

Straubing, 16 April 2003

TEST - REPORT

No. 56408-20820

for

AW-8P

Wireless Microphone Beltpack Transmitter

Applicant: SEKAKU Electron Industry Co. Ltd

Purpose of testing: To show compliance with

FCC Code of Federal Regulations,
Part 74 Subpart H, section 74.861

Note:

The test data of this report relate 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. Administrative Data

Test item (EUT)	
Type designation	AW-8P
Serial number(s):	001
Type of equipment:	Wireless Microphone Beltpack Transmitter
Parts/accessories:	
FCC-ID:	
Technical data	
Frequency range	794 – 805 MHz
Operational frequencies	794.300 MHz, 799.600 MHz, 804.3 MHz
Type of modulation	130KF3E
Pulse frequency	N/A
Pulse width	N/A
Antenna	Integrated
Power supply	9 V Battery
Applicant: (full address)	SEKAKU Electron Industry Co. Ltd. No. 1 Lane 17, Sec. 2, Han Shi West Road Taichung 401, Taiwan, R.O.C.
Contract identification:	---
Contact person:	Joan Wu
Manufacturer:	SEKAKU Electron Industry Co. Ltd.
Application details	
Receipt of EUT:	16 December 2002
Date of test:	February 2003
Note:	
Responsible for testing:	Johann Roidt
Responsible for test report:	Johann Roidt

2. Identification of Test Laboratory

DETAILS OF THE TEST LABORATORY	
COMPANY NAME:	Senton GmbH EMI/EMC Test Center
ADDRESS:	Aeussere Fruehlingsstrasse 45 D-94315 Straubing Germany
LABORATORY ACCREDITATION:	DAR-Registration No. TTI-P-G 062/94-40
FCC TEST SITE LISTING	
INDUSTRY CANADA TEST SITE REGISTRATION	IC 3050
NAME FOR CONTACT PURPOSES:	Mr. Johann Roidt
TELEPHONE: (+49) (0)9421 5522-0	FAX: (+49) (0)9421 5522-99

PERSONNEL INVOLVED IN THIS TEST REPORT	
TECHNICAL DIRECTOR:	 Mr. Johann Roidt
RESPONSIBLE FOR TESTING:	Mr. Johann Roidt
RESPONSIBLE FOR TEST REPORT:	Mr. Johann Roidt

SUMMARY OF TEST RESULTS
The tested sample complies with the requirements set forth in the Code of Regulations Part 15 Subpart H, Section § 74.861 of the Federal Communication Commission (FCC).

3. Operation Mode of EUT

Transmitter operating continuously,
full tests were performed on lowest, middle and highest RF channel.
With battery supply 9.00 V DC

4. Configuration

Configuration of the EUT
Not applicable

Cables connected to the EUT
Not applicable

Peripheral devices connected to the EUT
Not applicable

5. Measuring Methods

5.1. Maximum Transmitter Power (§ 2.1046 (a), 74.861 (e))

5.1.1. Conducted Maximum Transmitter Power

Rules and Specifications:	Sections 2.1046 (a)
Guide:	ANSI/TIA/EIA-603-1992, Paragraph 2.2.11

Measurement Procedure:
A spectrum analyzer / EMI test receiver is connected to the output of the transmitter power amplifier (conducted measurement) via dummy load while EUT was operating in transmit mode using the assigned frequency. The trace mode of the spectrum analyzer was set to max hold with: RBW = 100 kHz, VBW = 100 kHz, span = 1 MHz, sweep = 20 ms (auto mode)

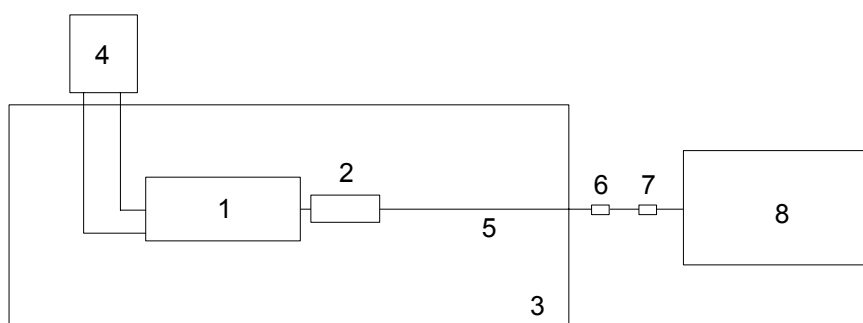


Figure 1: Measurement setup for testing on antenna connector

Test instruments used:

No.	Type	Model	Serial Number	Manufacturer
01	Spectrum Analyzer	FSP 30	100063	Rohde & Schwarz
08	Power Meter	NRVS	836856/015	Rohde & Schwarz
09	Power Sensor	NRV-Z52	837901/030	Rohde & Schwarz
18	Attenuator 20 dB	4776-20	9503	Narda
19	Attenuator 10 dB	4776-10	9412	Narda

5.1.2. Radiated Maximum Transmitter Power

Radiated Maximum Transmitter Power was measured with detector-function of the spectrum analyzer set to positive peak and trace mode max hold:
RBW = 100 kHz, VBW = 100 kHz, span = 1 MHz, sweep = 15 s

For measurement setup and procedure see section 5.2

5.2. Mean power of emissions 30 MHz – 1 GHz (§ 74.861.e.6.iii)

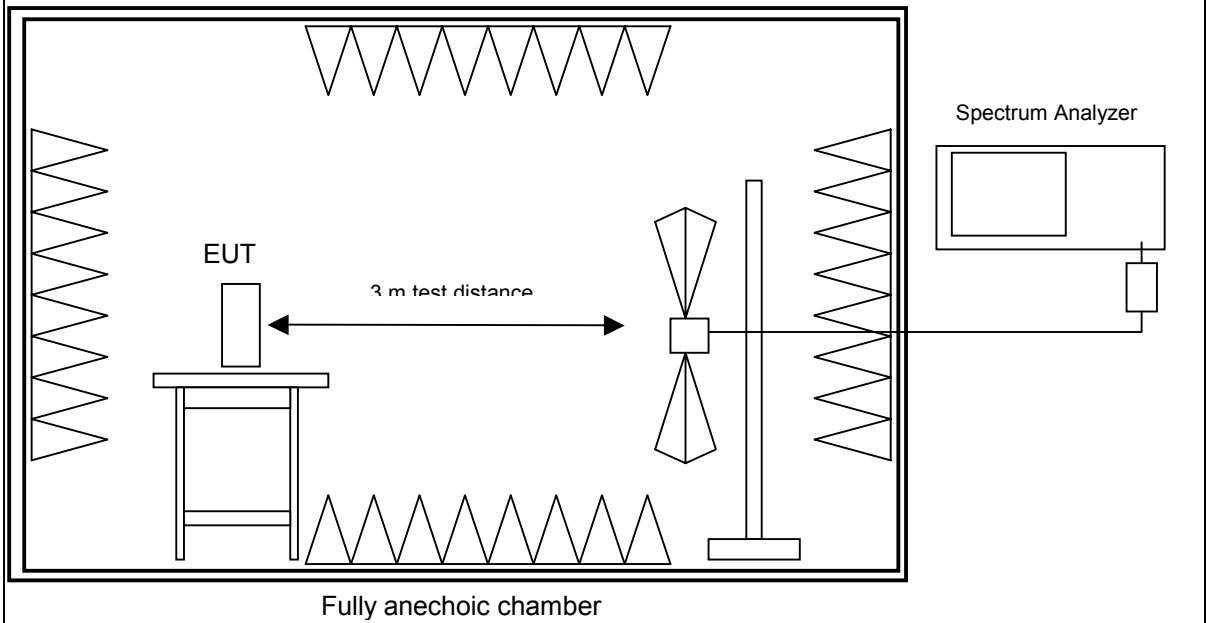
Rules and Specifications:	Sections 2.1053
Guide:	ANSI/TIA/EIA-603-1992, Paragraph 2.2.11

Measurement Procedure:

Radiated emissions were measured over the frequency range from 30 MHz to 1 GHz. For final testing the detector-function of the spectrum analyzer was set to positive peak and trace mode max hold: RBW = 3 kHz, VBW = 10 kHz, span = 20 kHz, sweep = 10 s

Measurements were 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 bandwidth set to 100 kHz. All tests were performed at a test-distance of 3 meters. 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. For final testing an open-area test-site was used. During the tests the EUT was rotated all around and the receiving-antenna was raised and lowered from 1 meter to 4 meters to find the maximum levels of emissions. The cables and equipment were placed and moved within the range of position likely to find their maximum emissions.

Final testing was performed referring to substitution method as described in TIA/EIA-603, section 2.2.12 ("Radiated Spurious Emissions").



Test instruments used:

No.	Type	Model	Serial Number	Manufacturer
01	Spectrum Analyzer	FSP 30	100063	Rohde & Schwarz
113	Preamplifier	CPA9231A	3393	Schaffner
141	Biconical antenna	HK 116	829708/006	Rohde & Schwarz
143	Log. periodic antenna	3147	9112-1054	EMCO
003	Fully anechoic room	No. 2	1452	Albatross Projects

5.3. Radiated Emission > 1 GHz (§ 74.861.e.6.iii)

Rules and Specifications:	Sections 2.1053
Guide:	ANSI/TIA/EIA-603-1992, Paragraph 2.2.11

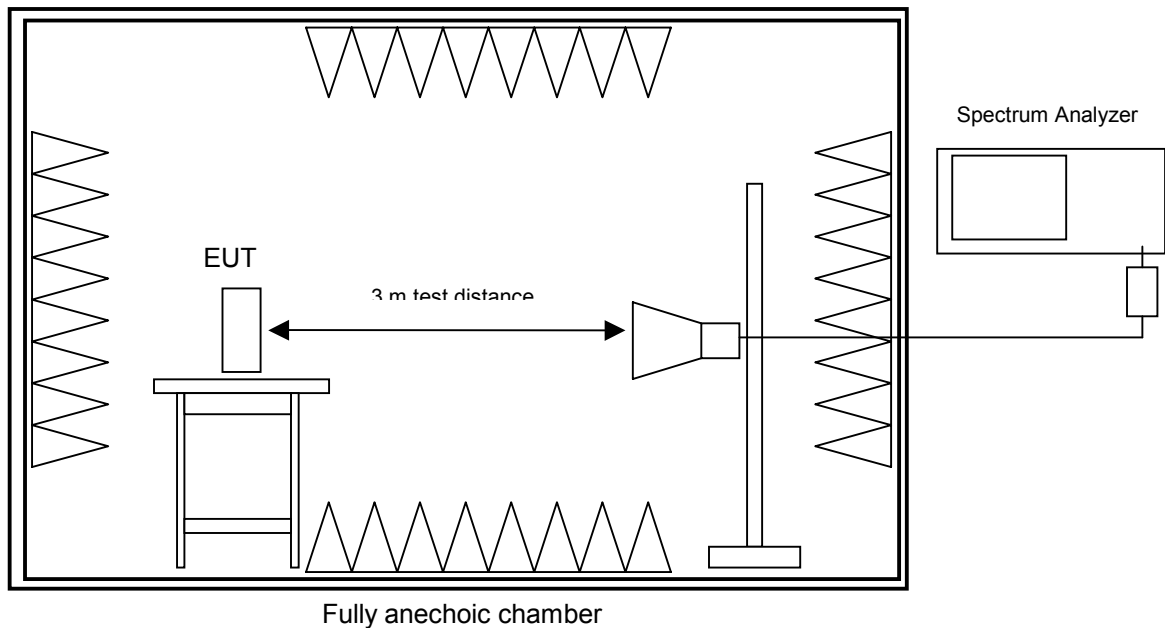
Measurement Procedure:

Radiated emissions are measured in the frequency range 1 GHz to 8 GHz. Resolution and video bandwidth of the spectrum analyzer are set to 1 MHz. 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. Additional measurements are performed at critical frequencies with reduced span.

EUT is rotated all around and receiving antenna is raised and lowered to find the maximum levels of emission. The cables and equipment are placed and moved within the range of position likely to find their maximum emissions.

All tests are performed in a fully-anechoic chamber with a test-distance of 3 meters.

If required preamplifiers are used for the whole frequency range. Special care is taken to avoid overload in transmit mode (using appropriate attenuators and filters if necessary).



Test instruments used:

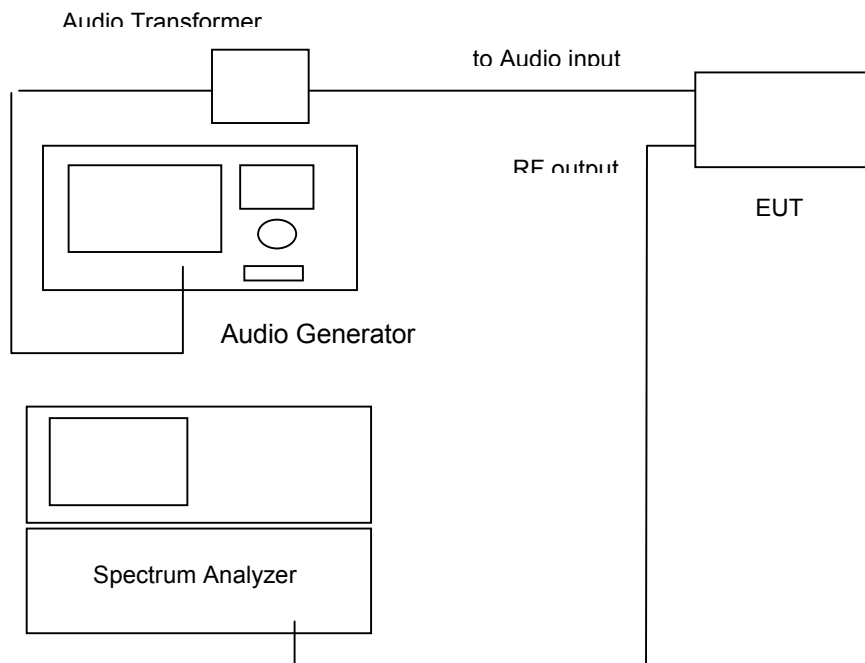
No.	Type	Model	Serial Number	Manufacturer
01	Spectrum Analyzer	FSP 30	100063	Rohde & Schwarz
143	Log. periodic antenna	3147	9112-1054	EMCO
145	Horn antenna	3115	9508-4553	EMCO
146	Horn antenna set	3160-03/-09	9112-1003	EMCO
114	Preamplifier 1-8 GHz	AFS3-00100800-32-LN	847743	Miteq
115	Preamplifier 8-18 GHz	ACO/180-3530	32641	CTT
003	Fully anechoic room	No. 2	1452	Albatross Projects

5.4. Emission Masks (Occupied Bandwidth) § 2.1049 (c) (1)

Rules and Specifications:	Sections 2.1049 (c) (1),
Guide:	ANSI/TIA/EIA-603-1992, Paragraph 2.2.11
Test Conditions:	As indicated below

Measurement Procedure:	1. The EUT and equipment were set up as shown below 2. The audio signal was adjusted for 16 dB above 50 % of nominal modulation at the frequency of maximum response. 3. The occupied bandwidth was measured with the Spectrum Analyzer set as shown on the test charts.
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Test Setup



Test instruments used:

No.	Type	Model	Serial Number	Manufacturer
108	Radio communication service monitor	CMS 54	838384/030	Rohde & Schwarz
102	Spectrum analyzer	FSP30	100036	Rohde & Schwarz
121	Attenuator	4776-10	9412	Narda
122	Attenuator	4776-20	9503	Narda
107	Audio analyzer	UPA	862954	Rohde & Schwarz

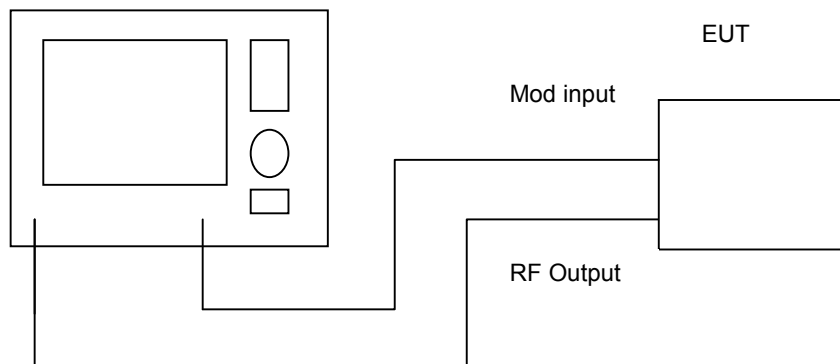
5.5. Audio Frequency Response, 2.1047 (a)

Rules and Specifications:	Sections 2.1047 (b),
Guide:	ANSI/TIA/EIA-603-1992, Paragraph 2.2.3
Test Conditions:	As indicated below

Measurement Procedure:	4. The audio signal was coupled to the microphone via a calibrated loudspeaker. 5. The audio signal was adjusted for 20 % nominal modulation at 1 kHz. this was taken as 0 dB reference. 6. With input levels held constant, the audiosignal was varied from 100 Hz to 30 kHz 7. The response was measured and recorded with a CMS 54 Radiocommunication Tester
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Test Setup

Radio Communication
Tester



Test instruments used:

No.	Type	Model	Serial Number	Manufacturer
108	Radio communication service monitor	CMS 54	838384/030	Rohde & Schwarz
102	Spectrum analyzer	FSP30	100036	Rohde & Schwarz
121	Attenuator	4776-10	9412	Narda
122	Attenuator	4776-20	9503	Narda
107	Audio analyzer	UPA	862954	Rohde & Schwarz

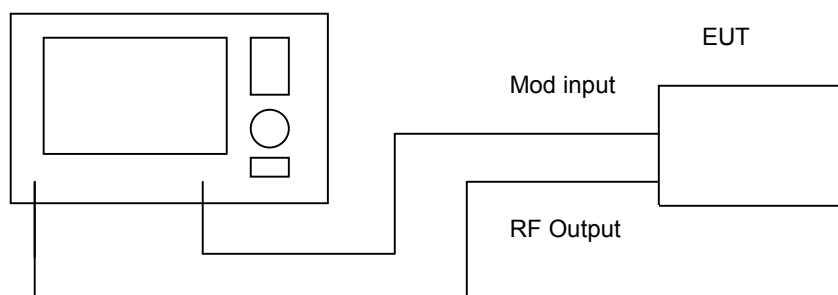
5.6. Modulation Limiting, § 2.1047 (b)

Rules and Specifications:	Sections 2.1047 (b),
Guide:	ANSI/TIA/EIA-603-1992, Paragraph 2.2.3
Test Conditions:	As indicated below

Measurement Procedure:	8. The audio signal was coupled to the microphone via a calibrated loudspeaker. 9. The modulation response was measured for three frequencies including the frequency with maximum response found during "Audio Frequency Response Test". 10. The input level was varied from 30 % modulation to 20 dB higher than the saturation point. The resulting deviation was measured with a CMS 54 Radiocommunication Tester. 11. Measurements were performed for positive and negative deviation.
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Test Setup

Radio Communication



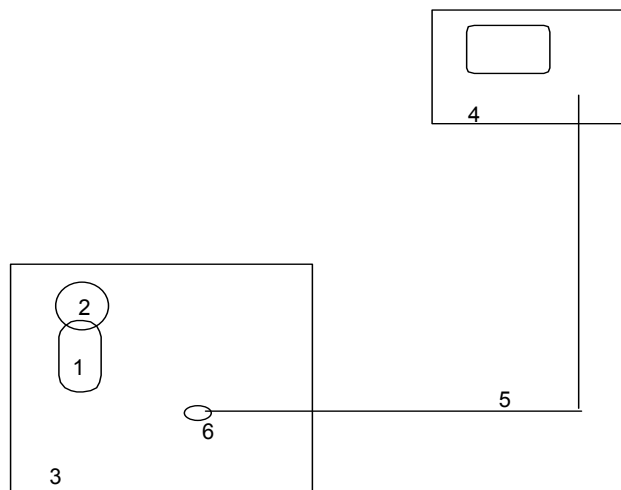
Test instruments used:

No.	Type	Model	Serial Number	Manufacturer
108	Radio communication service monitor	CMS 54	838384/030	Rohde & Schwarz
102	Spectrum analyzer	FSP30	100036	Rohde & Schwarz
121	Attenuator	4776-10	9412	Narda
122	Attenuator	4776-20	9503	Narda
107	Audio analyzer	UPA	862954	Rohde & Schwarz

5.7. Frequency Stability (Temperature Variation), § 2.1055 (a) (1)

Rules and Specifications:	Sections 2.1055 (a) (1), 74.861 (e) (4)
Guide:	ANSI/TIA/EIA-603-1992, Paragraph 2.2.2
Test Conditions:	As indicated below

Measurement Procedure:	12. The EUT and test equipment were set up as shown below 13. With all power removed, the temperature was decreased to -30°C and permitted to stabilize for three hours. Power was applied and the maximum change in frequency was noted within one minute. 14. With power OFF, the temperature was raised in 10°C steps. The sample was permitted to stabilize at each step for at least half of an hour. Power was applied and the maximum frequency change was noted within one minute. 15. The temperature test were performed for worst case conditions.
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- 1 Base unit (EUT)
- 2 RF-antenna (EUT)
- 3 Temperature test chamber
- 4 Spectrum analyzer
- 5 RF cable
- 6 Test probe

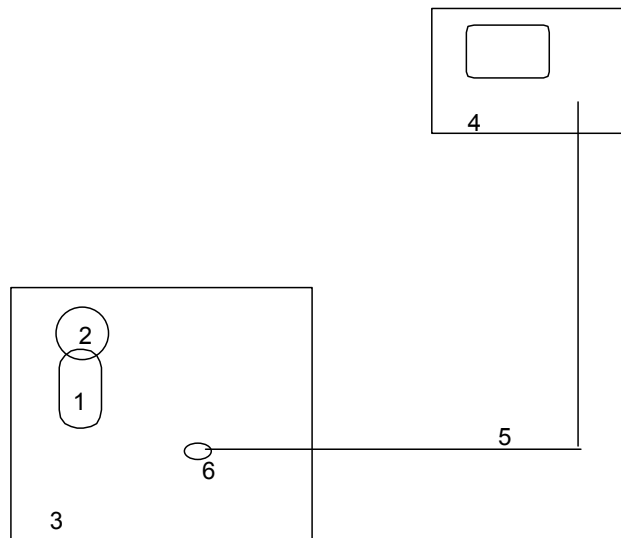
Test instruments used:

No.	Type	Model	Serial Number	Manufacturer
102	Spectrum analyzer	FSP30	100036	Rohde & Schwarz
121	Attenuator	4776-10	9412	Narda
122	Attenuator	4776-20	9503	Narda
017	DC power supply	NGSM 32/10	203	Rohde & Schwarz
007	Temperature test chamber	HT4010	07065550	Heraeus

5.8. Frequency Stability (Voltage Variation), § 2.1055 (b) (1)

Rules and Specifications:	Sections 2.1055 (b) (1), 74.861 (e) (4)
Guide:	ANSI/TIA/EIA-603-1992, Paragraph 2.2.2

Measurement Procedure:	16. The EUT and test equipment were set up as shown below 17. The temperature was set to 20 °C 18. The supply voltage was varied from 85% to 115% of the nominal voltage measured at the input of the EUT. 19. The variation in frequency was measured for worst case conditions.
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- 1 Base unit (EUT)
- 2 RF-antenna (EUT)
- 3 Temperature test chamber
- 4 Spectrum analyzer
- 5 RF cable
- 6 Test probe

Test instruments used:

No.	Type	Model	Serial Number	Manufacturer
102	Spectrum analyzer	FSP30	100036	Rohde & Schwarz
121	Attenuator	4776-10	9412	Narda
122	Attenuator	4776-20	9503	Narda
017	DC power supply	NGSM 32/10	203	Rohde & Schwarz
020	Variable transformer	RT 5A	10387	Grundig

6. Photographs Taken During Testing

Test setup for radiated emission measurement 30 MHz – 2 GHz (fully anechoic room)



7. List of Measurements

FCC Part 74 Subpart H			
Section(s):	Test	Page(s)	Result
	Transmitter:		
74.861.e.1	Measured unmodulated carrier power	20	Pass
74.861.e.6	Mean power of emissions 30 MHz - 1 GHz	21-22	Pass
74.861.e.6	Mean power of emissions 1 GHz - 8.0 GHz	21-22	Pass
74.861.e.5	Operating bandwidth	24-29	Pass
74.861.e.4	Frequency tolerance	30-31	Pass
	Receiver		
15.107	AC Powerline Emissions	---	Not applicable
15.109	Radiated Spurious emissions	---	Not applicable

Carrier Power Measurement

Rules and Specifications:	74.861 (e) (1) (i), 2.1046 (a)
Guide:	ANSI/TIA/EIA-603-1992, § 2.2.1
Limit:	The power of the measured unmodulated carrier power at the output of the transmitter power amplifier may not exceed 50 mW.

Test Site:	Radio Lab.
Distance:	Conducted Measurement
Date of Test:	26 March 2003

Frequency (MHz)	Detector	Antenna Polarization	Analyzer Reading (dBm)	Correction Factor (dB)	Mean Power (dBm)	Limit (dBm)	Margin (dB)
794,300	AV	N/A	1	0	1	17,0	16
799,600	AV	N/A	0,9	0	0,9	17,0	16,1
804,300	AV	N/A	0,7	0	0,7	17,0	16,3

*** = No emissions above noise floor detected

Sample calculation of erp values:

$$\text{Mean Power (dBm)} = \text{Analyzer Reading (dBm)} + \text{Correction Factor (dB)}$$

Test Results:	Pass
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Spurious Radiation Measurement

Rules and Specifications:	74.861 (e) (6) (iii), 2.1053 (a),
Guide:	ANSI/TIA/EIA-603-1992, § 2.2.12
Limit:	The attenuation for any frequency removed from the operating frequency by more than 50% up to 100% of the authorized bandwidth must be at least 25 dB by more than 100% up to 250% of the authorized bandwidth must be at least 35 dB by more than 250% of the authorized bandwidth must be at least 43+10log(mean output power in watts)

Tested Frequency:	794,300 MHz
Test Site:	Fully anechoic chamber
Distance:	3 Meter

Frequency (MHz)	Detector	Antenna Polarization	Analyzer Reading (dBm)	Correction Factor (dB)	Mean Power (dBm)	Limit (dBm)	Margin (dB)
1588,600	AV	Ver	-87,5	42.17	-44,88	-13,00	31,9

*** = All emissions showed more than 20 dB margin to the limit

Sample calculation of erp values:

$$\text{Mean Power (dBm)} = \text{Analyzer Reading (dBm)} + \text{Correction Factor (dB)}$$

Test Results:	Pass	
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Spurious Radiation Measurement

Rules and Specifications:	2.1053 (a), 74.861 (e) (6) (i), (II), (iii)
Guide:	ANSI/TIA/EIA-603-1992, § 2.2.12
Limit:	The attenuation for any frequency removed from the operating frequency by more than 50% up to 100% of the authorized bandwidth must be at least 25 dB by more than 100% up to 250% of the authorized bandwidth must be at least 35 dB by more than 250% of the authorized bandwidth must be at least $43+10\log(\text{mean output power in watts})$

Tested Frequency:	799.600 MHz
Test Site:	Fully anechoic chamber
Distance:	3 Meter

Frequency (MHz)	Detector	Antenna Polarization	Analyzer Reading (dBm)	Correction Factor (dB)	Mean Power (dBm)	Limit (dBm)	Margin (dB)
1600,000	AV	Ver	-89,1	42,3	-46,8	-13,0	33,8

*** = All emissions showed more than 20 dB margin to the limit

Sample calculation of erp values:

$$\text{Mean Power (dBm)} = \text{Analyzer Reading (dBm)} + \text{Correction Factor (dB)}$$

Test Results:	Pass	
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Spurious Radiation Measurement

Rules and Specifications:	2.1053 (a), 74.861 (e) (6) (i), (II), (iii)
Guide:	ANSI/TIA/EIA-603-1992, § 2.2.12
Limit:	The attenuation for any frequency removed from the operating frequency by more than 50% up to 100% of the authorized bandwidth must be at least 25 dB by more than 100% up to 250% of the authorized bandwidth must be at least 35 dB by more than 250% of the authorized bandwidth must be at least $43+10\log(\text{mean output power in watts})$

Tested Frequency:	804.300 MHz
Test Site:	Fully anechoic chamber
Distance:	3 Meter

Frequency (MHz)	Detector	Antenna Polarization	Analyzer Reading (dBm)	Correction Factor (dB)	Mean Power (dBm)	Limit (dBm)	Margin (dB)
25-2000	AV	Hor/Ver	***				

*** = All emissions showed more than 20 dB margin to the limit

Sample calculation of erp values:

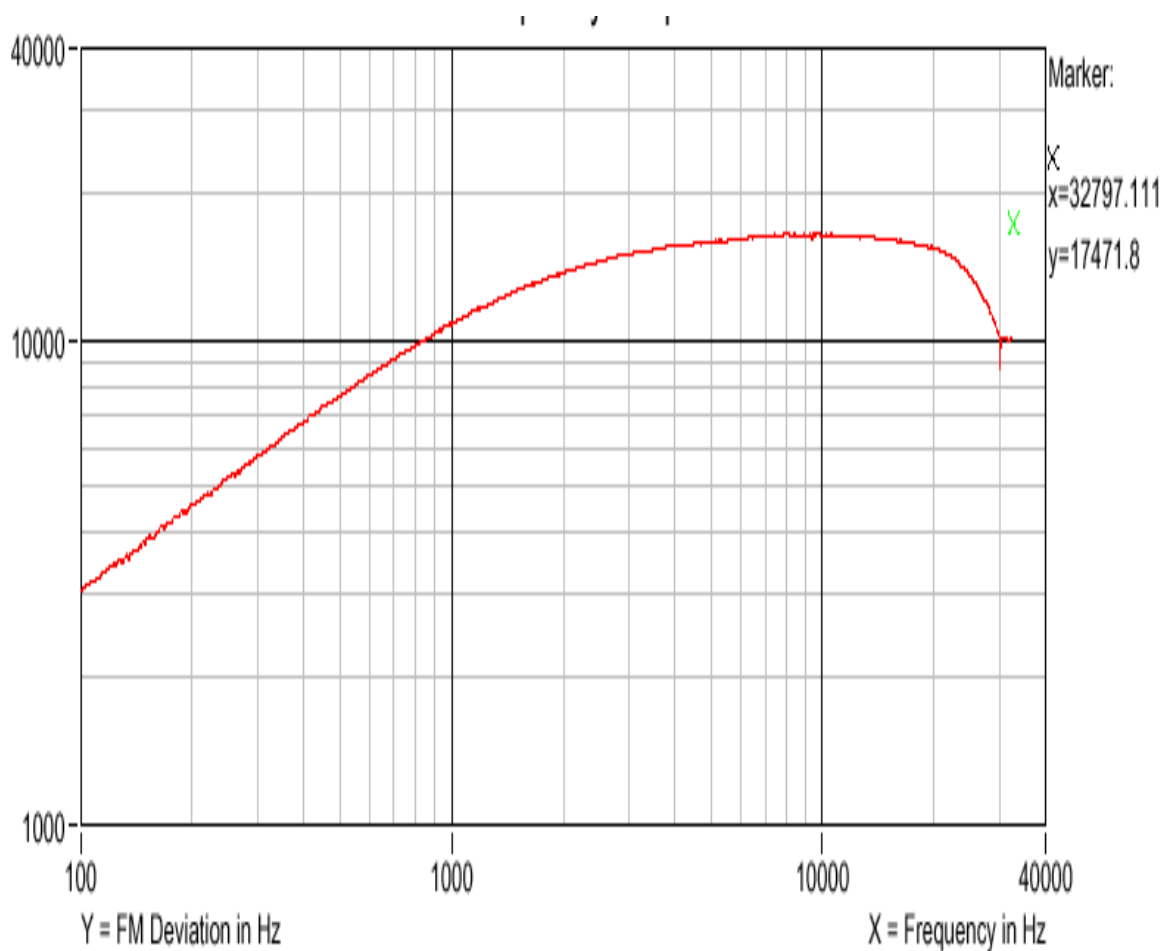
$$\text{Mean Power (dBm)} = \text{Analyzer Reading (dBm)} + \text{Correction Factor (dB)}$$

Test Results:	Pass
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Measurement of Audio Frequency Response

Rules and Specifications:	Sections 74.861 (5) and 2.1049 (c) (1)
Limits and Requirements:	---
Nominal Frequency of EUT:	799.600 MHz

Test Procedure:	According to TIA/EIA.603-1992, § 2.2.6
	Note: The audio signal was coupled to the microphone input of the transmitter via an audio isolation transformer with sufficient bandwidth

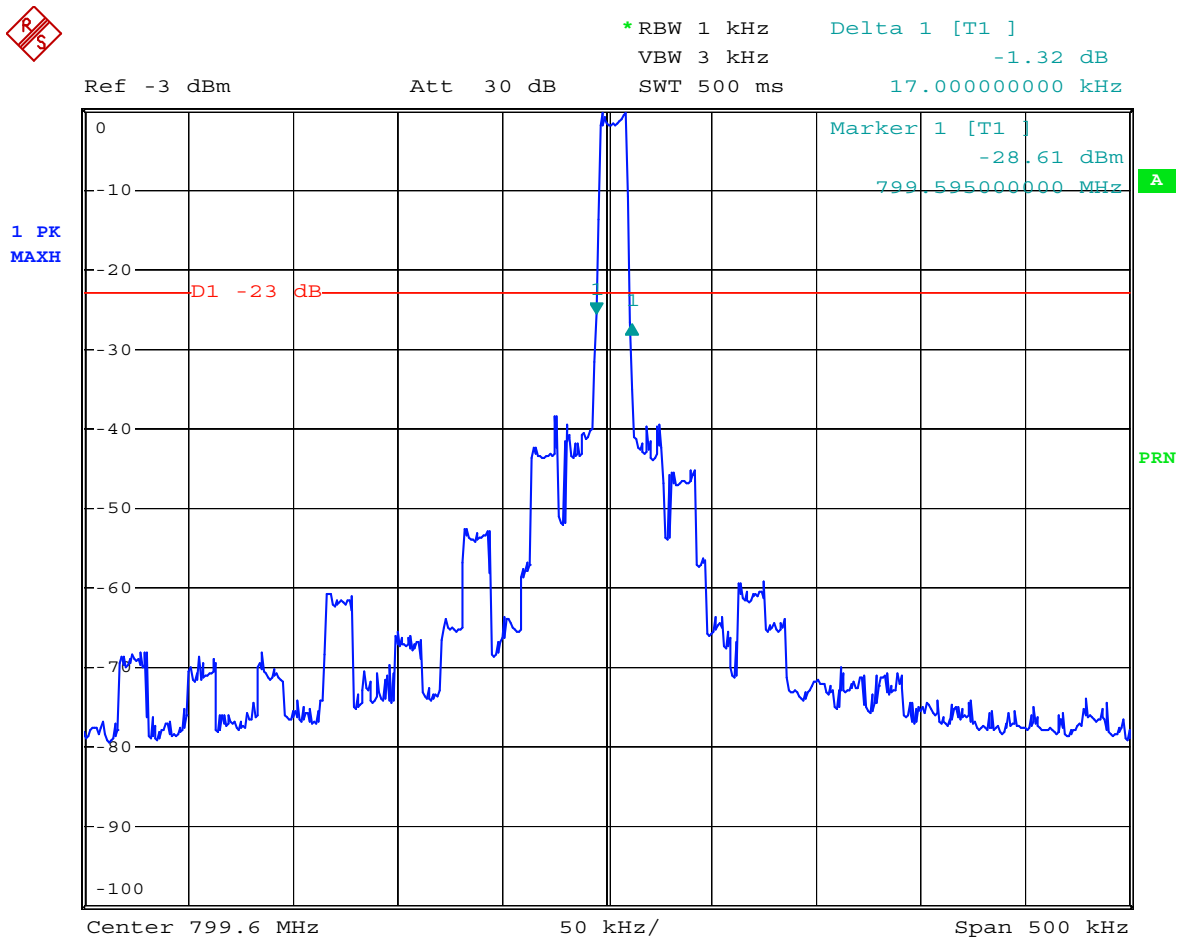


Test Results:	See graph above
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Measurement of Emission Masks (Occupied Bandwidth)

Rules and Specifications:	Sections 74.861 (5) and 2.1049 (c) (1)
Limits and Requirements:	The operating bandwidth shall not exceed 200 kHz
Nominal Frequency of EUT:	799.600 MHz

Test Procedure:	According to TIA/EIA.603-1992, § 2.2.11
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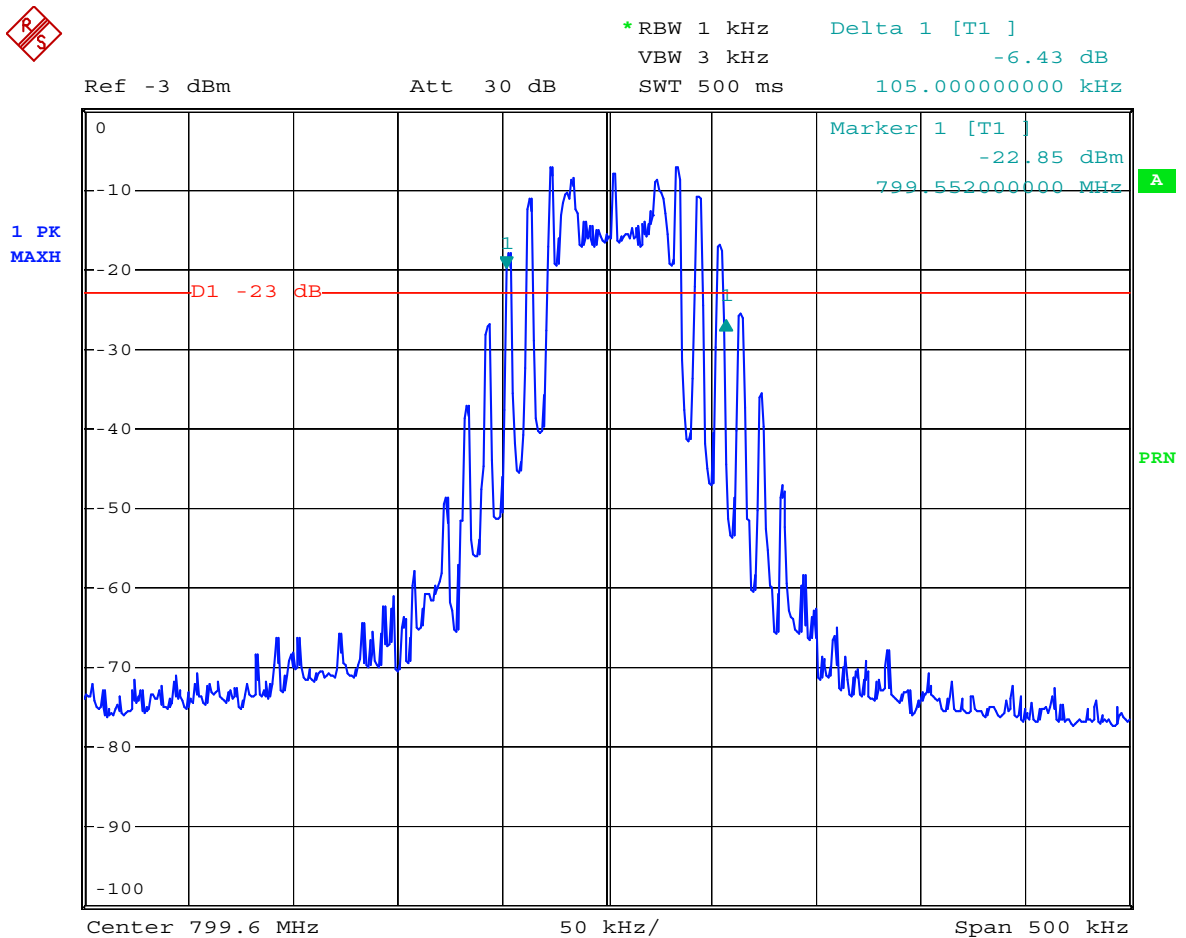
Comment A: UN20820 Occupied Bandwidth - 100 Hz
Date: 16.APR.2003 20:40:27

Test Results:	See graph above
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Measurement of Emission Masks (Occupied Bandwidth)

Rules and Specifications:	Sections 74.861 (5) and 2.1049 (c) (1)
Limits and Requirements:	The operating bandwidth shall not exceed 200 kHz
Nominal Frequency of EUT:	799.600 MHz

Test Procedure:	According to TIA/EIA.603-1992, § 2.2.11
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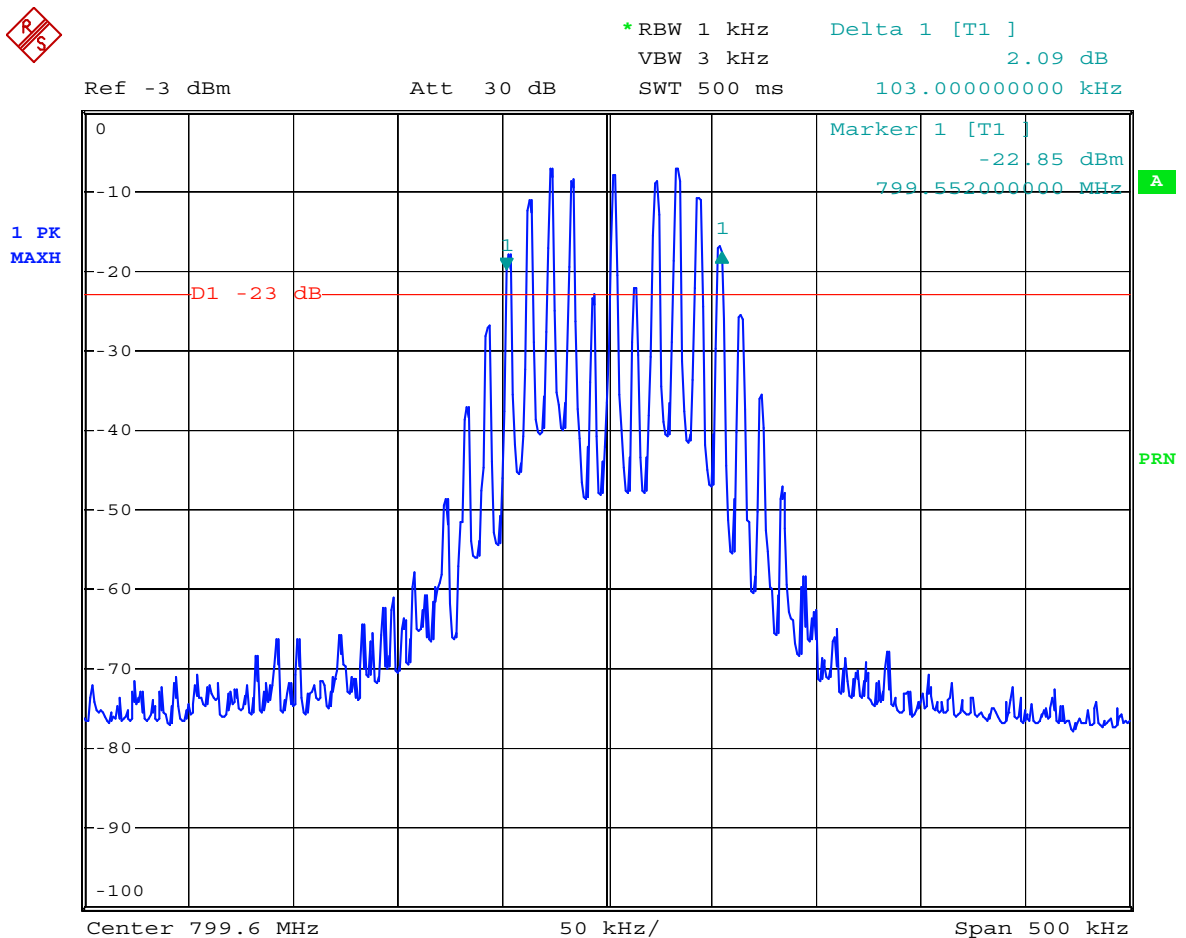
Comment A: UN20820 Occupied Bandwidth - 1 kHz
Date: 16.APR.2003 20:39:18

Test Results:	See graph above
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Measurement of Emission Masks (Occupied Bandwidth)

Rules and Specifications:	Sections 74.861 (5) and 2.1049 (c) (1)
Limits and Requirements:	The operating bandwidth shall not exceed 200 kHz
Nominal Frequency of EUT:	799.600 MHz

Test Procedure:	According to TIA/EIA.603-1992, § 2.2.11
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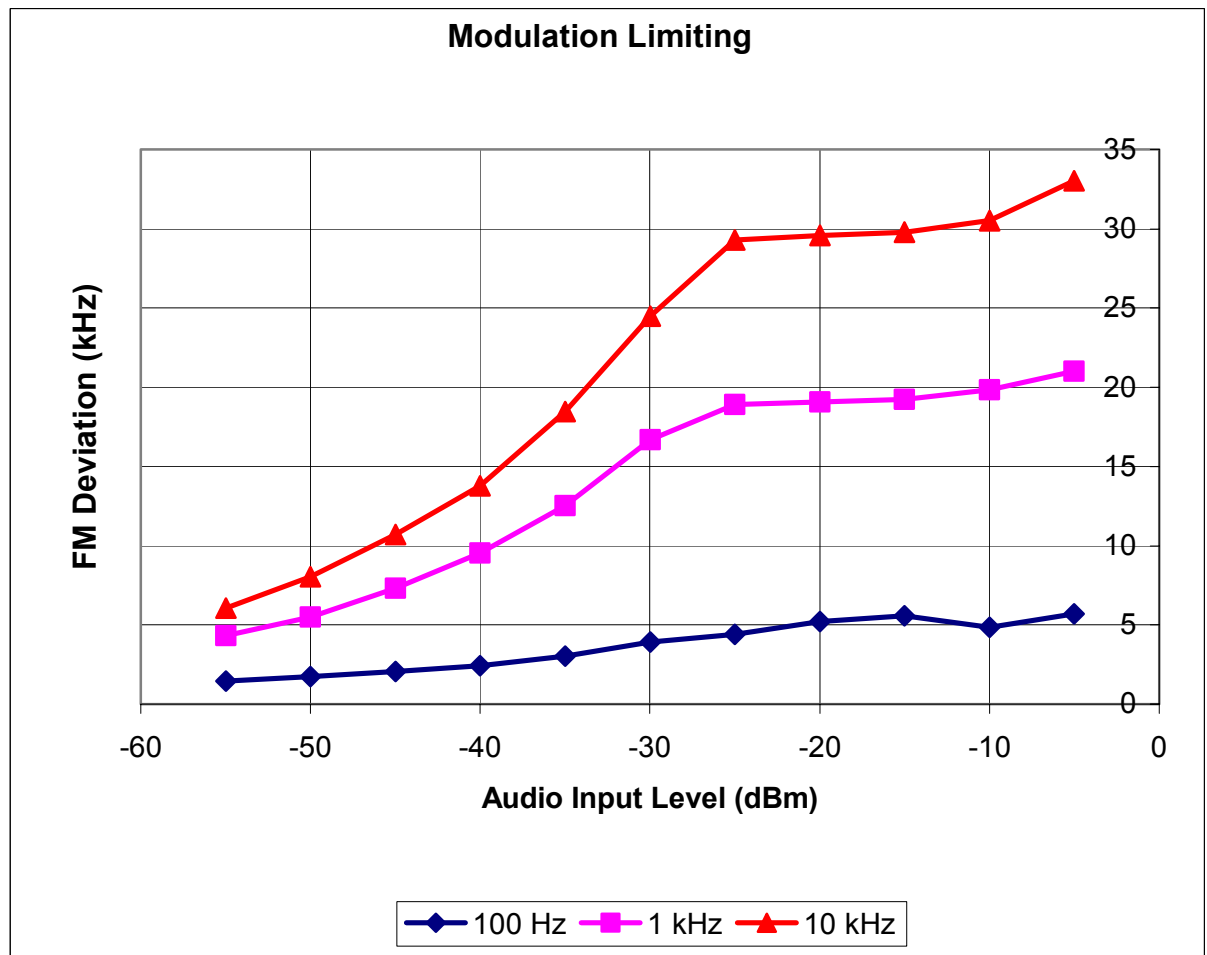
Comment A: UN20820 Occupied Bandwidth - 10 kHz
Date: 16.APR.2003 20:38:19

Test Results:	See graph above
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Measurement of Modulation Limiting

Rules and Specifications:	Sections 2.1047 (b) and 74.861
Limits and Requirements:	The frequency deviation shall be < 75 kHz
Nominal Frequency of EUT:	799,600 MHz

Test Procedure:	According to TIA/EIA.603-1992, § 2.2.3
	Note: The audio signal was coupled to the microphone input of the transmitter via a direct connection



Test Results:	Pass	
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Type of Emission

Rules and Specifications:	Sections 74.861 (5) and 2.1049 (c) (1)
Limits and Requirements:	ANSI TIA/EIA-603-1992
Nominal Frequency of EUT:	799,600 MHz

	$B_n = 2M + 2DK$
	$M = 15 \text{ kHz}$
	$D = 33 \text{ kHz}$
	$K = 1$
	$B_n = 2(15 \text{ kHz}) + 2(33 \text{ kHz}) = 30 + 66 = 96 \text{ kHz}$

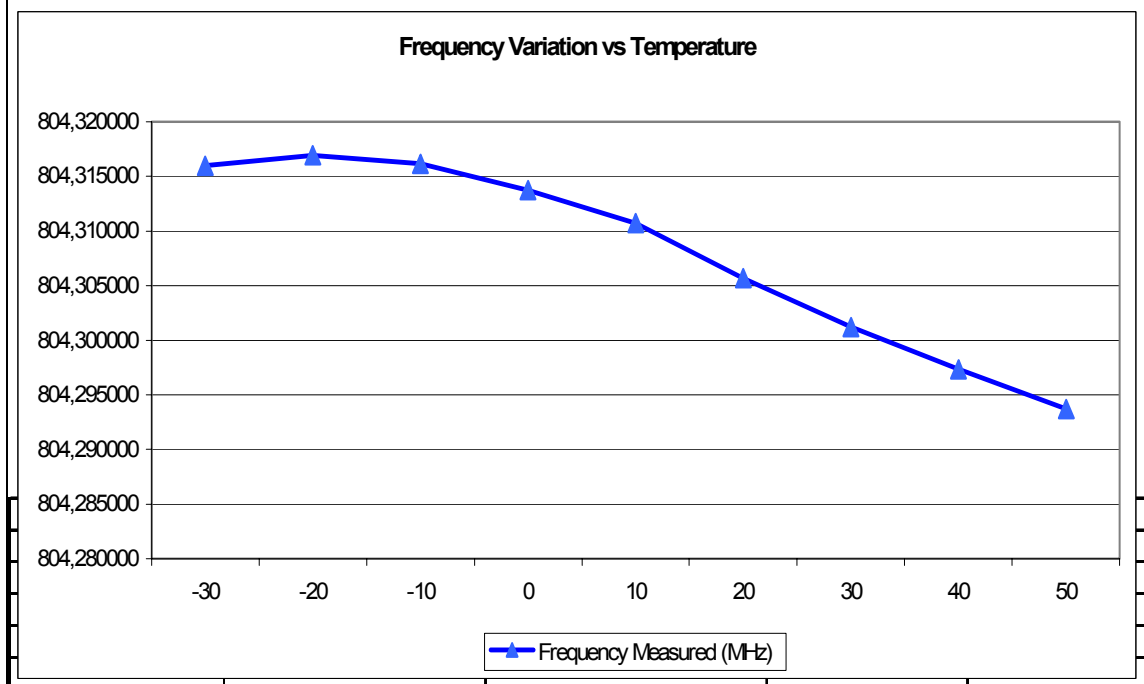
Type of Emission = 96K0F3E

Measurement of Frequency Stability vs Temperature

Rules and Specifications:	Section 74.861 (e) (4), 2.1055
Limits and Requirements:	The frequency tolerance of the transmitter shall be 0.005 %
Nominal Frequency of EUT:	804.300 MHz

Temperature Variation Table

Temperature (°C)	Nominal Frequency (MHz)	Frequency Measured (MHz)	Frequency Tolerance (ppm)	Limit (ppm)
-30	804,300000	804,315980	19,87	50
-20	804,300000	804,316915	21,03	50
-10	804,300000	804,316141	20,07	50
0	804,300000	804,313730	17,07	50
10	804,300000	804,310700	13,30	50
20	804,300000	804,305690	7,07	50
30	804,300000	804,301220	1,52	50
40	804,300000	804,297340	-3,31	50
50	804,300000	804,293713	-7,82	50

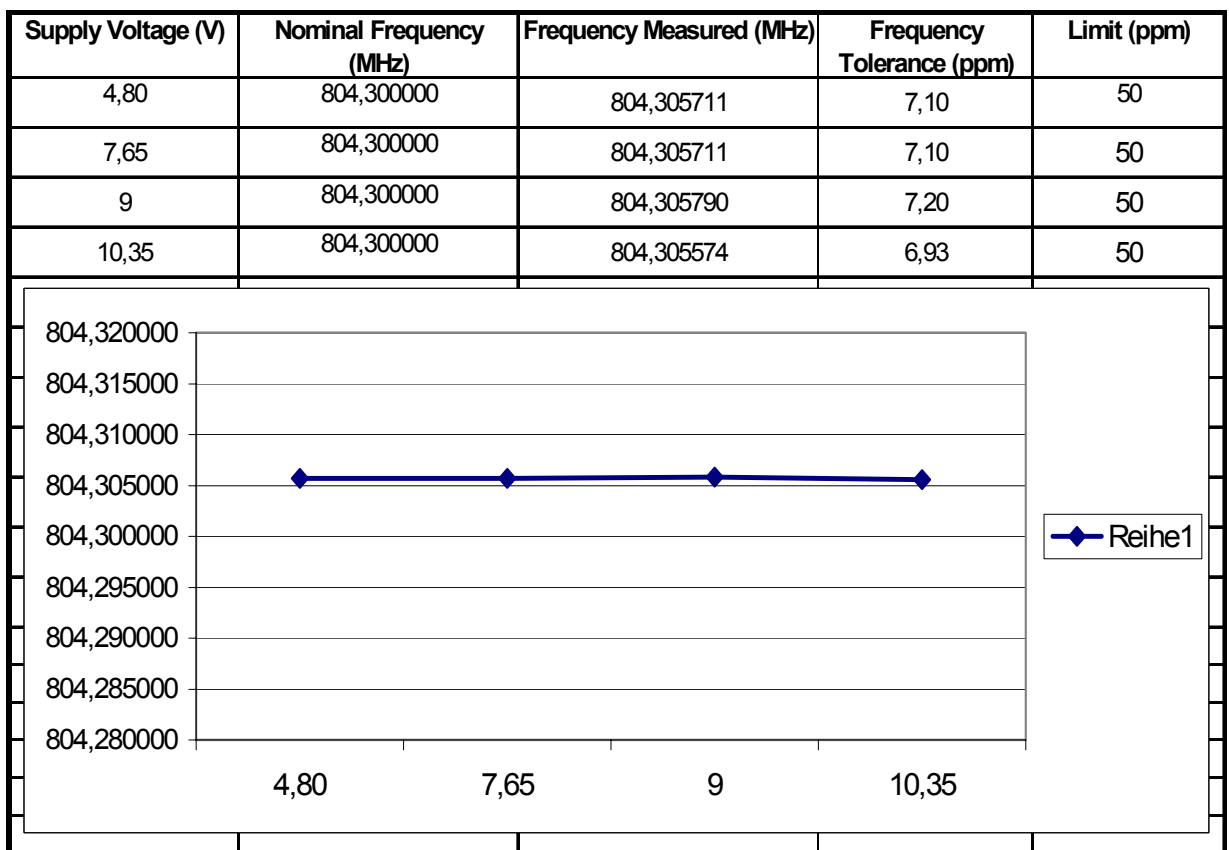


Test Results:	Pass
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Measurement of Frequency Stability vs Supply Voltage

Rules and Specifications:	Sections 74.861 (e) (4), 2.1055 (d)
Limits and Requirements:	The frequency tolerance of the transmitter shall be 0.005 %
Nominal Frequency of EUT:	804,300 MHz
Battery end-point:	4.80 V

Voltage Variation Table



Test Results:	Pass	
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8. Referenced Regulations

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

☒	FCC Part 2	Code of Federal Regulations Part 2 Frequency allocation and radio treaty matters; General rules and regulations	October 01, 1999
☐	FCC Part 15 Subpart A	Code of Regulations Part 15 (Radio Frequency Devices), Subpart A (General) of the Federal Communication Commission (FCC)	October 20, 1997
☐	FCC Part 15 Subpart B	Code of Regulations Part 15 (Radio Frequency Devices), Subpart B (Unintentional Radiators) of the Federal Communication Commission (FCC)	October 20, 1997
☐	FCC Part 15 Subpart C	Code of Regulations Part 15 (Radio Frequency Devices), Subpart C (Intentional Radiators) of the Federal Communication Commission (FCC)	October 20, 1997
☒	FCC Part 74 Subpart H	Code of Regulations Part 15 (Radio Frequency Devices), Subpart H (Low Power Auxiliary Stations) of the Federal Communication Commission (FCC)	October 20, 1997
☒	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 - 40 GHz	October, 1992
☐	RSS-210	Radio Standards Specification RSS-210 Issue 2 for Low Power Licence-Exempt Radiocommunication Devices of Industry Canada	February 24, 1996

Charts taken during testing

Radiated Power Test 25 MHz - 200 MHz acc. to FCC Part 74 Subpart H

Model:

AW-8P

Serial no.:

test sample

Applicant:

Universal Technologies Co. Ltd.

Test site:

Fully anechoic room, cabin no. 2

Tested on:

**Test distance 3 meters
Horizontal Polarization**

Date of test:

03/28/2003

Operator:

M. Steindl

Test performed:

automatically

File name:

default.emi

Comment:

- TX-Mode
-
- Channel: 794.300 MHz
-
-

Detector:

Peak

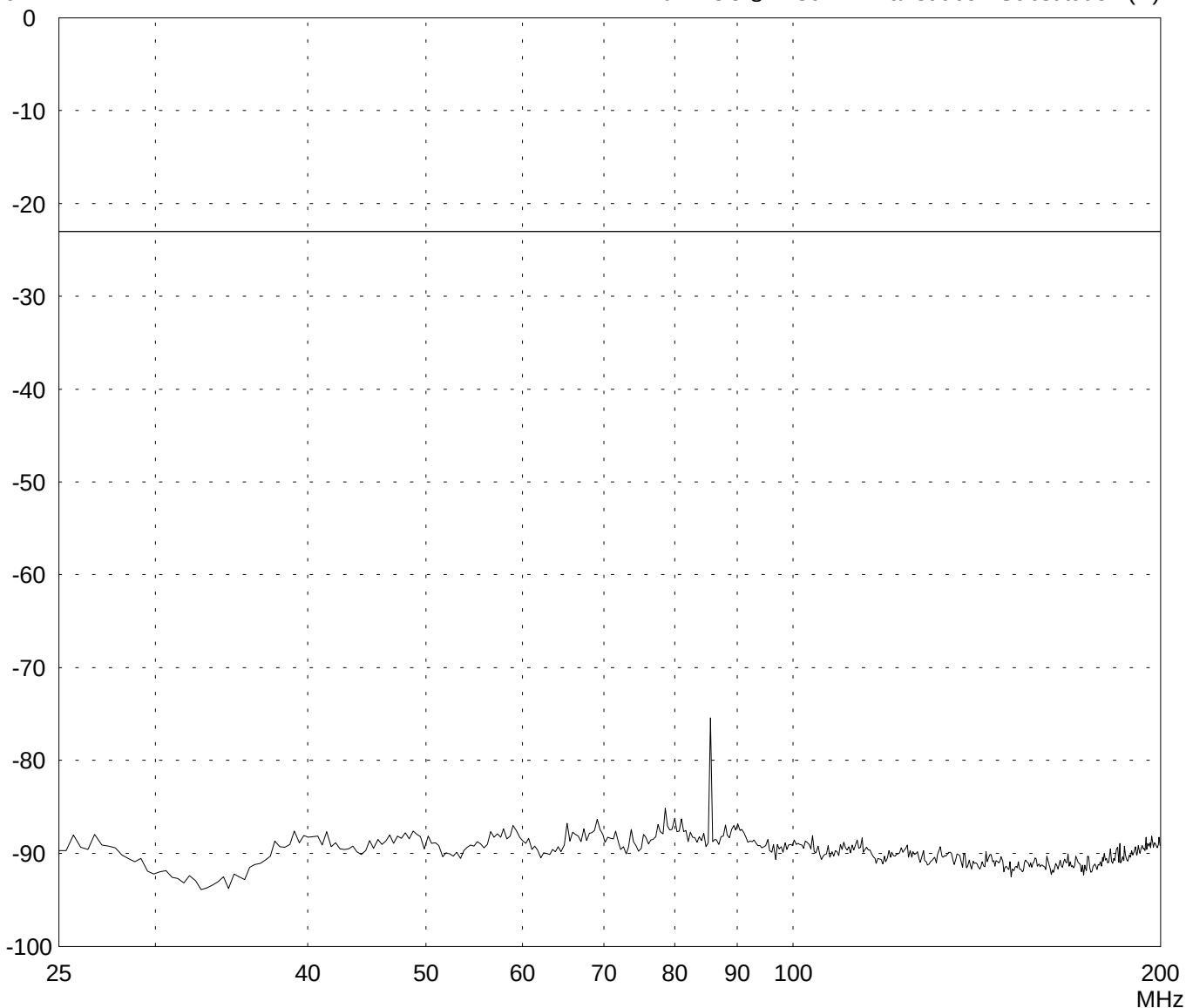
List of values:

10 dB Margin

50 Subranges

dBm

Limit1: FCC §74.861 Transducer: Substitution (H)



Result:

Limit kept

Project file:

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Radiated Power Test 25 MHz - 200 MHz acc. to FCC Part 74 Subpart H

Model:

AW-8P

Serial no.:

test sample

Applicant:

Universal Technologies Co. Ltd.

Test site:

Fully anechoic room, cabin no. 2

Tested on:

**Test distance 3 meters
Vertical Polarization**

Date of test:

03/28/2003

Operator:

M. Steindl

Test performed:

automatically

File name:

default.emi

Comment:

- TX-Mode
-
- Channel: 794.300 MHz
-
-

Detector:

Peak

List of values:

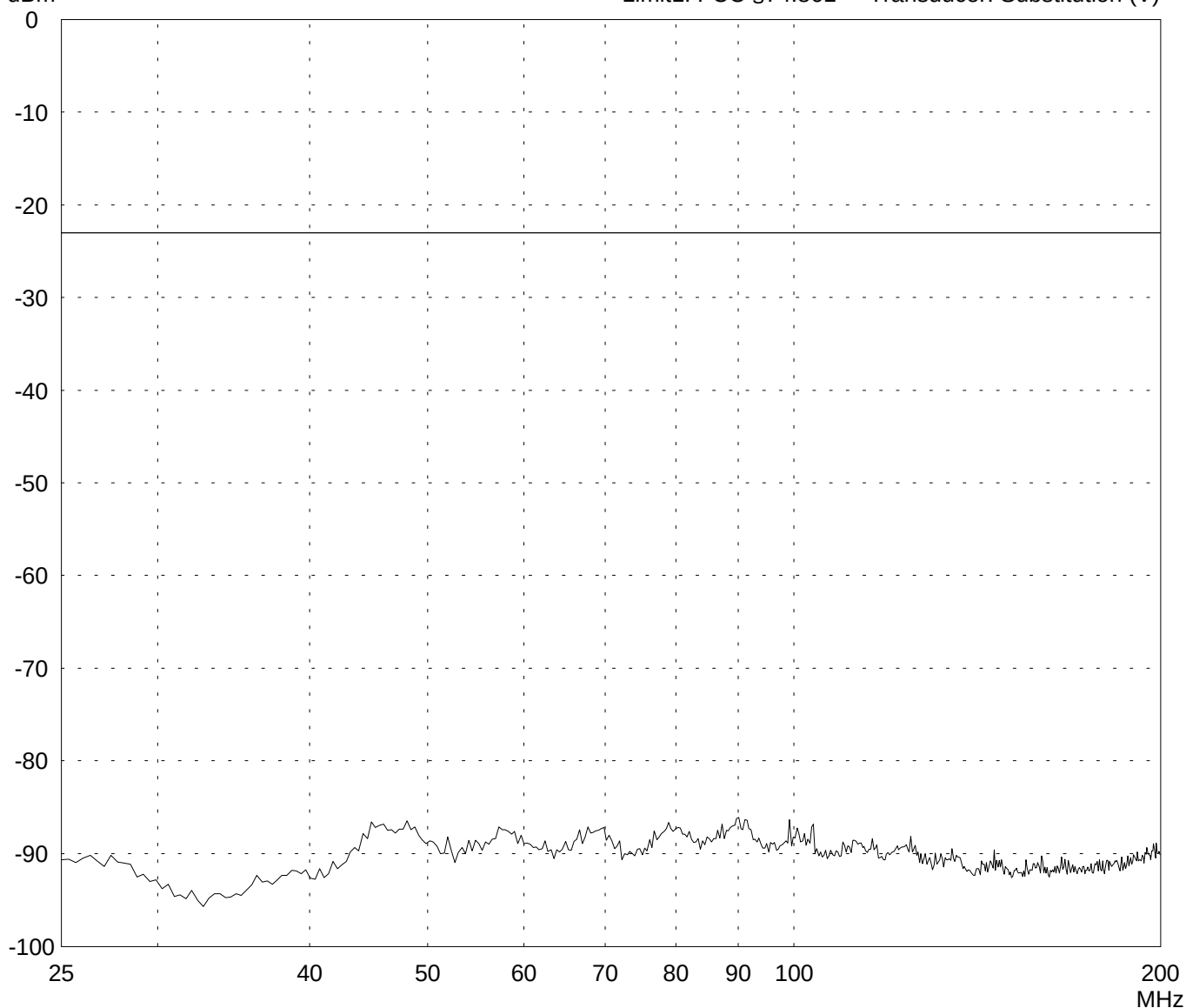
10 dB Margin

50 Subranges

dBm

Limit1: FCC §74.861

Transducer: Substitution (V)



Result:

Limit kept

Project file:

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Pages

Radiated Power Test 200 MHz - 1 GHz acc. to FCC Part 74 Subpart H

Model:

AW-8P

Serial no.:

test sample

Applicant:

Universal Technologies Co. Ltd.

Test site:

Fully anechoic room, cabin no. 2

Tested on:

**Test distance 3 meters
Horizontal Polarization**

Date of test:

03/28/2003

Operator:

M. Steindl

Test performed:

automatically

File name:

default.emi

Comment:

- TX-Mode
-
- Channel: 794.300 MHz
-
-

Detector:

Peak

List of values:

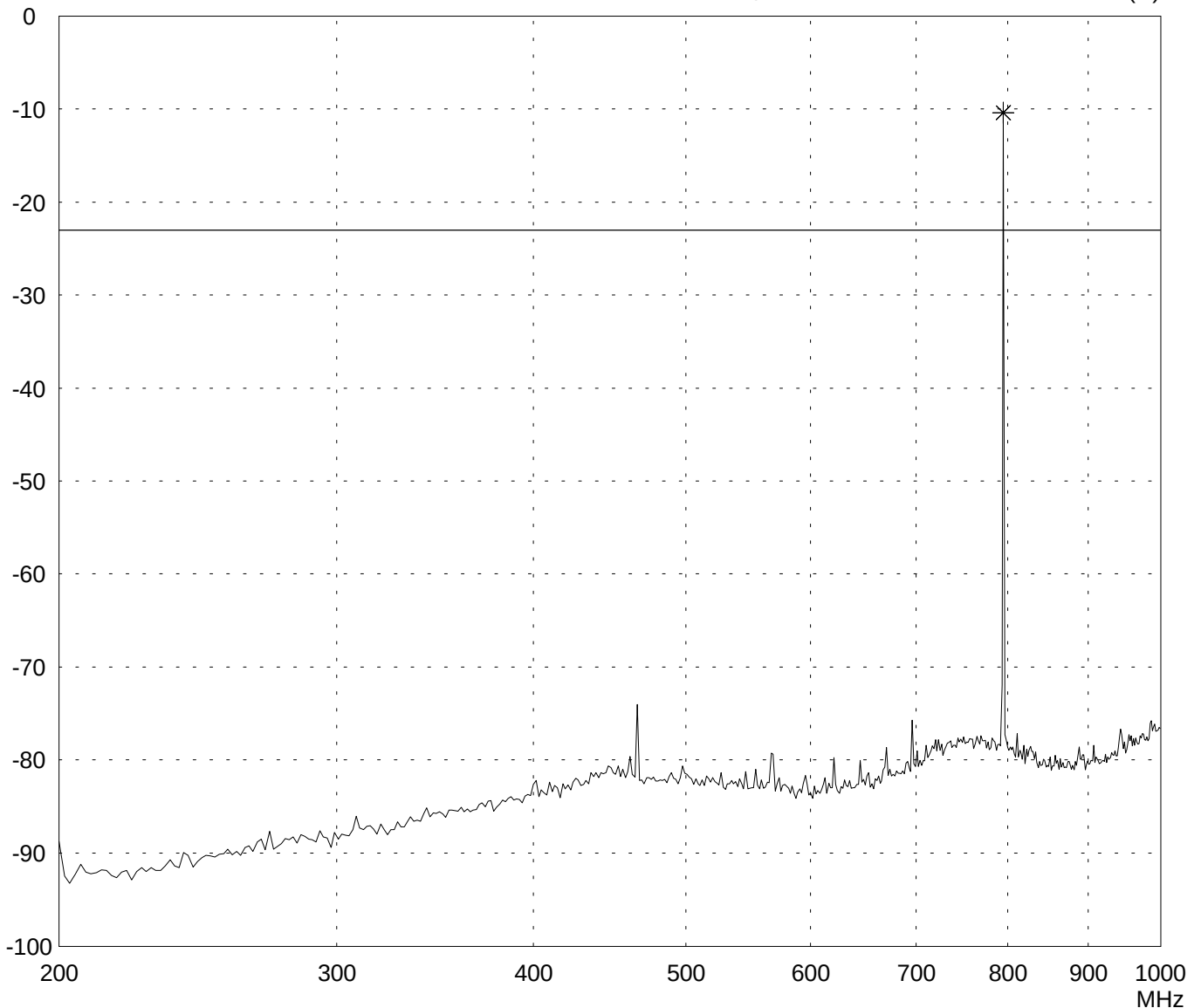
10 dB Margin

50 Subranges

dBm

Limit1: FCC §74.861

Transducer: Substitution (H)



Result:

Limit kept

Project file:

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Radiated Power Test 200 MHz - 1 GHz acc. to FCC Part 74 Subpart H

Model:

AW-8P

Serial no.:

test sample

Applicant:

Universal Technologies Co. Ltd.

Test site:

Fully anechoic room, cabin no. 2

Tested on:

**Test distance 3 meters
Vertical Polarization**

Date of test:

03/28/2003

Operator:

M. Steindl

Test performed:

automatically

File name:

default.emi

Comment:

- TX-Mode
-
- Channel: 794.300 MHz
-
-

Detector:

Peak

List of values:

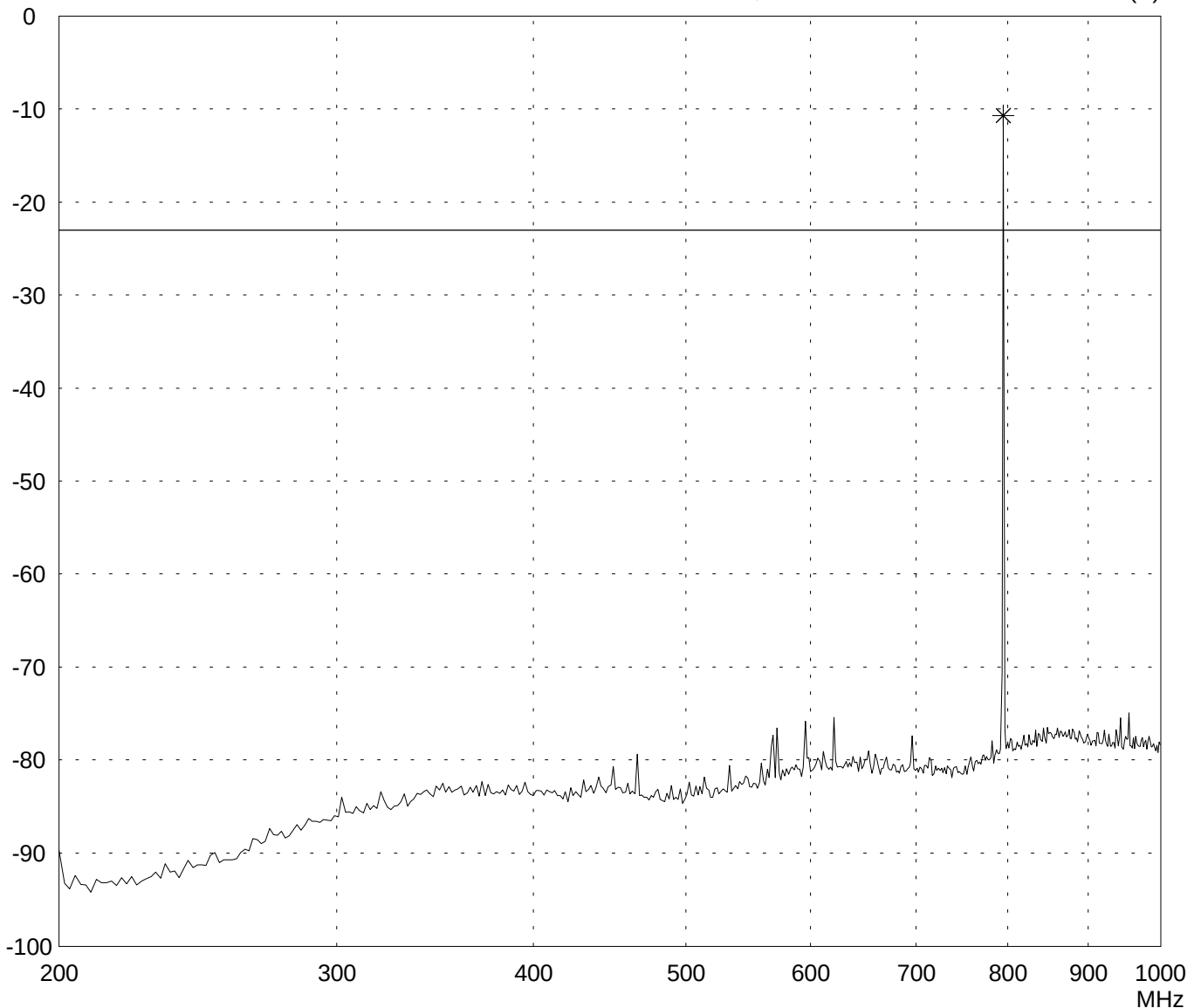
10 dB Margin

50 Subranges

dBm

Limit1: FCC §74.861

Transducer: Substitution (V)



Result:

Limit kept

Project file:

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Radiated Power Test 1 GHz - 4 GHz acc. to FCC Part 74 Subpart H

Model:

AW-8P

Serial no.:

test sample

Applicant:

Universal Technologies Co. Ltd.

Test site:

Fully anechoic room, cabin no. 2

Tested on:

**Test distance 3 metres
Horizontal Polarization**

Date of test:

04/17/2003

Operator:

M. Steindl

Test performed:

automatically

File name:

default.emi

Comment:

- TX-Mode
-
- Channel: 794.3 MHz
-
- with high pass filtern WHKS1000-10SS

Detector:

Peak

List of values:

Selected by hand

dBm

Limit1: FCC §74.861 Transducer: Substitution (EMCO 3115)

0

-10

-20

-30

-40

-50

-60

-70

-80

-90

-100

1000

2000

3000

4000
MHz

Result:

Limit kept

Project file:

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Pages

Radiated Power Test 1 GHz - 4 GHz acc. to FCC Part 74 Subpart H

Model:

AW-8P

Serial no.:

test sample

Applicant:

Universal Technologies Co. Ltd.

Test site:

Fully anechoic room, cabin no. 2

Tested on:

**Test distance 3 metres
Vertical Polarization**

Date of test:

04/17/2003

Operator:

M. Steindl

Test performed:

automatically

File name:

default.emi

Comment:

- TX-Mode
-
- Channel: 794.3 MHz
-
- with high pass filtern WHKS1000-10SS

Detector:

Peak

List of values:

Selected by hand

dBm

Limit1: FCC §74.861 Transducer: Substitution (EMCO 3115)

0

-10

-20

-30

-40

-50

-60

-70

-80

-90

-100

1000

2000

3000

4000
MHz

Result:

Limit kept

Project file:

56408-20820

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Pages

Radiated Power Test 4 GHz - 8.2 GHz acc. to FCC Part 74 Subpart H

Model:

AW-8P

Serial no.:

test sample

Applicant:

Universal Technologies Co. Ltd.

Test site:

Fully anechoic room, cabin no. 2

Tested on:

**Test distance 3 metres
Horizontal Polarization**

Date of test:

04/17/2003

Operator:

M. Steindl

Test performed:

automatically

File name:

default.emi

Comment:

- TX-Mode
-
- Channel: 794.3 MHz
-
- with high pass filtern WHK/M3/13G-10SS

Detector:

Peak

List of values:

10 dB Margin

50 Subranges

dBm

Limit1: FCC §74.861 Transducer: Substitution (EMCO 3115)

0

-10

-20

-30

-40

-50

-60

-70

-80

-90

-100

4000

5000

6000

7000

8200
MHz

Result:

Limit kept

Project file:

56408-20820

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Pages

Radiated Power Test 4 GHz - 8.2 GHz acc. to FCC Part 74 Subpart H

Model:
AW-8P

Serial no.:
test sample

Applicant:
Universal Technologies Co. Ltd.

Test site:
Fully anechoic room, cabin no. 2

Tested on:
**Test distance 3 metres
Vertical Polarization**

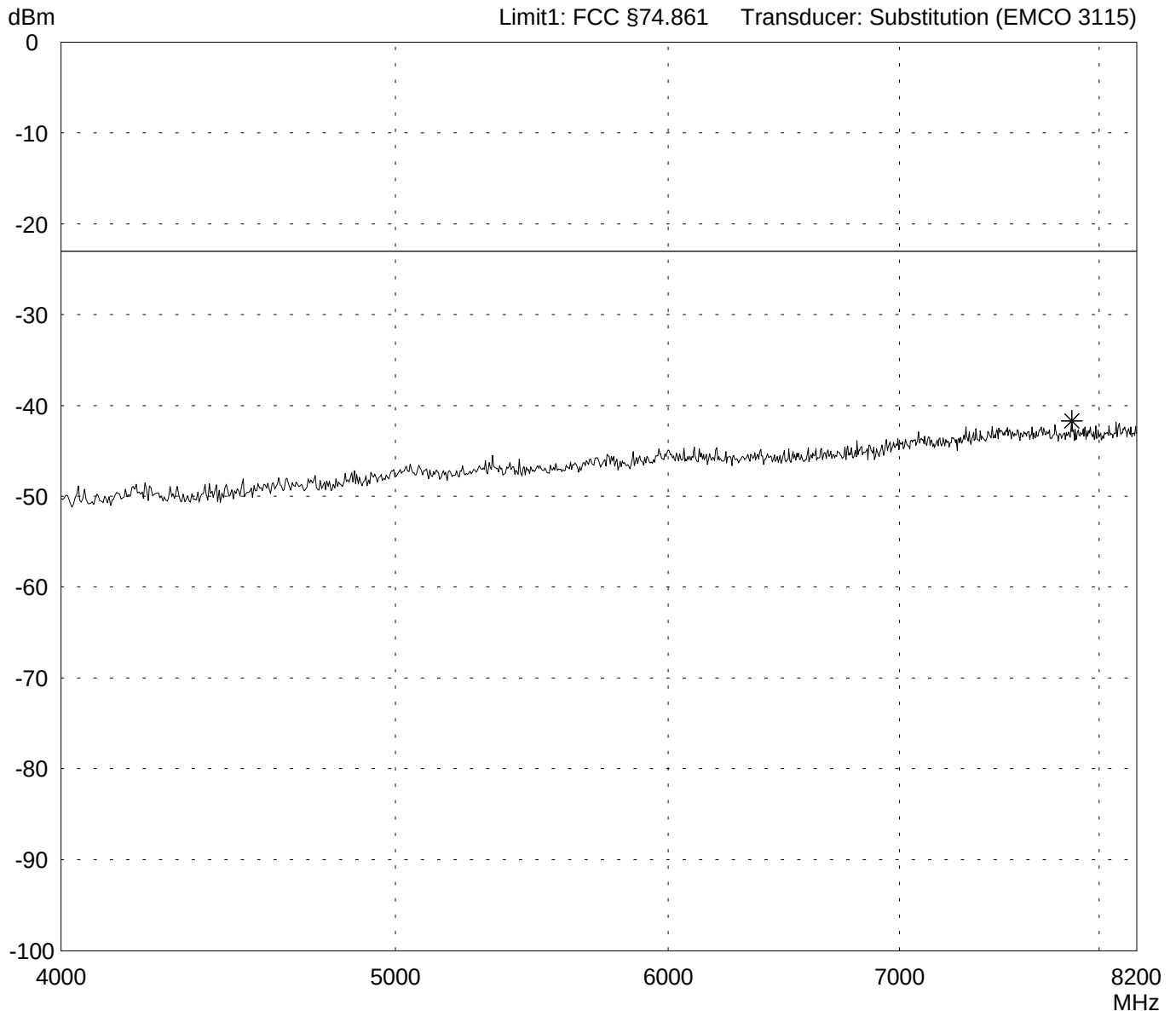
Date of test: Operator:
04/17/2003 M. Steindl

Test performed: File name:
automatically default.emi

Comment:
- TX-Mode
-
- Channel: 794.3 MHz
-
- with high pass filtern WHK/M3/13G-10SS

Detector:
Peak

List of values:
Selected by hand



Result:
Limit kept

Project file:
56408-20820

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Radiated Power Test 25 MHz - 200 MHz acc. to FCC Part 74 Subpart H

Model:

AW-8P

Serial no.:

test sample

Applicant:

Universal Technologies Co. Ltd.

Test site:

Fully anechoic room, cabin no. 2

Tested on:

**Test distance 3 meters
Horizontal Polarization**

Date of test:

03/28/2003

Operator:

M. Steindl

Test performed:

automatically

File name:

default.emi

Comment:

- TX-Mode
-
- Channel: 799.600 MHz
-
-

Detector:

Peak

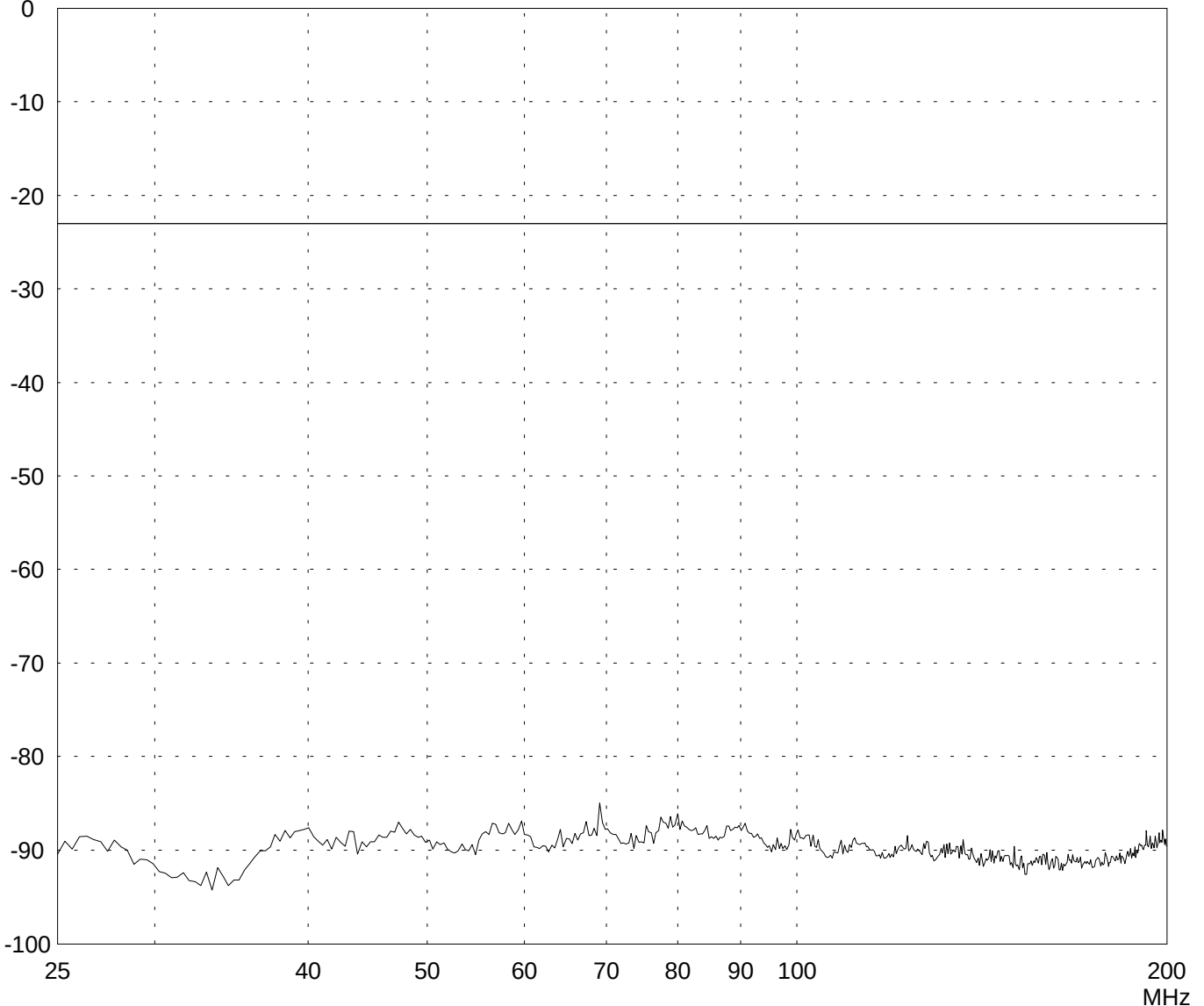
List of values:

10 dB Margin

50 Subranges

dBm
0

Limit1: FCC §74.861 Transducer: Substitution (H)



Result:

Limit kept

Project file:

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Radiated Power Test 25 MHz - 200 MHz acc. to EN 300 220-1

Model:

AW-8P

Serial no.:

test sample

Applicant:

Universal Technologies Co. Ltd.

Test site:

Fully anechoic room, cabin no. 2

Tested on:

Test distance 3 meters
Vertical Polarization

Date of test:

03/28/2003

Operator:

M. Steindl

Test performed:

automatically

File name:

default.emi

Comment:

- TX-Mode
-
- Channel: 799.600 MHz
-
-

Detector:

Peak

List of values:

10 dB Margin

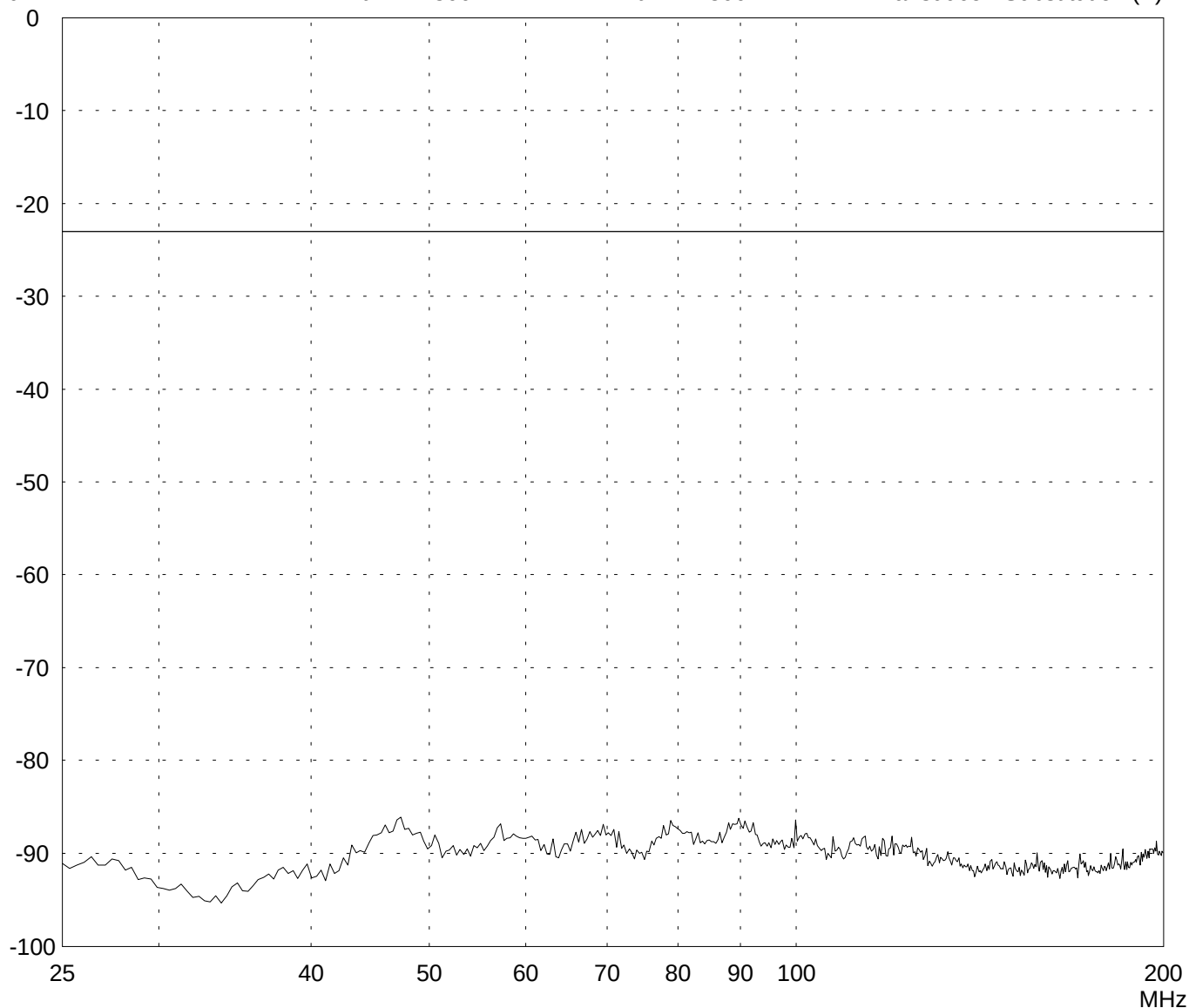
50 Subranges

dBm

Limit1: EN 300 XXX TX

Limit2: EN 300 XXX RX

Transducer: Substitution (V)



Result:

Limit kept

Project file:

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Radiated Power Test 200 MHz - 1 GHz acc. to FCC Part 74 Subpart H

Model:

AW-8P

Serial no.:

test sample

Applicant:

Universal Technologies Co. Ltd.

Test site:

Fully anechoic room, cabin no. 2

Tested on:

**Test distance 3 meters
Horizontal Polarization**

Date of test:

03/28/2003

Operator:

M. Steindl

Test performed:

automatically

File name:

default.emi

Comment:

- TX-Mode
-
- Channel: 799.600 MHz
-
-

Detector:

Peak

List of values:

10 dB Margin

50 Subranges

dBm

Limit1: FCC §74.861

Transducer: Substitution (H)

0

-10

-20

-30

-40

-50

-60

-70

-80

-90

-100

200

300

400

500

600

700

800

900

1000
MHz

Result:

Limit kept

Project file:

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Pages

Radiated Power Test 200 MHz - 1 GHz acc. to FCC Part 74 Subpart H

Model:

AW-8P

Serial no.:

test sample

Applicant:

Universal Technologies Co. Ltd.

Test site:

Fully anechoic room, cabin no. 2

Tested on:

**Test distance 3 meters
Vertical Polarization**

Date of test:

03/28/2003

Operator:

M. Steindl

Test performed:

automatically

File name:

default.emi

Comment:

- TX-Mode
-
- Channel: 799.600 MHz
-
-

Detector:

Peak

List of values:

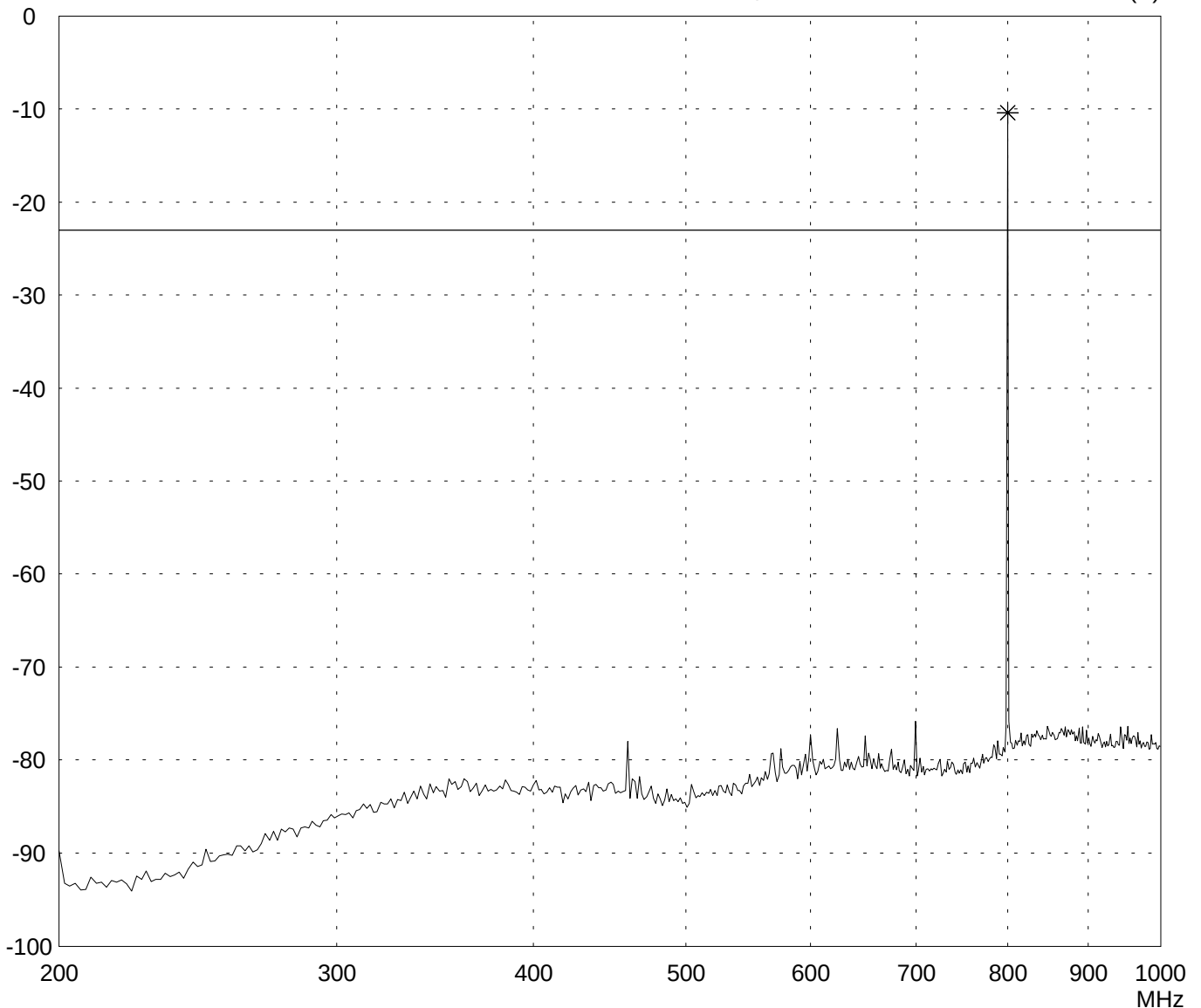
10 dB Margin

50 Subranges

dBm

Limit1: FCC §74.861

Transducer: Substitution (V)



Result:

Limit kept

Project file:

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Radiated Power Test 1 GHz - 4 GHz acc. to FCC Part 74 Subpart H

Model:

AW-8P

Serial no.:

test sample

Applicant:

Universal Technologies Co. Ltd.

Test site:

Fully anechoic room, cabin no. 2

Tested on:

**Test distance 3 metres
Horizontal Polarization**

Date of test:

04/17/2003

Operator:

M. Steindl

Test performed:

automatically

File name:

default.emi

Comment:

- TX-Mode
-
- Channel: 799.6 MHz
-
- with high pass filtern WHKS1000-10SS

Detector:

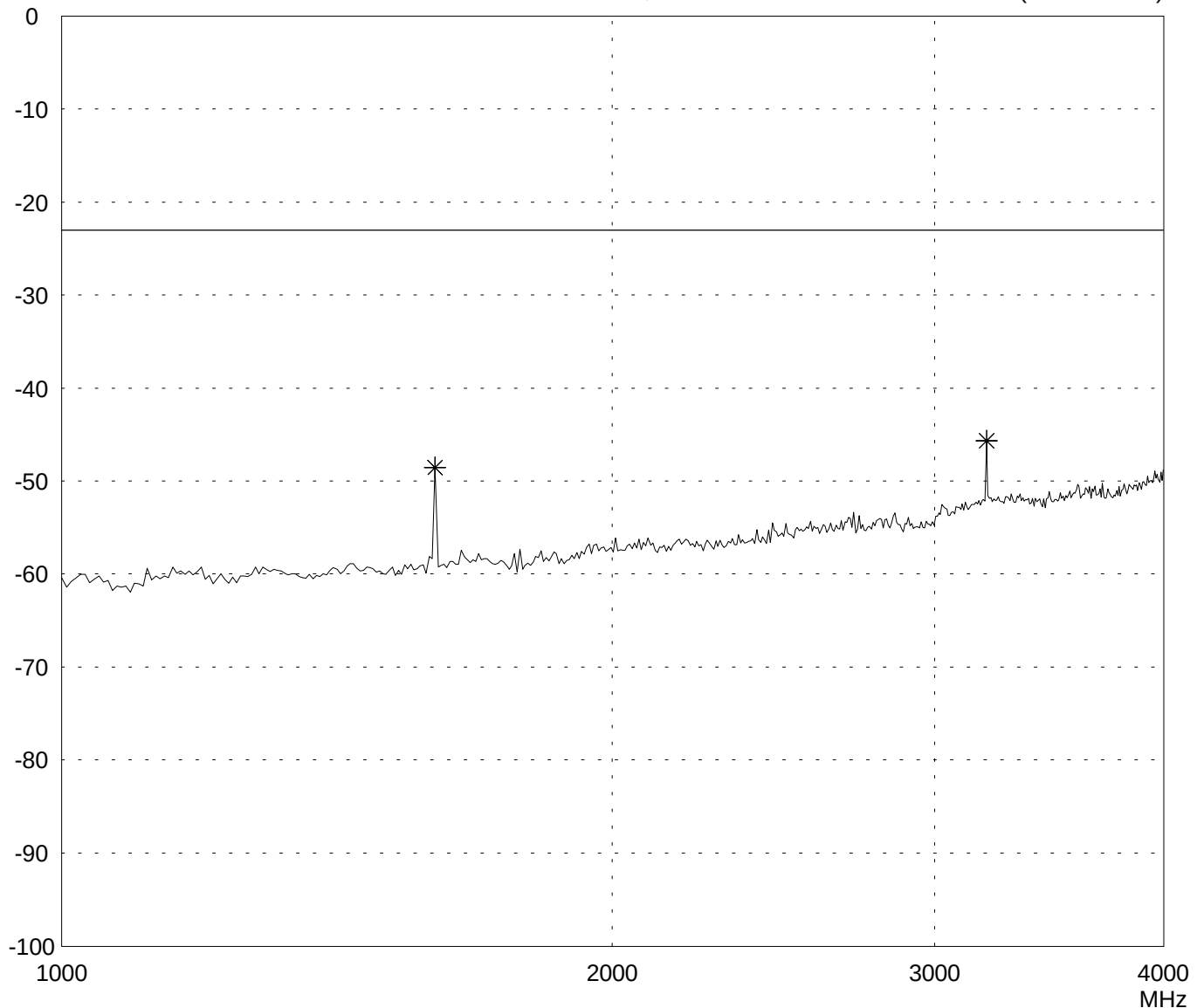
Peak

List of values:

Selected by hand

dBm

Limit1: FCC §74.861 Transducer: Substitution (EMCO 3115)



Result:

Limit kept

Project file:

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Radiated Power Test 1 GHz - 4 GHz acc. to FCC Part 74 Subpart H

Model:

AW-8P

Serial no.:

test sample

Applicant:

Universal Technologies Co. Ltd.

Test site:

Fully anechoic room, cabin no. 2

Tested on:

**Test distance 3 metres
Vertical Polarization**

Date of test:

04/17/2003

Operator:

M. Steindl

Test performed:

automatically

File name:

default.emi

Comment:

- TX-Mode
-
- Channel: 799.6 MHz
-
- with high pass filtern WHKS1000-10SS

Detector:

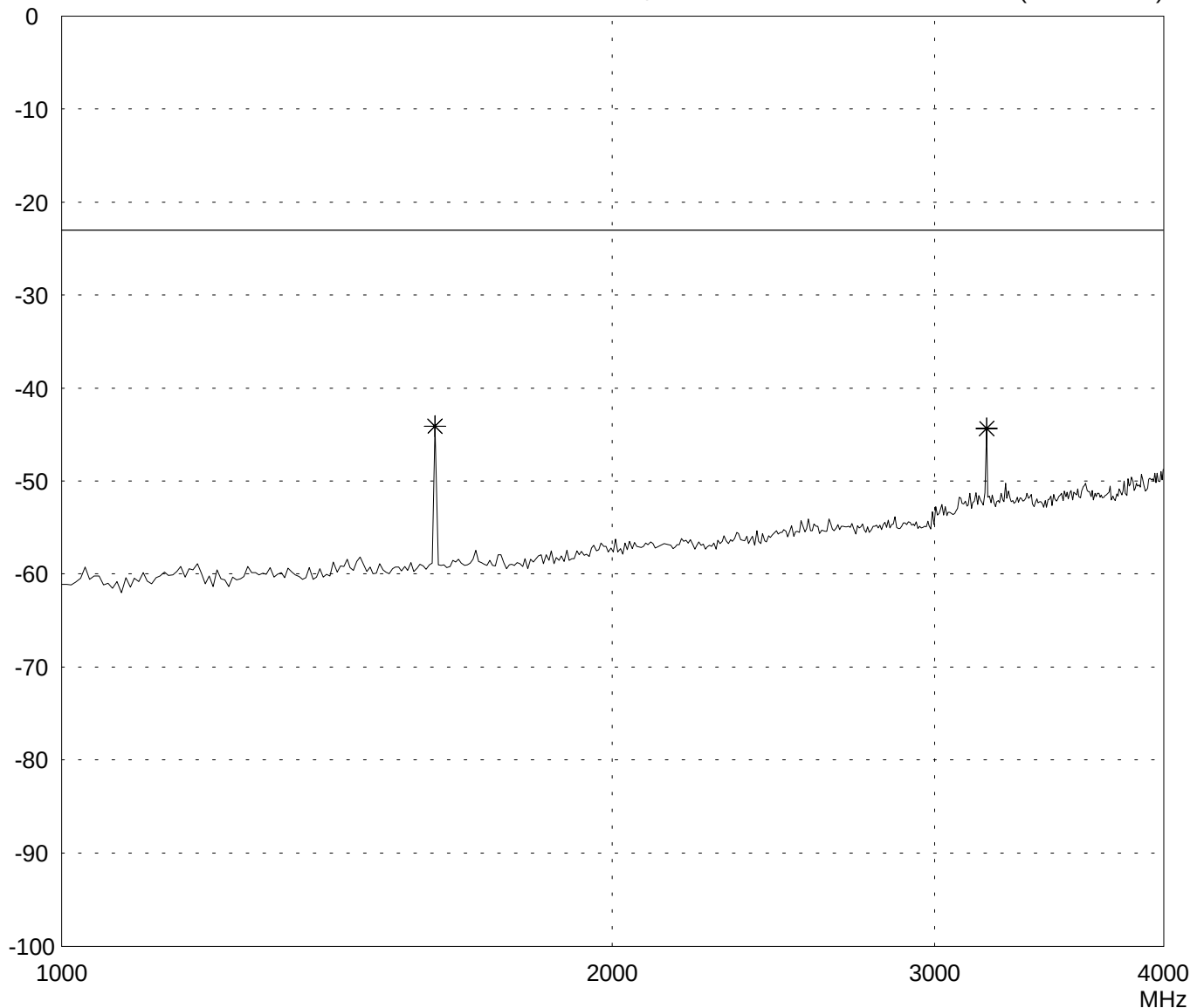
Peak

List of values:

Selected by hand

dBm

Limit1: FCC §74.861 Transducer: Substitution (EMCO 3115)



Result:

Limit kept

Project file:

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Radiated Power Test 4 GHz - 8.2 GHz acc. to FCC Part 74 Subpart H

Model:

AW-8P

Serial no.:

test sample

Applicant:

Universal Technologies Co. Ltd.

Test site:

Fully anechoic room, cabin no. 2

Tested on:

Test distance 3 metres
Horizontal Polarization

Date of test:

04/17/2003

Operator:

M. Steindl

Test performed:

automatically

File name:

default.emi

Comment:

- TX-Mode
-
- Channel: 799.6 MHz
-
- with high pass filter WHK/M3/13G-10SS

Detector:

Peak

List of values:

Selected by hand

dBm

Limit1: FCC §74.861 Transducer: Substitution (EMCO 3115)

0

-10

-20

-30

-40

-50

-60

-70

-80

-90

-100

4000

5000

6000

7000

8200
MHz

Result:

Limit kept

Project file:

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Radiated Power Test 4 GHz - 8.2 GHz acc. to FCC Part 74 Subpart H

Model:
AW-8P

Serial no.:
test sample

Applicant:
Universal Technologies Co. Ltd.

Test site:
Fully anechoic room, cabin no. 2

Tested on:
**Test distance 3 metres
Vertical Polarization**

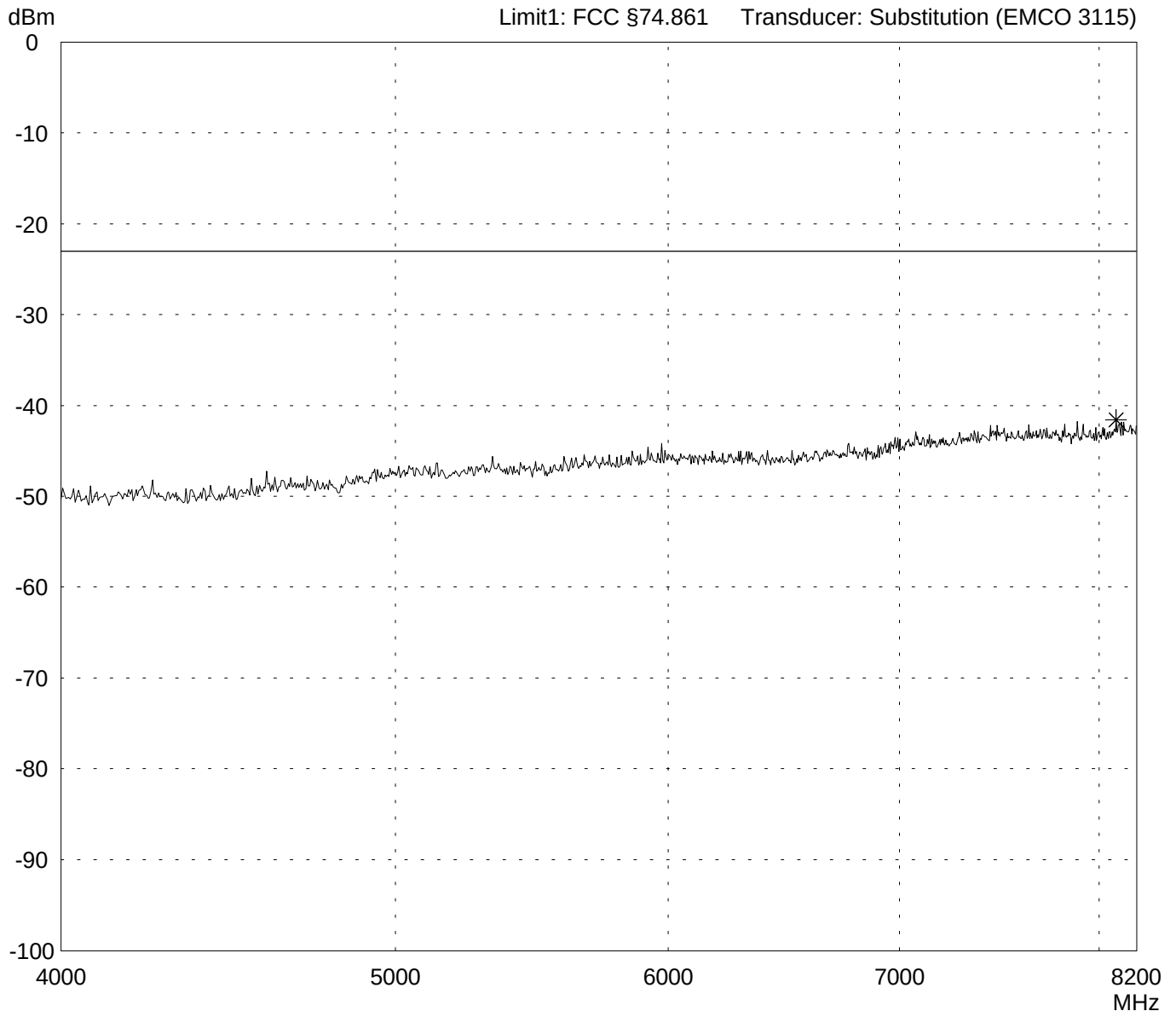
Date of test: Operator:
04/17/2003 M. Steindl

Test performed: File name:
automatically default.emi

Comment:
- TX-Mode
-
- Channel: 799.6 MHz
-
- with high pass filter WHK/M3/13G-10SS

Detector:
Peak

List of values:
Selected by hand



Result:
Limit kept

Project file:
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Radiated Power Test 25 MHz - 200 MHz acc. to FCC Part 74 Subpart H

Model:

AW-8P

Serial no.:

test sample

Applicant:

Universal Technologies Co. Ltd.

Test site:

Fully anechoic room, cabin no. 2

Tested on:

**Test distance 3 meters
Horizontal Polarization**

Date of test:

04/17/2003

Operator:

M. Steindl

Test performed:

automatically

File name:

default.emi

Comment:

- TX-Mode
-
- Channel: 804.3 MHz
-
-

Detector:

Peak

List of values:

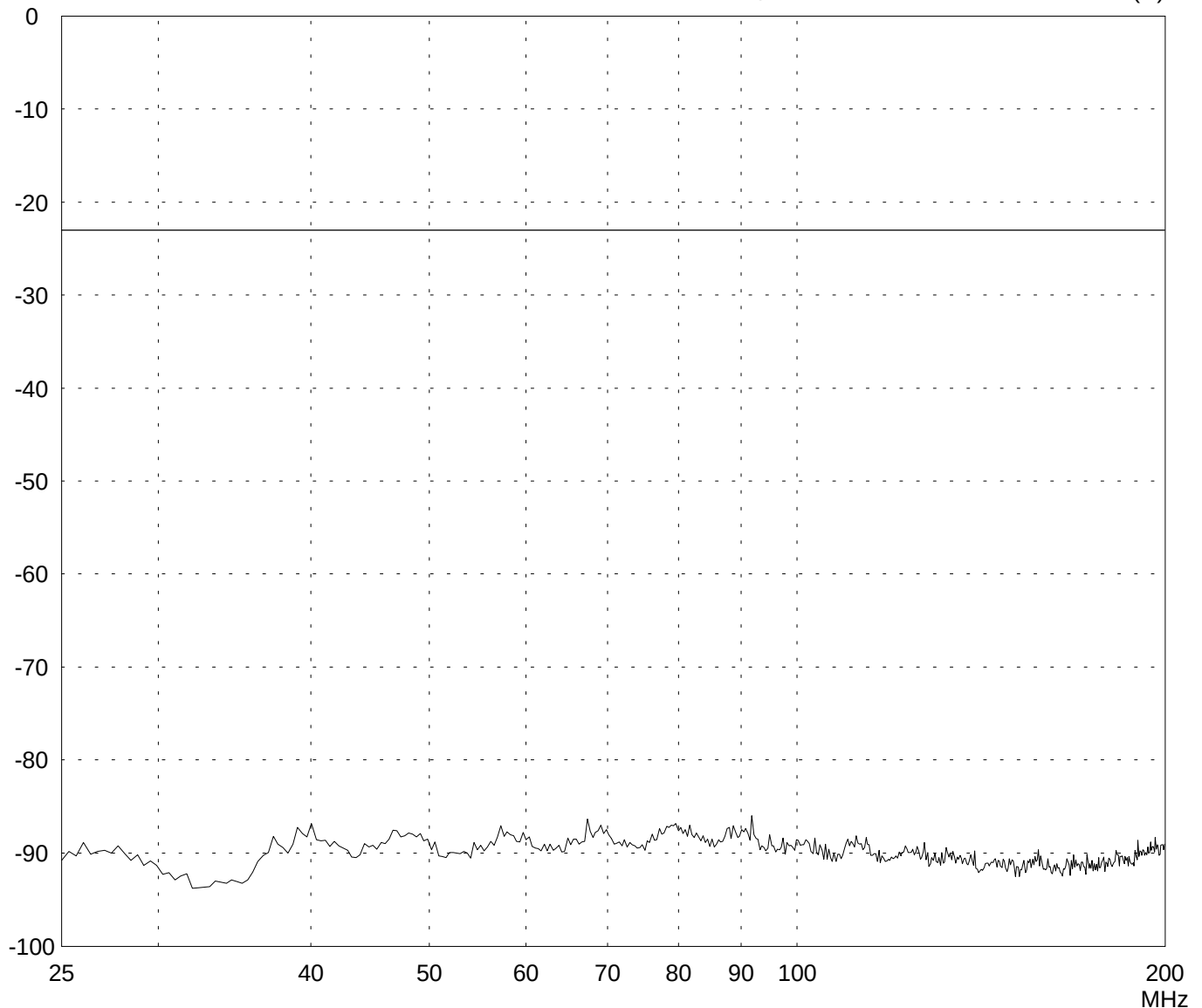
10 dB Margin

50 Subranges

dBm

Limit1: FCC §74.861

Transducer: Substitution (H)



Result:

Limit kept

Project file:

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Pages

Radiated Power Test 25 MHz - 200 MHz acc. to FCC Part 74 Subpart H

Model:

AW-8P

Serial no.:

test sample

Applicant:

Universal Technologies Co. Ltd.

Test site:

Fully anechoic room, cabin no. 2

Tested on:

**Test distance 3 meters
Vertical Polarization**

Date of test:

04/17/2003

Operator:

M. Steindl

Test performed:

automatically

File name:

default.emi

Comment:

- TX-Mode
-
- Channel: 804.3 MHz
-
-

Detector:

Peak

List of values:

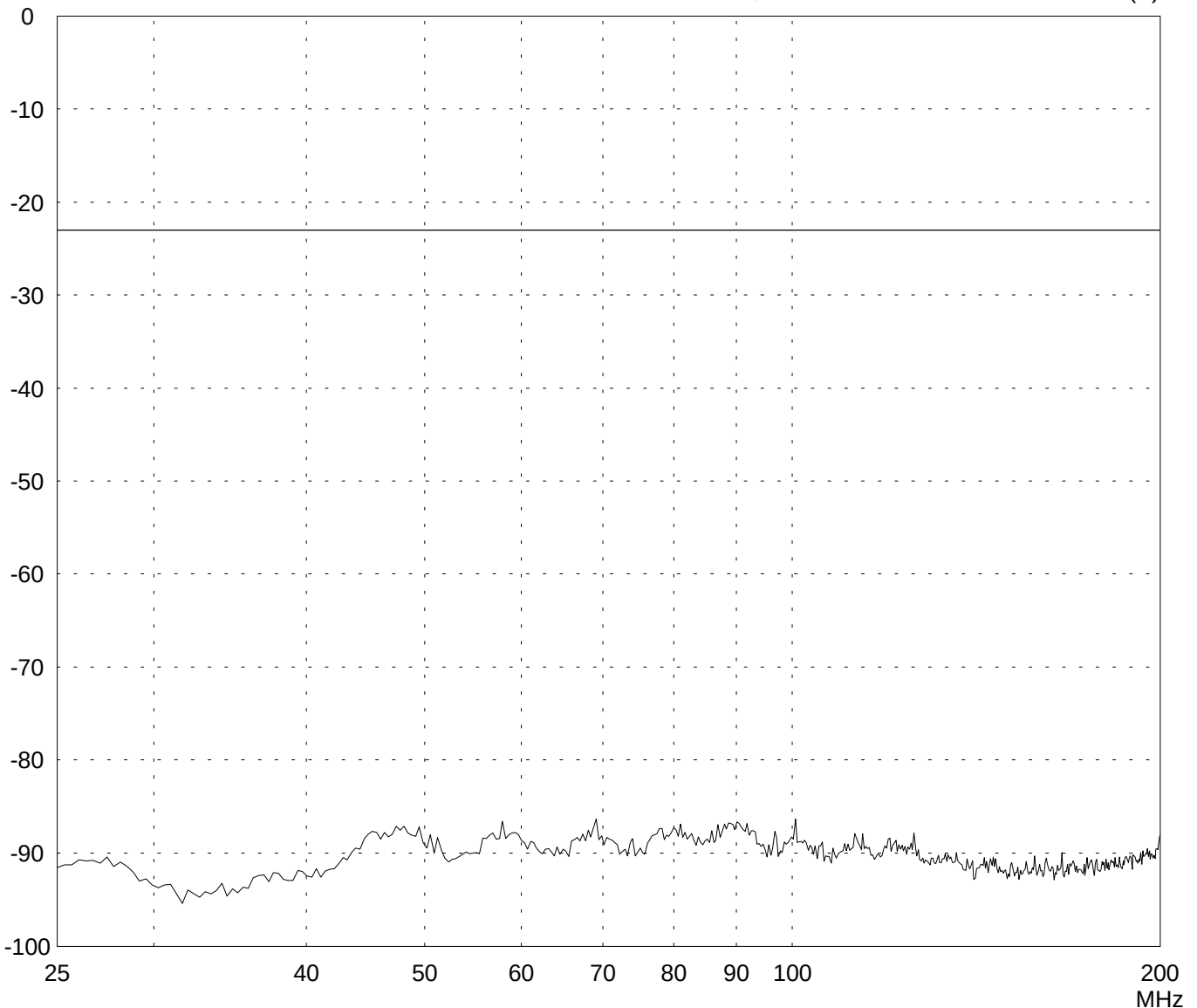
10 dB Margin

50 Subranges

dBm

Limit1: FCC §74.861

Transducer: Substitution (V)



Result:

Limit kept

Project file:

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Radiated Power Test 200 MHz - 1 GHz acc. to EN 300 220-1

Model:

AW-8P

Serial no.:

test sample

Applicant:

Universal Technologies Co. Ltd.

Test site:

Fully anechoic room, cabin no. 2

Tested on:

**Test distance 3.5 metres
Horizontal Polarization**

Date of test:

03/28/2003

Operator:

M. Steindl

Test performed:

automatically

File name:

default.emi

Comment:

- TX-Mode

-

- Channel:804.300 MHz

Detector:

Peak

List of values:

10 dB Margin

50 Subranges

dBm

Limit1: EN 300 XXX TX

Limit2: EN 300 XXX RX

Transducer: Substitution (H)

0

-10

-20

-30

-40

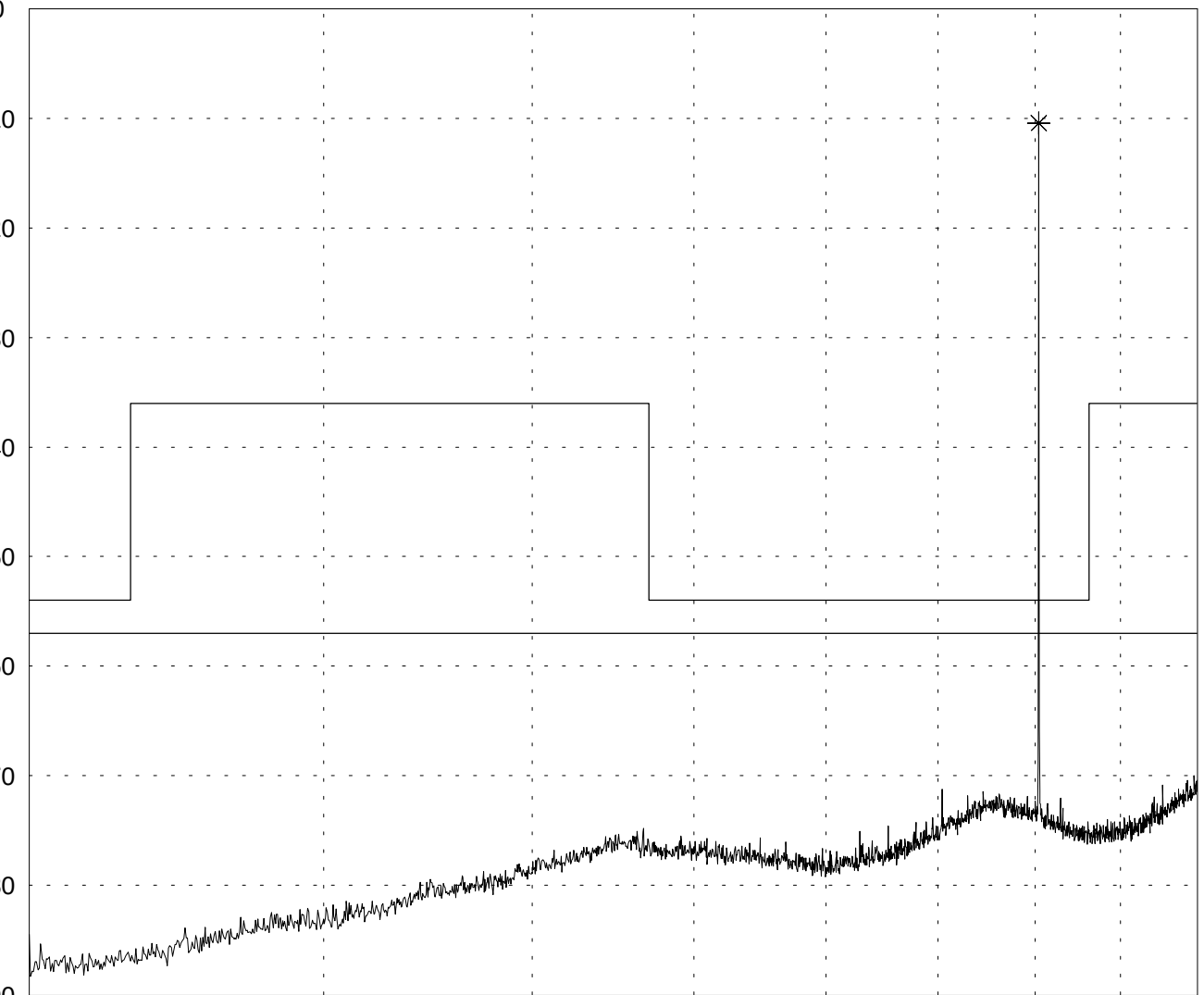
-50

-60

-70

-80

-90



200

300

400

500

600

700

800

900

1000

MHz

Result:

Prescan

Project file:

56408-20820

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Pages

Radiated Power Test 200 MHz - 1 GHz acc. to EN 300 220-1

Model:

AW-8P

Serial no.:

test sample

Applicant:

Universal Technologies Co. Ltd.

Test site:

Fully anechoic room, cabin no. 2

Tested on:

Test distance 3.5 metres
Vertical Polarization

Date of test:

03/28/2003

Operator:

M. Steindl

Test performed:

automatically

File name:

default.emi

Comment:

- TX-Mode

-

- Channel:804.300 MHz

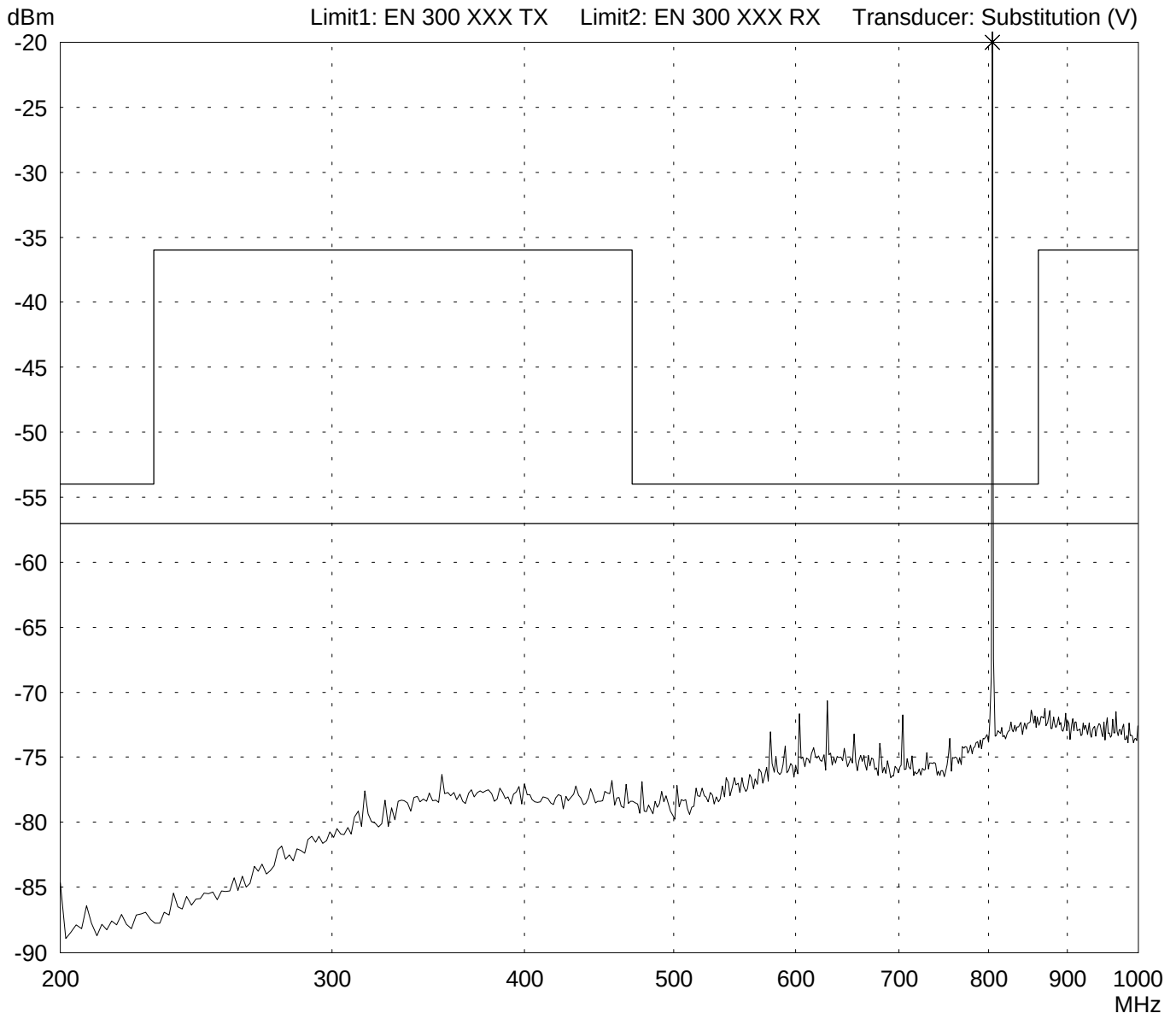
Detector:

Peak

List of values:

10 dB Margin

50 Subranges



Result:

Prescan

Project file:

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Radiated Power Test 1 GHz - 4 GHz acc. to FCC Part 74 Subpart H

Model:

AW-8P

Serial no.:

test sample

Applicant:

Universal Technologies Co. Ltd.

Test site:

Fully anechoic room, cabin no. 2

Tested on:

**Test distance 3 metres
Horizontal Polarization**

Date of test:

04/17/2003

Operator:

M. Steindl

Test performed:

automatically

File name:

default.emi

Comment:

- TX-Mode
-
- Channel: 804.3 MHz
-
- with high pass filter HWKS1000-10SS

Detector:

Peak

List of values:

Selected by hand

dBm

Limit1: FCC §74.861 Transducer: Substitution (EMCO 3115)

0

-10

-20

-30

-40

-50

-60

-70

-80

-90

-100

1000

2000

3000

4000
MHz

Result:

Limit kept

Project file:

56408-20820

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Pages

Radiated Power Test 1 GHz - 4 GHz acc. to FCC Part 74 Subpart H

Model:

AW-8P

Serial no.:

test sample

Applicant:

Universal Technologies Co. Ltd.

Test site:

Fully anechoic room, cabin no. 2

Tested on:

**Test distance 3 metres
Vertical Polarization**

Date of test:

04/17/2003

Operator:

M. Steindl

Test performed:

automatically

File name:

default.emi

Comment:

- TX-Mode
-
- Channel: 804.3 MHz
-
- with high pass filter HWKS1000-10SS

Detector:

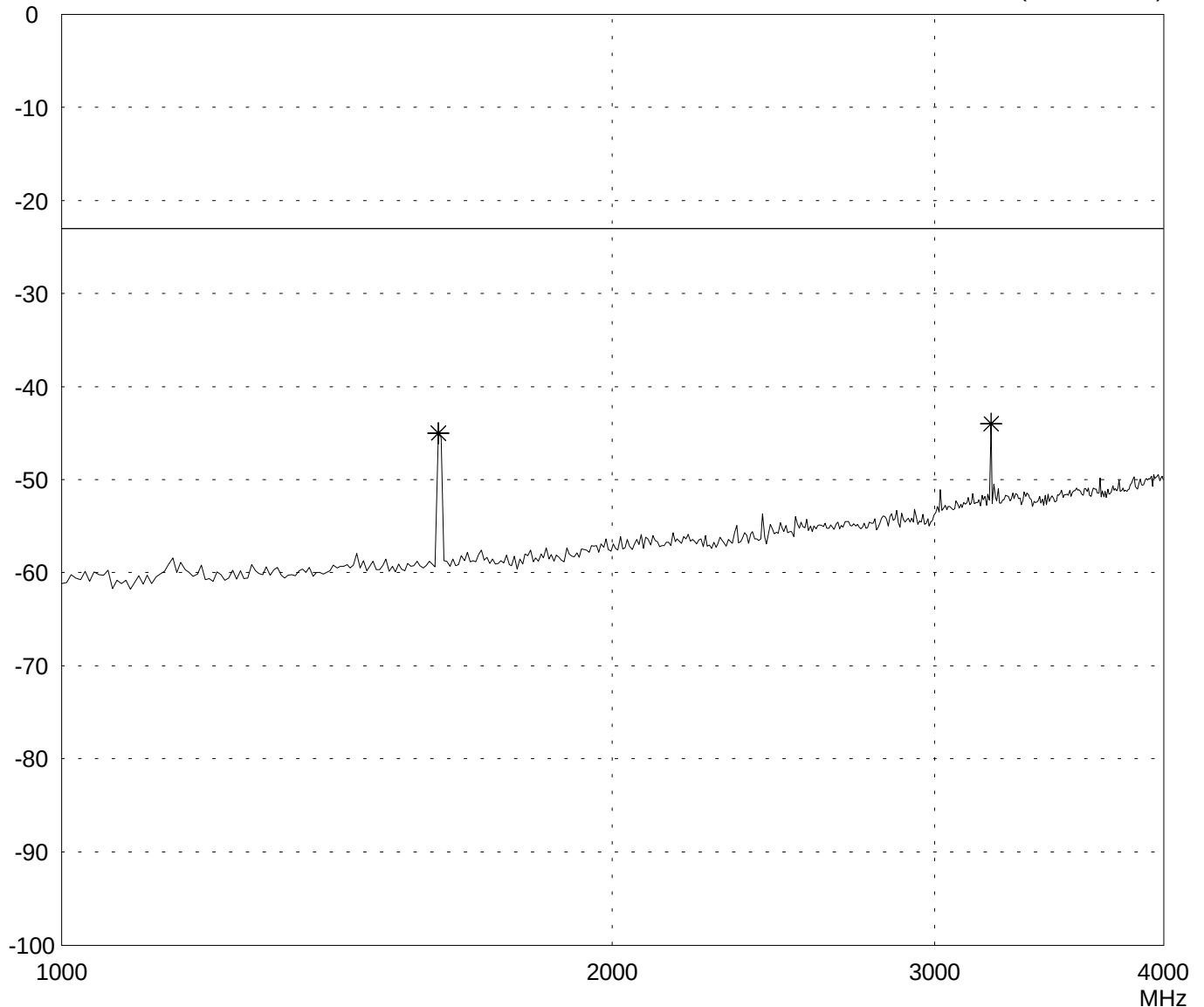
Peak

List of values:

Selected by hand

dBm

Limit1: FCC §74.861 Transducer: Substitution (EMCO 3115)



Result:

Limit kept

Project file:

56408-20820

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Radiated Power Test 4 GHz - 8.2 GHz acc. to FCC Part 74 Subpart H

Model:

AW-8P

Serial no.:

test sample

Applicant:

Universal Technologies Co. Ltd.

Test site:

Fully anechoic room, cabin no. 2

Tested on:

Test distance 3 metres
Horizontal Polarization

Date of test:

04/17/2003

Operator:

M. Steindl

Test performed:

automatically

File name:

default.emi

Comment:

- TX-Mode
-
- Channel: 804.3 MHz
-
- with high pass filter WHK/M3/13G-10SS

Detector:

Peak

List of values:

Selected by hand

dBm

Limit1: FCC §74.861 Transducer: Substitution (EMCO 3115)

0

-10

-20

-30

-40

-50

-60

-70

-80

-90

-100

4000

5000

6000

7000

8200
MHz

Result:

Limit kept

Project file:

56408-20820

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Pages

Radiated Power Test 4 GHz - 8.2 GHz acc. to FCC Part 74 Subpart H

Model:

AW-8P

Serial no.:

test sample

Applicant:

Universal Technologies Co. Ltd.

Test site:

Fully anechoic room, cabin no. 2

Tested on:

**Test distance 3 metres
Vertical Polarization**

Date of test:

04/17/2003

Operator:

M. Steindl

Test performed:

automatically

File name:

default.emi

Comment:

- TX-Mode
-
- Channel: 804.3 MHz
-
- with high pass filter WHK/M3/13G-10SS

Detector:

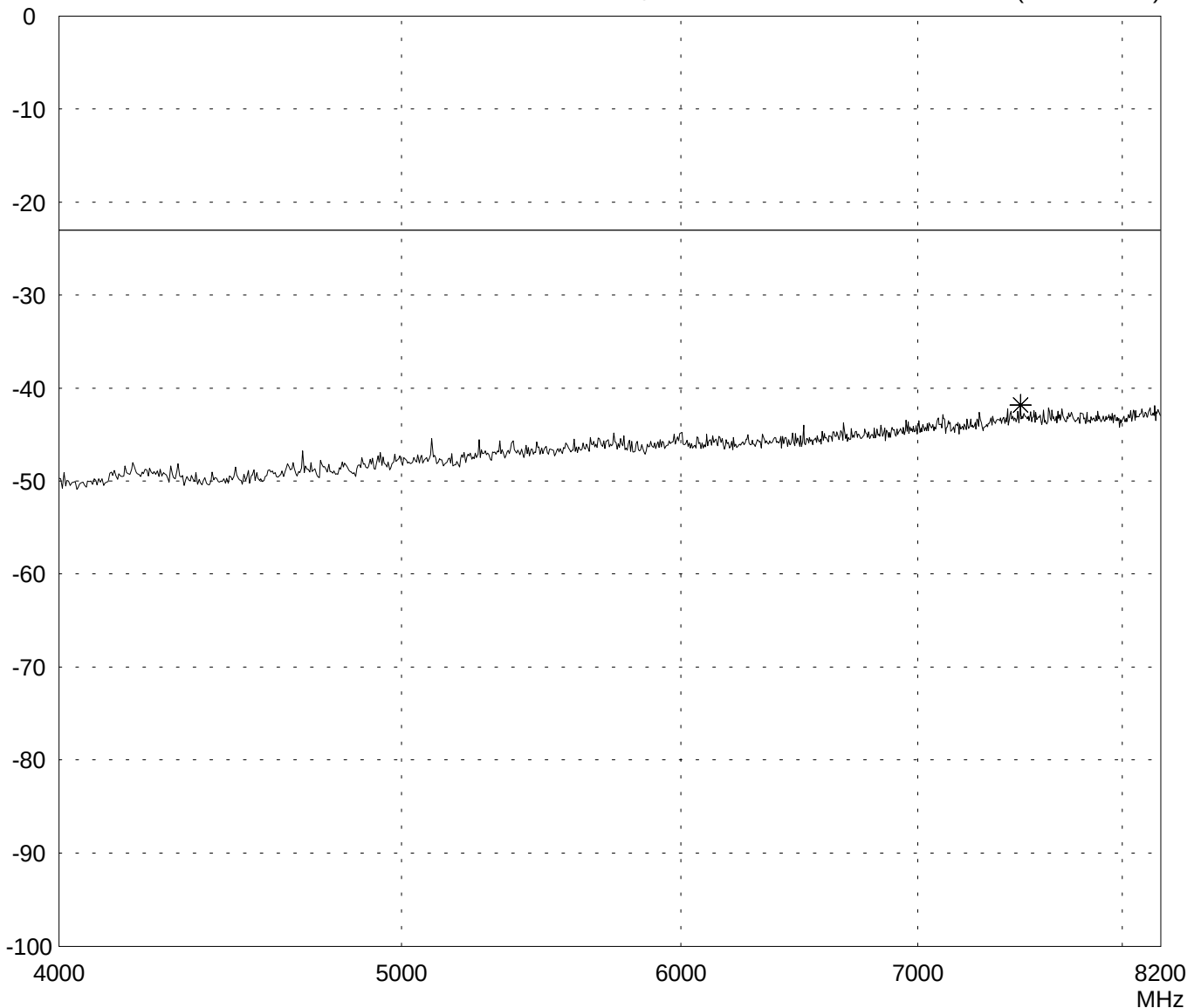
Peak

List of values:

Selected by hand

dBm

Limit1: FCC §74.861 Transducer: Substitution (EMCO 3115)



Result:

Limit kept

Project file:

56408-20820

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