial no.: <b>Transmitter</b>	
Applicant: <b>Amphony Deutschland GmbH</b>	
Test site: <b>Fully anechoic room, cabin no. 2</b>	
Tested on: <b>Test distance 1 meter Vertical Polarization</b>	
Date of test: <b>08/11/2005</b> Operator: <b>J. Roidt</b>	
Test performed: <b>by hand</b>	File name: <b>default.emi</b>

Detector: <b>Peak</b>	List of values: <b>Selected by hand</b>
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Result: <b>Limit kept</b>	Project file: <b>50104-50463-1</b>
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# Radiated Emissions Test

Model:  
Model 1500

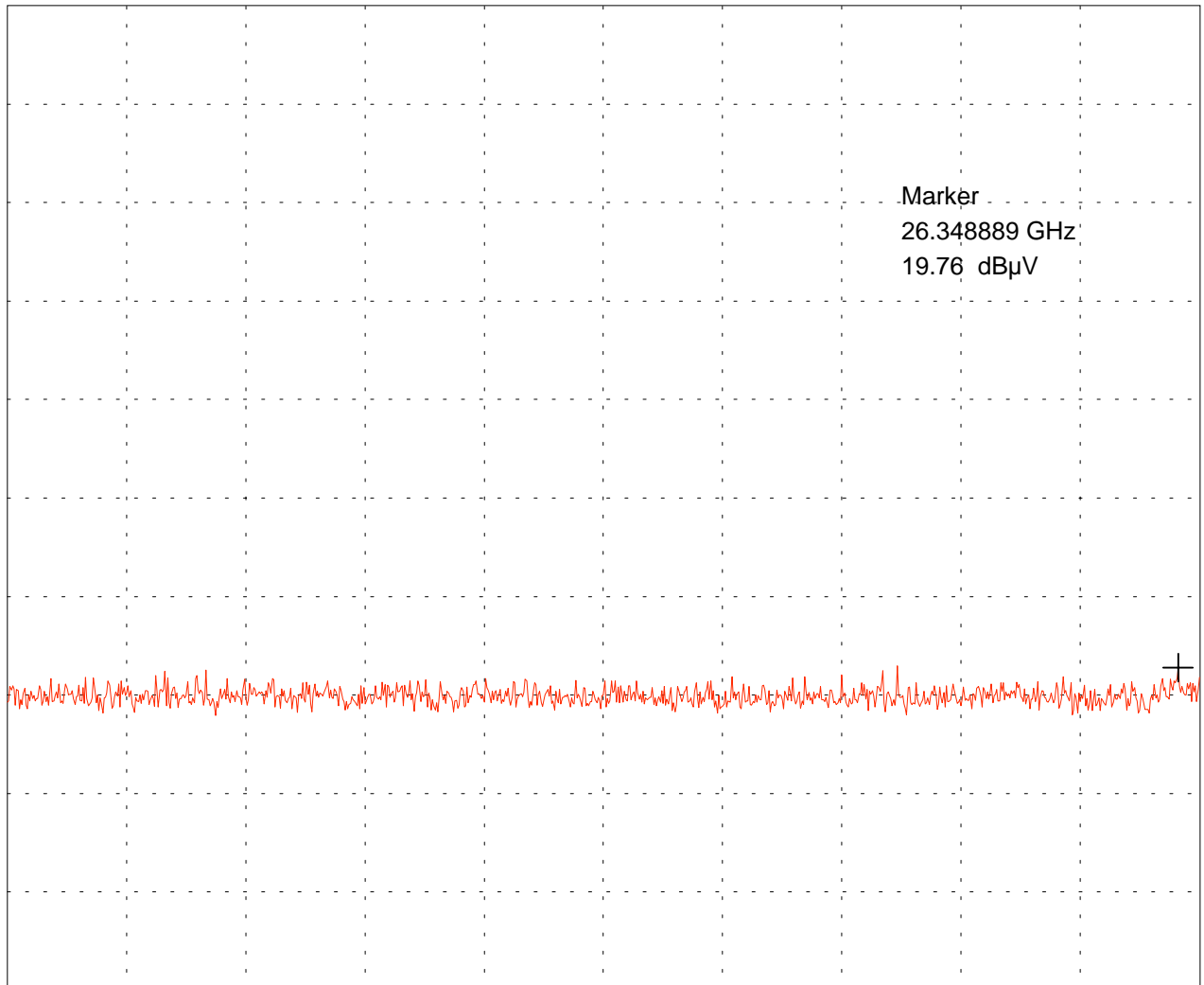
Serial No.:  
Transmitter

Applicant:  
Amphony Deutschland GmbH

Mode:

Ref.Level 87 dB $\mu$ V  
10 dB/Div.

ATT 0 dB



Start 18.000 GHz  
RBW 100 kHz

VBW 100 kHz

Stop 26.500 GHz  
SWP 2.60 s

Tested by:  
Johann Roidt

Date:  
18 October 2005

Project-No.:  
50104-050603

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# Radiated Emissions Test

Model:  
Model 1500

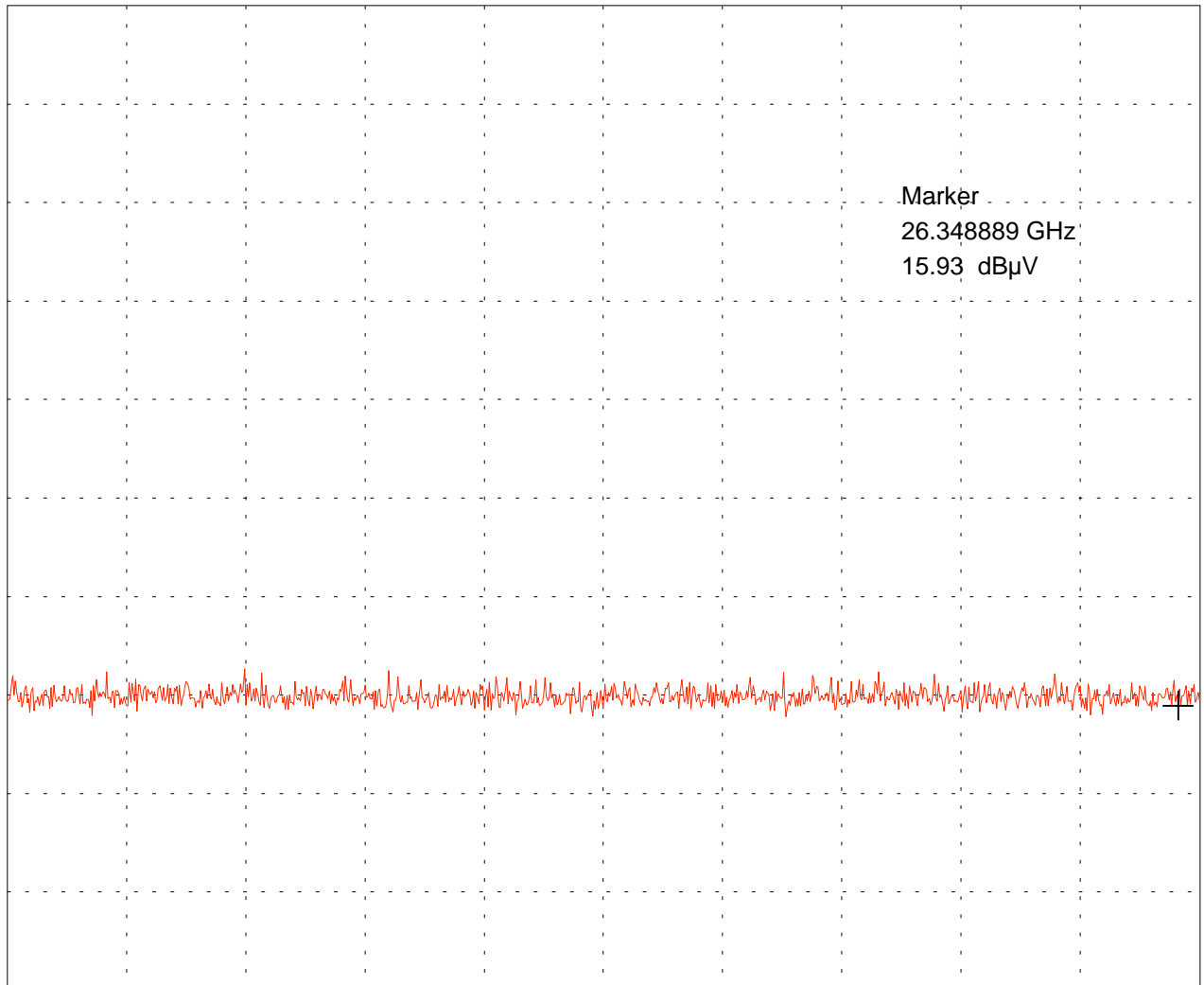
Serial No.:  
Transmitter

Applicant:  
Amphony Deutschland GmbH

Mode:

Ref.Level 87 dB $\mu$ V  
10 dB/Div.

ATT 0 dB



Start 18.000 GHz  
RBW 100 kHz

VBW 100 kHz

Stop 26.500 GHz  
SWP 2.60 s

Tested by:  
Johann Roidt

Date:  
18 October 2005

Project-No.:  
50104-050603

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# Radiated Emissions Test

Model:  
Model 1500

Serial No.:  
Transmitter

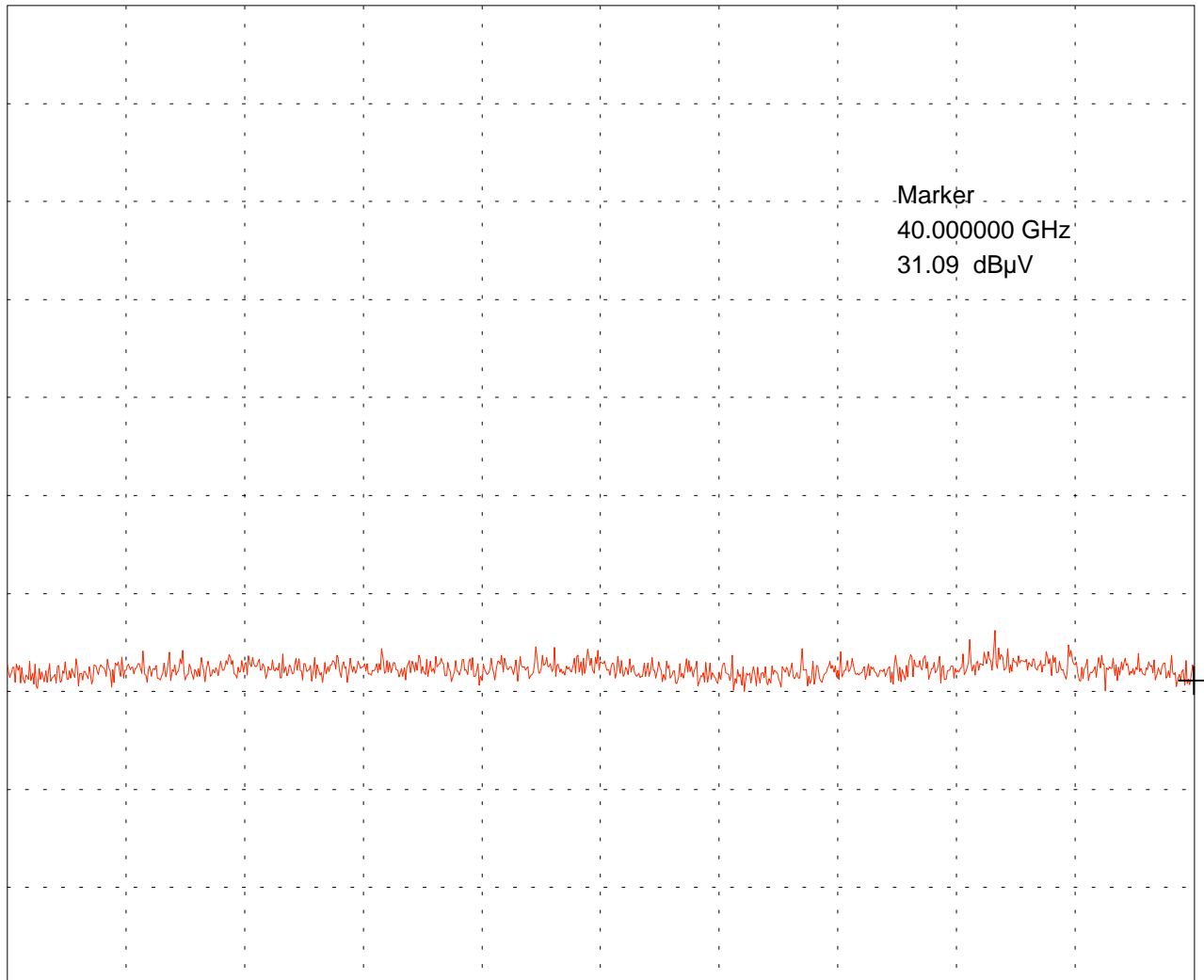
Applicant:  
Amphony Deutschland GmbH

Mode:  
- Horizontal Polarisation

Ref.Level 100 dB $\mu$ V  
10 dB/Div.

ATT 0 dB

Ref. Offset 26 dB



Start 26.500 GHz  
RBW 100 kHz

VBW 100 kHz

Stop 40.000 GHz  
SWP 4.20 s

Tested by:  
Johann Roidt

Date:  
18 October 2005

Project-No.:  
50104-050603

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# Radiated Emissions Test

Model:  
Model 1500

Serial No.:  
Transmitter

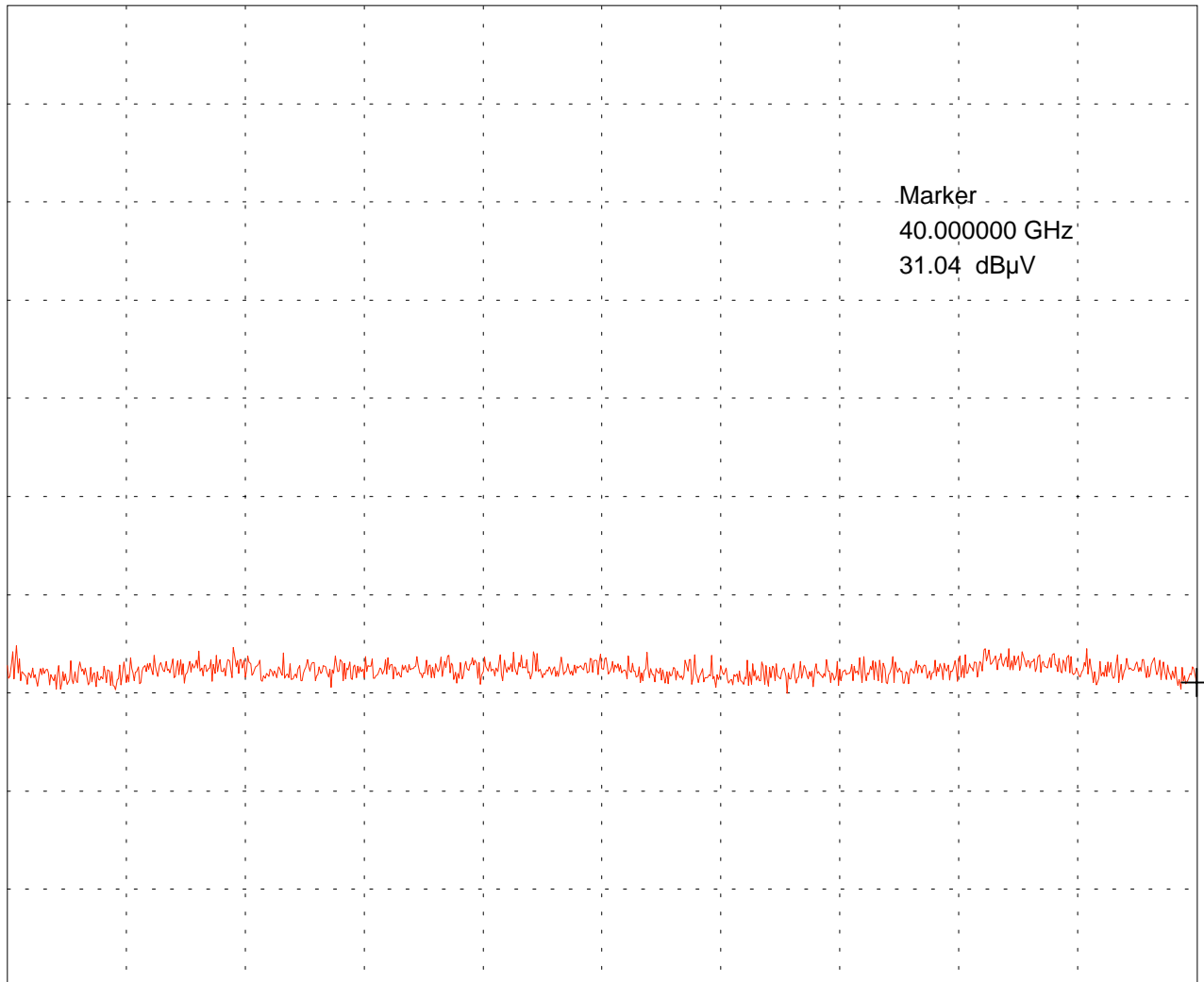
Applicant:  
Amphony Deutschland GmbH

Mode:  
- Vertical Polarisation

Ref.Level 100 dB $\mu$ V  
10 dB/Div.

ATT 0 dB

Ref. Offset 26 dB



Start 26.500 GHz  
RBW 100 kHz

VBW 100 kHz

Stop 40.000 GHz  
SWP 4.20 s

Tested by:  
Johann Roidt

Date:  
18 October 2005

Project-No.:  
50104-050603

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