



TEST MEASUREMENTS REPORT
ACCORDING TO FCC Part 2 and Part 22
FOR
TEL RAD Telecommunication
and Electronic Industries Ltd.
EQUIPMENT UNDER TEST:
Digital radio telephone CET-10
FCC ID: ARACET-10

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HERMON LABORATORIES

Test Report: TLR FCC.12663
Date: April, 1998
FCC ID:ARACET-10

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of Hermon Laboratories Ltd.***



Description of equipment under test

Test item	Digital radio telephone (fixed cellular terminal) FCC ID:ARACET-10
Manufacturer	Telrad Telecommunications and Electronic Industries Ltd.
Types (Models)	CET-10
Receipt date	December 23, 1997

Applicant information

Applicant's representative	Mr. Josef Bakalzuk, department manager
Applicant's responsible person	Mr. Josef Bakalzuk, department manager
Company	Telrad Telecommunications and Electronic Industries Ltd.
Address	
P.O. Box	50
Postal code	71100
City	Lod
Country	Israel
Telephone number	+972-(0) 8913 3716
Telefax number	+972-(0) 8913 3164
Order number:	

Test performance

Project Number:	12663
Location	Hermon Laboratories
Test started	December 23, 1997
Test completed	April 1, 1998
Purpose of test	Type acceptance
Test specification(s)	FCC Part 2, §§ 2.985, 2.987, 2.989, 2.991, 2.993, 2.995, 2.997, Part 1, §1.1310 FCC Part 22, §§ 22.905, 22.913, 22.915, 22.917 FCC Part 15, §§ 15.107, 15.109, 15.207



Table of Contents

1 GENERAL INFORMATION.....	6
1.1 ABBREVIATIONS AND ACRONYMS	6
1.2 SPECIFICATION REFERENCES	7
1.3 EUT DESCRIPTION	7
1.4 STATEMENT OF MANUFACTURER	9
2 TEST FACILITY DESCRIPTION	10
2.1 GENERAL.....	10
2.2 EQUIPMENT CALIBRATION	10
2.2.1 Uncertainty in Hermon Labs Measurements.....	10
2.3 LABORATORY PERSONNEL	11
2.4 STATEMENT OF QUALIFICATION	11
3 TEST MEASUREMENTS.....	12
3.1 RF POWER OUTPUT TEST ACCORDING TO PART 2, § 2.985.....	12
3.1.1 Definition of the test	12
3.1.2 The test set-up configuration	12
3.1.3 Test results.....	12
3.2 FREQUENCY STABILITY TEST ACCORDING TO PART 2, § 2.995	43
3.2.1 Definition of the test	43
3.2.2 The test set-up configuration	43
3.2.3 Test results.....	43
3.3 OCCUPIED BANDWIDTH TEST ACCORDING TO PART 22, § 22.905 AND PART 2, § 2.989 (C).....	68
3.3.1 Definition of the test	68
3.3.2 The test set-up configuration	68
3.3.3 Test results.....	68
3.4 MODULATION CHARACTERISTICS (FREQUENCY DEVIATION) TEST ACCORDING TO PART 2, § 2.987 AND PART 22, § 22.915	75
3.4.1 Definition of the test	75
3.4.2 The test set-up configuration	75
3.4.3 Test results.....	76
3.5 EMISSION MASK TEST ACCORDING TO PART 22, § 22.917(B).....	79
3.5.1 Definition of the test	79
3.5.2 The test set-up configuration	79
3.5.3 Test results.....	79
3.6 EFFECTIVE RADIATED POWER TEST ACCORDING TO PART 2, §22.913 AND FIELD STRENGTH OF SPURIOUS RADIATION TEST ACCORDING TO PART 2, § 2.993 AND PART 22, § 22.917 (E).....	156
3.6.1 Effective radiated power test	156
3.6.1.1 Definition of the test	156
3.6.1.2 The test set-up configuration	156
3.6.1.3 Test results.....	156
3.6.1.4 Exposure limit according to part 1, §1.1310.....	156
3.6.2 Field strength of spurious radiation test	157
3.6.2.1 Definition of the test	157
3.6.2.2 The test set-up configuration	157
3.6.2.3 Test results.....	157
3.7 SPURIOUS EMISSIONS AT ANTENNA TERMINALS (EXCEPT EMISSION MASK) TEST ACCORDING TO PART 2, § 2.991, PART 22, § 22.917(E).....	165
3.7.1 Definition of the test	165



3.7.2 The test set-up configuration	165
3.7.3 Test results.....	165
3.8 MOBILE EMISSIONS IN BASE FREQUENCY RANGE TEST ACCORDING TO PART 22, § 22.917	190
3.8.1 Definition of the test	190
3.8.2 The test set-up configuration	190
3.8.3 Test results.....	190
3.9 AUDIO FILTER CHARACTERISTICS TEST ACCORDING TO PART 22, § 22.915 (D)	203
3.9.1 Definition of the test	203
3.9.2 The test set-up configuration	203
3.9.3 Test results.....	204
3.10 UNINTENTIONAL RADIATED EMISSIONS (CLASS A DIGITAL DEVICE) TEST ACCORDING TO §15.109.....	222
3.10.1 Definition of the test	222
3.10.2 The test set-up configuration	222
3.11 CONDUCTED EMISSION MEASUREMENTS ACCORDING TO §15.107, §15.207	225
3.11.1 Definition of the test	225
3.11.2 The test set-up configuration	225
4 SUMMARY AND SIGNATURES	229
APPENDIX A - TEST EQUIPMENT AND ANCILLARIES USED FOR TESTS.....	230
APPENDIX B-TEST EQUIPMENT CORRECTION FACTORS.....	231



3.8.3 Test results.....	190
3.9 AUDIO FILTER CHARACTERISTICS TEST ACCORDING TO PART 22, § 22.915 (D)	203
3.9.1 Definition of the test	203
3.9.2 The test set-up configuration	203
3.9.3 Test results.....	204
3.10 UNINTENTIONAL RADIATED EMISSIONS (CLASS A DIGITAL DEVICE) TEST ACCORDING TO §15.109...222	
3.10.1 Definition of the test	222
3.10.2 The test set-up configuration.....	222
3.11 CONDUCTED EMISSION MEASUREMENTS ACCORDING TO §15.107, §15.207	225
3.11.1 Definition of the test	225
3.11.2 The test set-up configuration.....	225
4 SUMMARY AND SIGNATURES	229
APPENDIX A - TEST EQUIPMENT AND ANCILLARIES USED FOR TESTS.....	230
APPENDIX B-TEST EQUIPMENT CORRECTION FACTORS.....	231



1 General Information

1.1 Abbreviations and Acronyms

The following abbreviations and acronyms are applicable to this test report:

AVR	average
BW	bandwidth
cm	centimeter
dB	decibel
dB _i	decibel above isotropic
dB(μ V)	decibel referred to one microvolt
dB(μ V/m)	decibel referred to one microvolt per meter
EMC	Electromagnetic Compatibility
EUT	Equipment Under Test
GHz	Gigahertz
HL	Hermon Laboratories
HP	Hewlett Packard
Hz	Hertz
IF	intermediate frequency
kHz	kilohertz
m	meter
MHz	megahertz
MMS	main modulating signal
msec	millisecond
NA	Not Applicable
NARTE	National Association of Radio and Telecommunications Engineers, Inc.
Ω	Ohm
ppm	part per million
RBW	resolution bandwidth
RE	radiated emission
RF	radio frequency
QP	quasi-peak (detector)
SAT	supervisory audio tones
ST	signaling tone
VBW	video bandwidth
VHF	very high frequency
V	volt
V/m	volt per meter
WBS	wideband data signals



1.2 Specification References

CFR 47 part 2, 10/1996	Frequency Allocations and Radio Treaty Matters; General Rules and Regulations
CFR 47 part 22, 10/1996	Personal Radio Services
ANSI C63.2:06/1987	American National Standard for Instrumentation-Electromagnetic Noise and Field Strength, 10 kHz to 40 GHz-Specifications.
ANSI C63.4:1992	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.

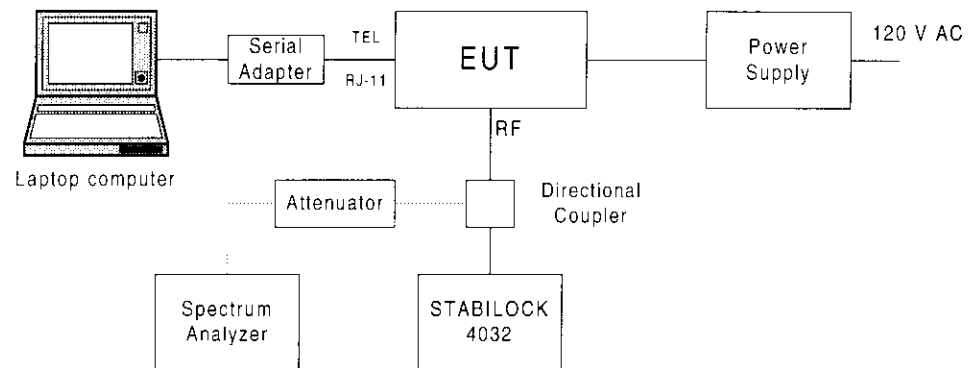
1.3 EUT Description

The EUT is a digital radio telephone (fixed cellular terminal), model CET-10, provides voice, and voice + data services, accessing all wired equipment. The CET-10 supports any type of tone dialing feature phones, modem, fax, answering machine. The CET-10 cellular transceiver transmit frequency range is 824-849 MHz, receive frequency range is 869-894 MHz, F3E type emission. Maximum RF output power is 1.6 W (ERP). The EUT is supplied by 120 V AC/12 V DC external power supply unit.

The EUT test block diagram is shown in Figure 1.1. The EUT configuration and operation during the tests was defined by the customer. Throughout the testing the following customer test equipment was used:

1. STABLOCK 4032 Communication Test Set (manufactured by WAVETEK) with software NADC-900MS Test, ver.1.60/SYS.
2. Directional Coupler, MINI-Circuits, ZEDC-10-2B (11 dB attenuation).

Figure 1.1
EUT Test Configuration





1.4 Statement of Manufacturer

The term identical means identical within the variations that can be expected to arise as a result of quantity production technique.

Signature: _____
Date: _____



2 Test Facility Description

2.1 General

Tests were performed at Hermon Laboratories, which is a fully independent, private EMC, Safety and Telecommunication testing facility. Hermon Laboratories is listed by the Federal Communications Commission (USA) for all parts of Code of Federal Regulations 47 (CFR 47), recognized by VDE (Germany) for witness test, certified by VCCI Registration No. R-263, C-266 (Japan), assessed by NMI Certin B.V. (Netherlands) for a number of EMC, Telecommunications and Safety standards, recognized by TUV Sudwest (Germany) for safety testing, and Assessed by AMTAC (UK) for safety of Medical Devices. The laboratory is accredited by American Association for Laboratory Accreditation (USA) according to ISO GUIDE 25/EN 45001 for EMC, Telecommunications and Product Safety Information Technology Equipment (Certificate No. 839.01).

Address: PO Box 23, Binyamina 30550, Israel.
Telephone: +972 (0)6628 8001
Fax: +972 (0)6628 8277

Person for contact: Mr. Alex Usoskin, Testing and QA Manager.

2.2 Equipment calibration

The test equipment has been calibrated according to its recommended procedures and is within the manufacturer's published limit of error. The standards and instruments used in the calibration system conform to the present requirements of MIL-STD-45662A.

The laboratory standards are calibrated by the third party (traceable to NIST, USA) on a regular basis according to equipment manufacturer requirements.

2.2.1 Uncertainty in Hermon Labs Measurements

Radiated Emissions (95% Confidence)	Biconical Antenna: 3m measuring distance : + 4.06 dB Expanded uncertainty : - 3.98 dB Expanded uncertainty : + 2.032 dB Combined standard uncertainty : - 1.99 dB Combined standard uncertainty 10m measuring distance : + 3.98 dB Expanded uncertainty : - 4.08 dB Expanded uncertainty : + 1.99 dB Combined standard uncertainty : - 2.04 dB Combined standard uncertainty Log periodic Antenna: 3m measuring distance : + 4.74 dB Expanded uncertainty : - 3.26 dB Expanded uncertainty : + 2.37 dB Combined standard uncertainty : - 1.63 dB Combined standard uncertainty 10m measuring distance : + 3.06 dB Expanded uncertainty : - 3.00 dB Expanded uncertainty
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Test Report: TLR FCC.12663

Date: April, 1998

FCC ID:ARACET-10

2.3 Laboratory Personnel

The four people of Hermon Laboratories that have participated in measurements and documentation preparation are: Dr. Edward Usoskin - C.E.O., Mrs. Eleonora Pitt and Mr. Michael Nikishin- test engineers and Mrs. Marina Cherniavsky - certification engineer.

Dr. E. Usoskin is an EMC Specialist, M. Cherniavsky is a telecommunication engineer certified by the National Association of Radio and Telecommunications Engineers (NARTE, USA.).

The Hermon Laboratories' personnel that participated in this project have more than 90 years combined experience time in EMC measurements and electronic products design.

2.4 Statement of Qualification

The test measurement data supplied in this test measurement report having been received by me, is hereby duly certified. The following is a statement of my qualifications: I am an engineer, graduated from university in 1996 with an MScEE degree, have obtained 1 year experience in EMC measurements and have been with Hermon Laboratories since 1998.

Name: Mr. Michael Nikishin
Position: test engineer

Signature: 
Date: April 7, 1998

The test measurement data supplied in this test measurement report having been received by me, is hereby duly certified. The following is a statement of my qualifications: I am an engineer, graduated from university in 1974 with an MScEE degree, have obtained 24 years experience in EMC measurements and have been with Hermon Laboratories since 1991.

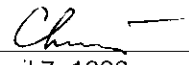
Name: Mrs. Eleonora Pitt
Position: test engineer

Signature: 
Date: April 7, 1998

I hereby certify that this test measurement report was prepared by me and is hereby duly certified. The following is a statement of my qualifications.

I am an engineer, graduated from university in 1971, with an MScEE degree, have obtained 25 years experience in electronic products design and development. Also, I am a Telecommunication Class II engineer certified by the National Association of Radio and Telecommunications Engineers, Inc. (USA.), the certificate no. is E2-03410 and have been with Hermon Labs since 1991.

Name: Mrs. Marina Cherniavsky
Position: certification engineer

Signature: 
Date: April 7, 1998

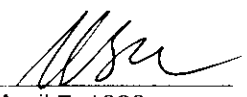
I hereby certify that this test measurement report was prepared under my direction and that to the best of my knowledge and belief, the facts set in the report and accompanying technical data are true and correct.

The following is a statement of my qualifications.

I have a Ph.D. degree in electronics, have obtained more than 41 years of experience in EMC, Safety, Telecommunications measurements and electronic product design.

Also, I am an EMC engineer certified by the National Association of Radio and Telecommunications Engineers, Inc. (USA). The certificate no. is EMC-000623-NE, Senior Member, and have been with Hermon Labs since 1986.

Name: Dr. Edward Usoskin
Position: C.E.O.

Signature: 
Date: April 7, 1998



3 Test Measurements

3.1 RF power output test according to Part 2, § 2.985

3.1.1 Definition of the test

This test was performed to demonstrate that the EUT maximum RF power output is not more than 7 W.

3.1.2 The test set-up configuration

The EUT was configured as shown in Figure 1.1 and the EUT RF output was connected to the spectrum analyzer through 30 dB attenuator (total 41 dB external attenuation). The radio transmission was activated by the customer Test Equipment. All the spectrum analyzer settings are shown in the plots.

3.1.3 Test results

The measurements were performed for analog and digital modes of operation at ambient temperatures from 0°C to +40°C. The Plots 3.1.1 to 3.1.30 that follow this page show the maximum RF output power measured at 3 carrier (channel) frequencies (low, middle, high) with the 41 dB external to the spectrum analyzer attenuator, therefore 41 dB should be added to the plotted results.

The output power calculation example (refer to Plot 3.1.1):

$$-10.40 \text{ dBm} + 41 \text{ dB} = 30.6 \text{ dBm} = 1.15 \text{ W},$$

where:

-10.40 dBm - measured transmitter power

41 dB - external attenuation.

The Table 3.1 below gives measured output power in watts (W). All results are less than allowed 7 W.

Table 3.1.1
Maximum transmitter power test results

Mode of operation	Frequency, MHz	RF power output, W @temperature, °C				
		0	10	20	30	40
Digital	824.04	1.15	0.75	1.05	1.12	1.10
	836.49	1.90	2.09	1.78	1.95	1.70
	848.97	1.95	1.86	1.86	1.74	1.86
Analog	824.04	0.85	0.81	0.72	0.78	0.70
	836.49	0.83	0.81	0.74	0.74	0.70
	848.97	0.79	0.89	0.70	0.69	0.70

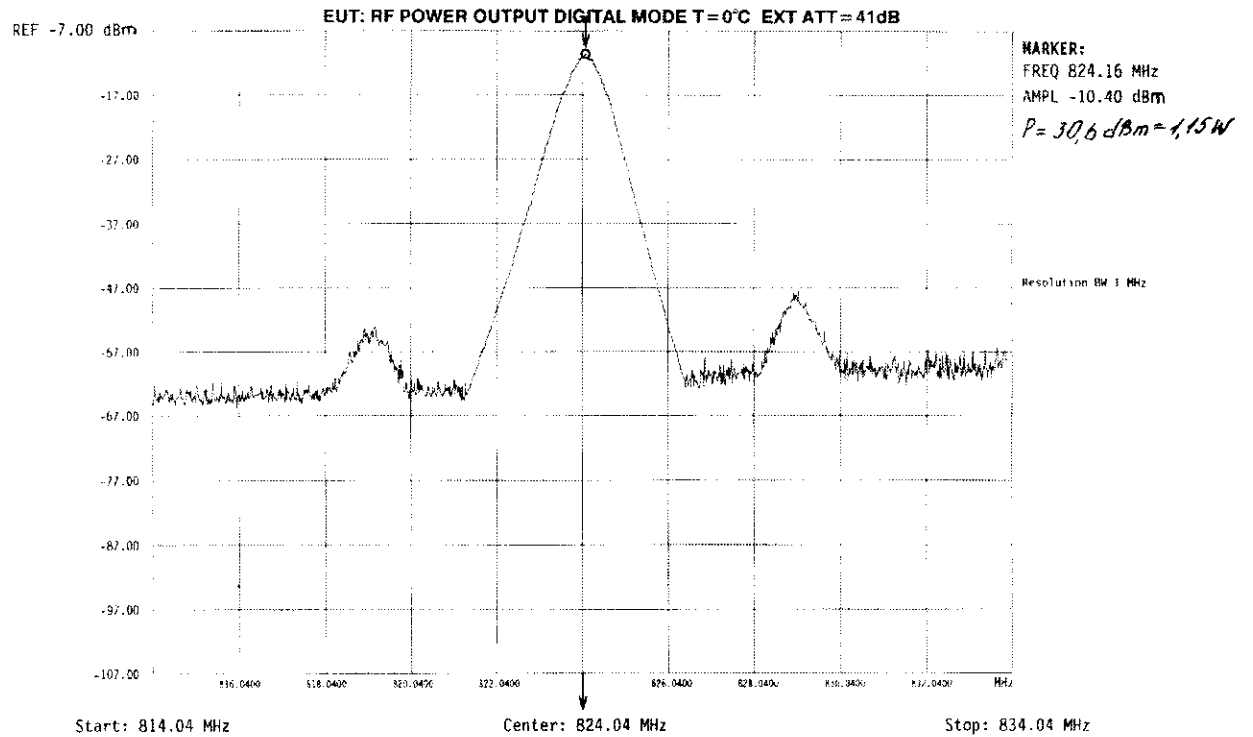
Reference numbers of test equipment used

HL 0027	HL 0056	HL 0500	
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Full description is given in Appendix A.

Plot 3.1.1
RF power output test

Wednesday, 4/3/1998
Time: 12:4:14



Handwritten signature

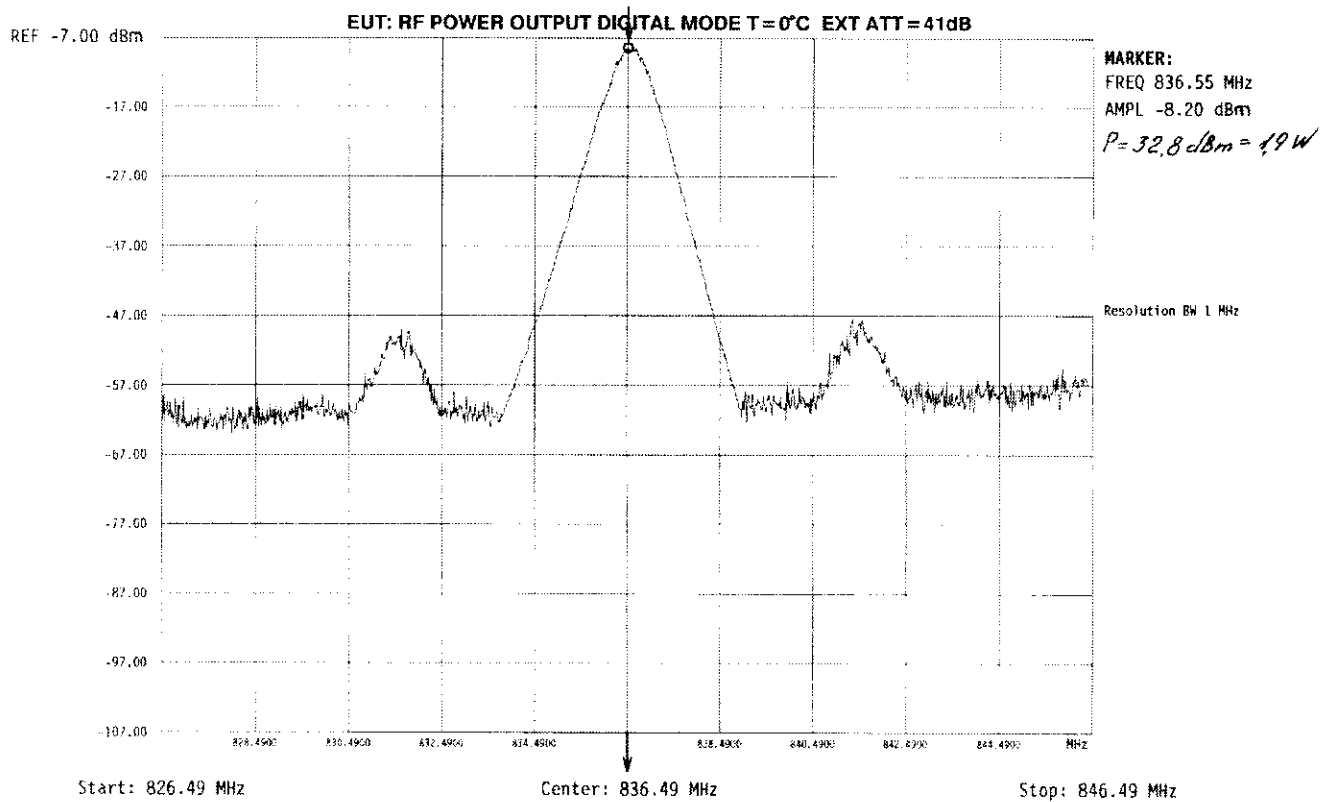


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Test Report: TLR FCC.12663
Date: April, 1998
FCC ID: ARACET-10

Plot 3.1.2
RF power output test

Wednesday, 4/3/1998
Time: 12:6:21

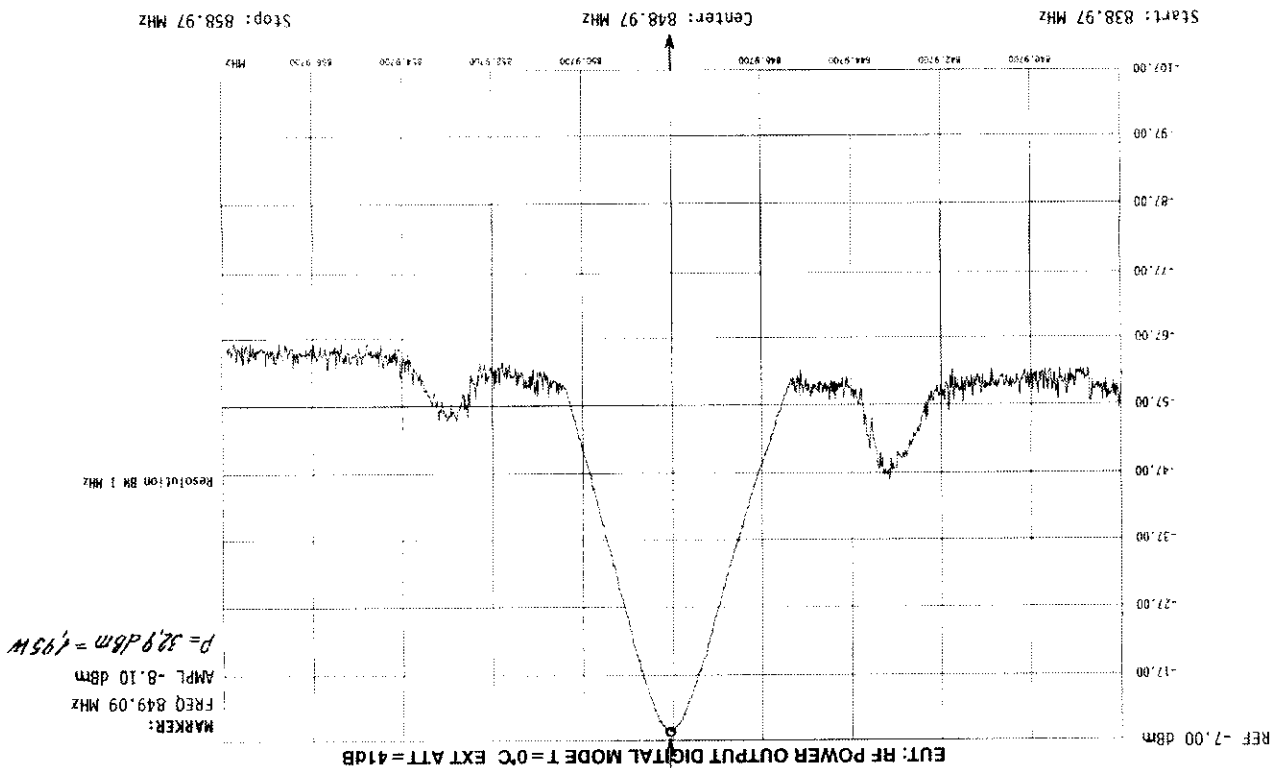


Pth



Plot 3.1.3
RF power output test

Wednesday, 4/31/1998
Time: 12:9:1



7/11



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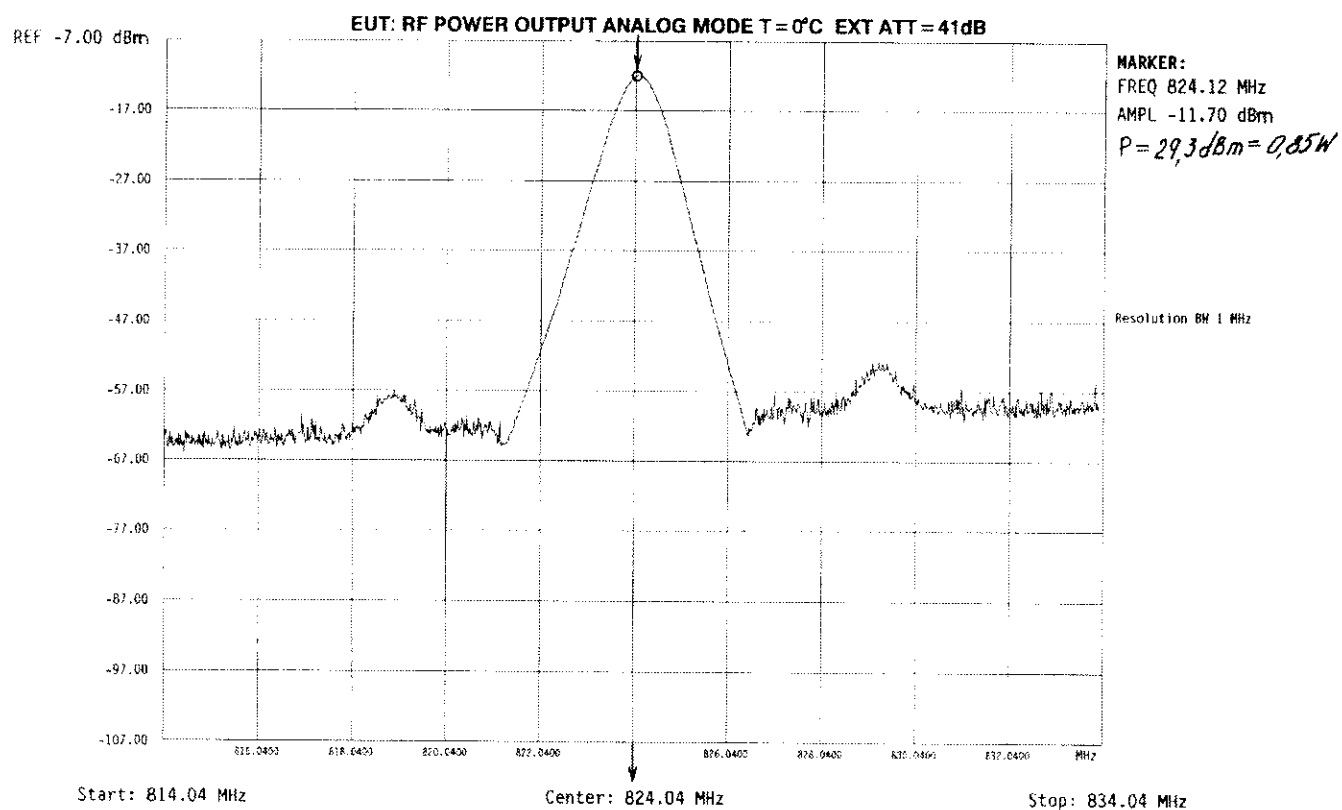
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Plot 3.1.4
RF power output test

Wednesday, 4/3/1998
Time: 12:1:45





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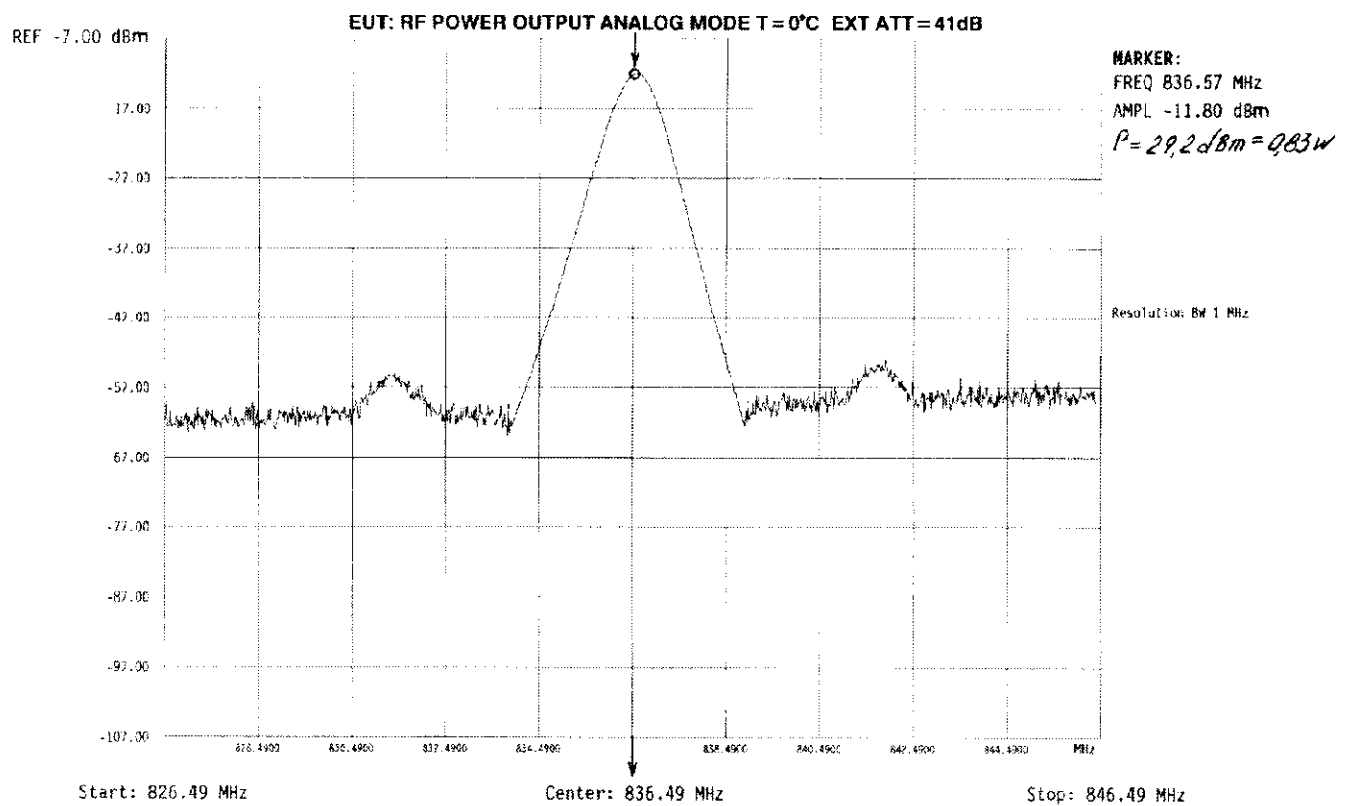
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Date: April, 1998

FCC ID: ARACET-10

Plot 3.1.5
RF power output test

Wednesday, 4/3/1998
Time: 11:59:46



PHL

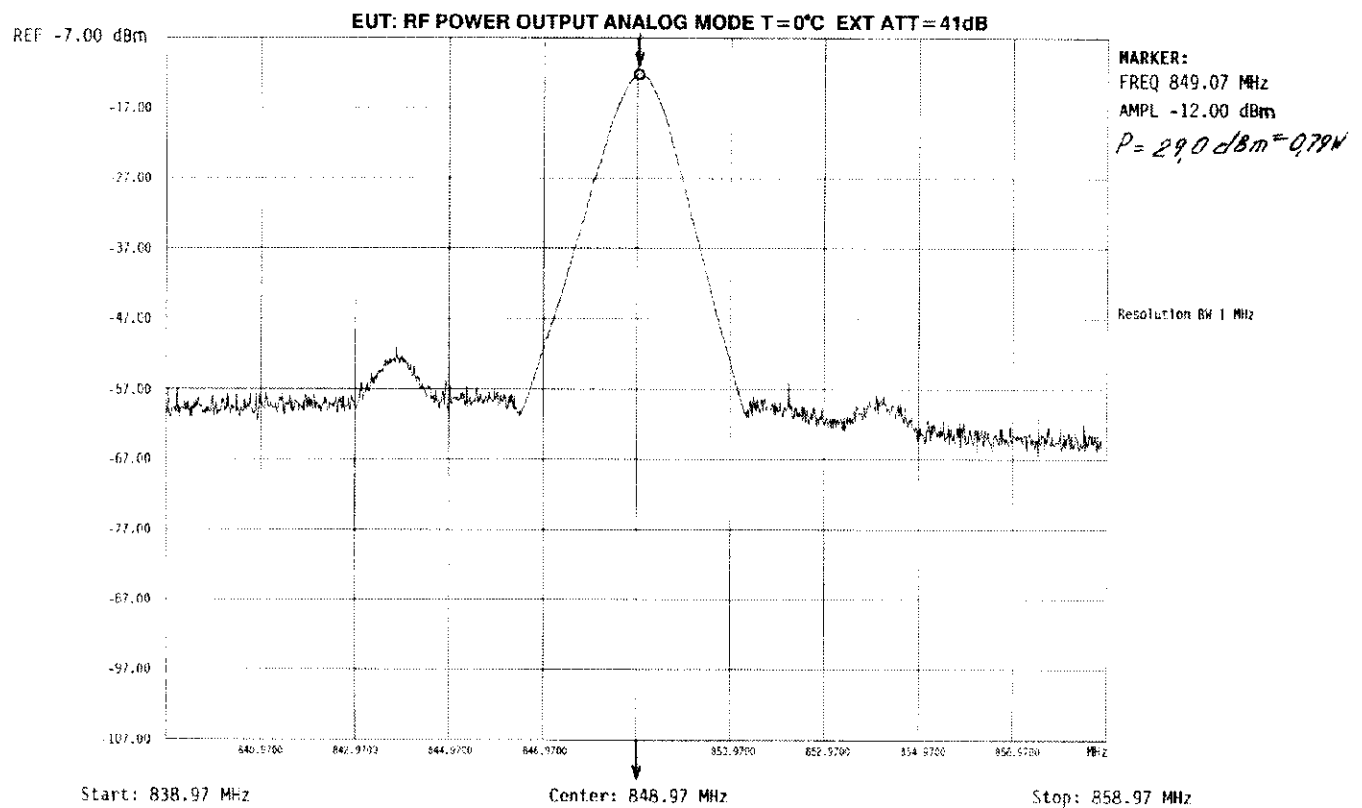


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Date: April, 1998
FCC ID: ARACET-10

Plot 3.1.6
RF power output test

Wednesday, 4/3/1998
Time: 11:57:47



RH



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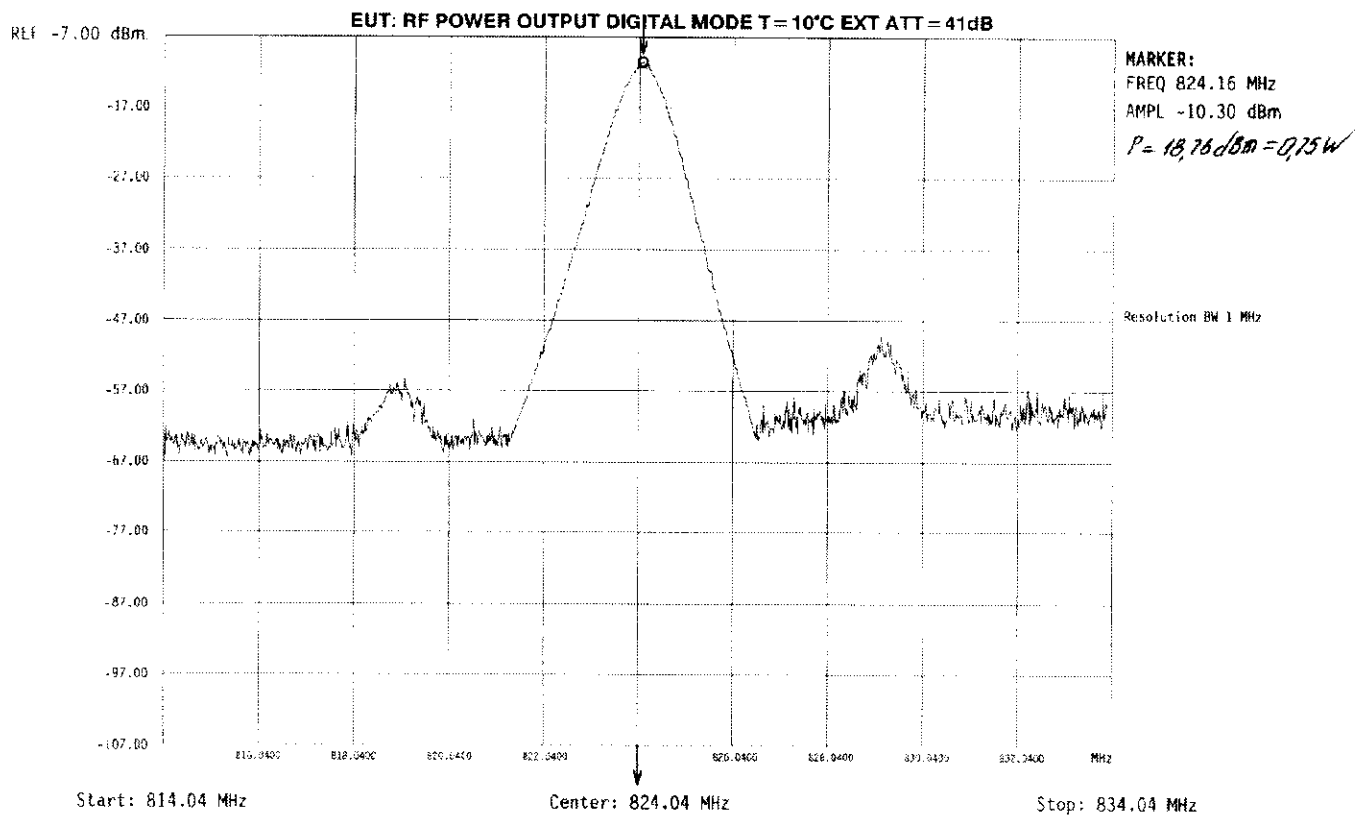
Test Report: TLRFCC.12663

Date: April, 1998

FCC ID:ARACET-10

Plot 3.1.7
RF power output test

Wednesday, 4/3/1998
Time: 13:23:9



PH

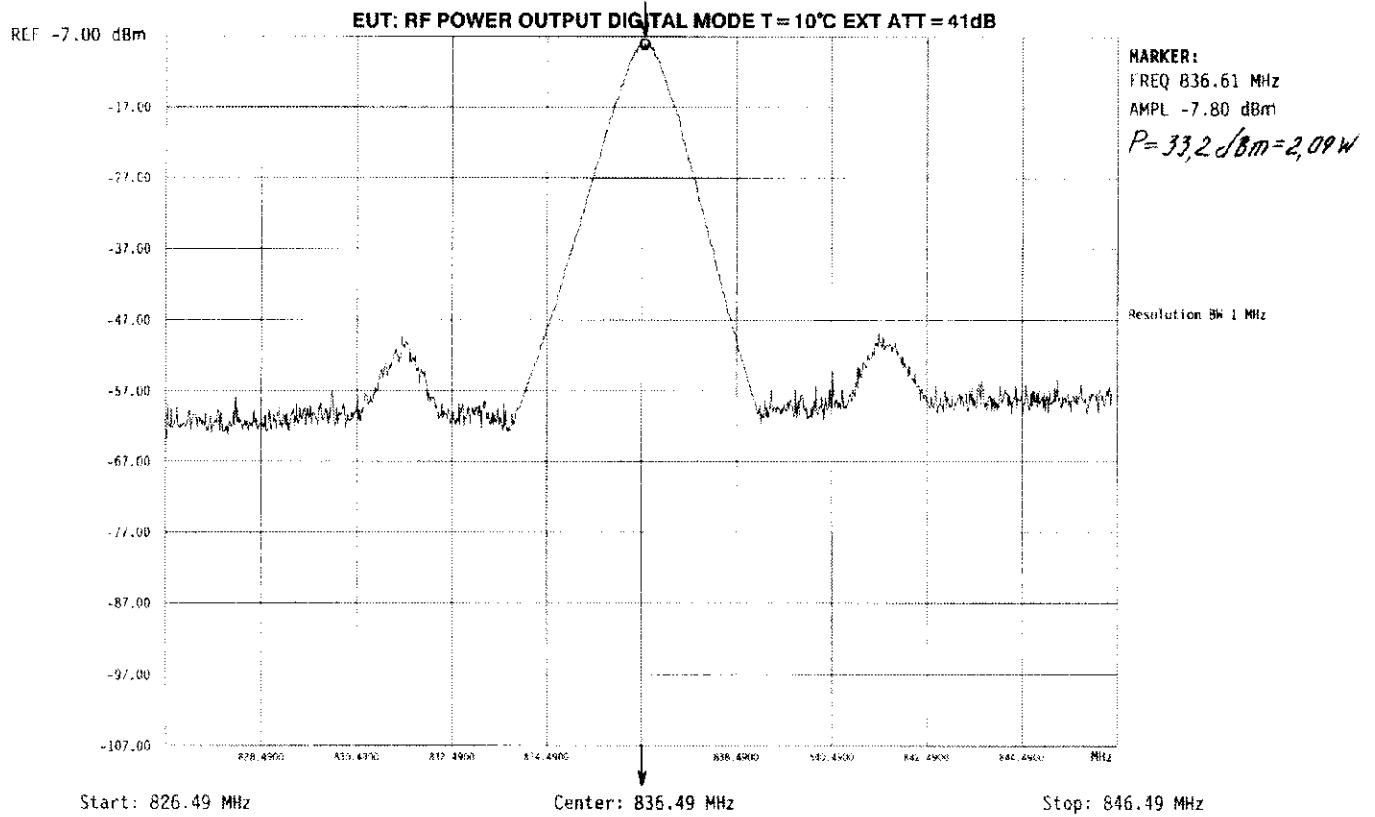


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Date: April, 1998
FCC ID: ARACET-10

Plot 3.1.8
RF power output test

Wednesday, 4/3/1998
Time: 13:25:16



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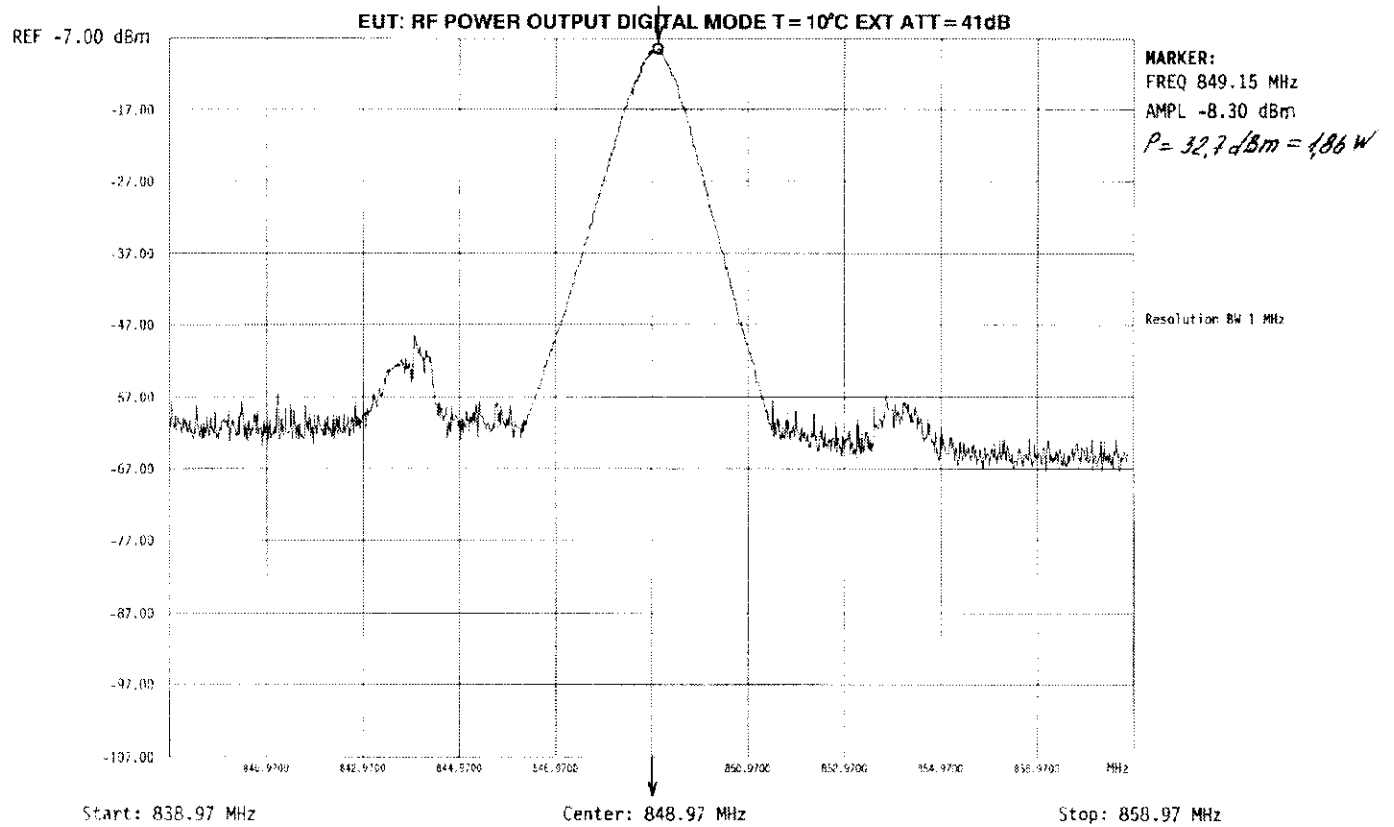
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Date: April, 1998

FCC ID: ARACET-10

Plot 3.1.9
RF power output test

Wednesday, 4/3/1998
Time: 13:27:27



RA



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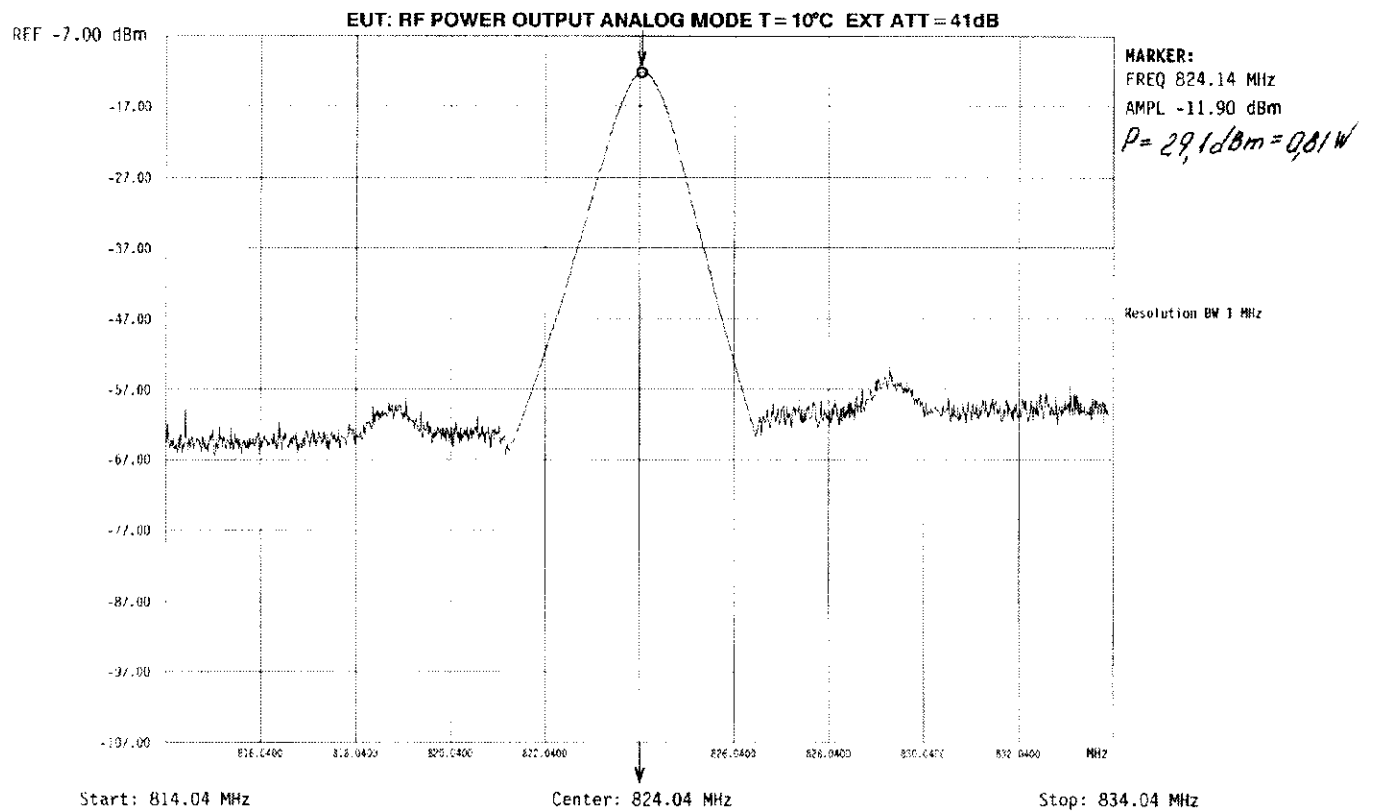
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FCC ID: ARACET-10

Plot 3.1.10
RF power output test

Wednesday, 4/3/1998
Time: 13:41:38



RH



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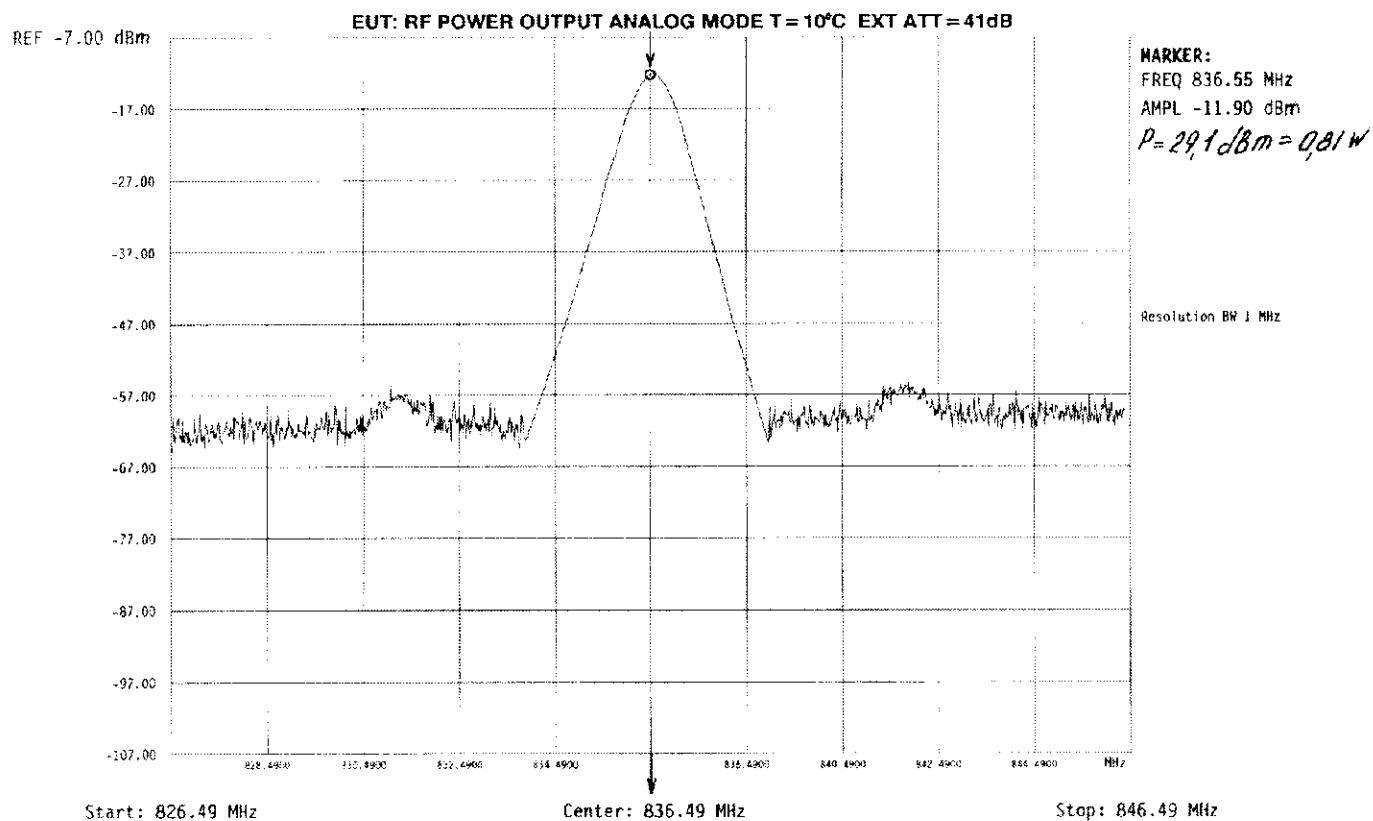
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Date: April, 1998

FCC ID: ARACET-10

Plot 3.1.11
RF power output test

Wednesday, 4/3/1998
Time: 13:39:40



PH

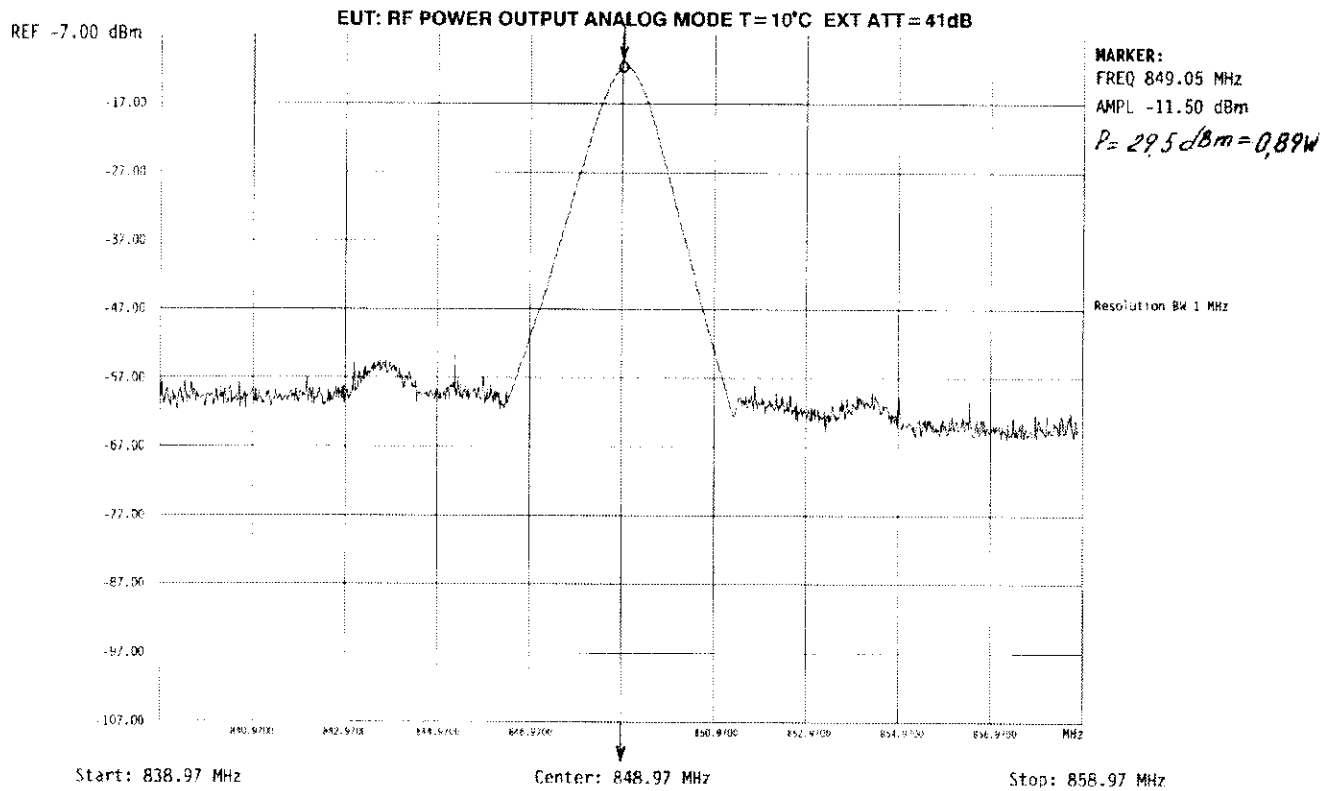


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Plot 3.1.12
RF power output test

Wednesday, 4/3/1998
Time: 13:34:44



RH



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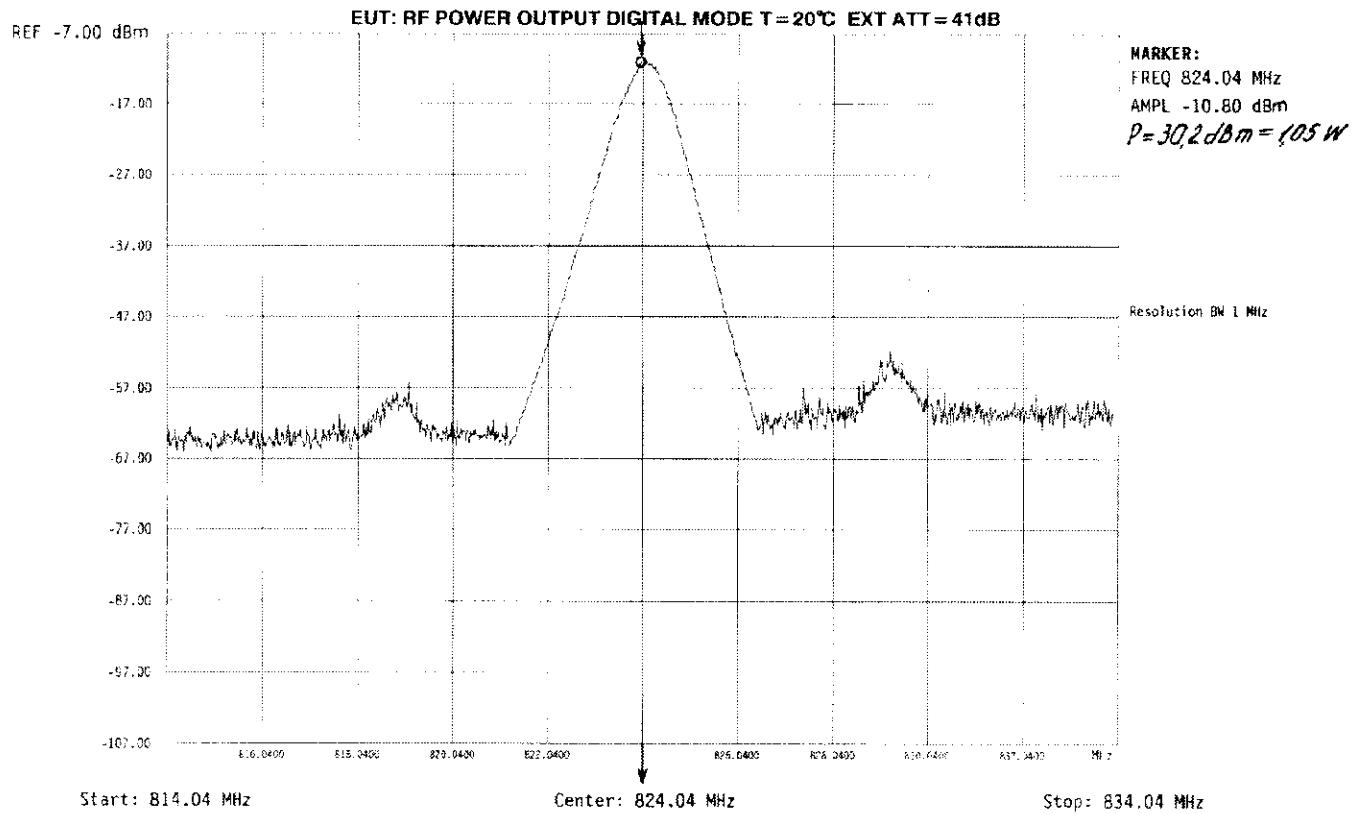
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Plot 3.1.13
RF power output test

Wednesday, 4/3/1998
Time: 10:52:16



RH



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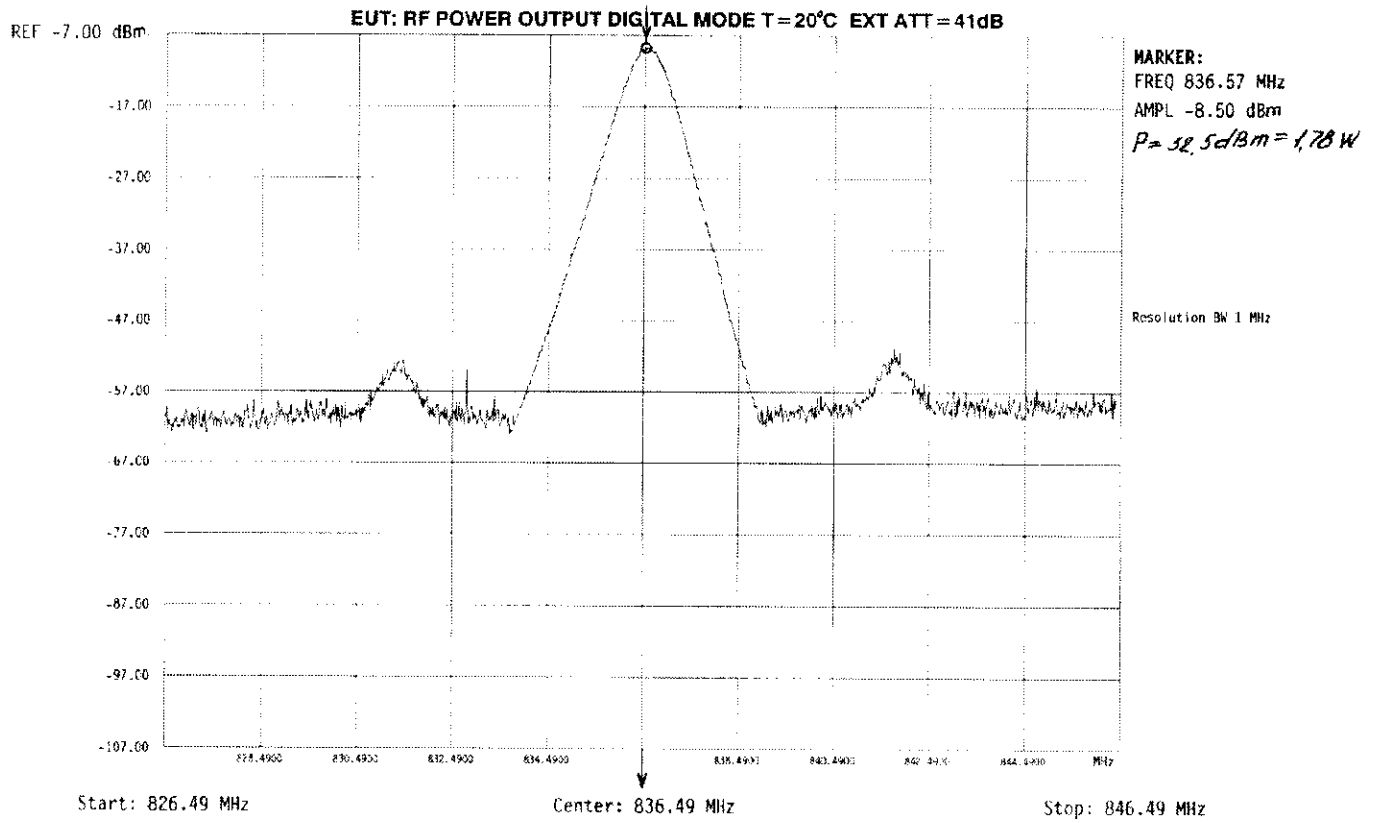
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Date: April, 1998

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Plot 3.1.14
RF power output test

Wednesday, 4/3/1998
Time: 10:50:13



RHL



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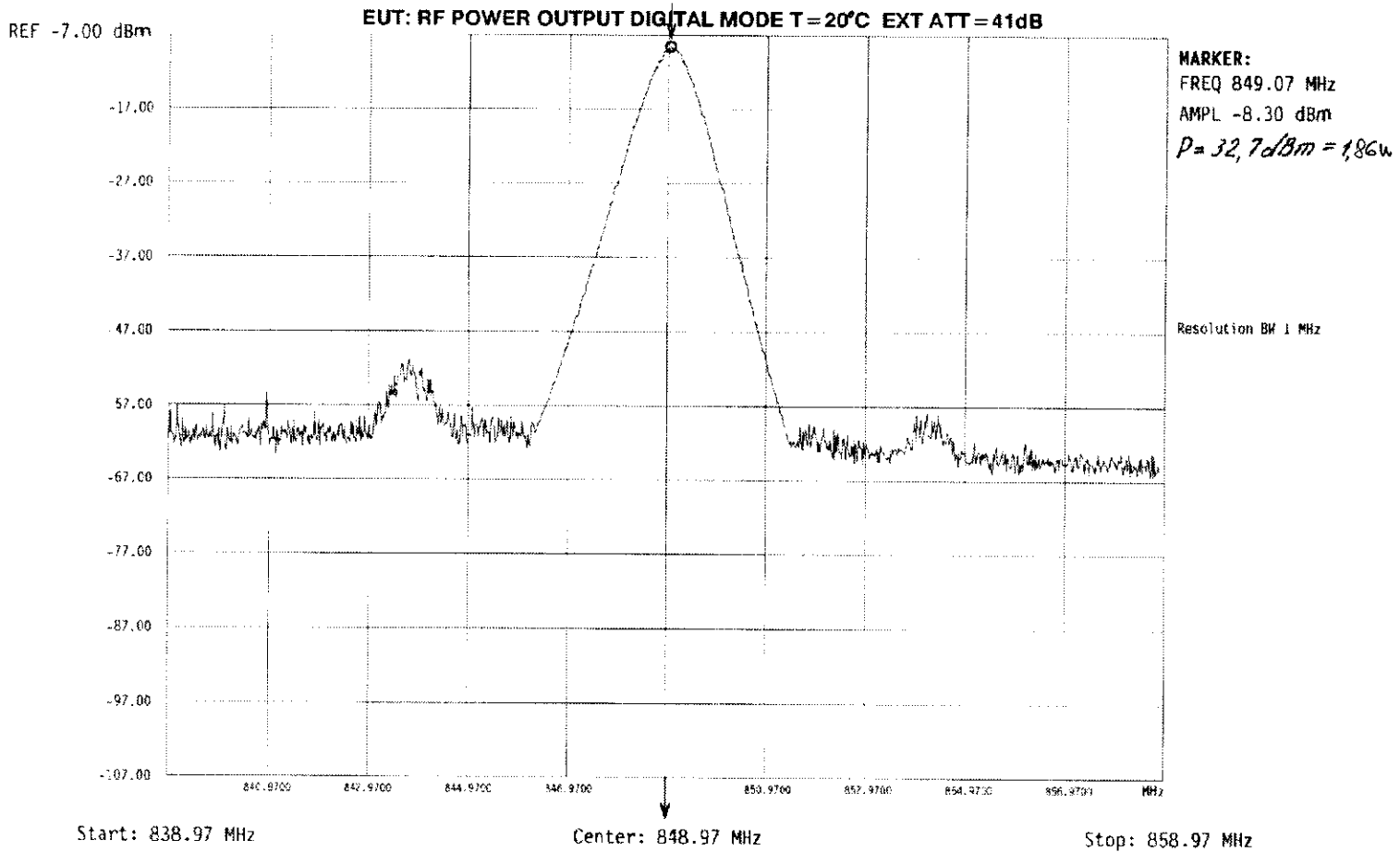
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Date: April, 1998

FCC ID: ARACET-10

Plot 3.1.15
RF power output test

Wednesday, 4/3/19
Time: 10:47:53





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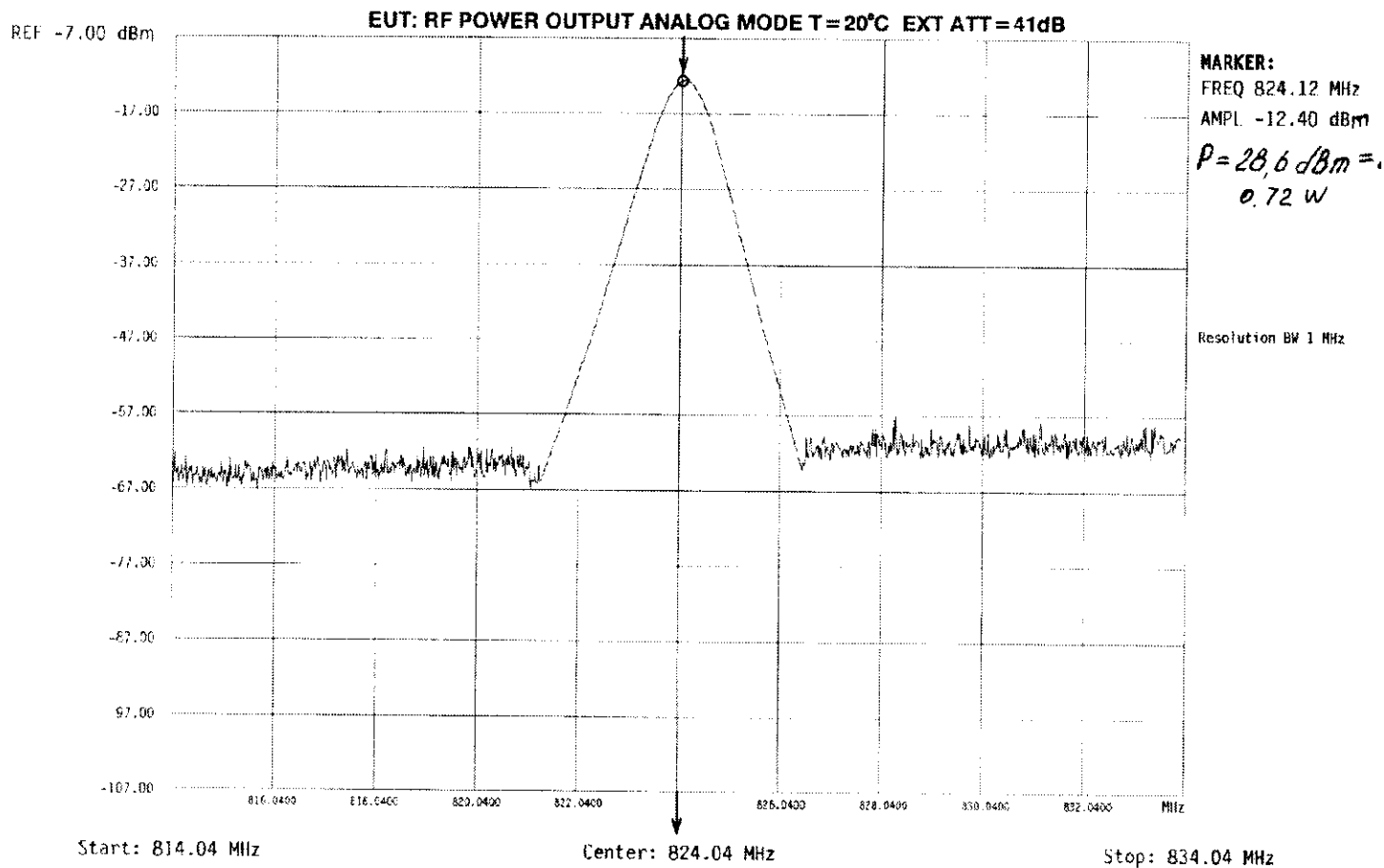
Test Report: TLR FCC.12663

Date: April, 1998

FCC ID: ARACET-10

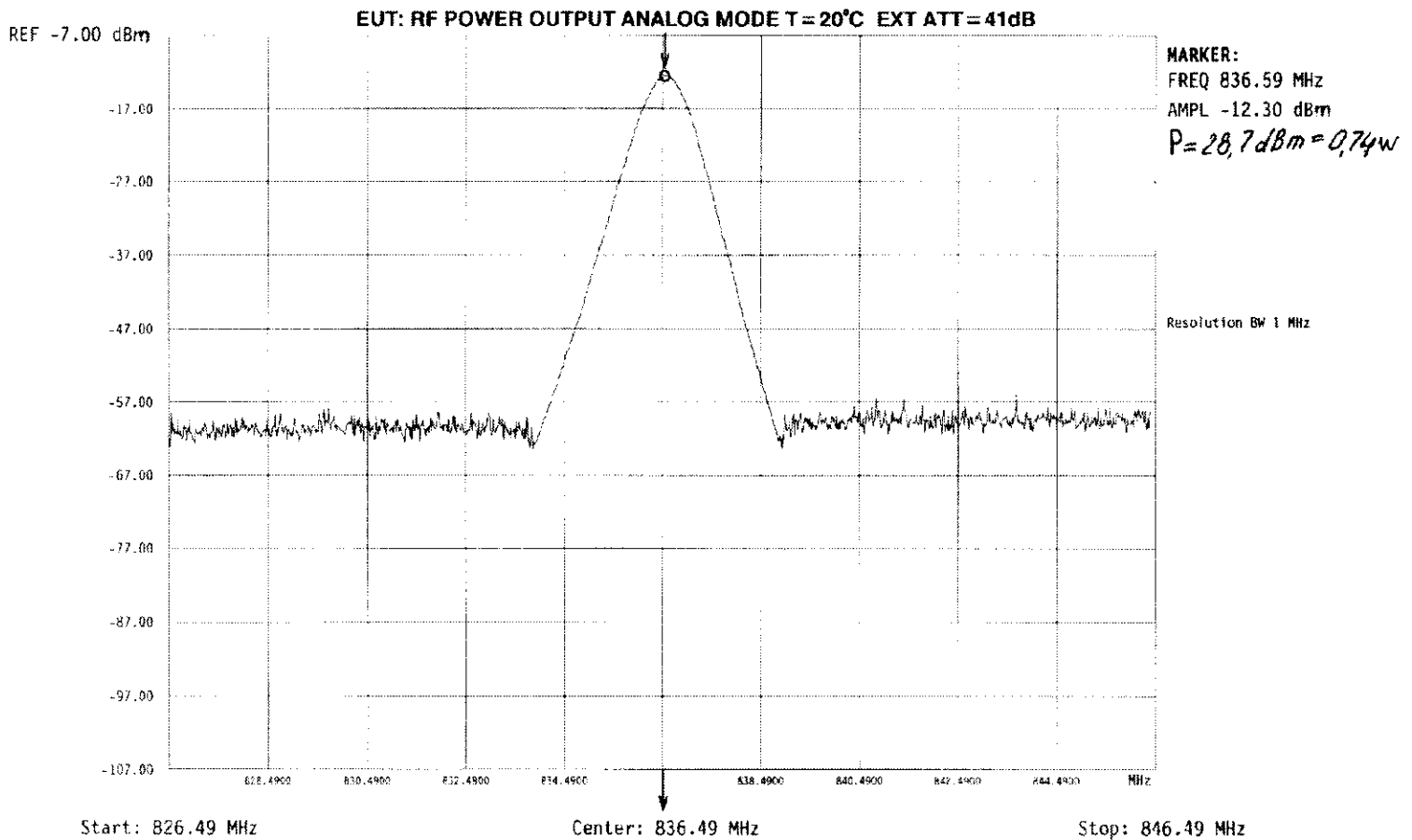
Plot 3.1.16
RF power output test

Wednesday, 4/3/19:
Time: 10:55:29



Plot 3.1.17
RF power output test

Wednesday, 4/3/1998
Time: 10:57:41



R



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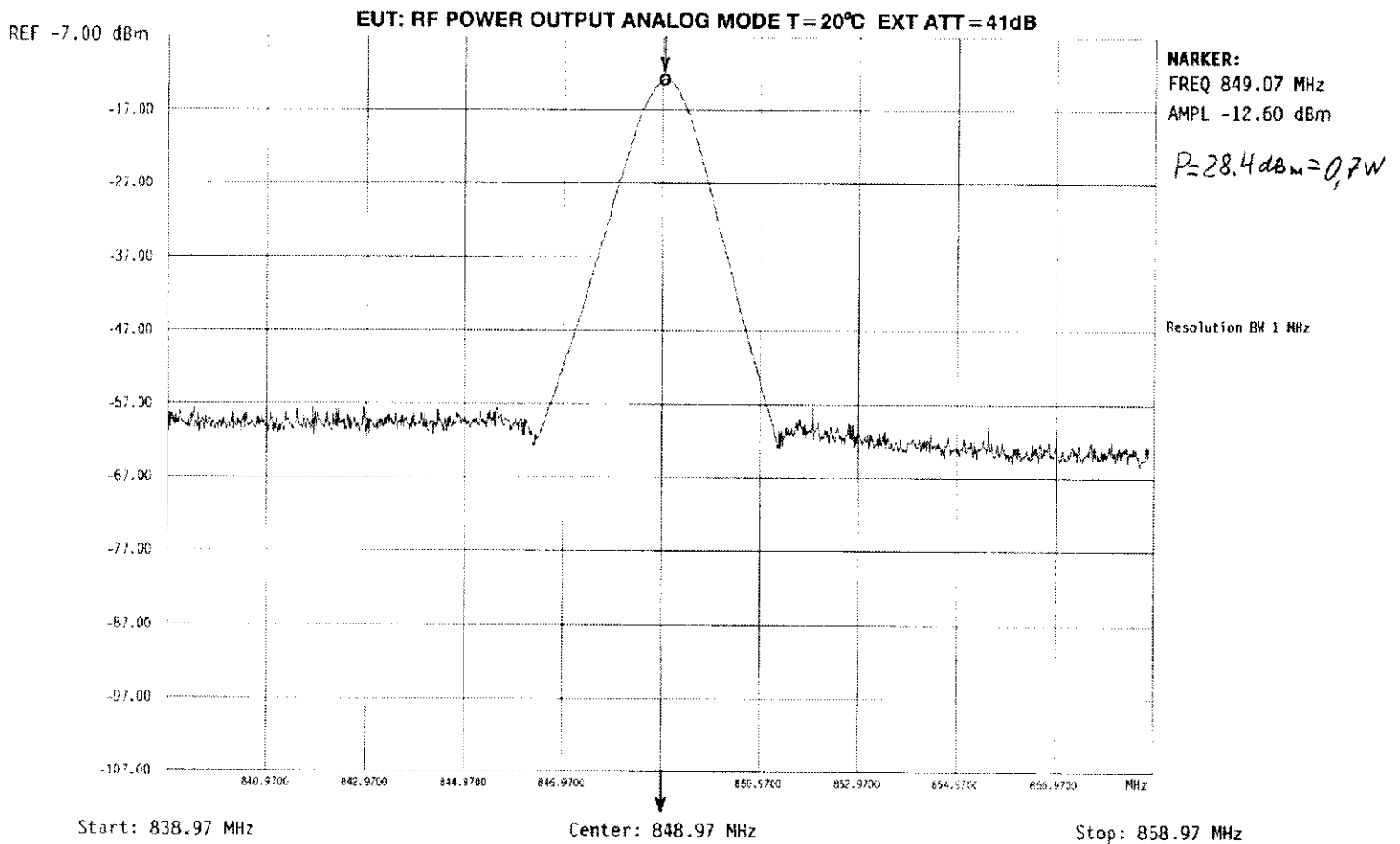
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FCC ID: ARACET-10

Plot 3.1.18
RF power output test

Wednesday, 4/3/1998
Time: 10:59:56





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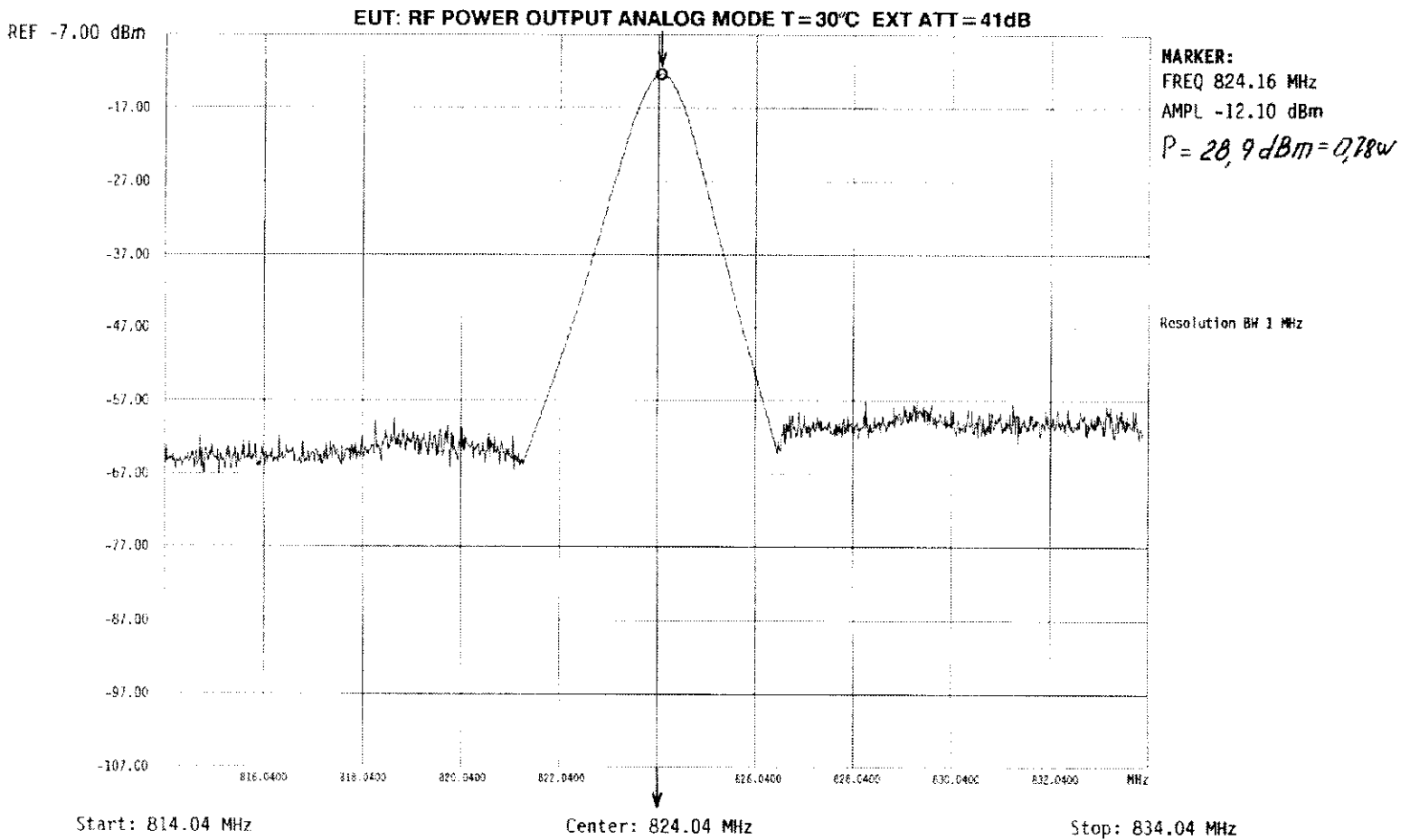
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Date: April, 1998

FCC ID: ARACET-10

Plot 3.1.19
RF power output test

Wednesday, 4/3/1998
Time: 14:21:22



AB



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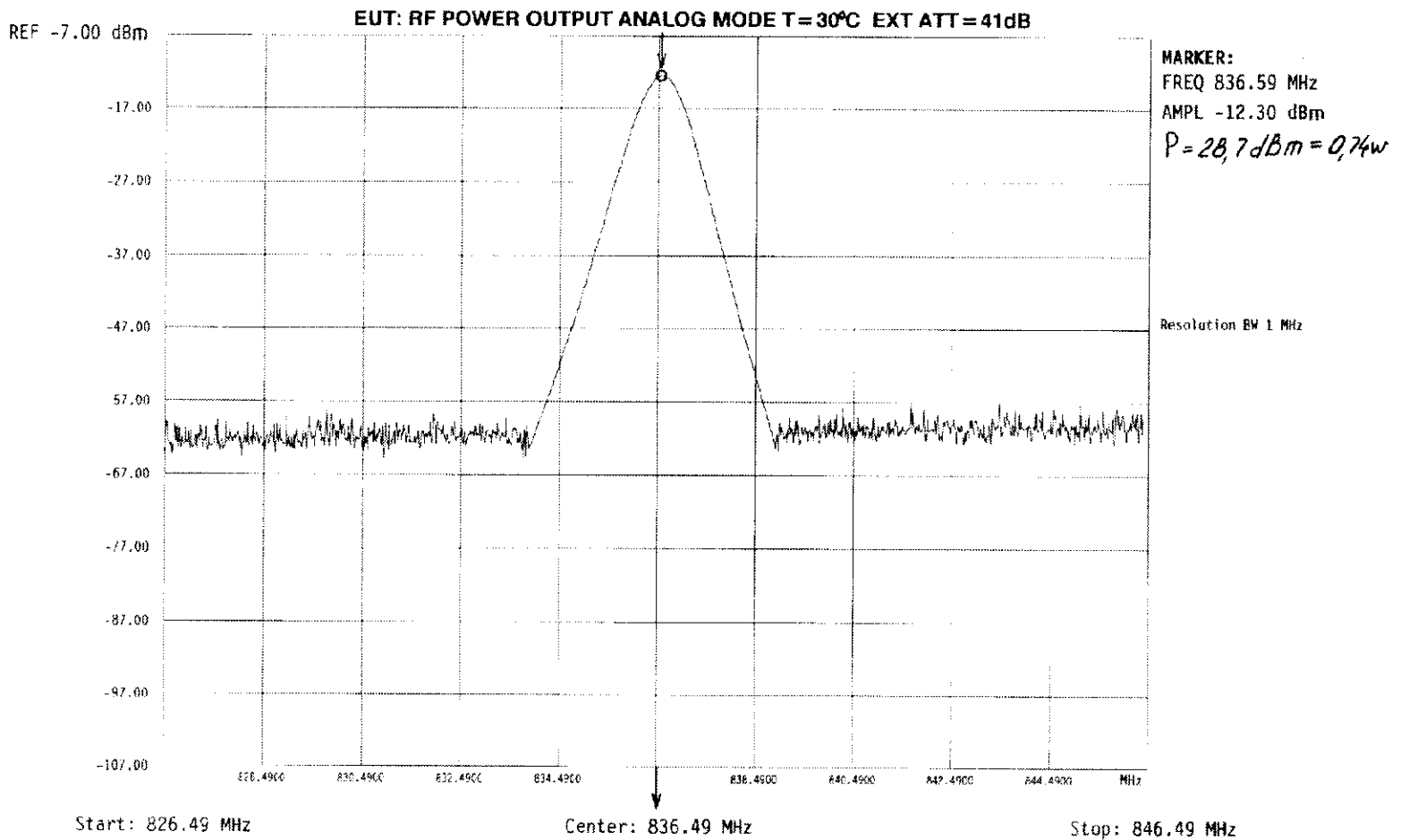
Test Report: TLR FCC.12663

Date: April, 1998

FCC ID: ARACET-10

Plot 3.1.20
RF power output test

Wednesday, 4/3/1998
Time: 14:23:21



hs



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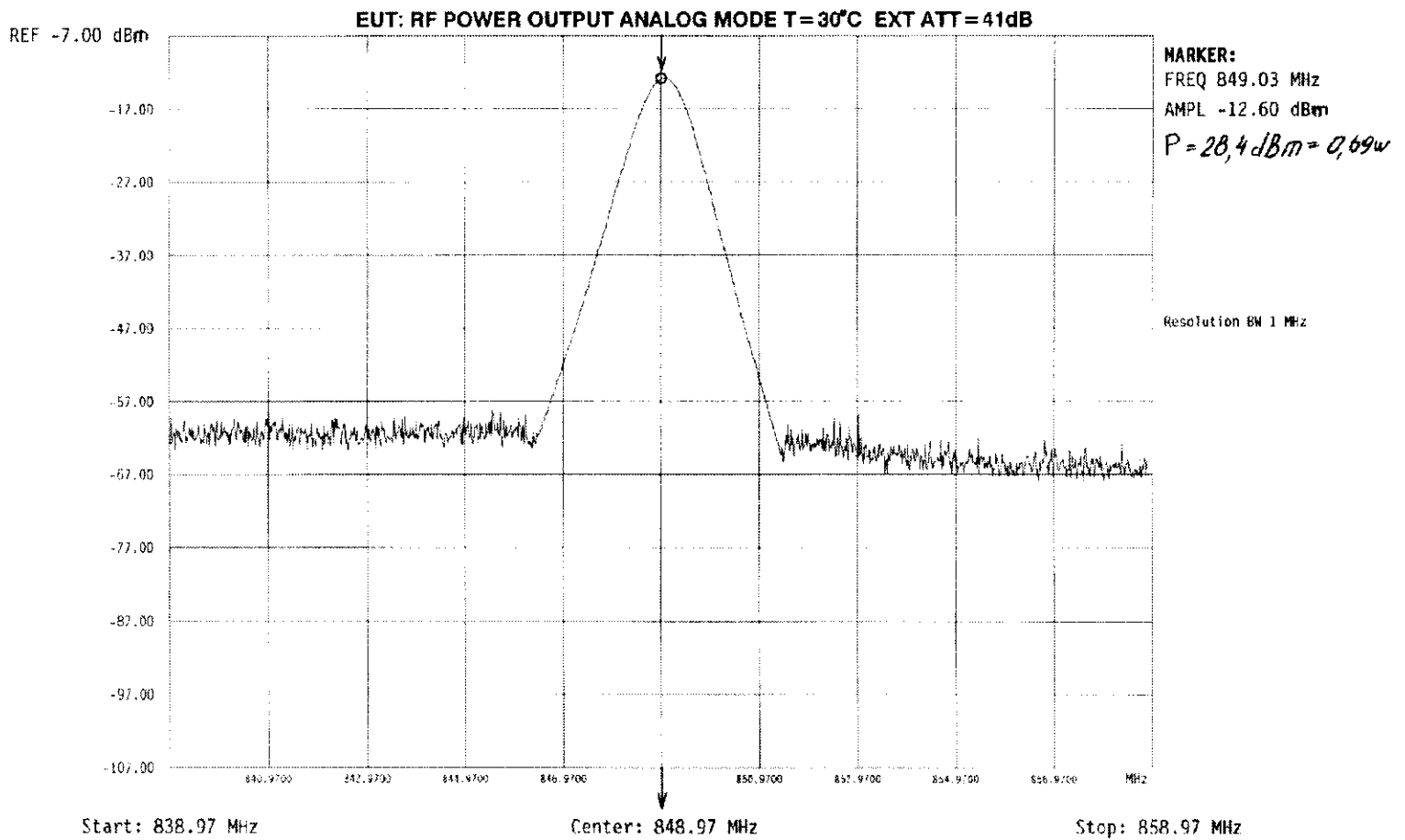
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Date: April, 1998

FCC ID:ARACET-10

Plot 3.1.21
RF power output test

Wednesday, 4/3/1998
Time: 14:25:16



BA



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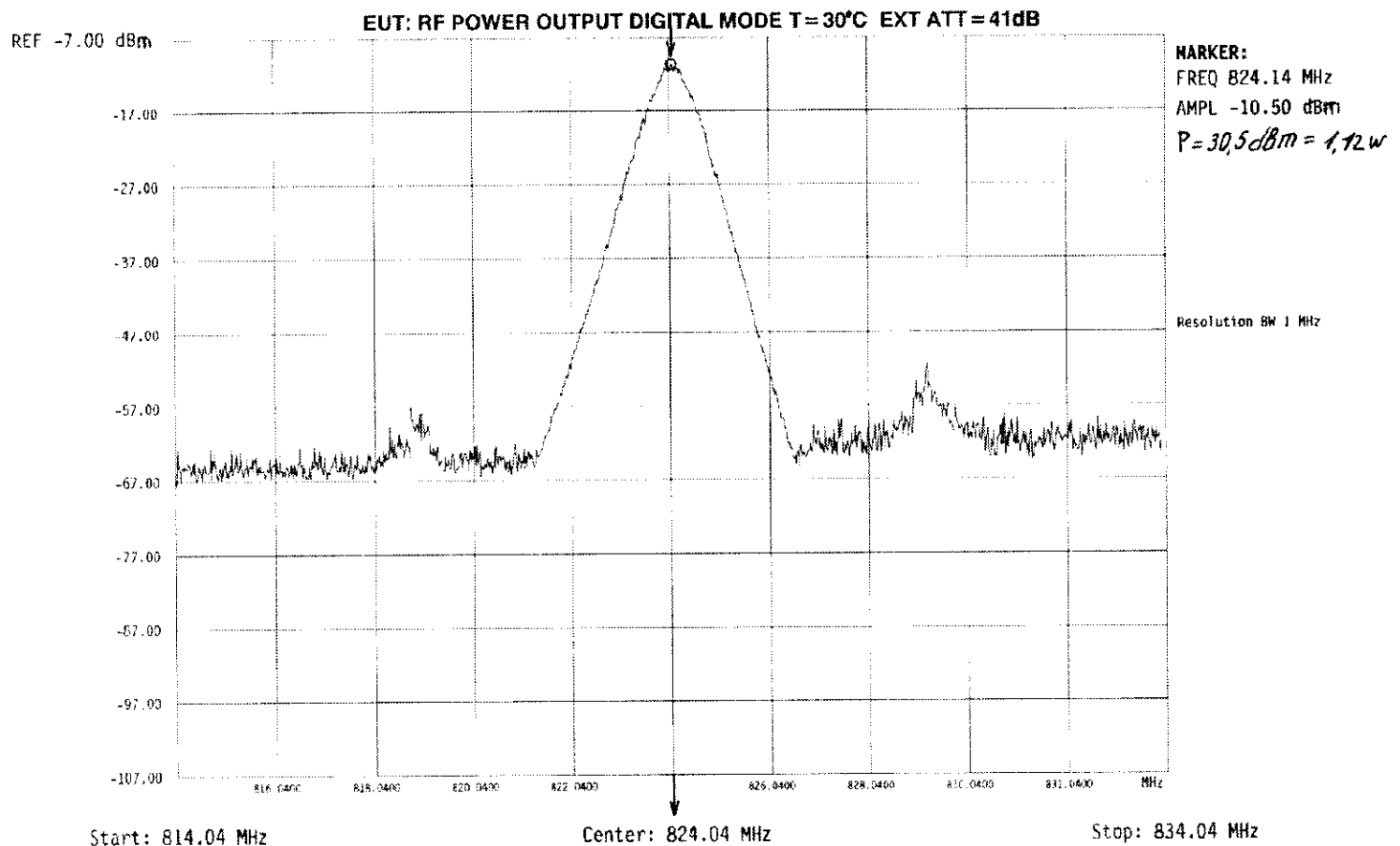
Test Report: TLR FCC.12663

Date: April, 1998

FCC ID: ARACET-10

Plot 3.1.22
RF power output test

Wednesday, 4/3/1998
Time: 14:31:49





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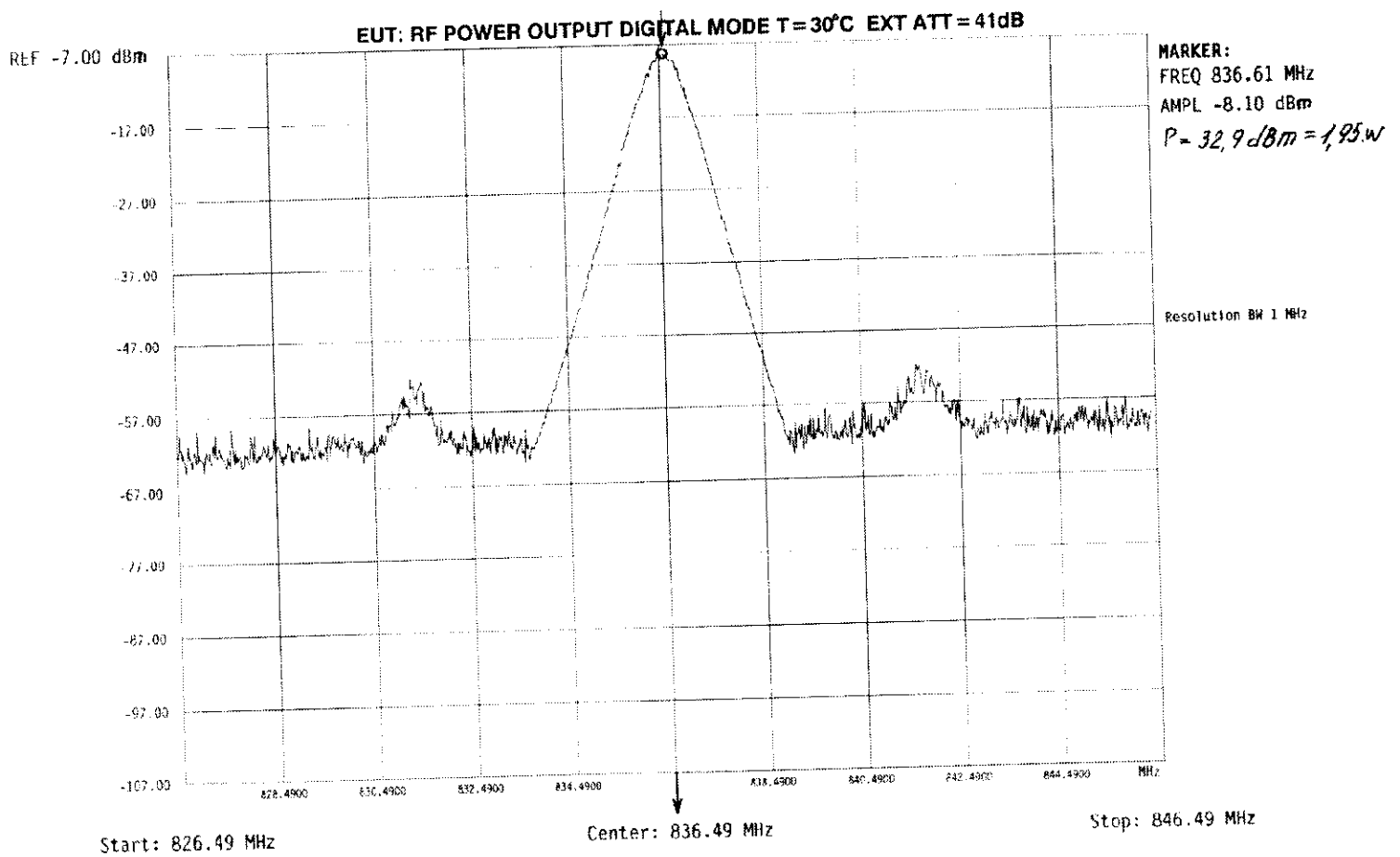
Test Report: TLR FCC.12663

Date: April, 1998

FCC ID: ARACET-10

Plot 3.1.23
RF power output test

Wednesday, 4/3/1998
Time: 14:29:56



11/1
10/1



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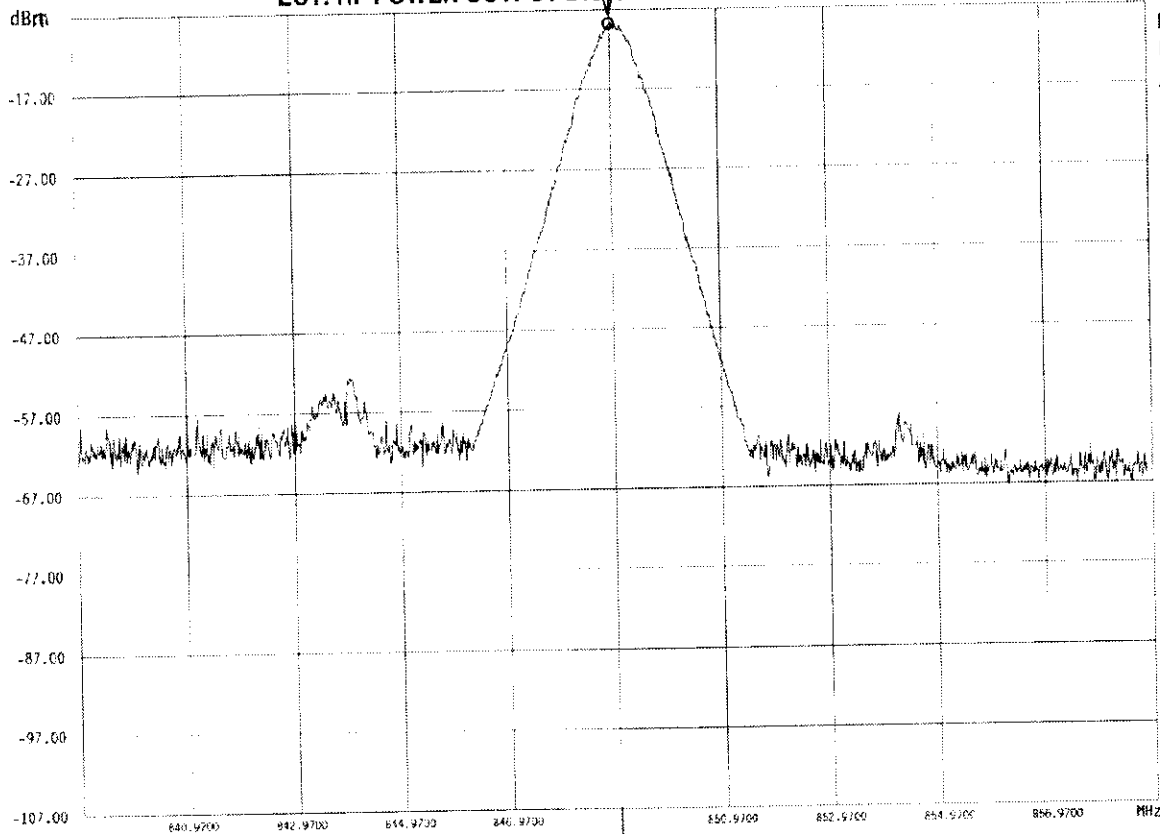
Test Report: TLR FCC.12663
Date: April, 1998
FCC ID: ARACET-10

Plot 3.1.24
RF power output test

Wednesday, 4/3/1998
Time: 14:27:58

EUT: RF POWER OUTPUT DIGITAL MODE T = 30°C EXT ATT = 41dB

REF -7.00 dBm



MARKER:

FREQ 849.01 MHz

AMPL -8.60 dBm

$P = 32.4 \text{ dBm} = 1.7 \text{ W}$

Start: 838.97 MHz

Center: 848.97 MHz

Stop: 858.97 MHz

PA



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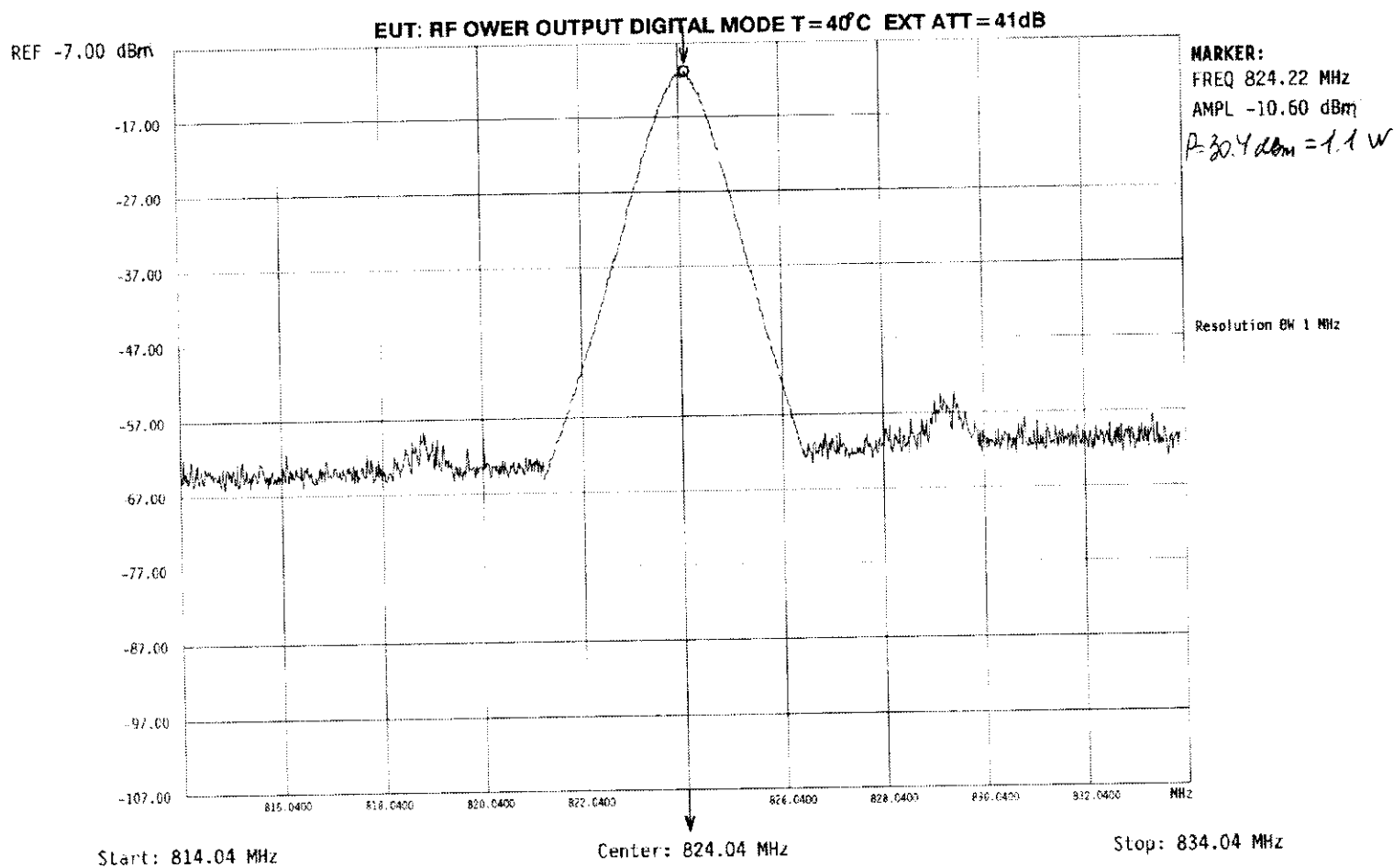
Test Report: TLR FCC.12663

Date: April, 1998

FCC ID: ARACET-10

Plot 3.1.25
RF power output test

Wednesday, 4/3/19
Time: 15:49:53





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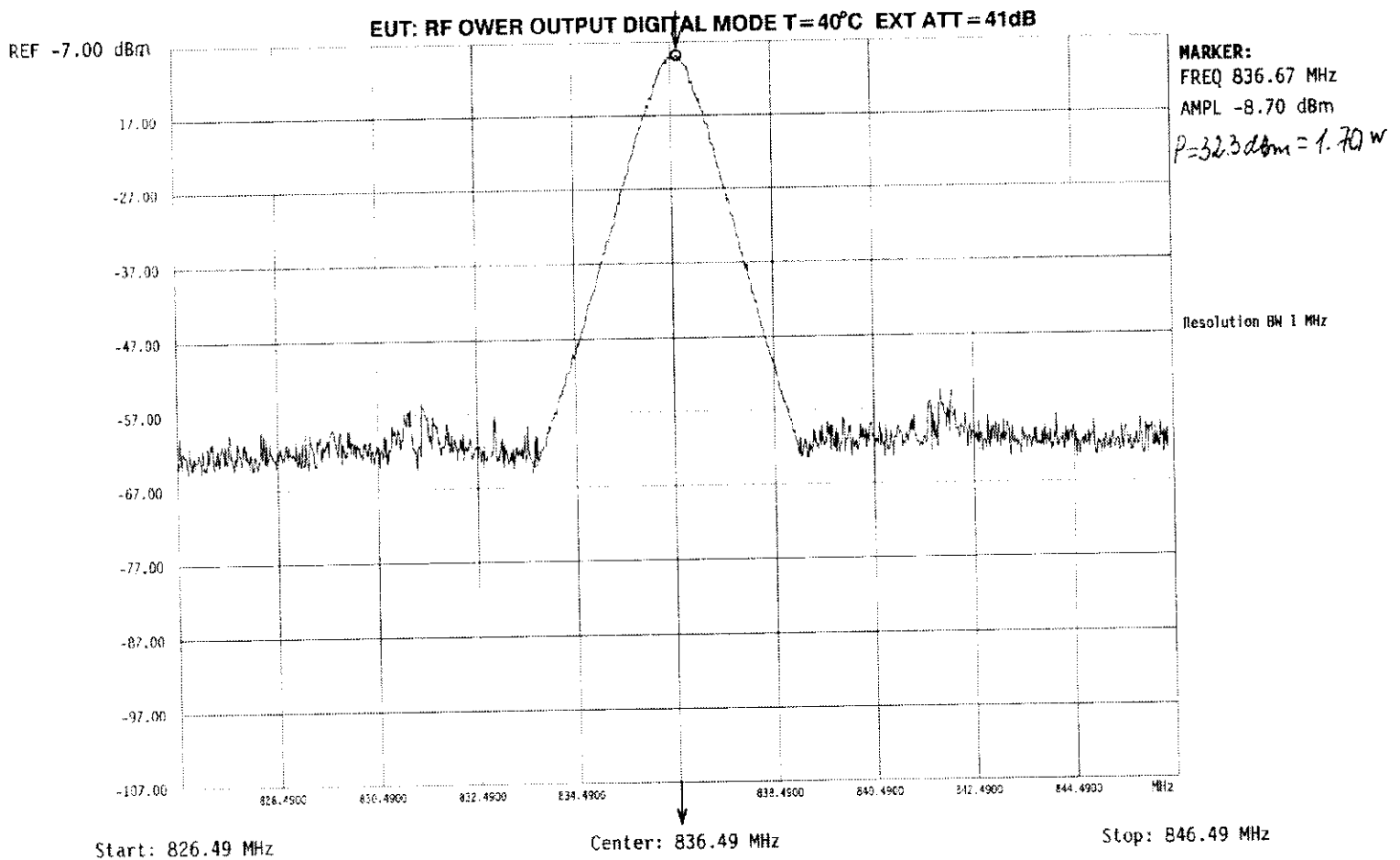
Test Report: TLR FCC.12663

Date: April, 1998

FCC ID: ARACET-10

Plot 3.1.26
RF power output test

Wednesday, 4/3/19:
Time: 15:51:57





HERMION LABORATORIES

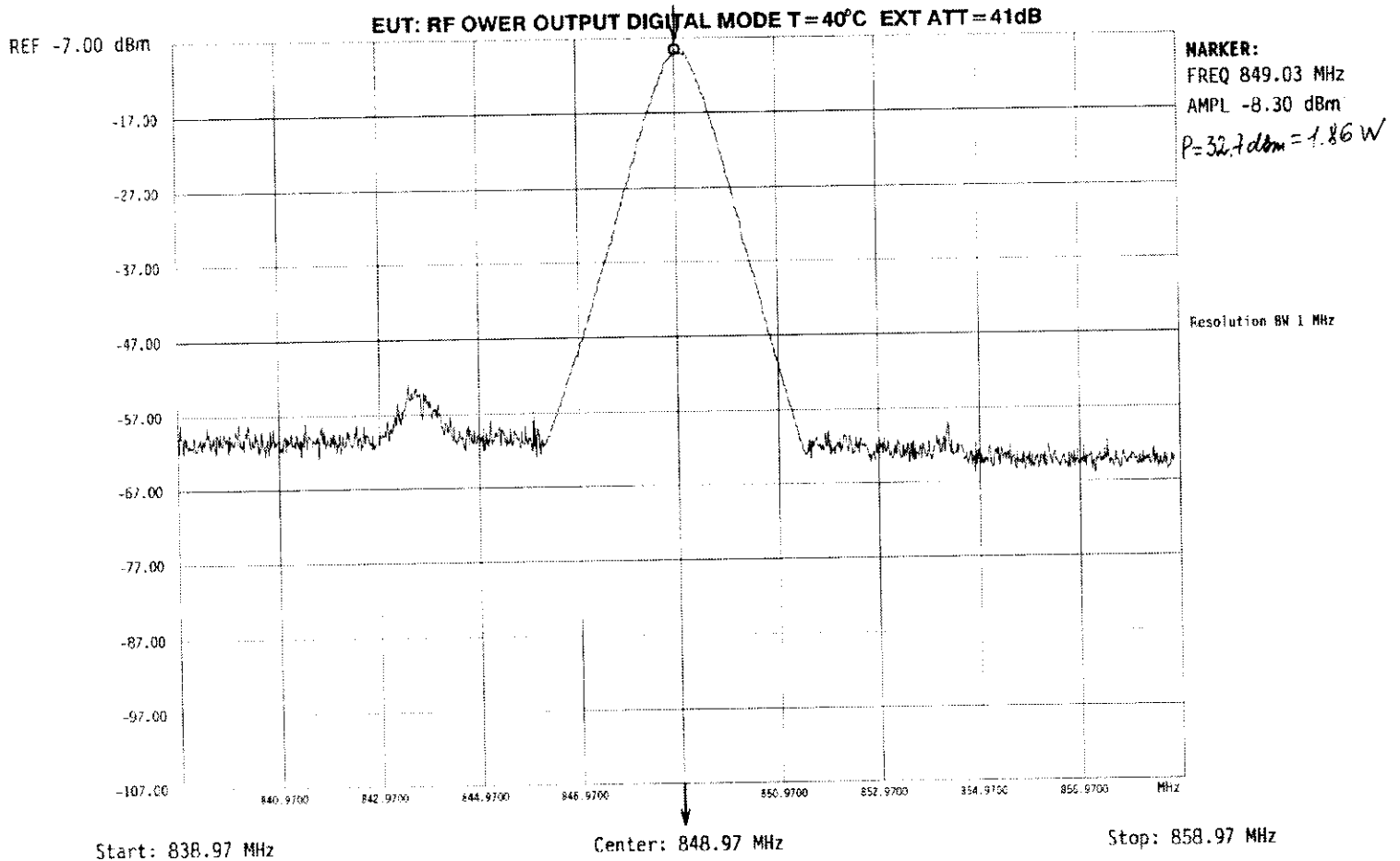
Test Report: TLR FCC.12663

Date: April, 1998

FCC ID: ARACET-10

Plot 3.1.27
RF power output test

Wednesday, 4/3/1998
Time: 15:54:9





HERMON LABORATORIES

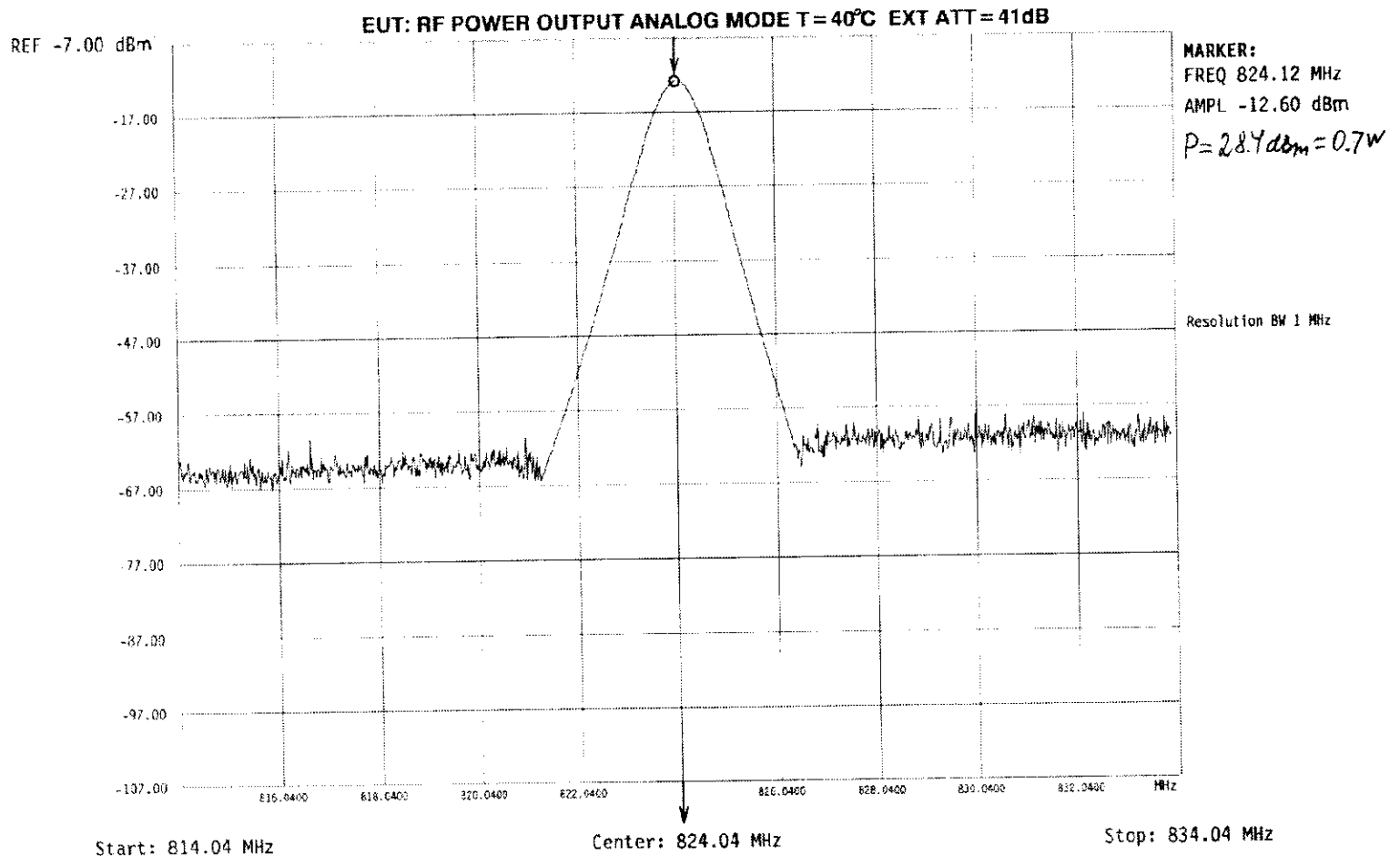
Test Report: TLR FCC.12663

Date: April, 1998

FCC ID: ARACET-10

Plot 3.1.28
RF power output test

Wednesday, 4/3/11
Time: 15:47:21



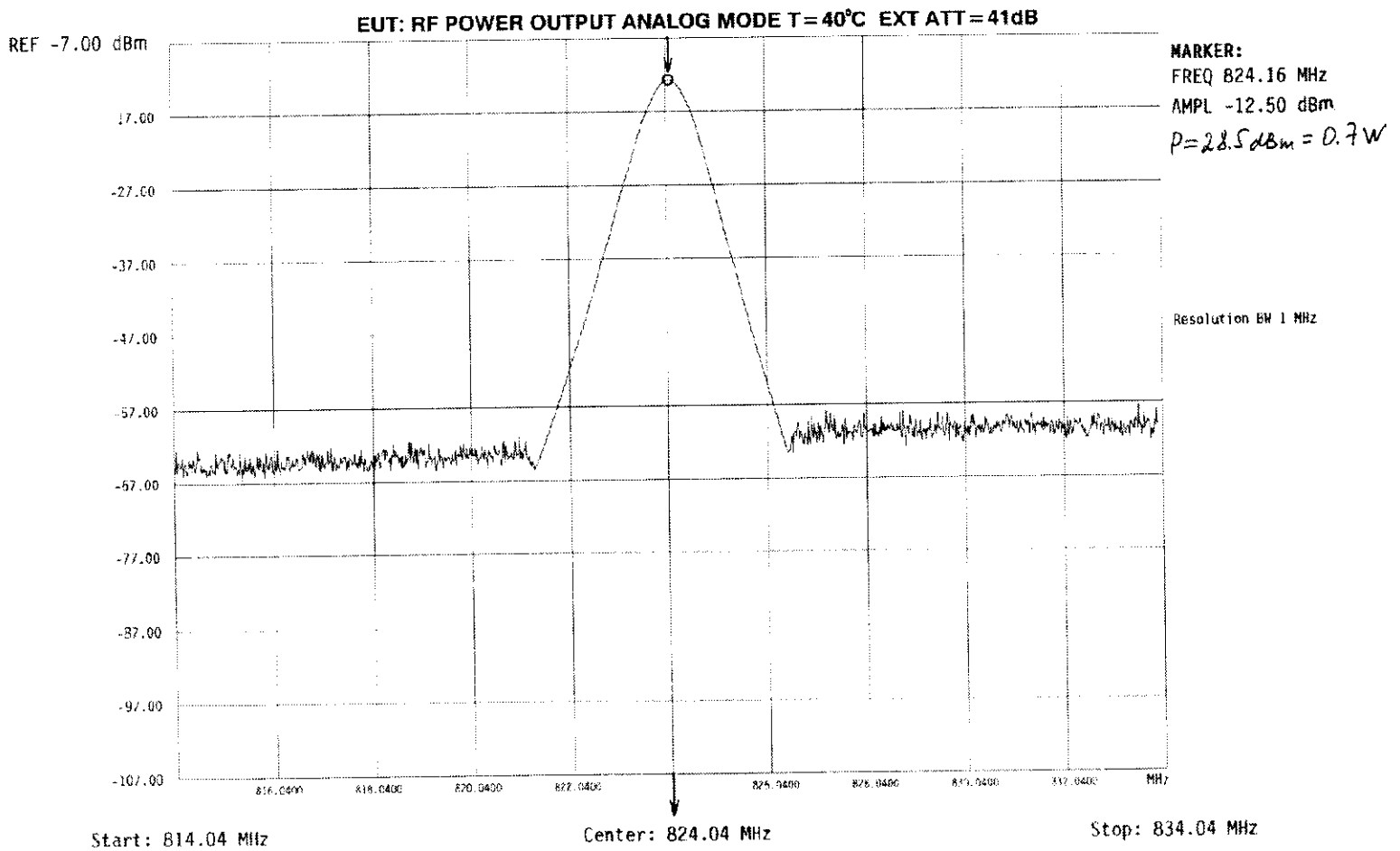


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Test Report: TLR FCC.12663
Date: April, 1998
FCC ID: ARACET-10

Plot 3.1.29
RF power output test

Wednesday, 4/3/1998
Time: 15:42:29



12



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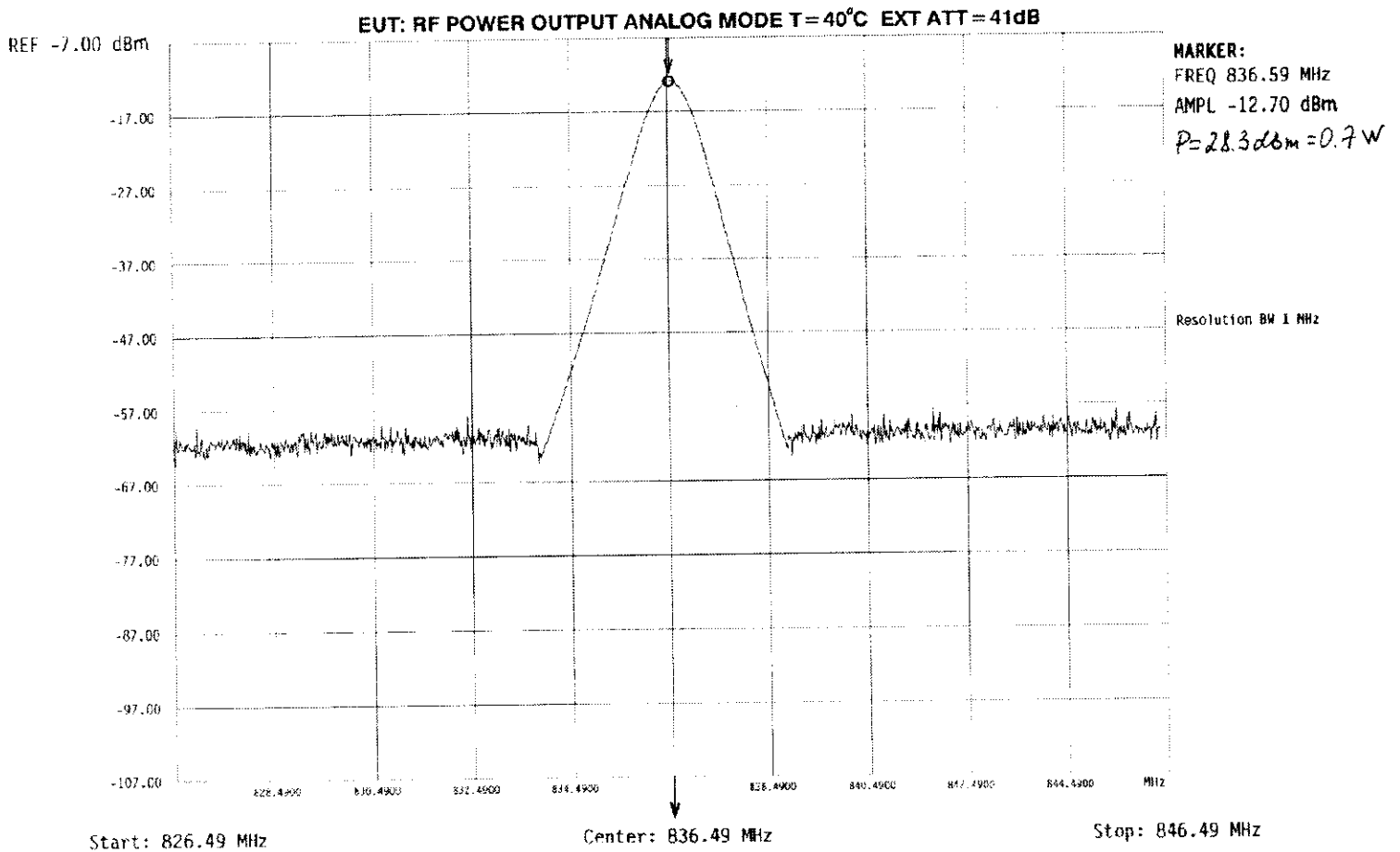
Test Report: TLR FCC.12663

Date: April, 1998

FCC ID: ARACET-10

Plot 3.1.30
RF power output test

Wednesday, 4/3/1998
Time: 15:44:26



B₁



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Test Report: TLR FCC.12663
Date: April, 1998
FCC ID:ARACET-10

3.2 Frequency stability test according to Part 2, § 2.995

3.2.1 Definition of the test

This test was performed to measure the frequency stability versus ambient temperatures from 0°C to +40°C and versus primary supply voltage from 102 V AC to 138 V AC. The maximum allowed instability is 0.00025%.

3.2.2 The test set-up configuration

The test setup is the same as in Test 3.1 and shown in Photographs 3.2.1 and 3.2.2.

3.2.3 Test results

The test was performed at 3 carrier unmodulated frequencies (low, middle, high) in analog mode of operation. The EUT has passed the test.

The test results are given in the Tables 3.2.1 and 3.2.2 below and in Plots 3.2.1 to 3.2.15 (variation of temperatures) and Plots 3.2.16 to 3.2.21 (variation of primary supply voltage).

Reference numbers of test equipment used

HL 0027	HL 0056	HL 0500				
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Full description is given in Appendix A.



Table 3.2.1
 Frequency stability test results

Carrier frequency, MHz	Frequency stability limit, $\pm$ Hz	Measured frequency tolerance, $\pm$ Hz vs temperature, $^{\circ}$ C					Pass/Fail
		0	10	20	30	40	
824.04	2060	355	162	0	-80	20	Pass
836.49	2091	460	173	160	60	80	Pass
848.97	2122	240	218	-60	-160	-80	Pass

Table 3.2.2
 Frequency stability test results

Carrier frequency, MHz	Frequency stability limit, $\pm$ Hz	Measured frequency tolerance, $\pm$ Hz vs primary supply voltage		Pass/Fail
		102 V AC	138 V AC	
824.04	2060	140	120	Pass
836.49	2091	360	240	Pass
848.97	2122	80	-20	Pass



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Test Report: TLR FCC.12663

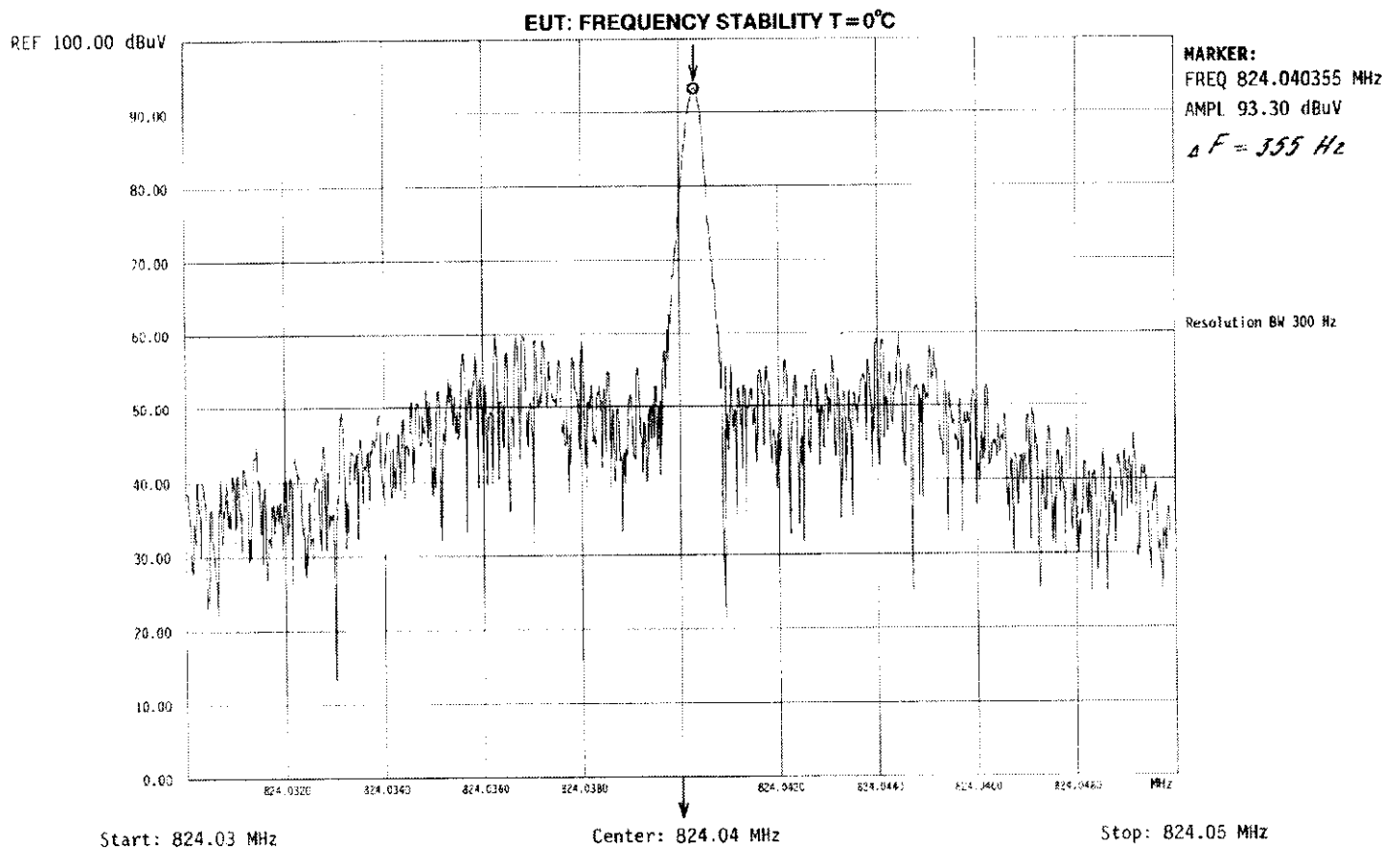
Date: April, 1998

FCC ID: ARACET-10

Plot 3.2.1
Frequency stability vs temperature test

A.12663

Wednesday, 4/3/1998
Time: 12:20:59



RR



HERMON LABORATORIES

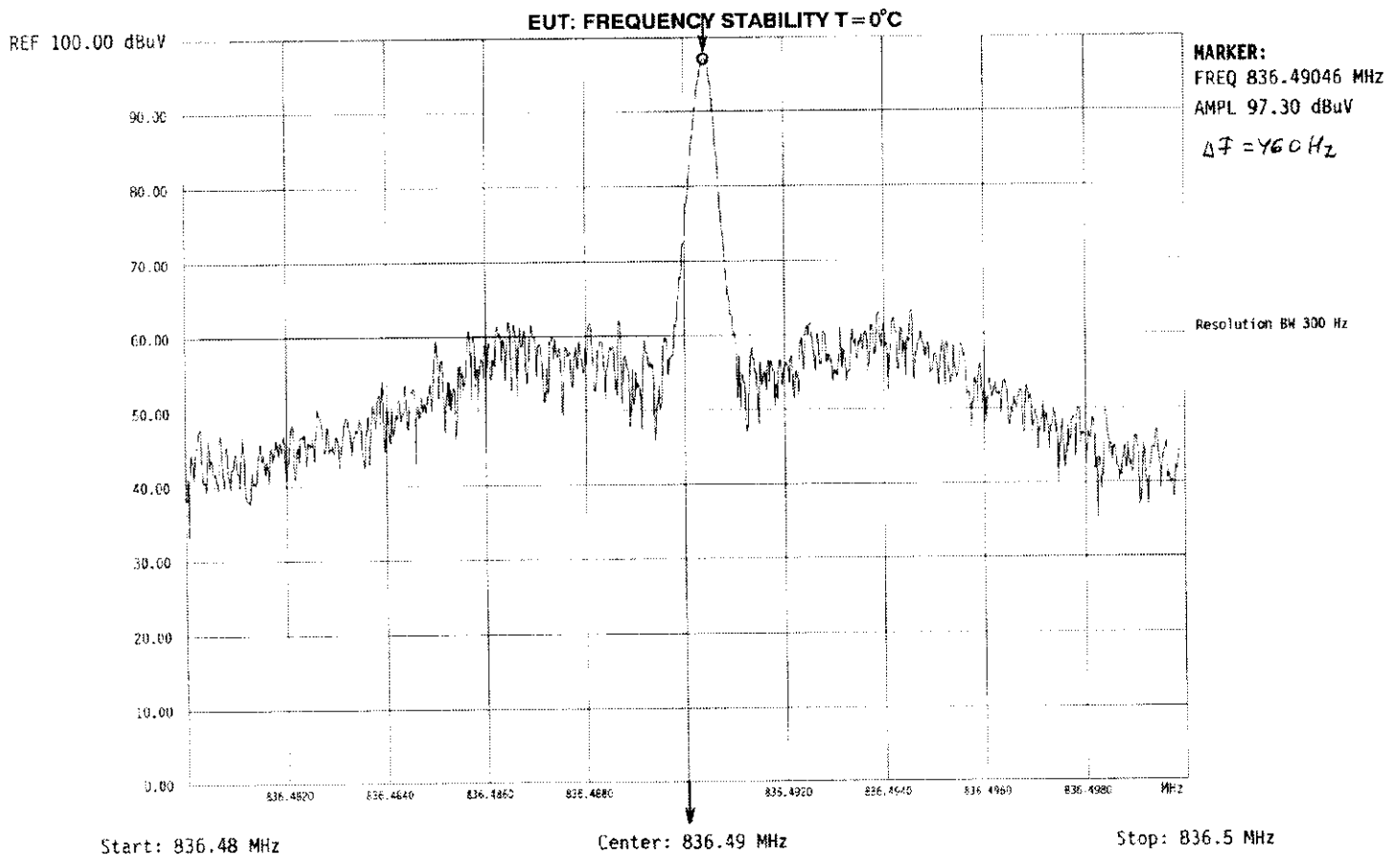
Test Report: TLR FCC.12663
Date: April, 1998
FCC ID: ARACET-10

Plot 3.2.2
Frequency stability vs temperature test

Pr. 12663

Hermon Labs EMC LTD

Wednesday, 4/3/1998
Time: 16:36:21



Generated by HERMON LABS EMC JTC Plot Generator program

1



HERMION LABORATORIES

Test Report: TLR FCC.12663

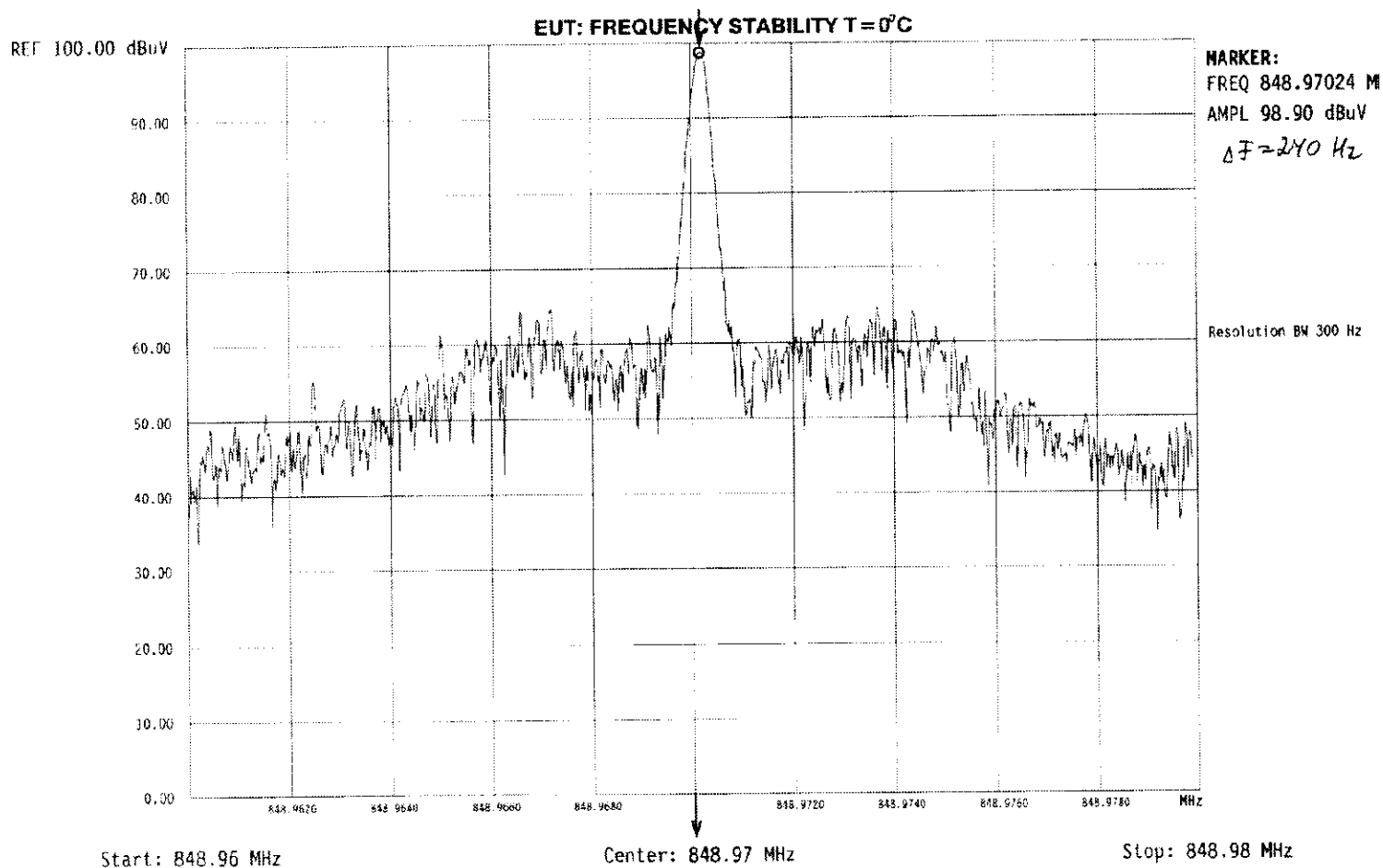
Date: April, 1998

FCC ID: ARACET-10

Plot 3.2.3
Frequency stability vs temperature test

PT 12663

Wednesday, 4/3/15
Time: 16:32:56





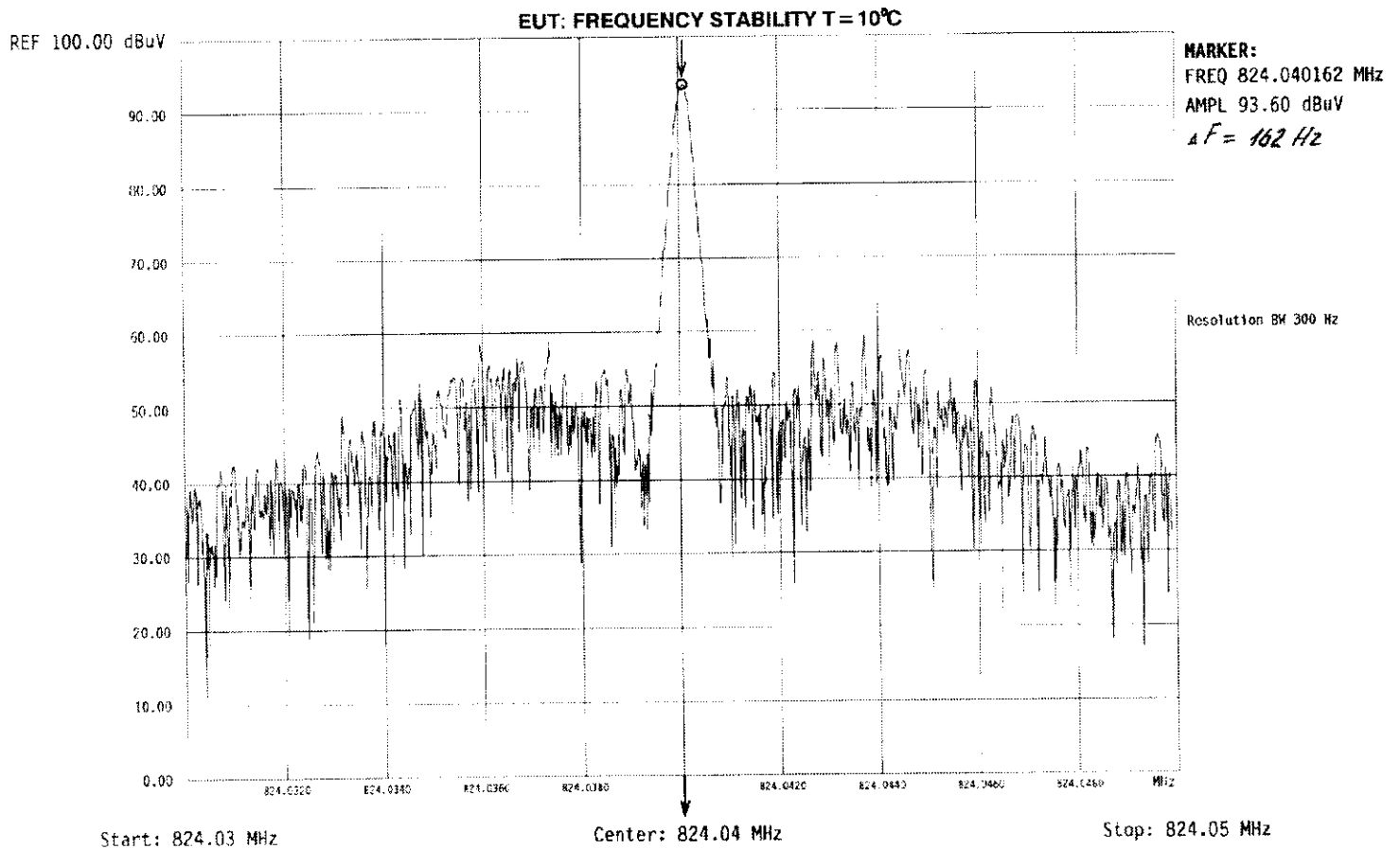
HERMON LABORATORIES

Test Report: TLR FCC.12663
Date: April, 1998
FCC ID: ARACET-10

Plot 3.2.4
Frequency stability vs temperature test

A.12663

Wednesday, 4/3/1998
Time: 13:15:2



2



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Test Report: TLR FCC.12663

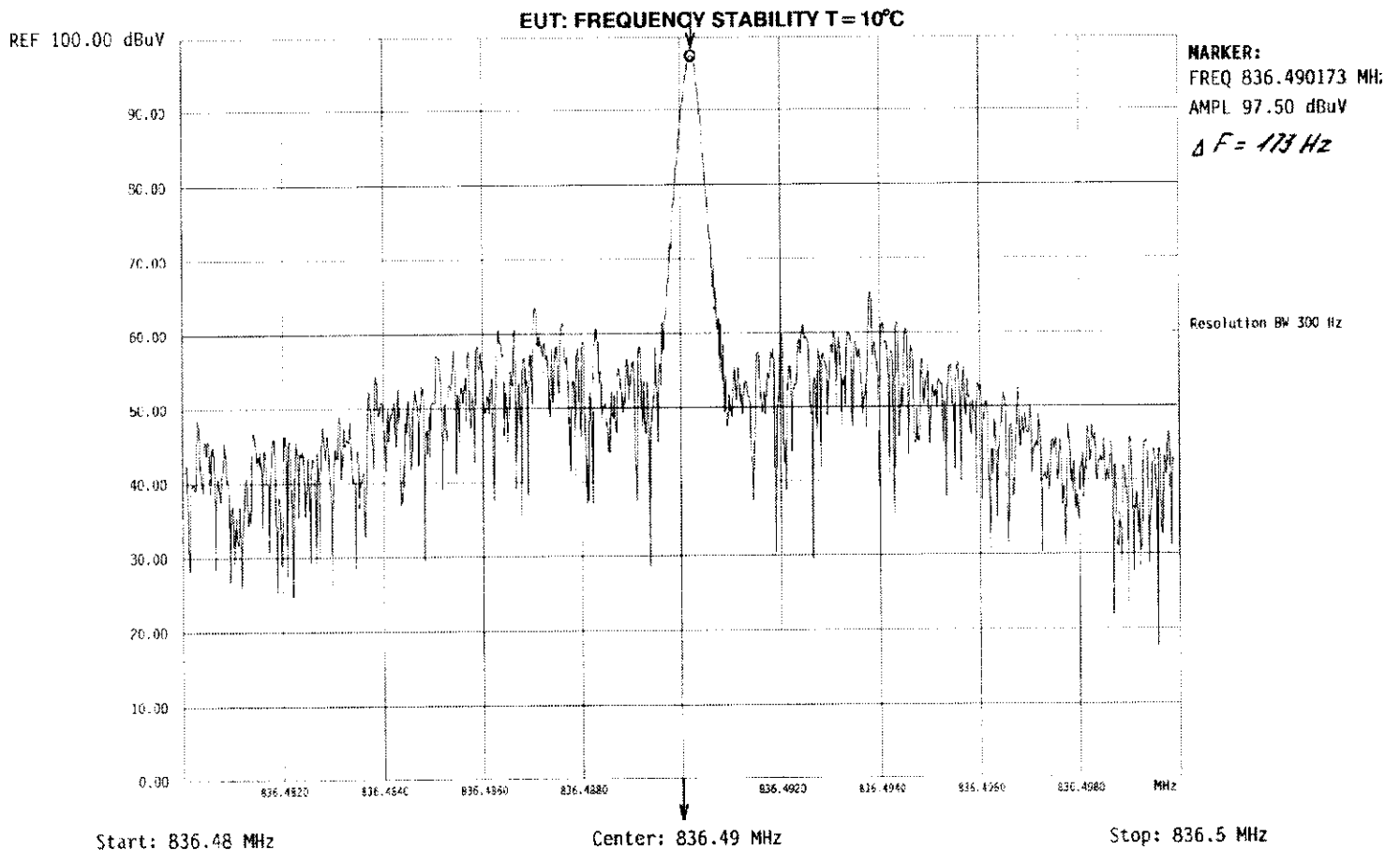
Date: April, 1998

FCC ID: ARACET-10

Plot 3.2.5
Frequency stability vs temperature test

A. 12663

Wednesday, 4/3/1998
Time: 13:13:1



5/2



HERMION LABORATORIES

Test Report: TLRFCC.12663

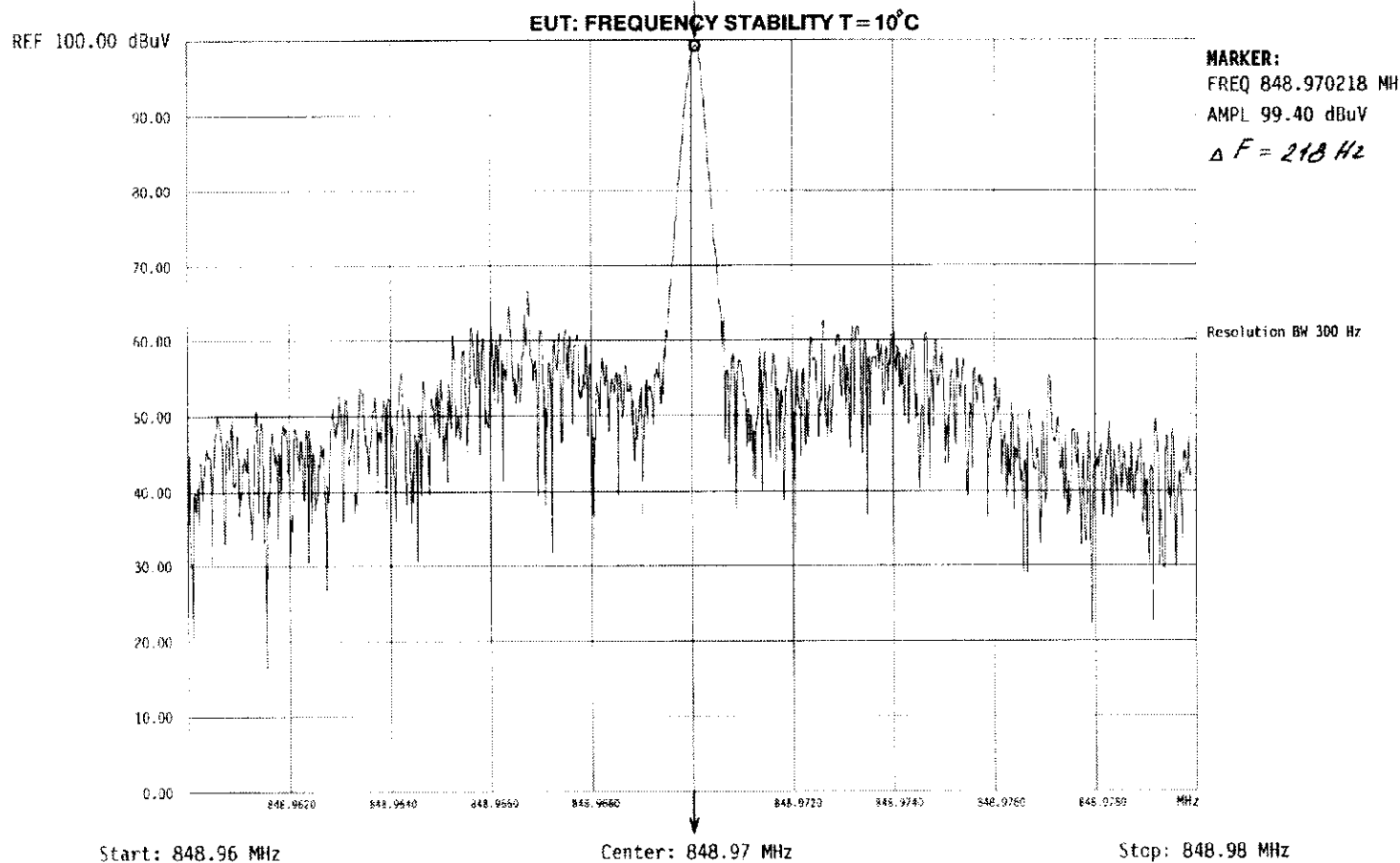
Date: April, 1998

FCC ID:ARACET-10

Plot 3.2.6
Frequency stability vs temperature test

A.12663

Wednesday, 4/3/1998
Time: 13:9:53



Pa



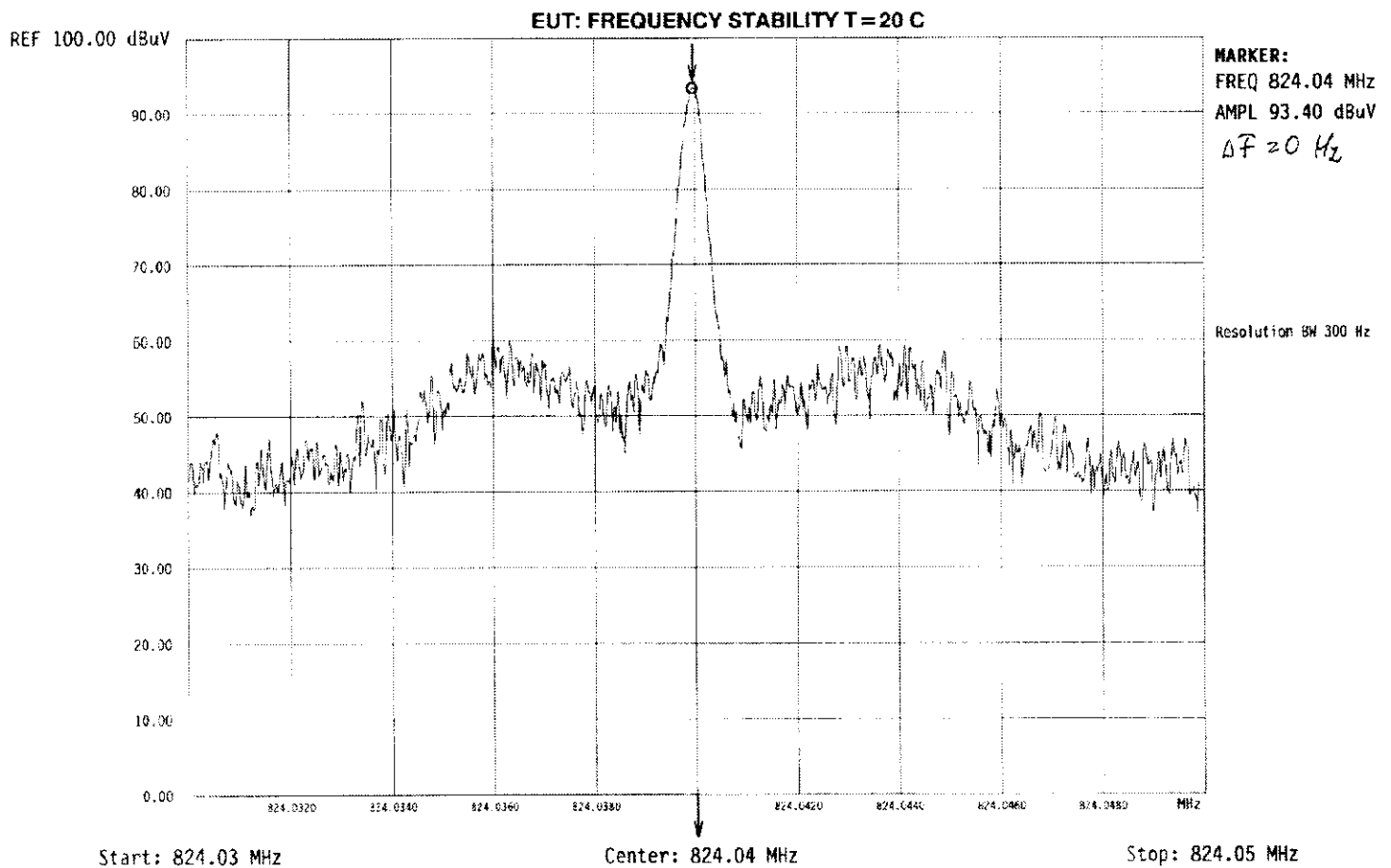
HERMON LABORATORIES

Test Report: TLR FCC.12663
Date: April, 1998
FCC ID: ARACET-10

Plot 3.2.7
Frequency stability vs temperature test

A.12663

Wednesday, 4/3/11
Time: 17:4:33



A



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Test Report: TLR FCC.12663

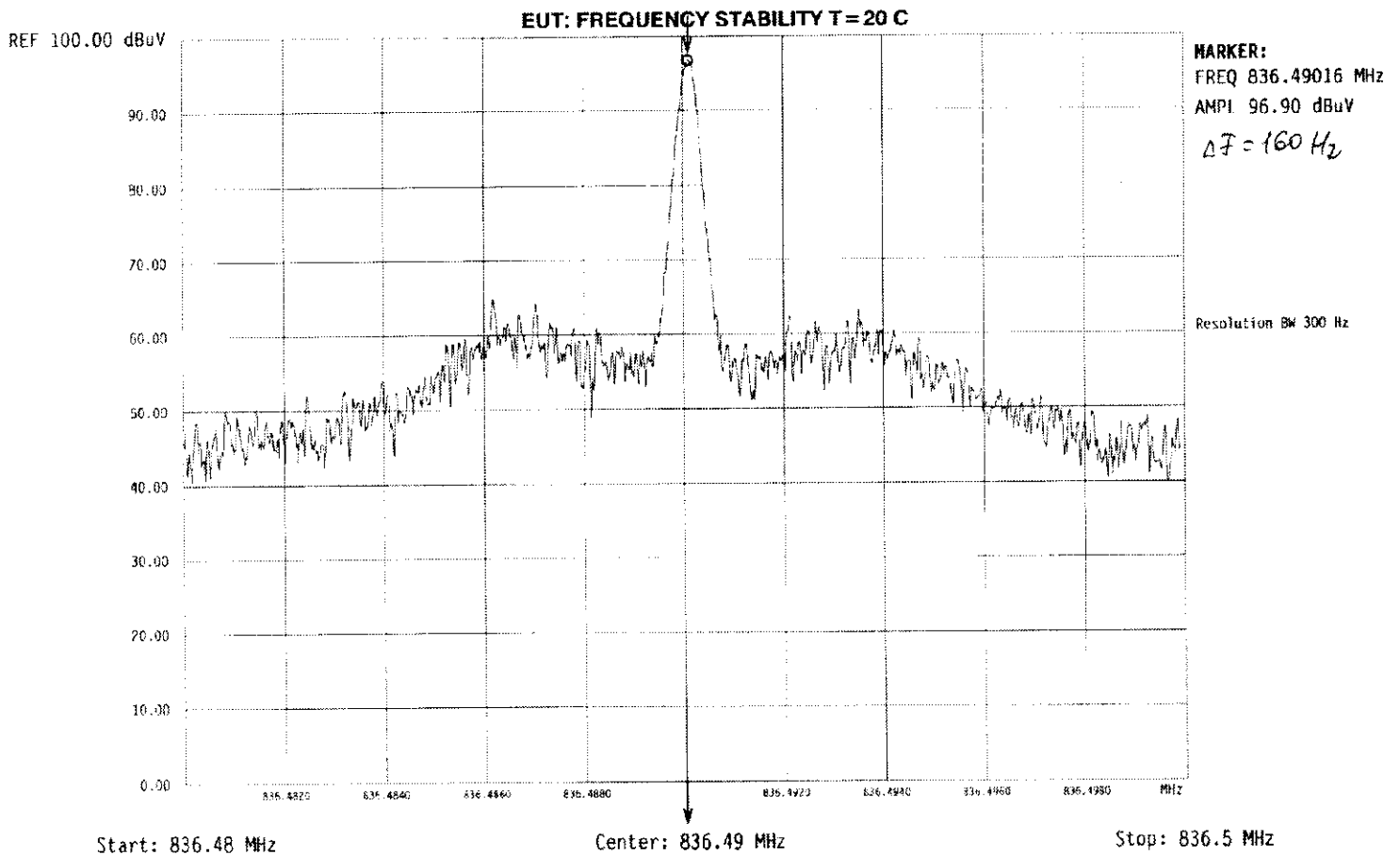
Date: April, 1998

FCC ID: ARACET-10

Plot 3.2.8
Frequency stability vs temperature test

A.12663

Wednesday, 4/3/1998
Time: 17:2:24





HERMION LABORATORIES

Test Report: TLR FCC.12663

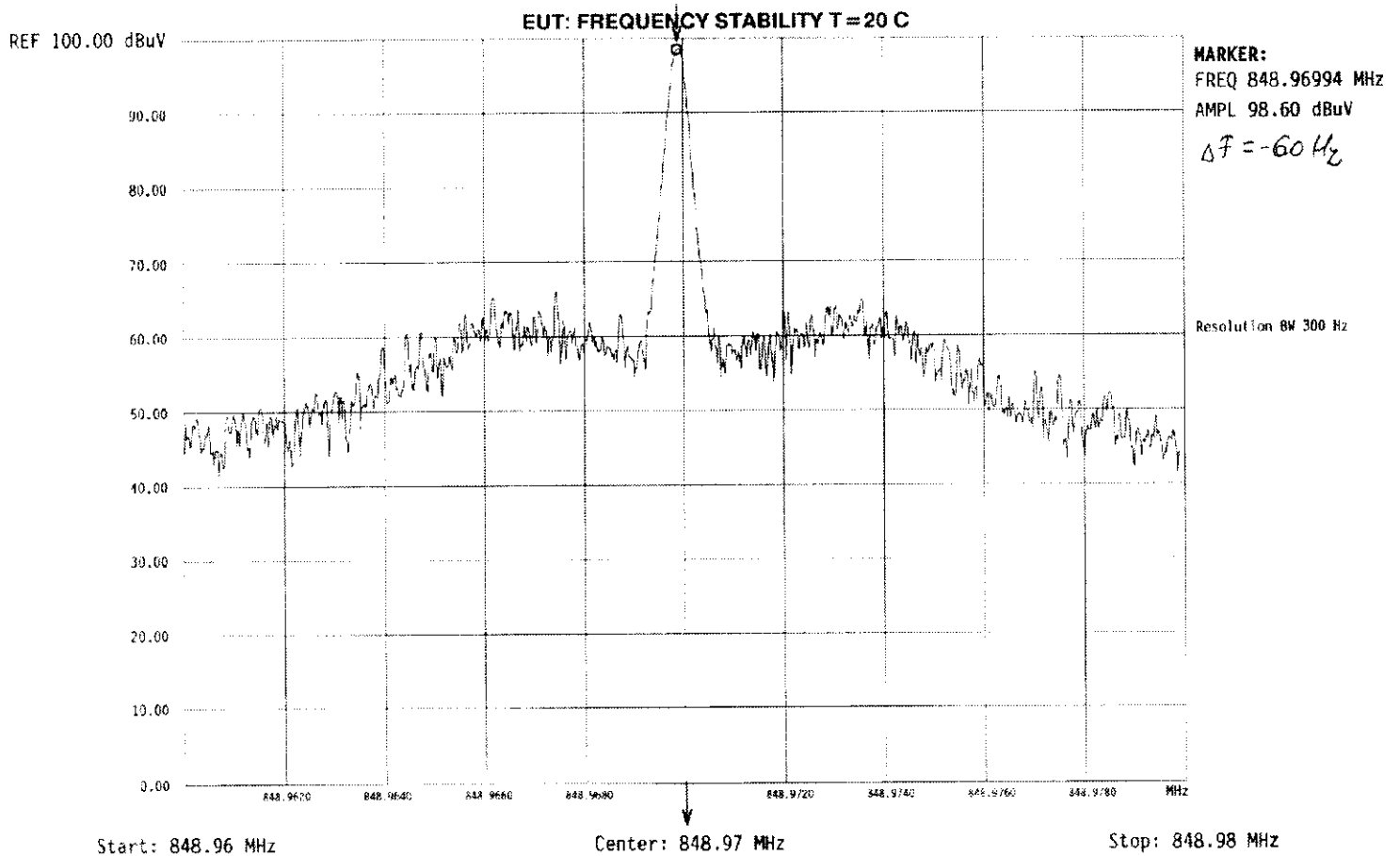
Date: April, 1998

FCC ID: ARACET-10

Plot 3.2.9
Frequency stability vs temperature test

A. 12663

Wednesday, 4/3/1998
Time: 17:0:28



Bth



HERMION LABORATORIES

Test Report: TLR FCC.12663

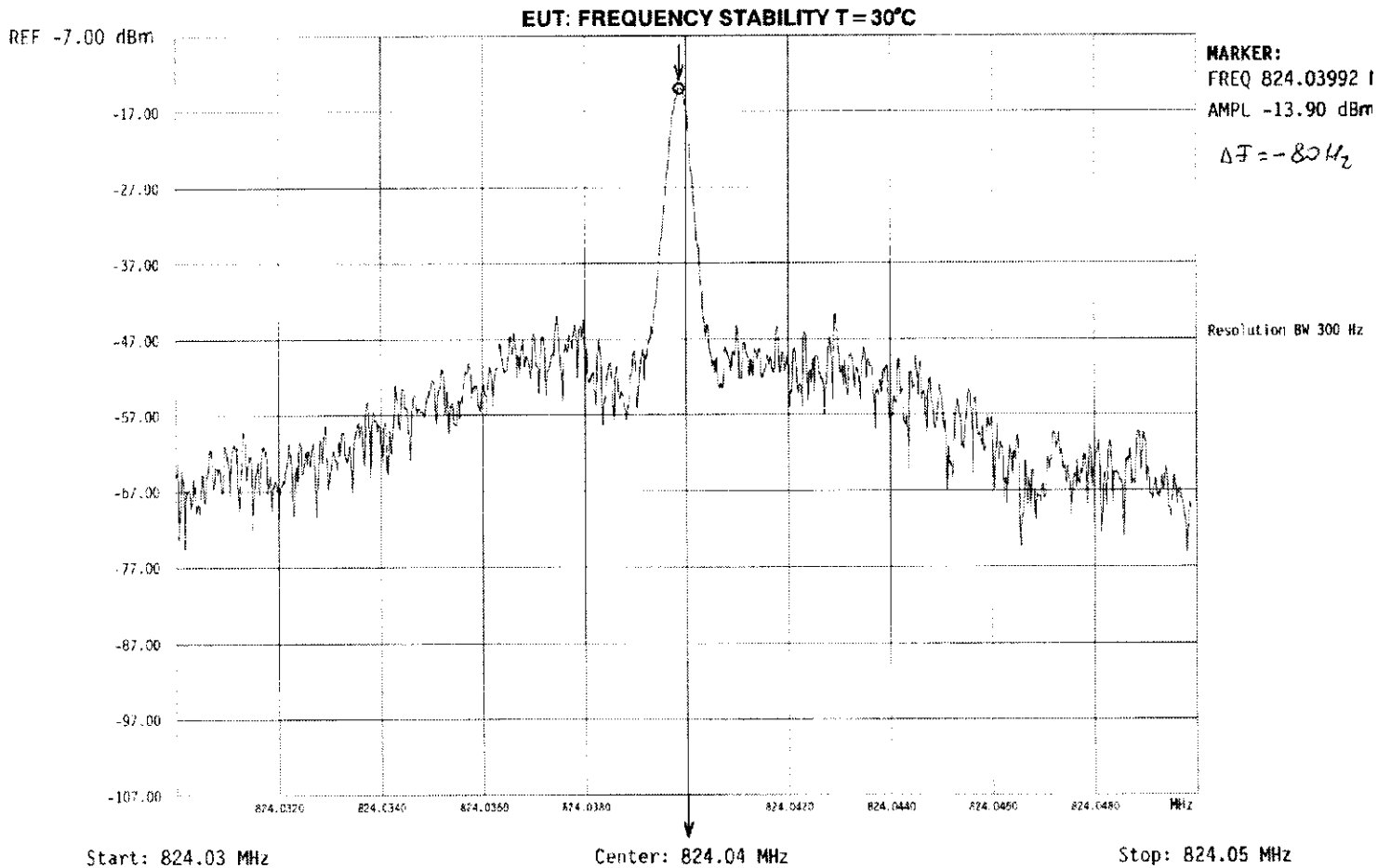
Date: April, 1998

FCC ID: ARACET-10

Plot 3.2.10
Frequency stability vs temperature test

8.12663

Wednesday, 4/3/1
Time: 14:39:45





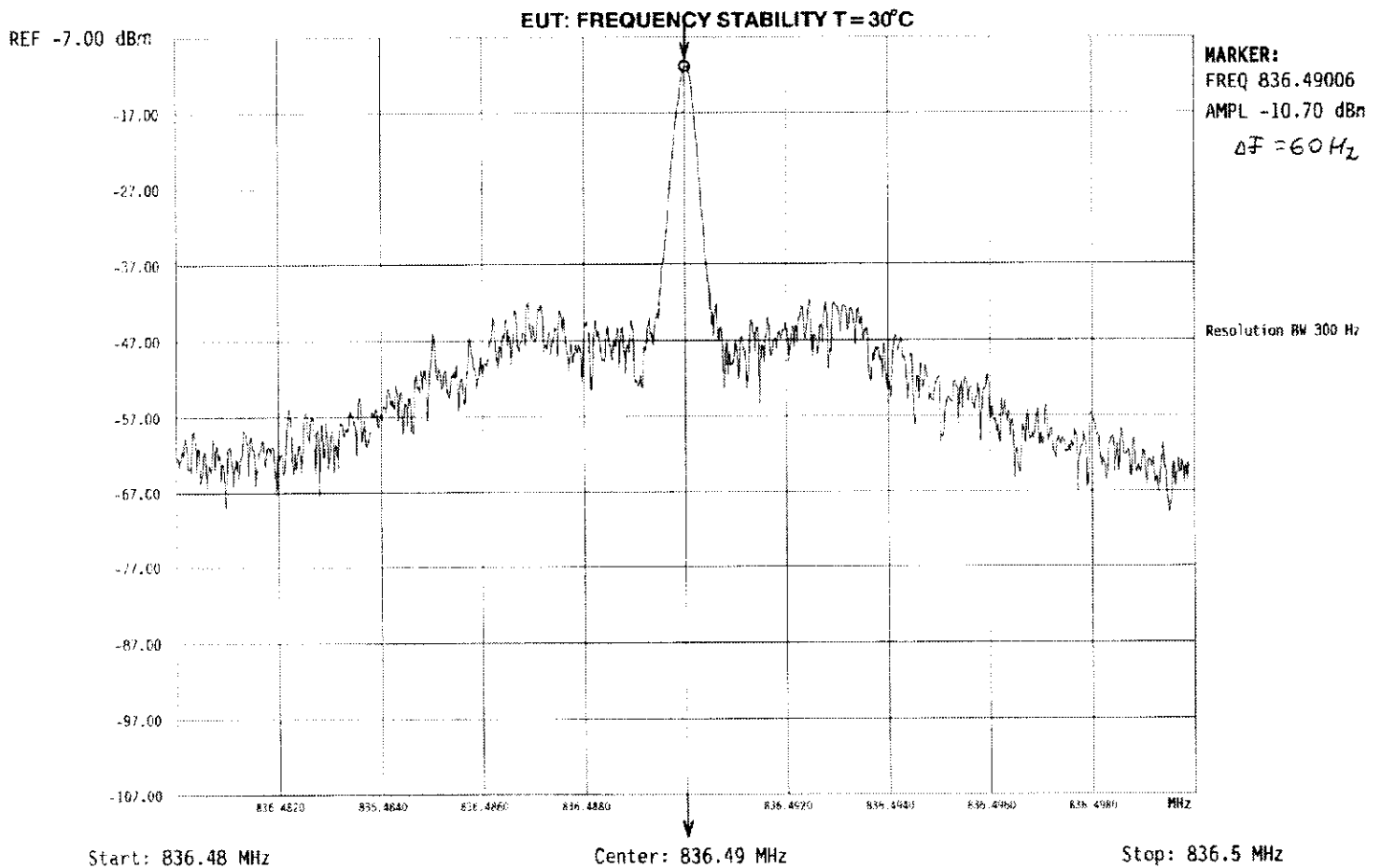
HERMON LABORATORIES

Test Report: TLR FCC.12663
Date: April, 1998
FCC ID: ARACET-10

Plot 3.2.11
Frequency stability vs temperature test

Pt. 12663

Wednesday, 4/3/
Time: 14:48:23





HERMON LABORATORIES

Test Report: TLR FCC.12663

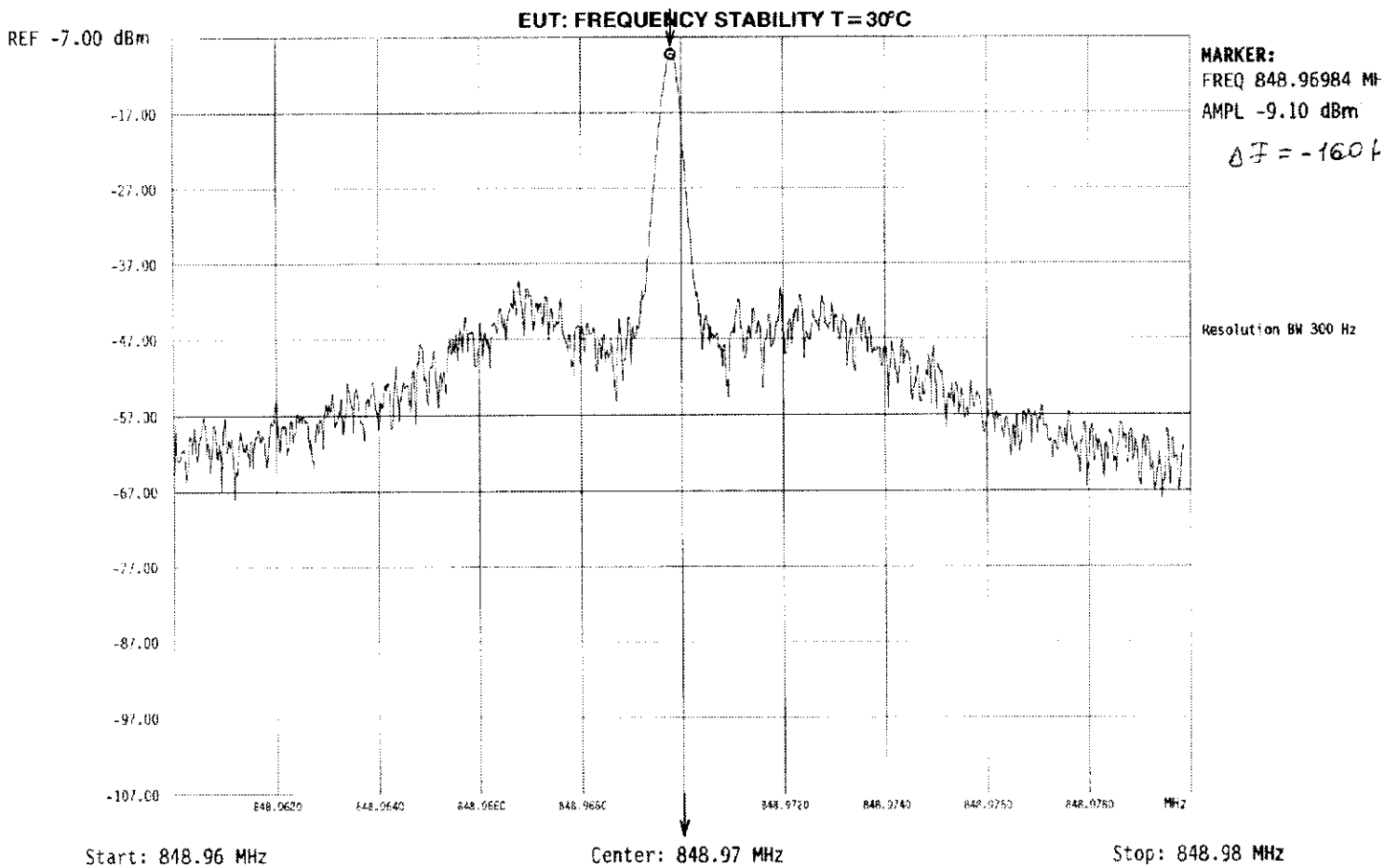
Date: April, 1998

FCC ID: ARACET-10

Plot 3.2.12
Frequency stability vs temperature test

Pf. 12663

Wednesday, 4/3/19
Time: 14:46:31





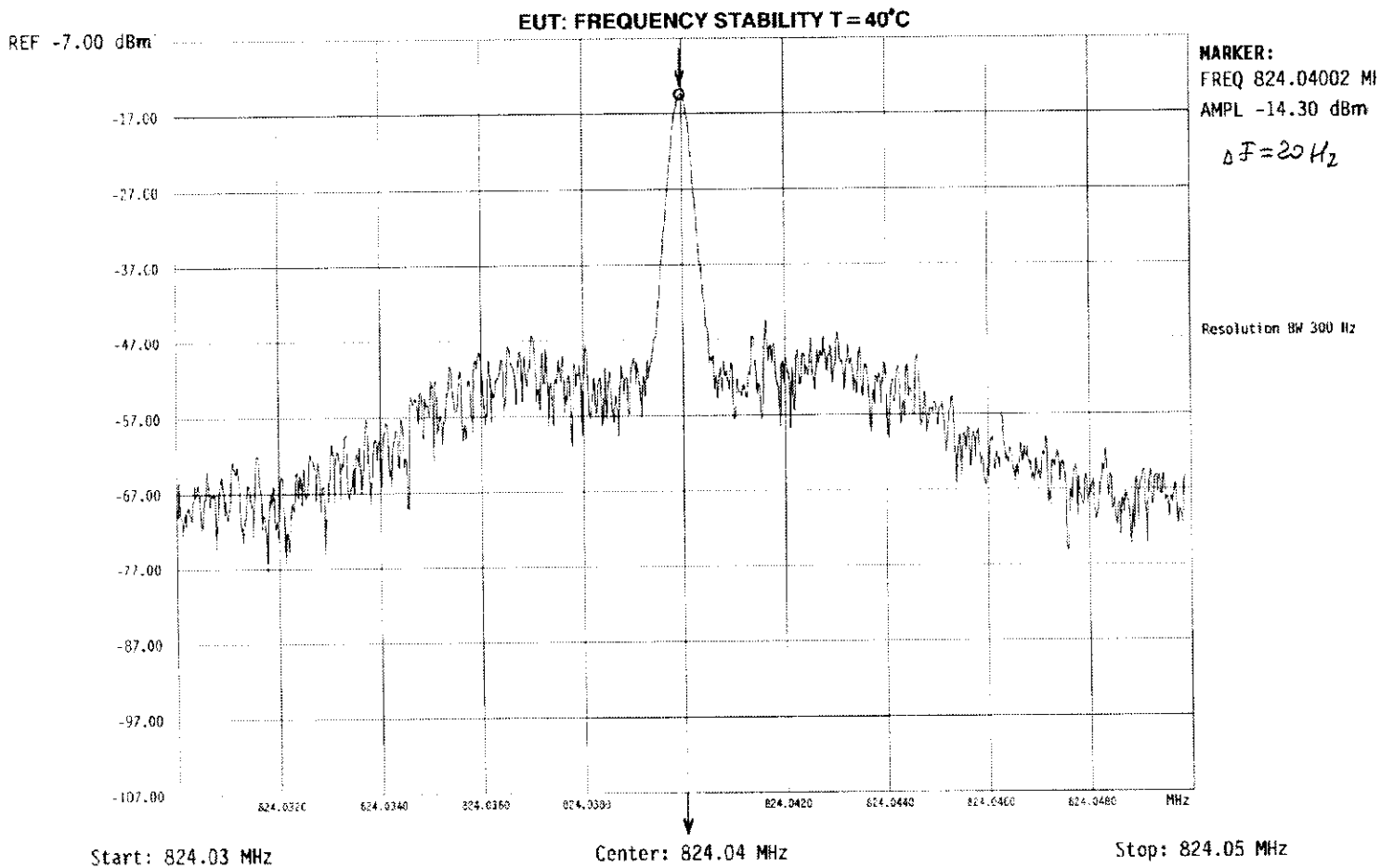
HERMON LABORATORIES

Test Report: TLR FCC.12663
Date: April, 1998
FCC ID: ARACET-10

Plot 3.2.13
Frequency stability vs temperature test

B.12663

Wednesday, 4/3/19
Time: 15:38:45



B₁



HERMON LABORATORIES

Test Report: TLR FCC.12663

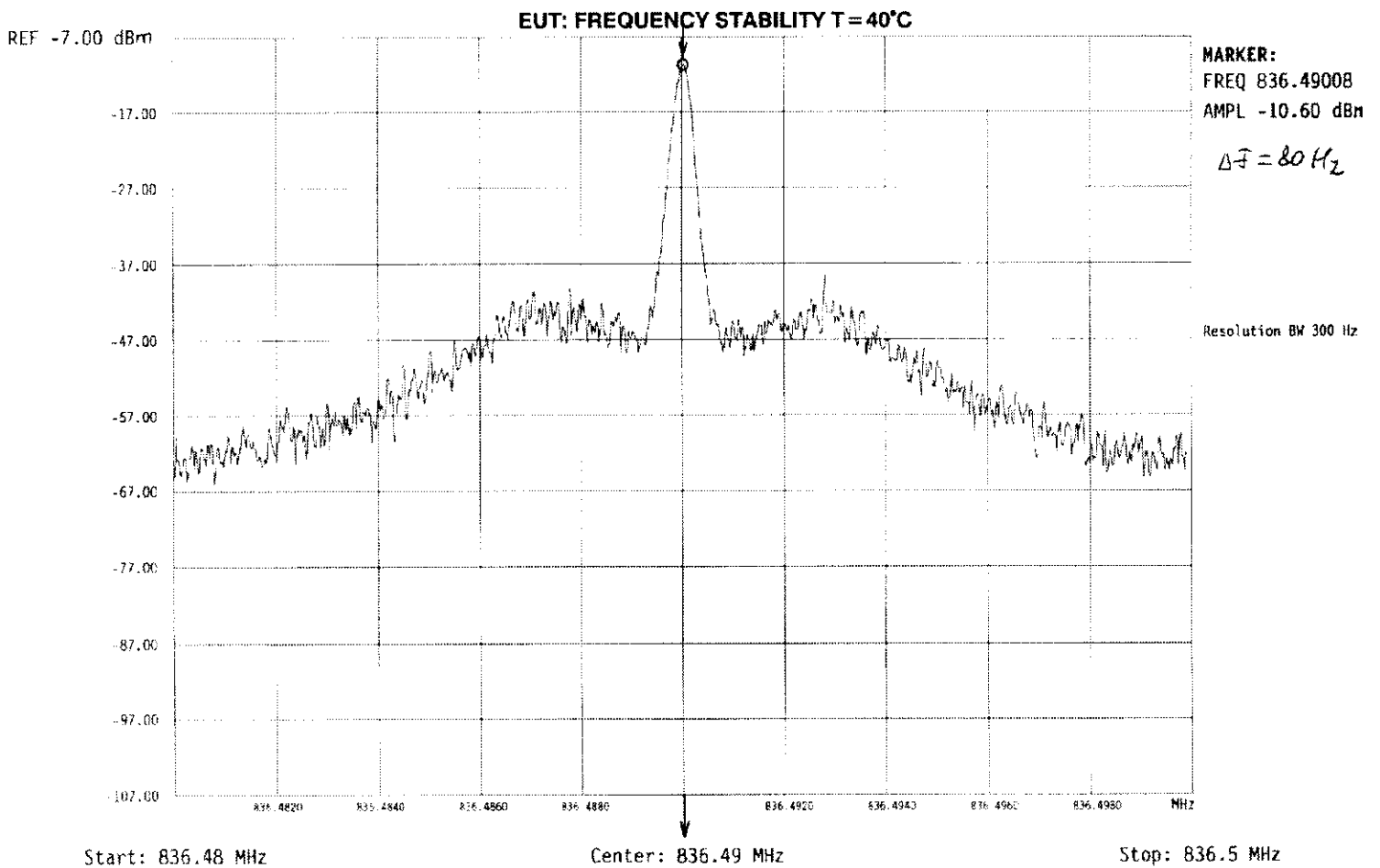
Date: April, 1998

FCC ID: ARACET-10

Plot 3.2.14
Frequency stability vs temperature test

P. 12663

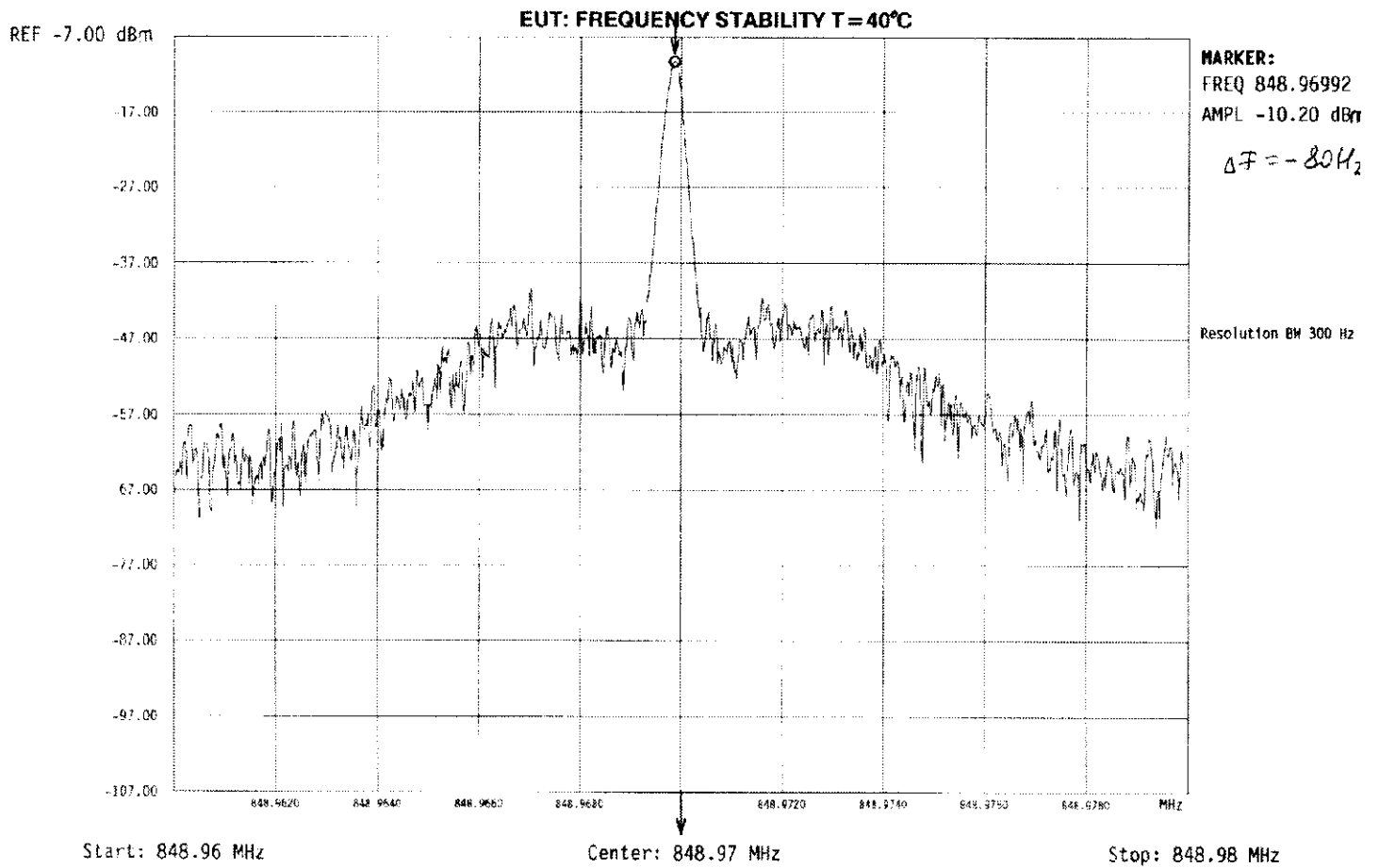
Wednesday, 4/3/98
Time: 15:32:30



Plot 3.2.15
Frequency stability vs temperature test

A. 12663

Wednesday, 4/3/98
Time: 15:36:54





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Test Report: TLR FCC.12663

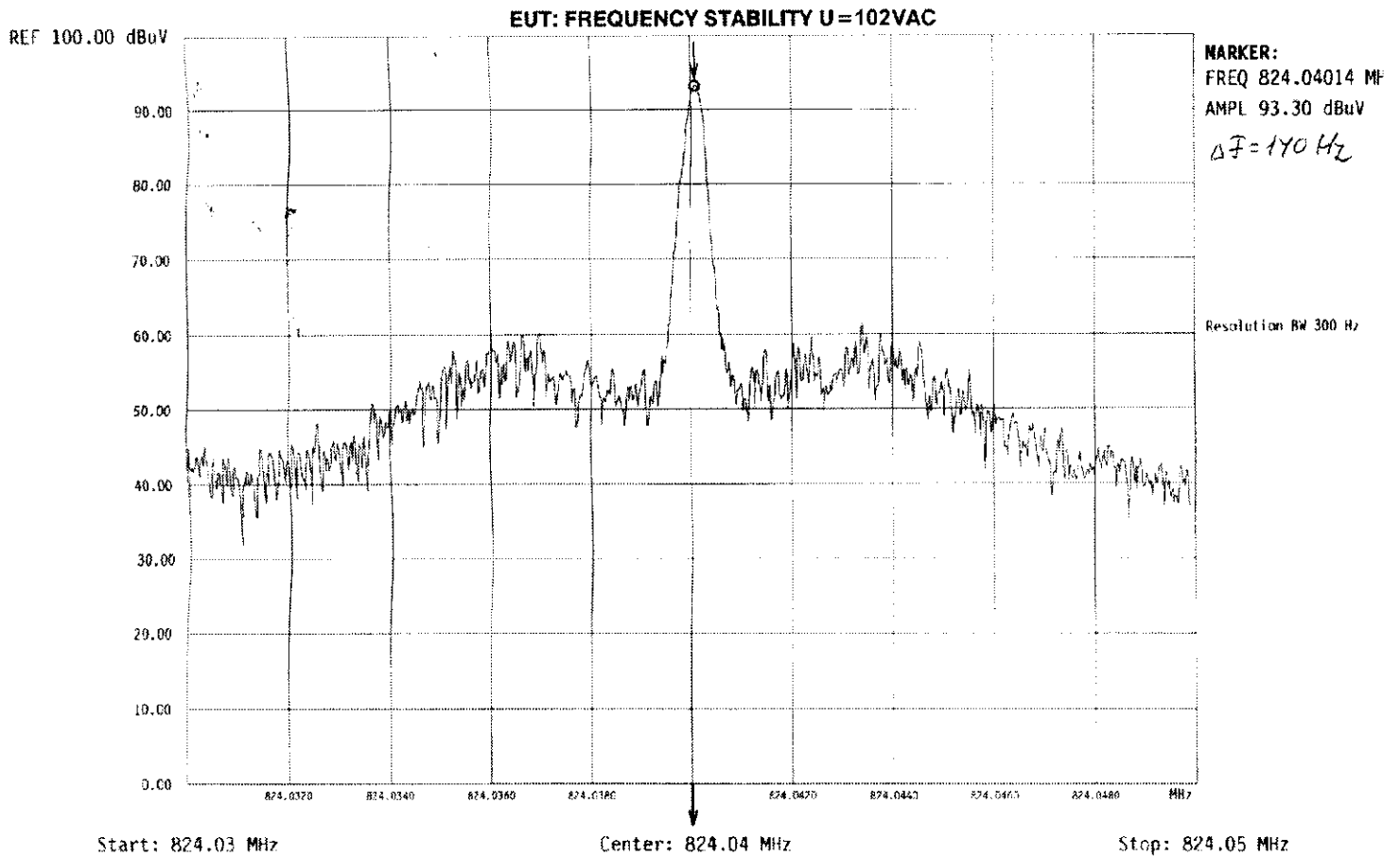
Date: April, 1998

FCC ID: ARACET-10

Plot 3.2.16
Frequency stability vs supply voltage test

Pr. 12663

Wednesday, 4/3/19
Time: 16:48:35

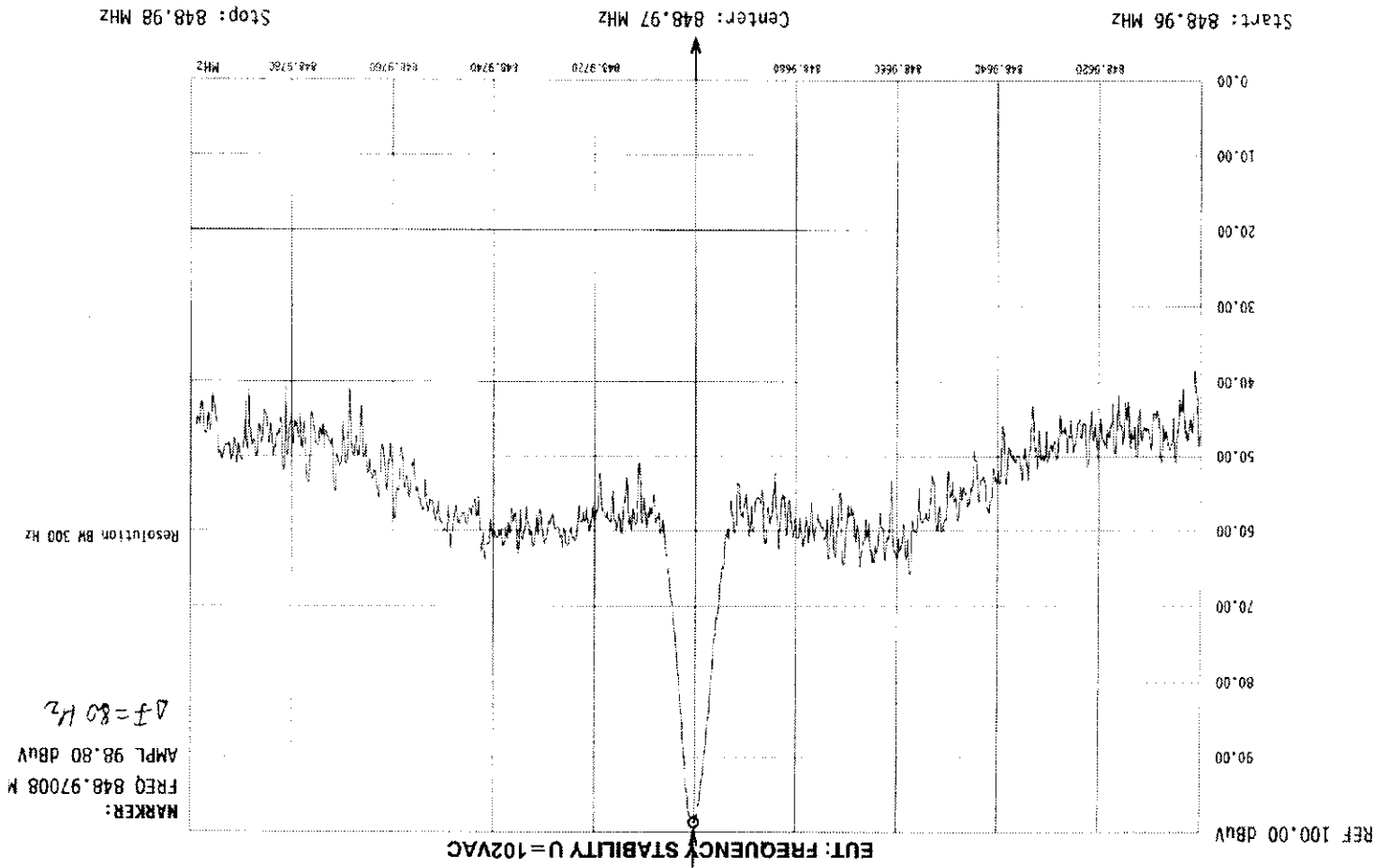




Plot 3.2.18
 Frequency stability vs supply voltage test

12663

Wednesday, 4/3/1
 Time: 16:46:38





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Test Report: TLR FCC.12663

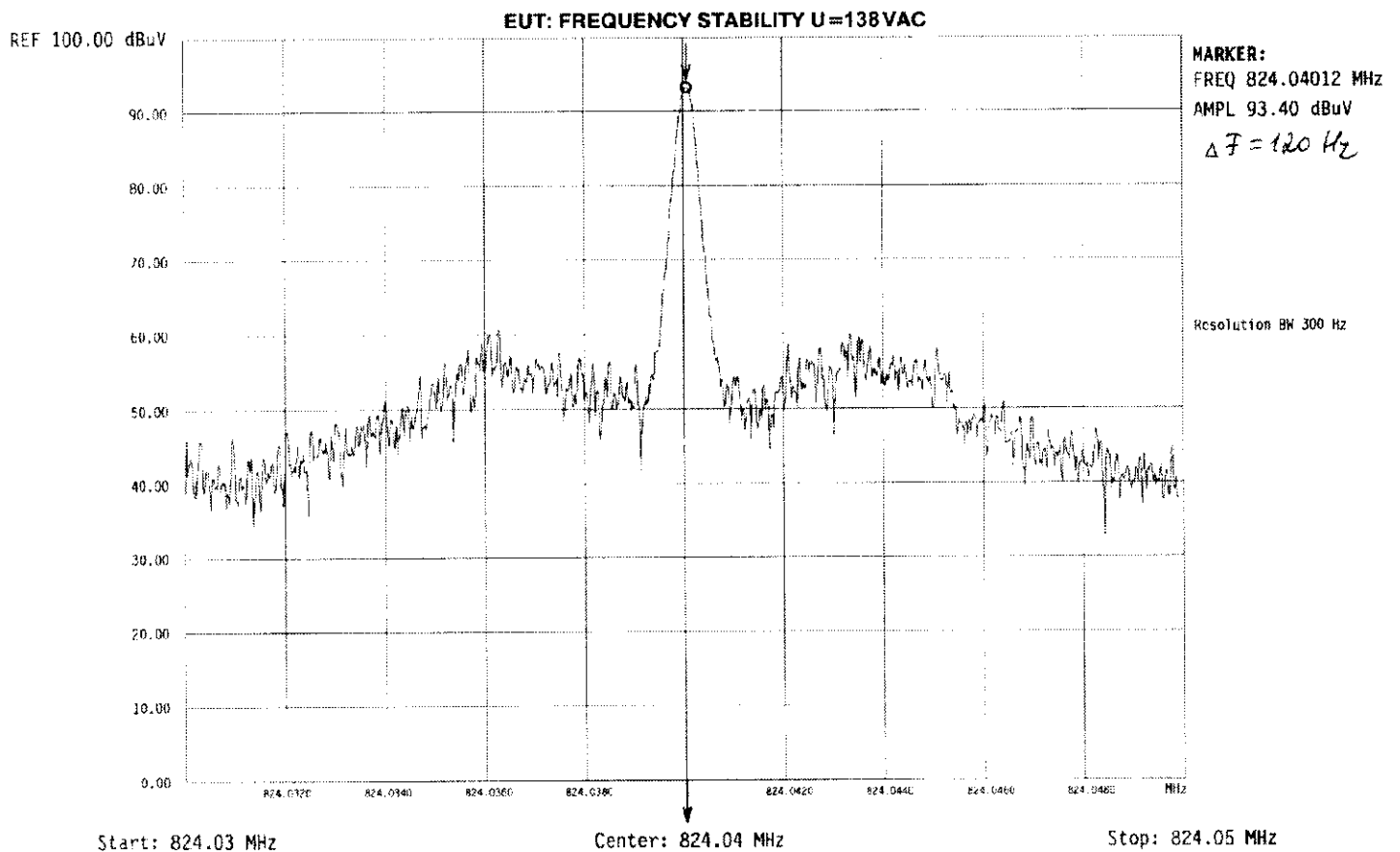
Date: April, 1998

FCC ID: ARACET-10

Plot 3.2.19
Frequency stability vs supply voltage test

Fig. 1266.3

Wednesday, 4/3/1998
Time: 16:51:27

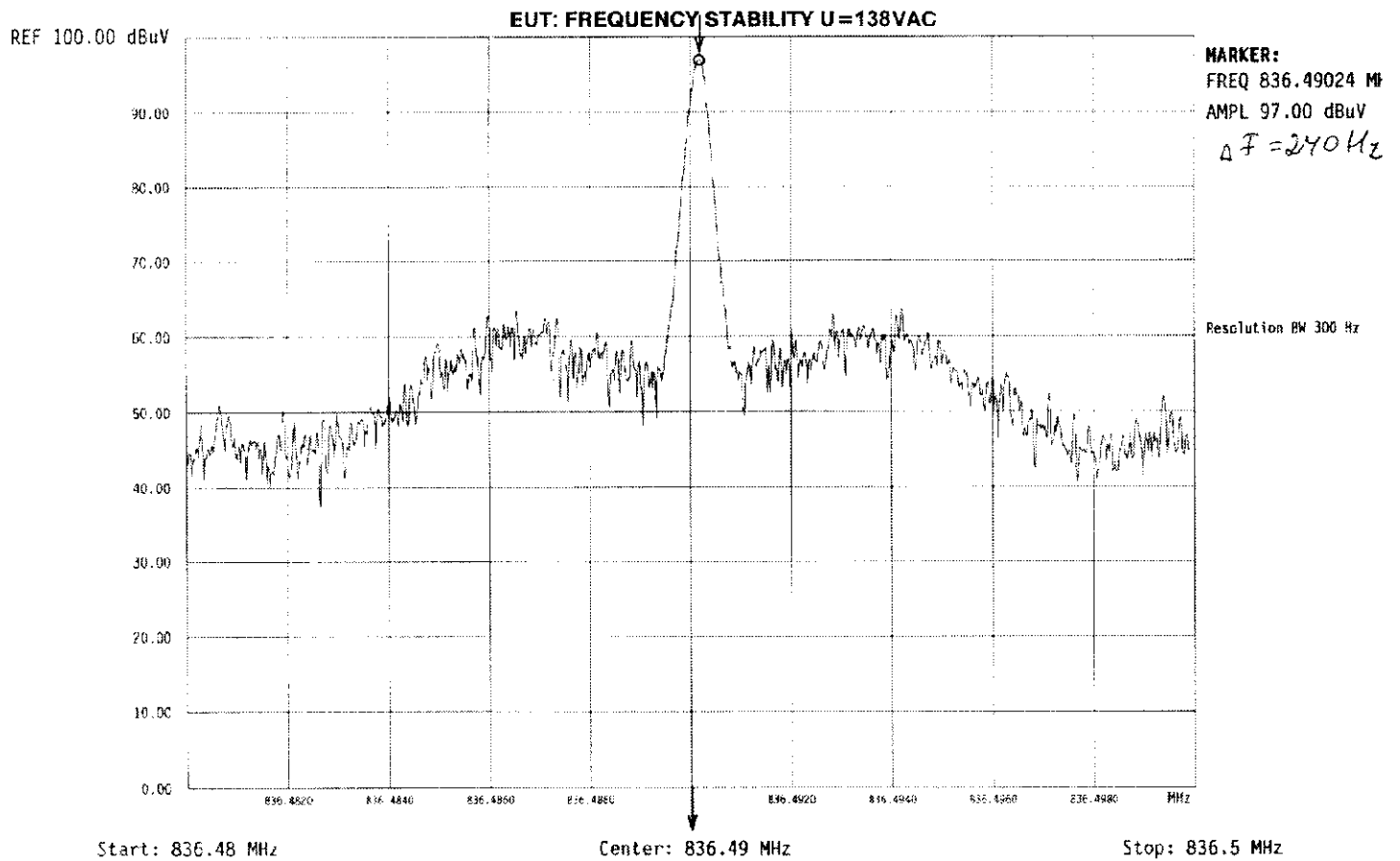


RH

Plot 3.2.20
Frequency stability vs supply voltage test

Pt. 12663

Wednesday, 4/3/19
Time: 16:53:37





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Test Report: TLR FCC.12663

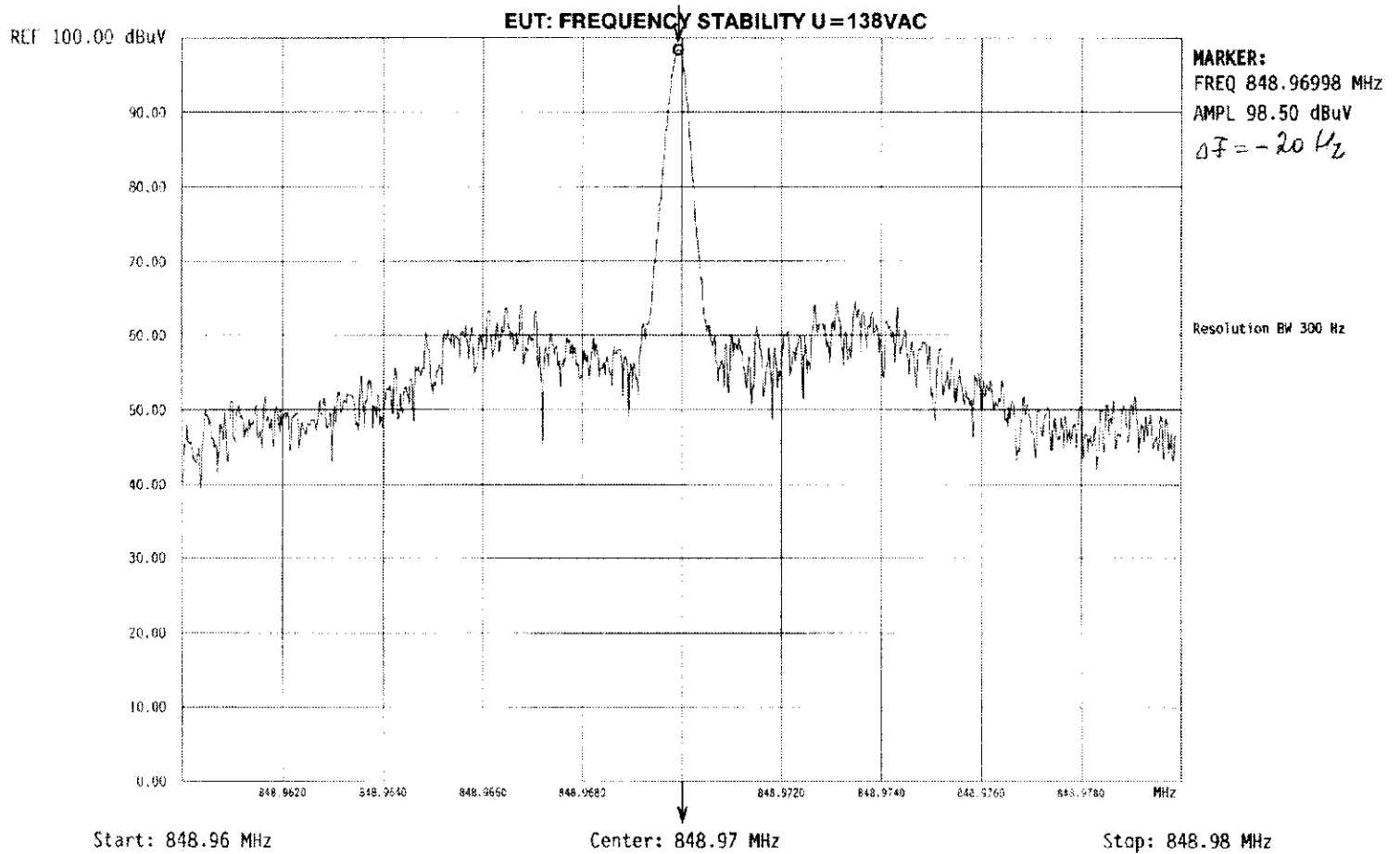
Date: April, 1998

FCC ID: ARACET-10

Plot 3.2.21
Frequency stability vs supply voltage test

Pt. 12663

Wednesday, 4/3/1998
Time: 16:55:27



Bk



99 %

3.3 Occupied Bandwidth test according to Part 22, § 22.905 and Part 2, § 2.989 (c)

3.3.1 Definition of the test

This test was performed to determine that the Tx occupying bandwidth is less than 40 kHz. The mean powers radiated are each equal to 0.5 percent of the total mean power radiated. In this case it should be 23 dB below the carrier.

3.3.2 The test set-up configuration

The EUT was configured as shown in Figure 1.1.

3.3.3 Test results

The EUT was tested in analog and digital modes of operation. The EUT has passed the test requirements. The test results are given in Table 3.3.1 and Plots 3.3.1 to 3.3.6.

Table 3.3.1
Occupied Bandwidth test results

Mode of operation	Carrier frequency, MHz	Measured result, kHz	Pass/Fail
Analog	824.04	32.05	Pass
	836.49	31.55	Pass
	848.97	31.65	Pass
Digital	824.04	33.6	Pass
	836.49	33.2	Pass
	848.97	34.0	Pass

Reference numbers of test equipment used

HL 0025						
---------	--	--	--	--	--	--

Full description is given in Appendix A.



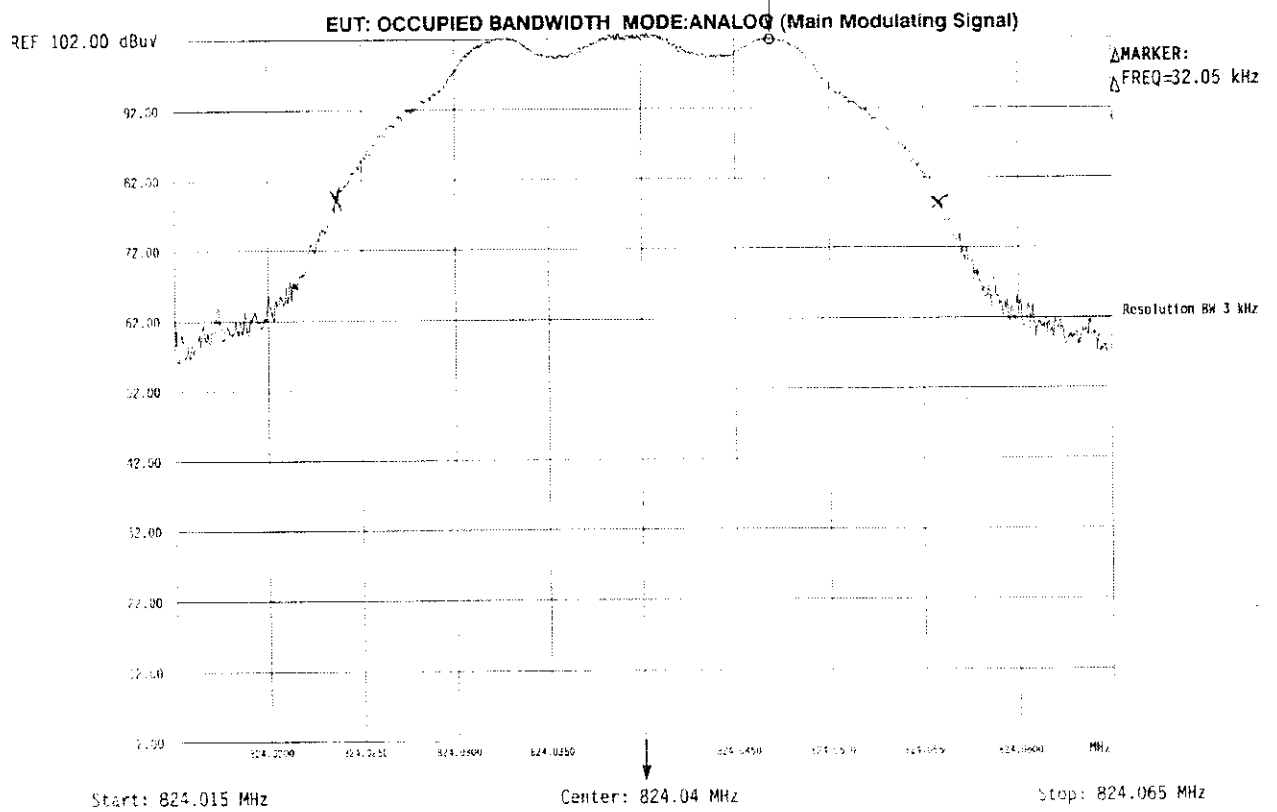
HERMON LABORATORIES

Test Report: TLR FCC.12663
Date: April, 1998

Plot 3.3.1
Occupied Bandwidth test

PT. 12663

Thursday, 19/2/98
Time: 13:22:1



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214



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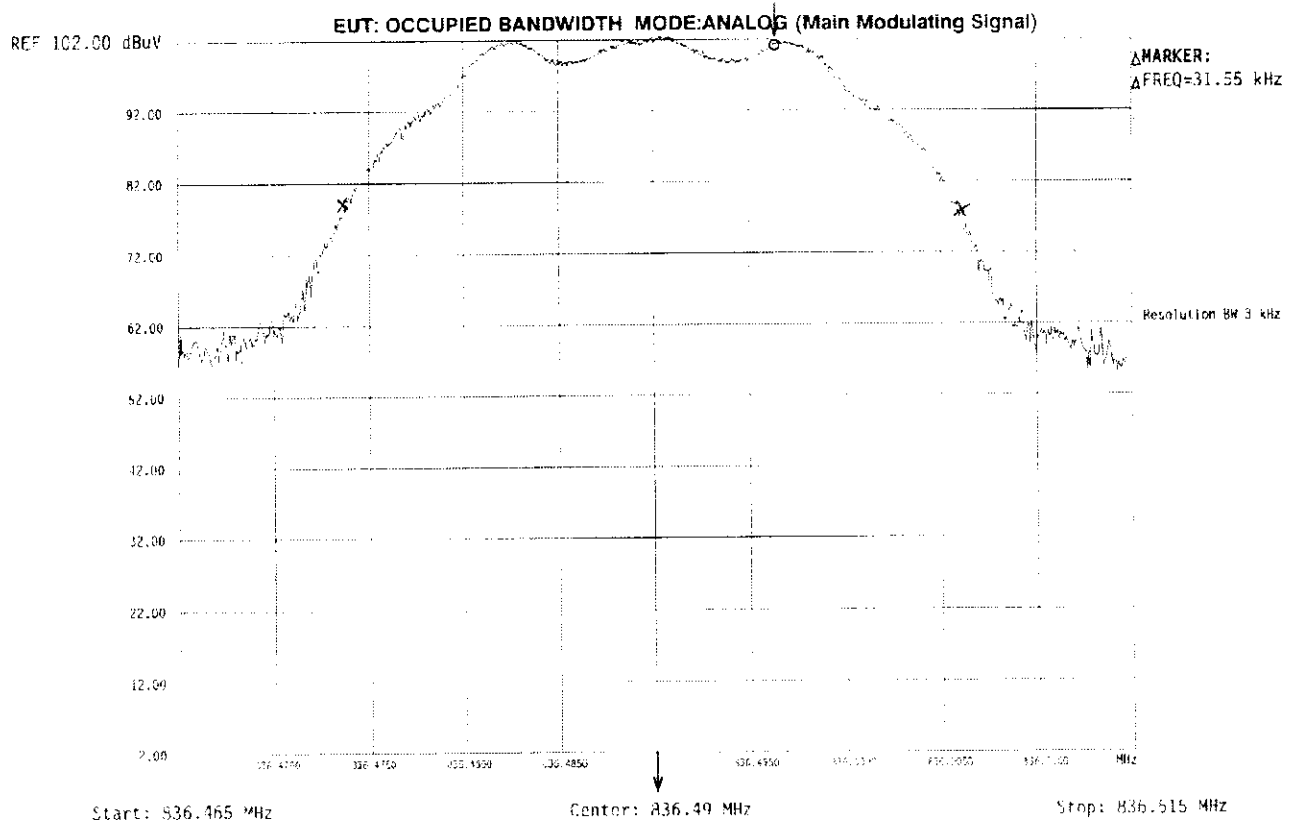
Test Report: TLR FCC.12663

Date: April, 1998

Plot 3.3.2
Occupied Bandwidth test

H.12663

Thursday, 19/2/19
Time: 12:26:39



Generated by HERMON LABORATORIES

BIL



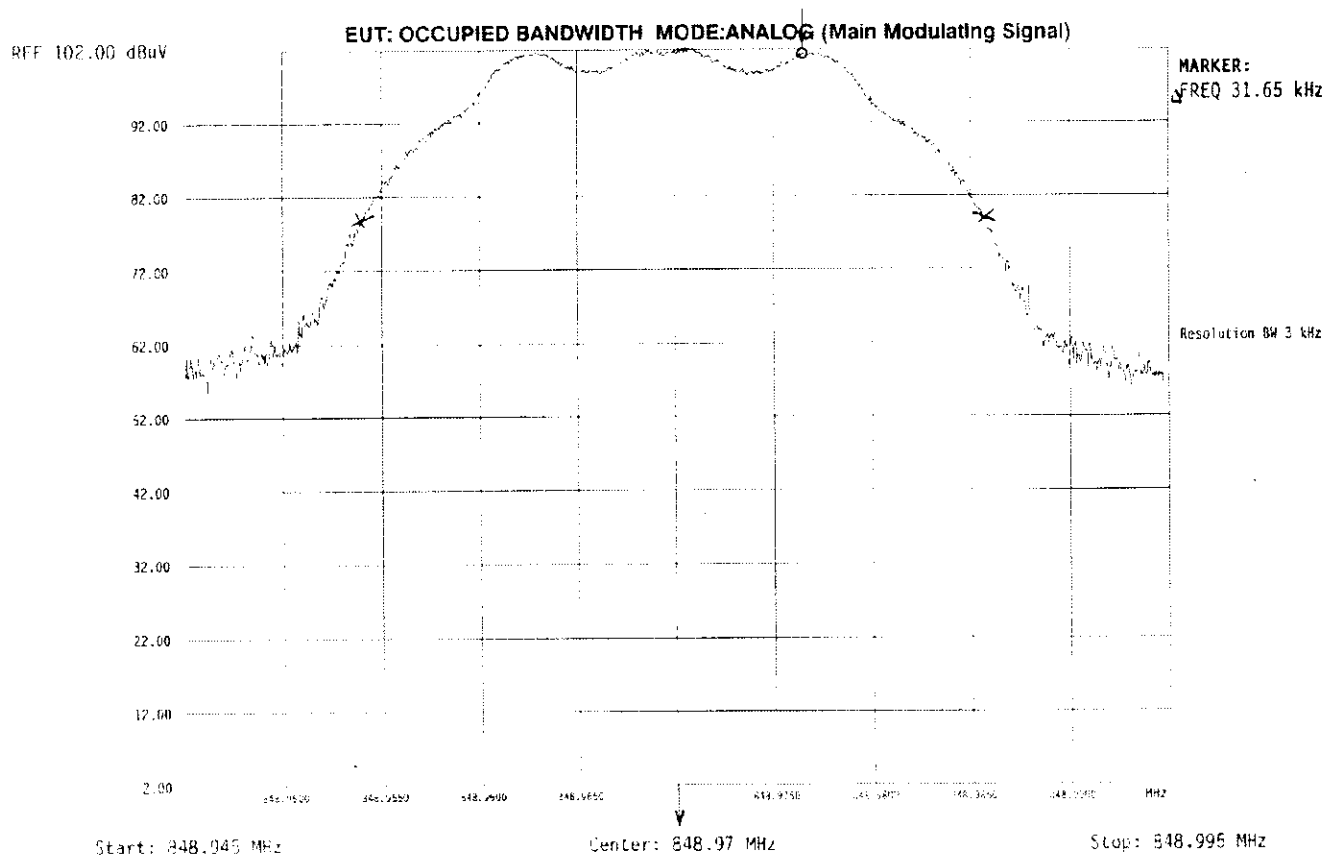
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Test Report: TLR FCC.12663
Date: April, 1998

Plot 3.3.3
Occupied Bandwidth test

A.12663

Thursday, 1912,
Time: 13:17:52



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RA



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Test Report: TLR FCC.12663

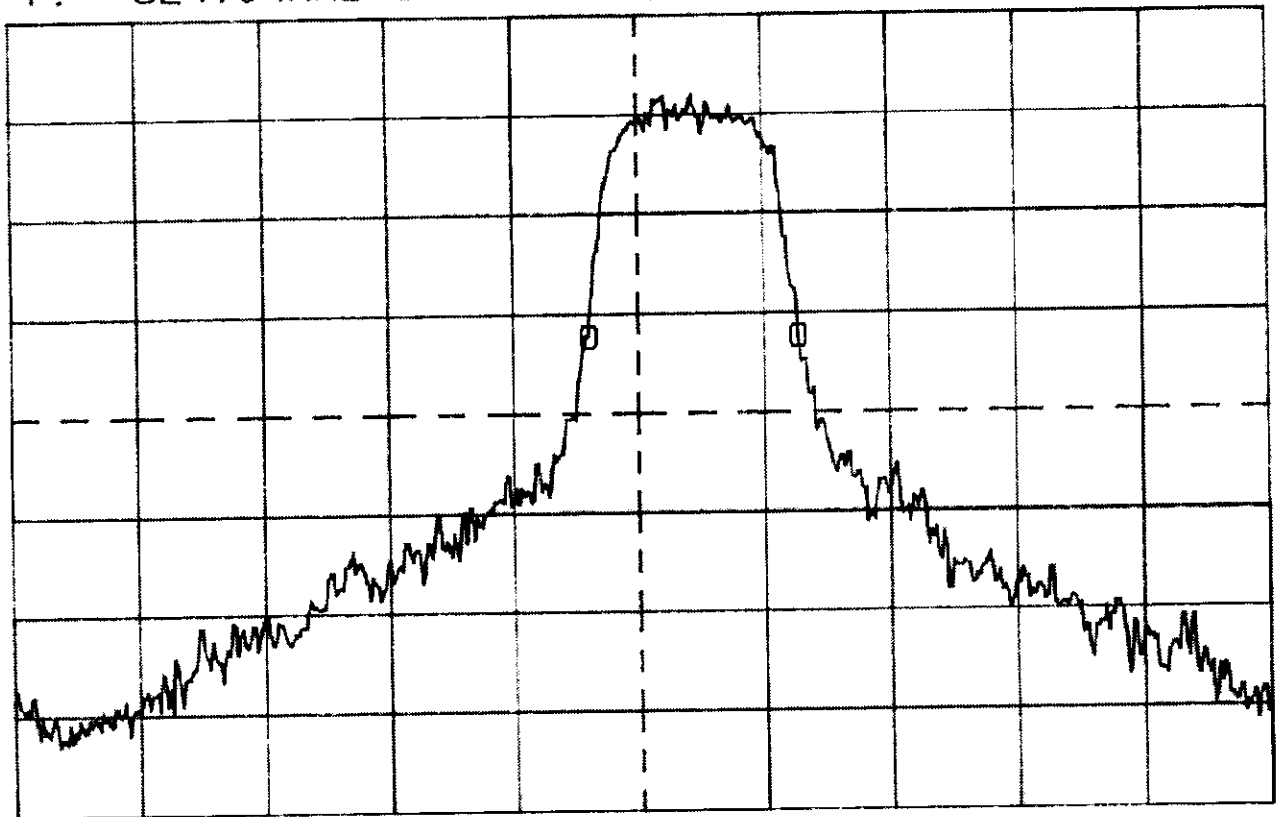
Date: April, 1998

FCC ID: ARACET-10

Plot 3.3.4
Occupied Bandwidth test
(digital mode)

dM: + 33.60kHz + 0.0dB

F: 824.04MHz SP: 20kHz/ RL: - 10 dBm 10dB/ 1-



RBW: 3kHz VBW: 3kHz SWP: 13mS/° ATT: 10dB

244



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Test Report: TLR FCC.12663

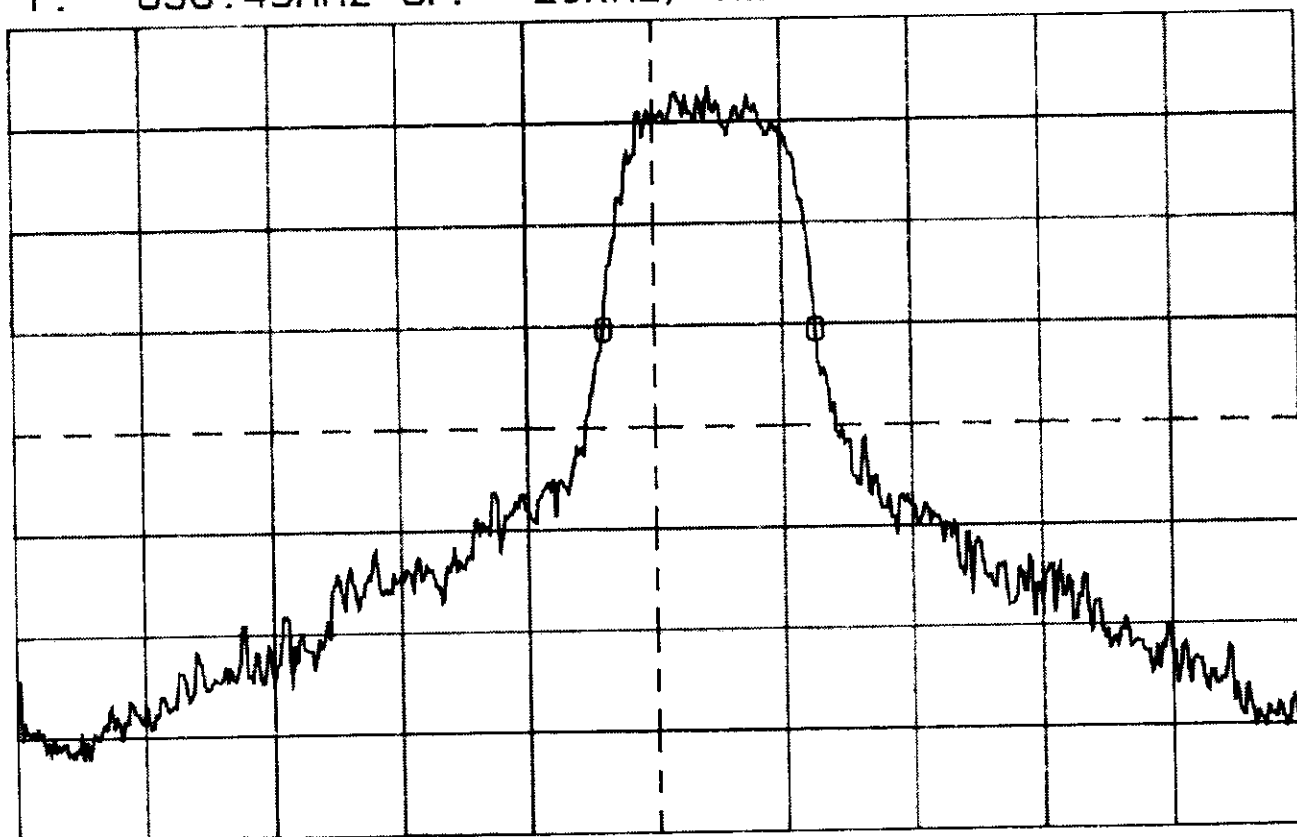
Date: April, 1998

FCC ID: ARACET-10

Plot 3.3.5
Occupied Bandwidth test
(digital mode)

dBm: + 33.20kHz - 0.2dB

F: 836.49MHz SP: 20kHz/ RL: - 10 dBm 10dB/ 1-



RBW: 3kHz VBW: 3kHz SWP: 13ms/° ATT: 10dB

271



3.4 Modulation characteristics (frequency deviation) test according to Part 2, § 2.987 and Part 22, § 22.915

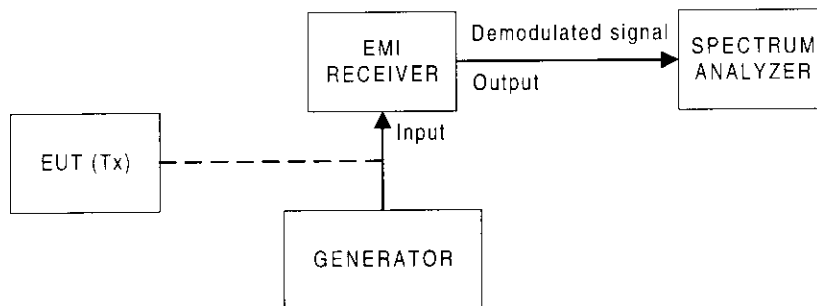
3.4.1 Definition of the test

This test was performed to determine that the instantaneous frequency deviation resulting from the main modulating signal (MMS) should be ± 12 kHz, from the supervisory audio tones (SAT) should be ± 2 kHz, from the signaling tone (ST) should be ± 8 kHz and from wideband data signals (WBS) should be ± 8 kHz.

3.4.2 The test set-up configuration

The test setup is shown in Figure 3.4 and Photographs 3.4.1 and 3.4.2.

Figure 3.4
Frequency deviation measurement setup





3.4.3 Test results

The EUT was tested according to the substitution method. The EUT modulation signal was compared with the generator reference signal. During the testing the modulation levels were maintained within $\pm 10\%$ of specified above values. In the SAT mode of operation the EUT was tested at 3 modulation frequencies: 5.97 kHz, 6.0 kHz and 6.03 kHz. The EUT has passed the test requirements. The test results are given in Tables 3.4.1 and 3.4.2.

Table 3.4.1

Frequency deviation results (kHz)

Frequency, MHz	SAT		ST		MMS		Pass/Fail
	Limit	Result	Limit	Result	Limit	Result	
824.04	± 2	± 2	± 8	± 7.5	± 12	± 8	Pass
836.49	± 2	± 2	± 8	± 8	± 12	± 8	Pass
848.97	± 2	± 2	± 8	± 7.6	± 12	± 8	Pass

Table 3.4.2

Frequency deviation results (kHz)

Frequency, MHz	WBS		Limit	Result	Pass/Fail
	Limit	Result			
834.99	± 8	± 8			Pass
835.28	± 8	± 8			Pass
835.56	± 8	± 8			Pass

Reference numbers of test equipment used

HL 0027	HL 0028	HL 0557			
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Full description is given in Appendix A.



3.5 Emission mask test according to Part 22, § 22.917(b)

3.5.1 Definition of the test

This test was performed to determine that the mean power of emissions should be attenuated below the mean power of the unmodulated carrier (P) as follows:

- (1) On any frequency removed from the carrier frequency by more than 20 kHz but not more than 45 kHz at least 26 dB;
- (2) On any frequency removed from the carrier frequency by more than 45 kHz up to the first multiple of the carrier frequency at least 60 dB or according to the equation $[43 + 10\log(\text{carrier power } P \text{ in watts})]$ dB, whichever is the lesser attenuation.

3.5.2 The test set-up configuration

The EUT was configured as shown in Figure 1.1 and the EUT RF output was connected to the spectrum analyzer.

3.5.3 Test results

The EUT was tested in ST, SAT, WBS and MMS modes of operation. The frequency range from 100 kHz up to 1.7 GHz was investigated. The following spectrum analyzer bandwidth settings were used:

- 1) in the radiotelephony mode or the supervisory audio tone mode

RBW = 300 Hz - for any emission removed from the carrier frequency not more than 45 kHz;

RBW = 30 kHz - for any emission removed from the carrier more than 45 kHz. In the cases, where RBW = 3 kHz was used, the correction factor of 10 dB was accounted.

- 2) in the wideband data mode or the signaling tone mode

RBW = 300 Hz - for any emission removed from the carrier frequency not more than 60 kHz;

RBW = 30 kHz - for any emission removed from the carrier more than 60 kHz. In the cases, where RBW = 3 kHz was used, the correction factor of 10 dB was accounted.

The test results are given in Table 3.5.1 and in Plots 3.5.1 to 3.5.76.

The EUT has passed the test requirements.

Reference numbers of test equipment used

HL 0027						
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Full description is given in Appendix A.



HERMON LABORATORIES

Test Report: TLR FCC.12663

Date: April, 1998

FCC ID: ARACET-10

Table 3.5.1
Emission mask test results

Frequency, MHz	Carrier power, W	Frequency range, kHz	Mode of operation	Measured minimum attenuation, dB	Specified Limit, dB	Pass/Fail
824.04	0.72	20-45 removed from carrier	ST	38.5	26	Pass
			WBS	42.8		Pass
			SAT	54.2		Pass
			MMS	45.2		Pass
		more than 45 removed from carrier	ST	55.0	41.6	Pass
			WBS	43.4		Pass
			SAT	42.1		Pass
			MMS	41.6		Pass
836.49	0.74	20-45 removed from carrier	ST	36.8	26	Pass
			WBS	44.4		Pass
			SAT	55.0		Pass
			MMS	45.5		Pass
		more than 45 removed from carrier	ST	55.2	41.7	Pass
			WBS	42.1		Pass
			SAT	41.7		Pass
			MMS	42.1		Pass
848.97	0.70	20-45 removed from carrier	ST	37.3	26	Pass
			WBS	48.7		Pass
			SAT	51.4		Pass
			MMS	44.7		Pass
		more than 45 removed from carrier	ST	55.3	41.5	Pass
			WBS	42.8		Pass
			SAT	42.6		Pass
			MMS	42.9		Pass



HERMION LABORATORIES

Test Report: TLR FCC.12663

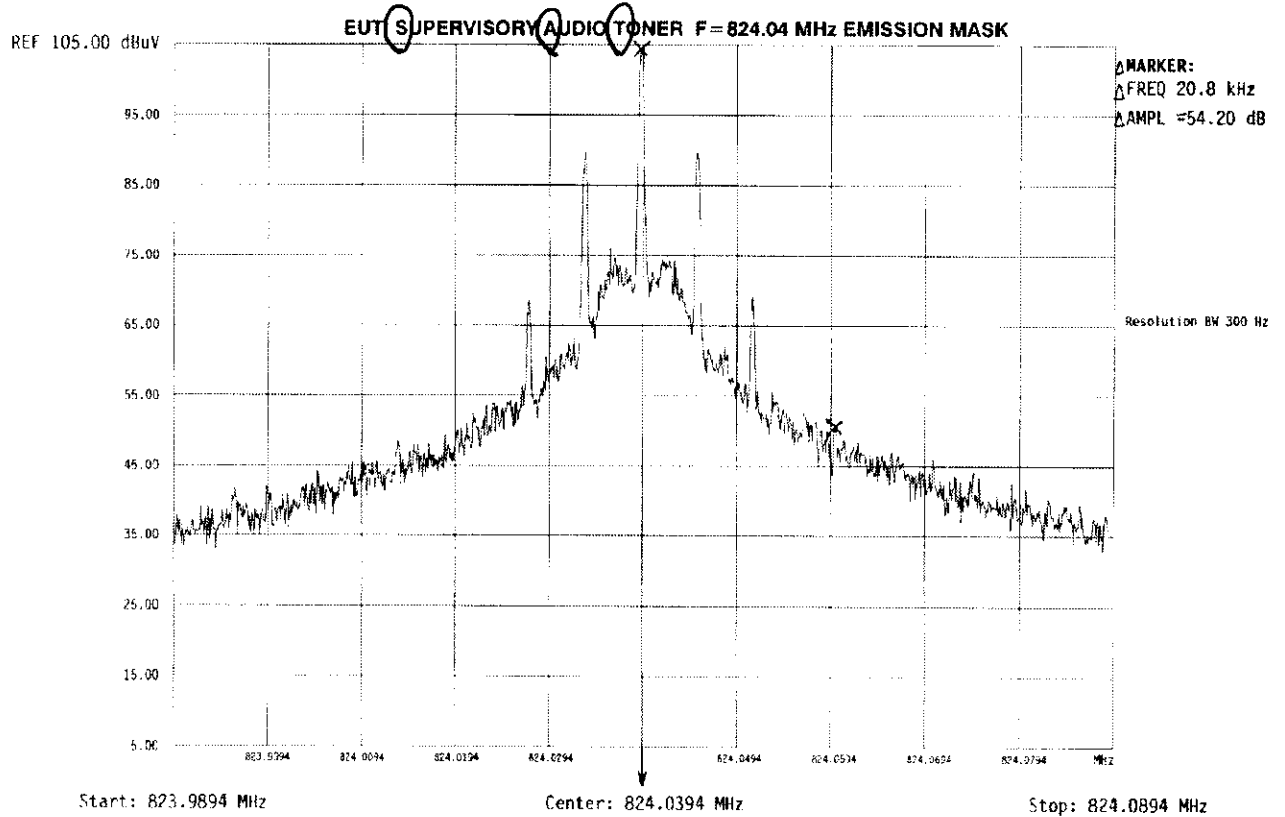
Date: April, 1998

FCC ID: ARACET-10

Plot 3.5.1
Emission mask test

A.12663

Sunday, 21/9/1997
Time: 3:37:46

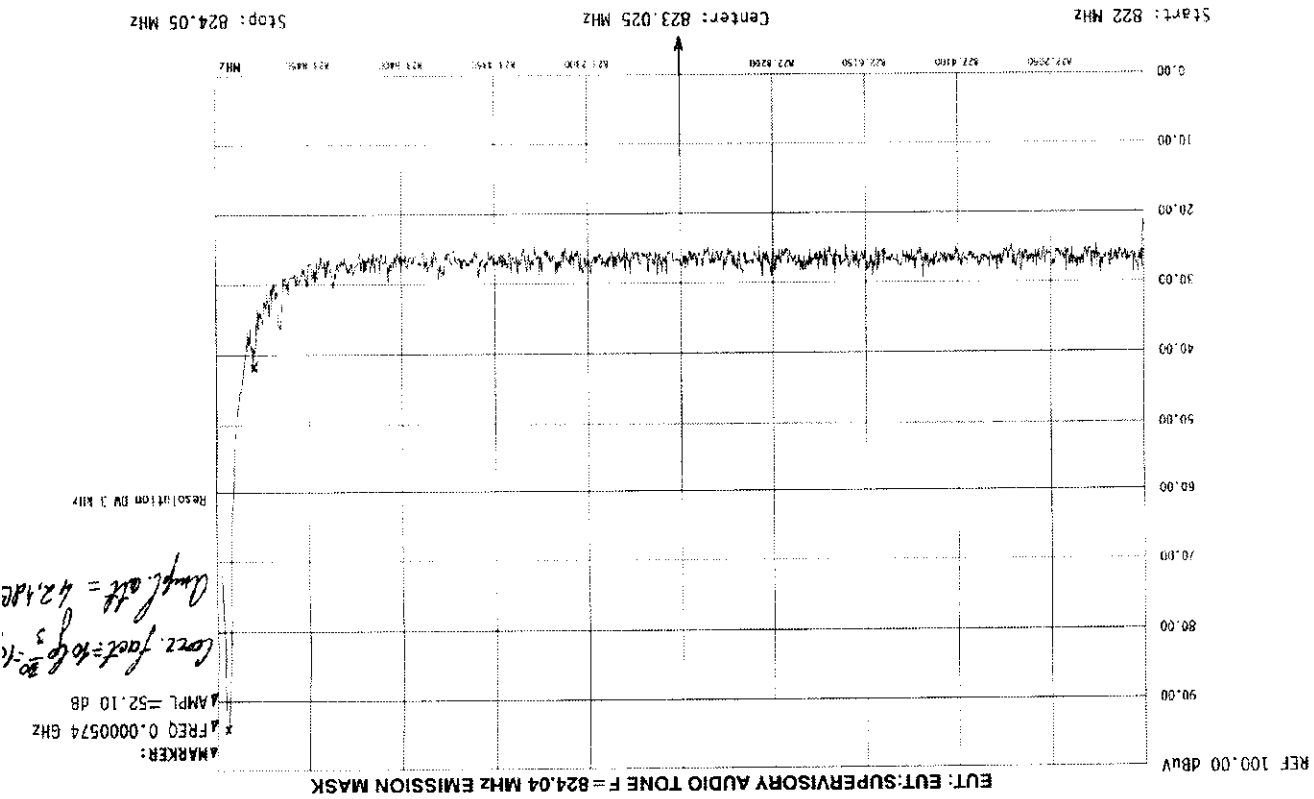




Plot 3.5.3
Emission mask test

Monday, 9/31/1998
Time: 14:28:46

Pr. 12663





HERMON LABORATORIES

Test Report: TLR FCC.12663

Date: April, 1998

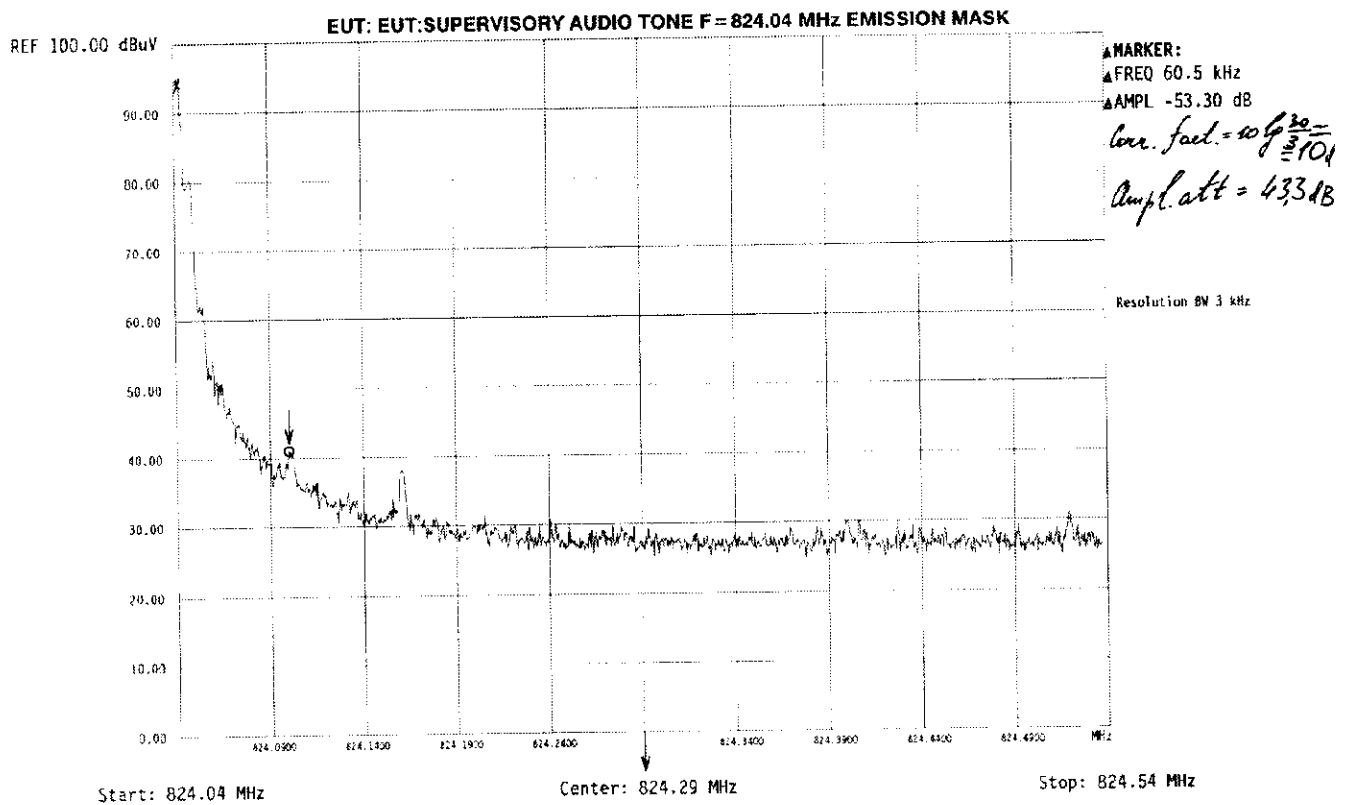
FCC ID: ARACET-10

Plot 3.5.4
Emission mask test

P2.12663

Monday, 9/3/1998

Time: 14:24:28



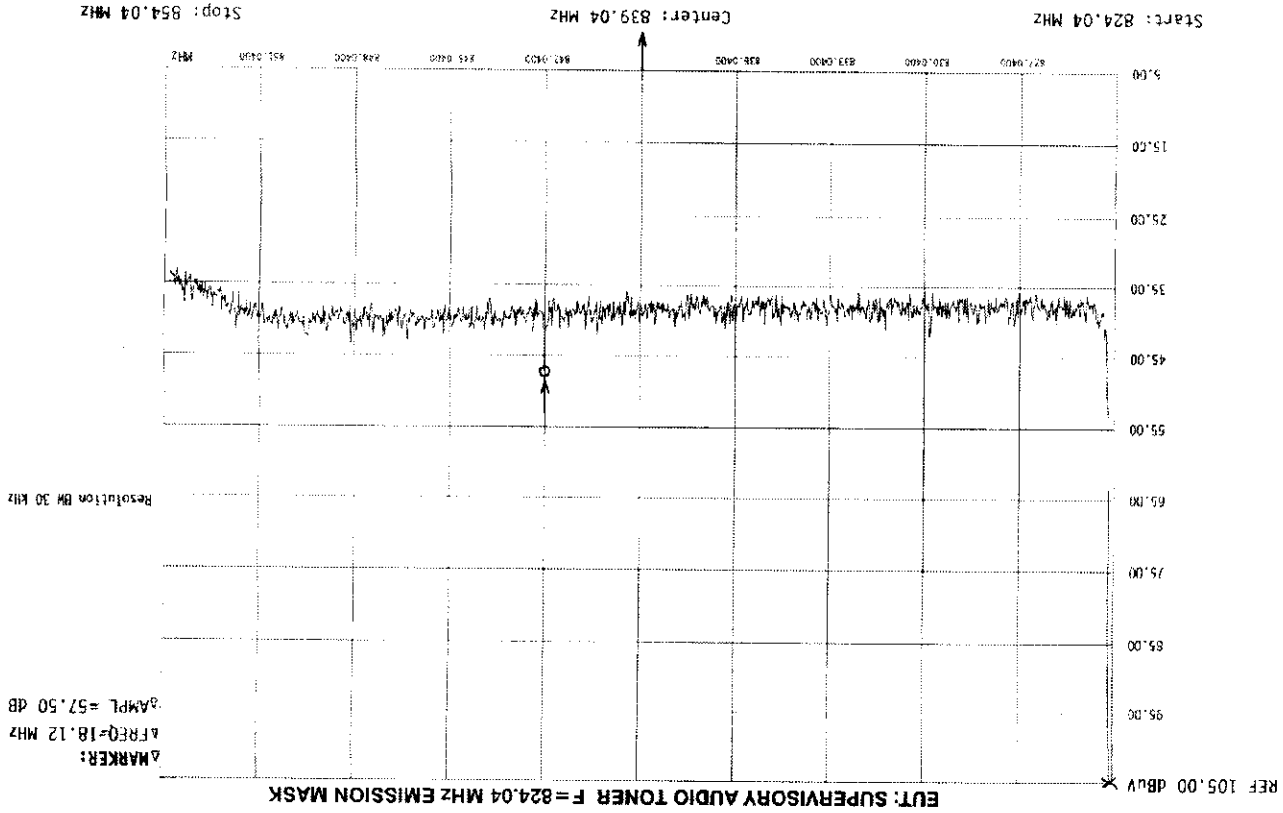
44



Plot 3.5.5
Emission mask test

Pl 12663

Thursday, 19/2/1998
Time: 9:9:11

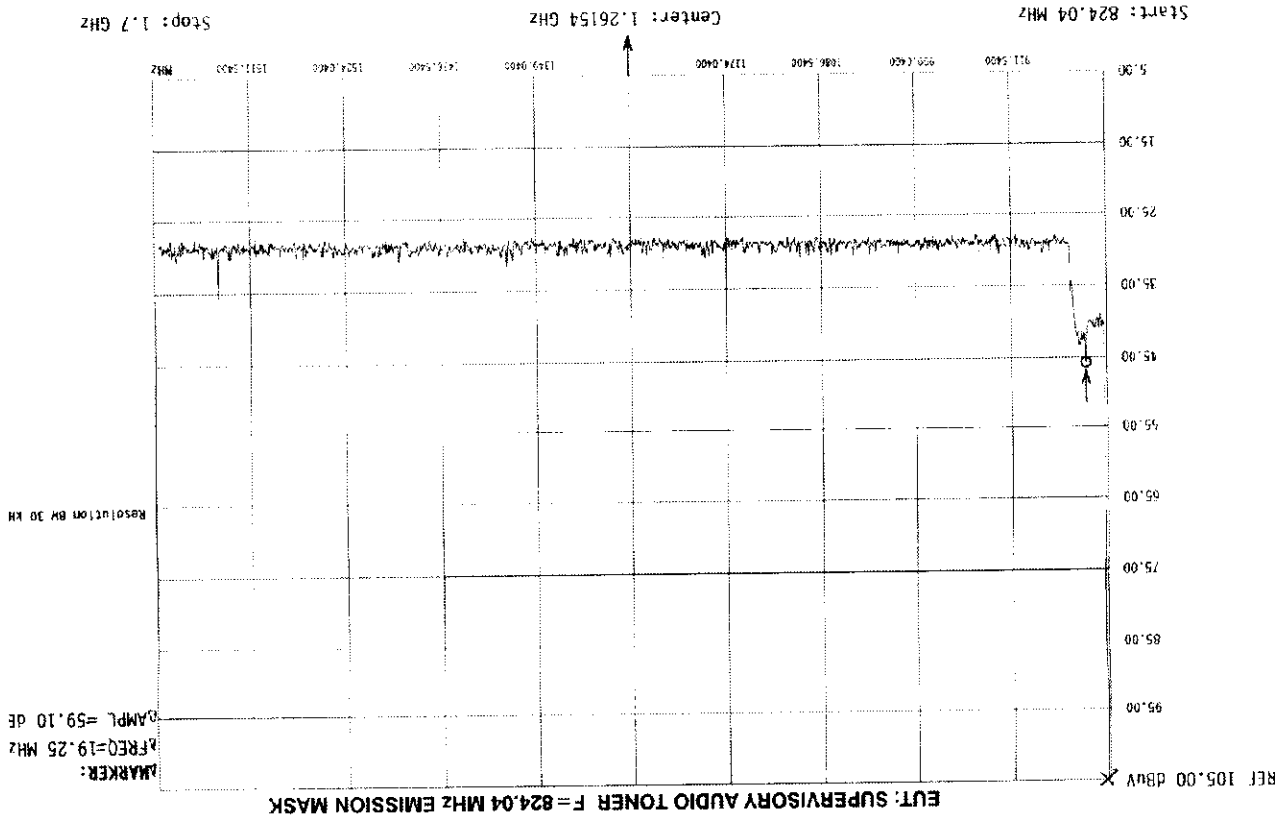




Plot 3.5.6
 Emission mask test

Thursday, 19/2
 Time: 9:5:47

12663



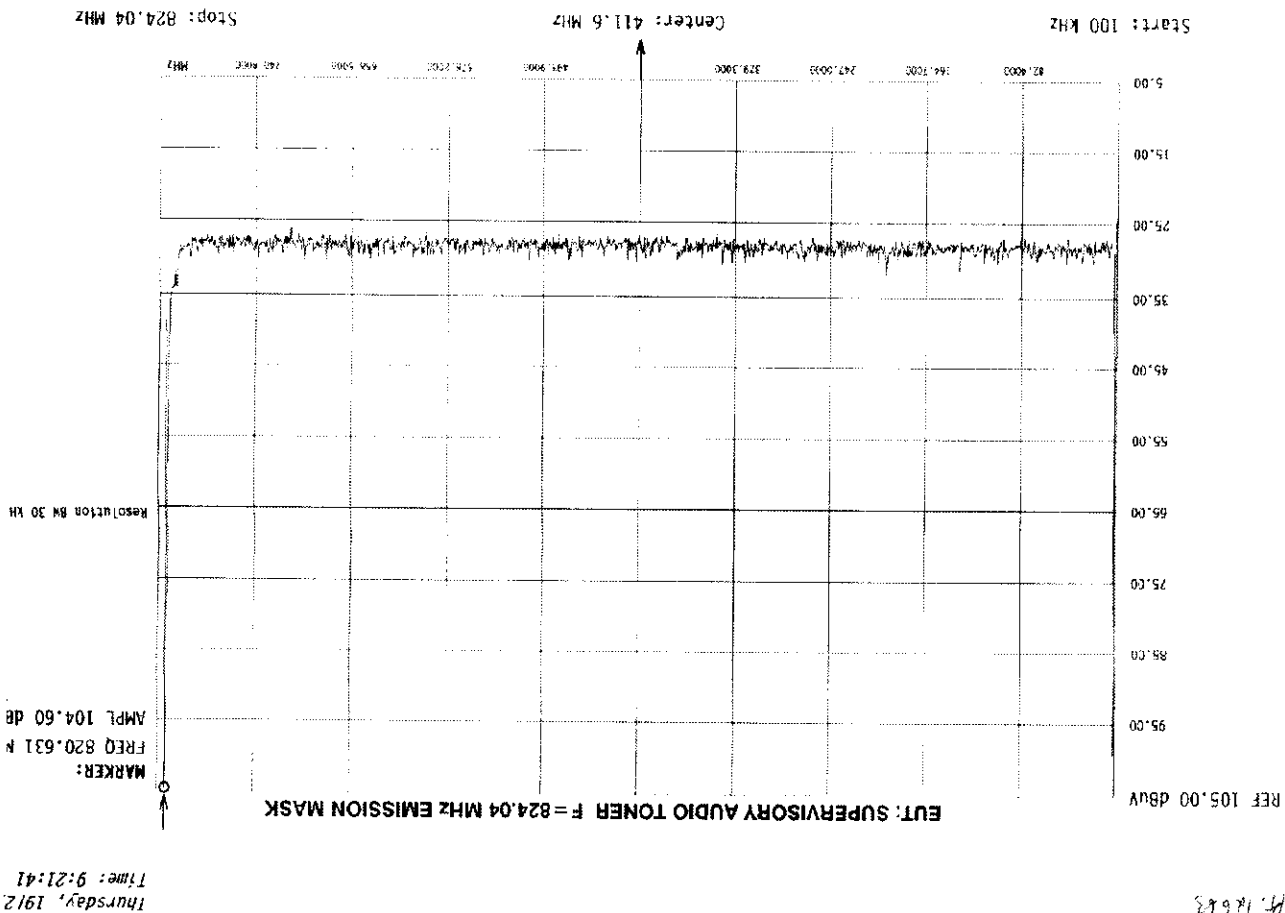


HERMON LABORATORIES

Test Report: TLRFCC.12663
Date: April, 1998
FCC ID: ARACFT-10

Plot 3.5.7 Emission mask test

Pl. 12663

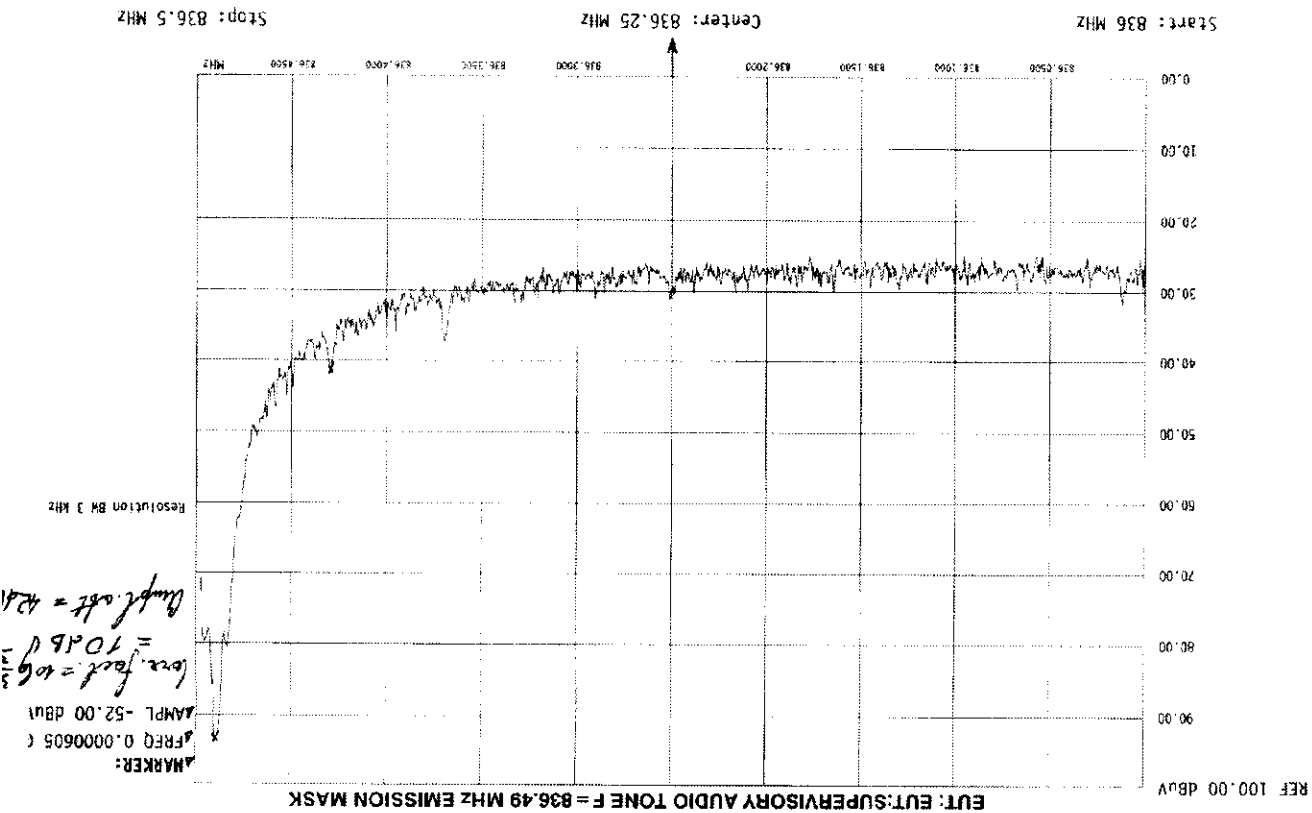




Plot 3.5.10
Emission mask test

P2.12663

Monday, 9/3/1998
Time: 14:4:12





HERMION LABORATORIES

Test Report: TLR FCC.12663

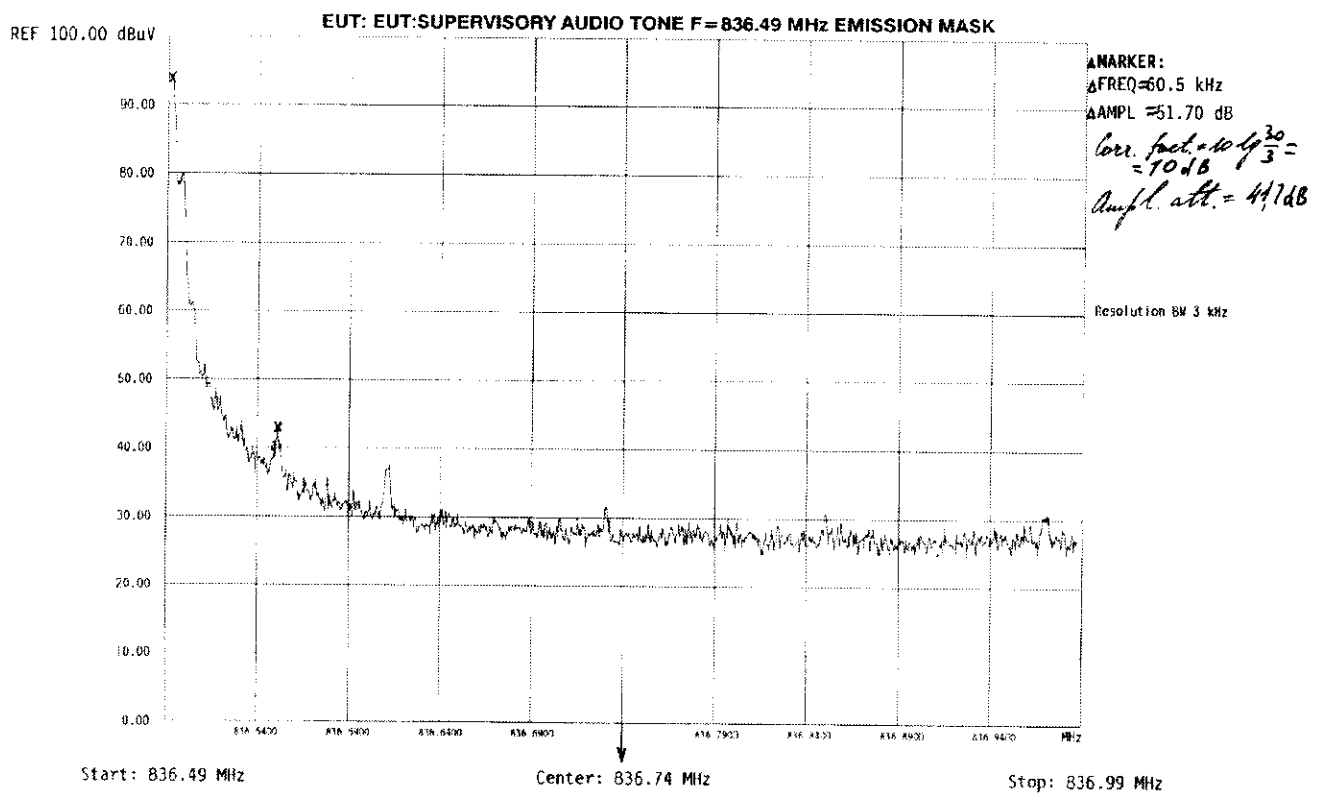
Date: April, 1998

FCC ID: ARACET-10

Plot 3.5.11
Emission mask test

Pl. 12663

Monday, 9/3/1998
Time: 14:03:37



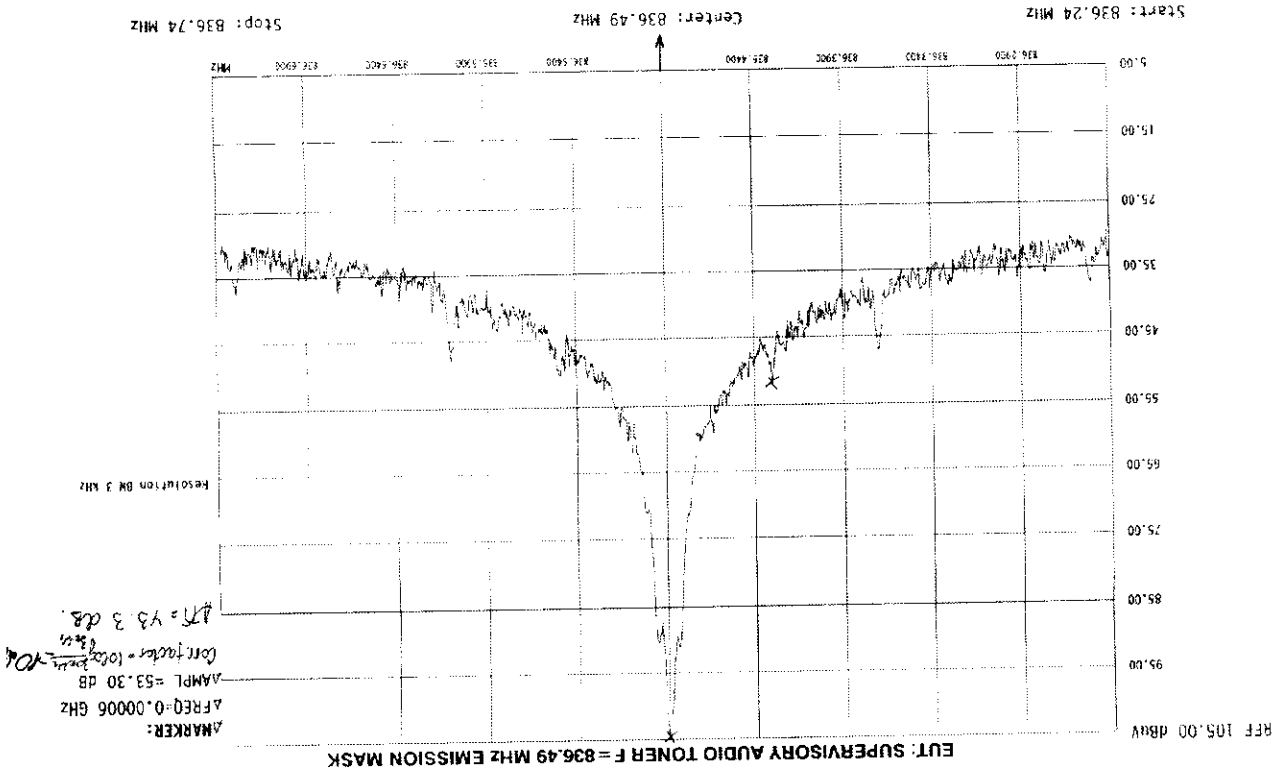
111



Plot 3.5.9
 Emission mask test

Tuesday, 24/2/1998
 Time: 10:12:35

12663

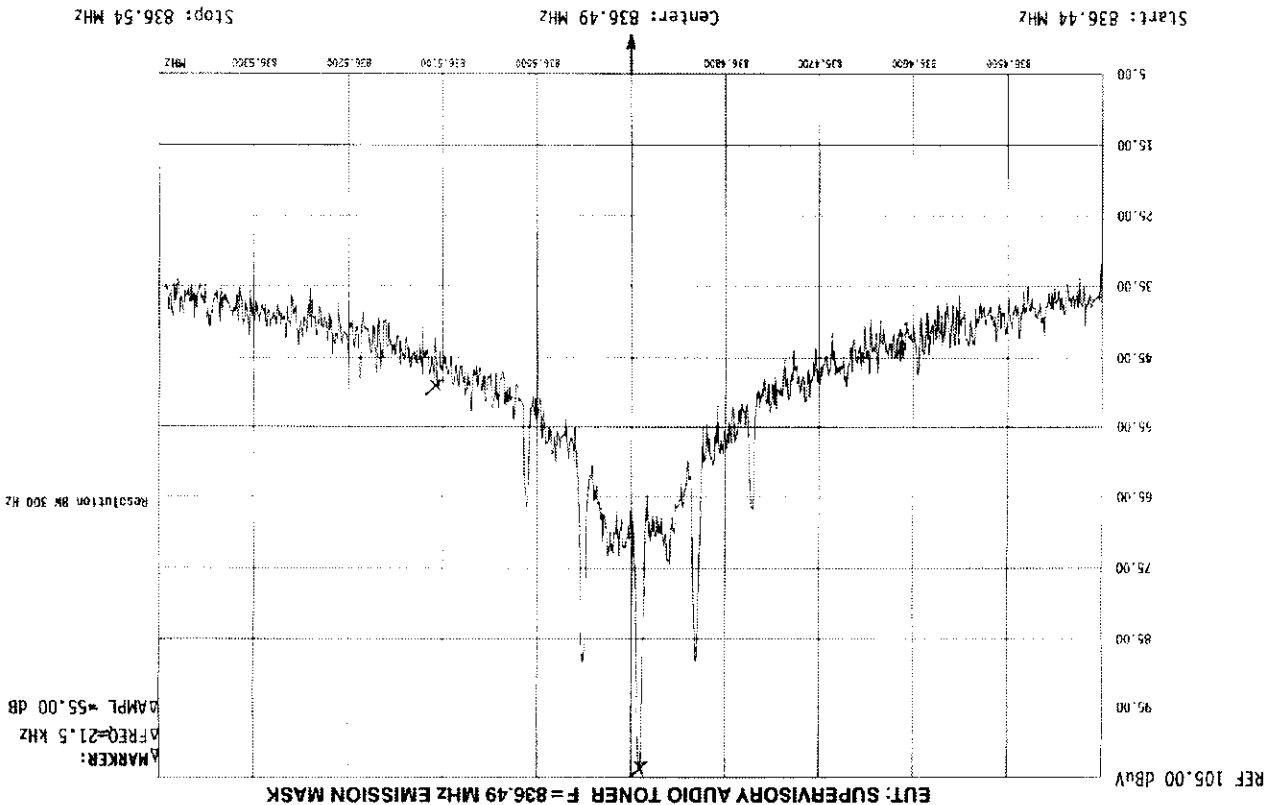




Plot 3.5.8
Emission mask test

#12663

Tuesday, 18/21/19
Time: 17:53:52





HERMION LABORATORIES

Test Report: TLR FCC.12663

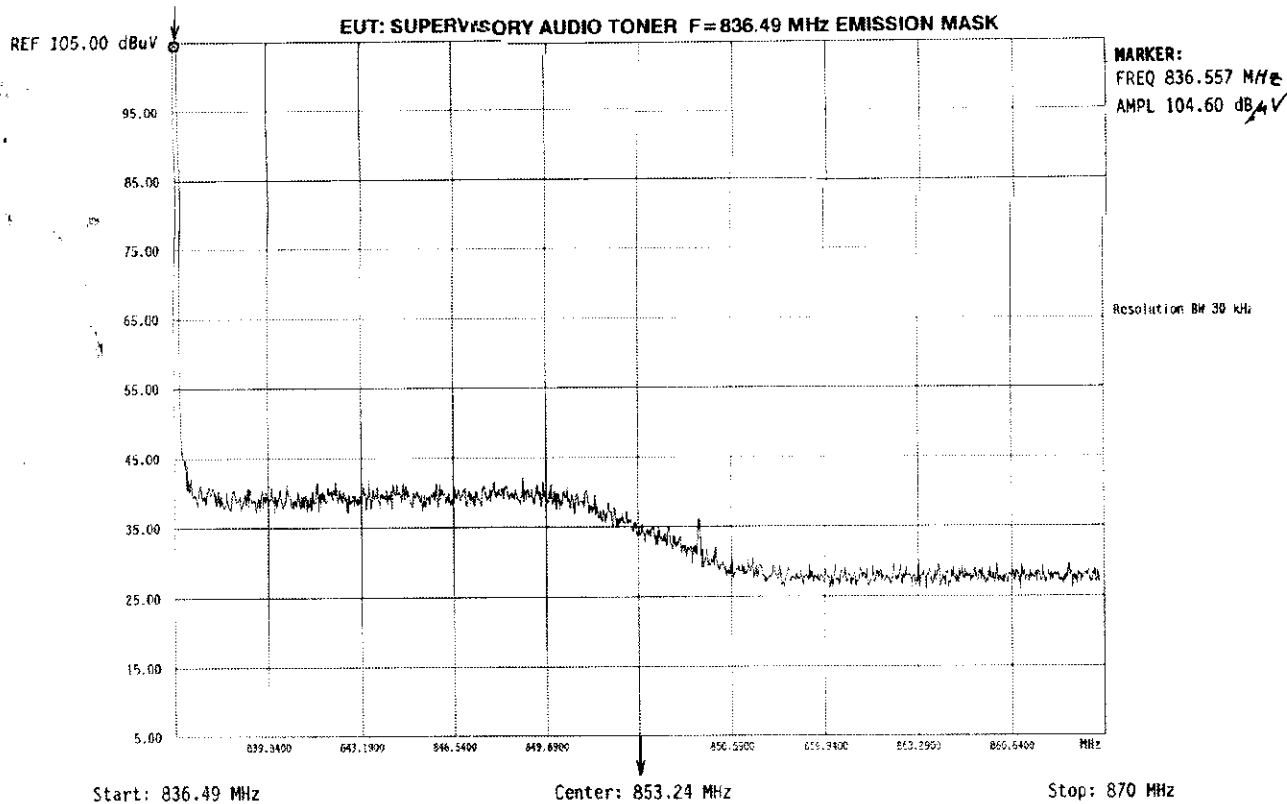
Date: April, 1998

FCC ID: ARACET-10

Plot 3.5.12
Emission mask test

A.12663

Tuesday, 18/2/98
Time: 18:18:44





HERMON LABORATORIES

Test Report: TLR FCC.12663

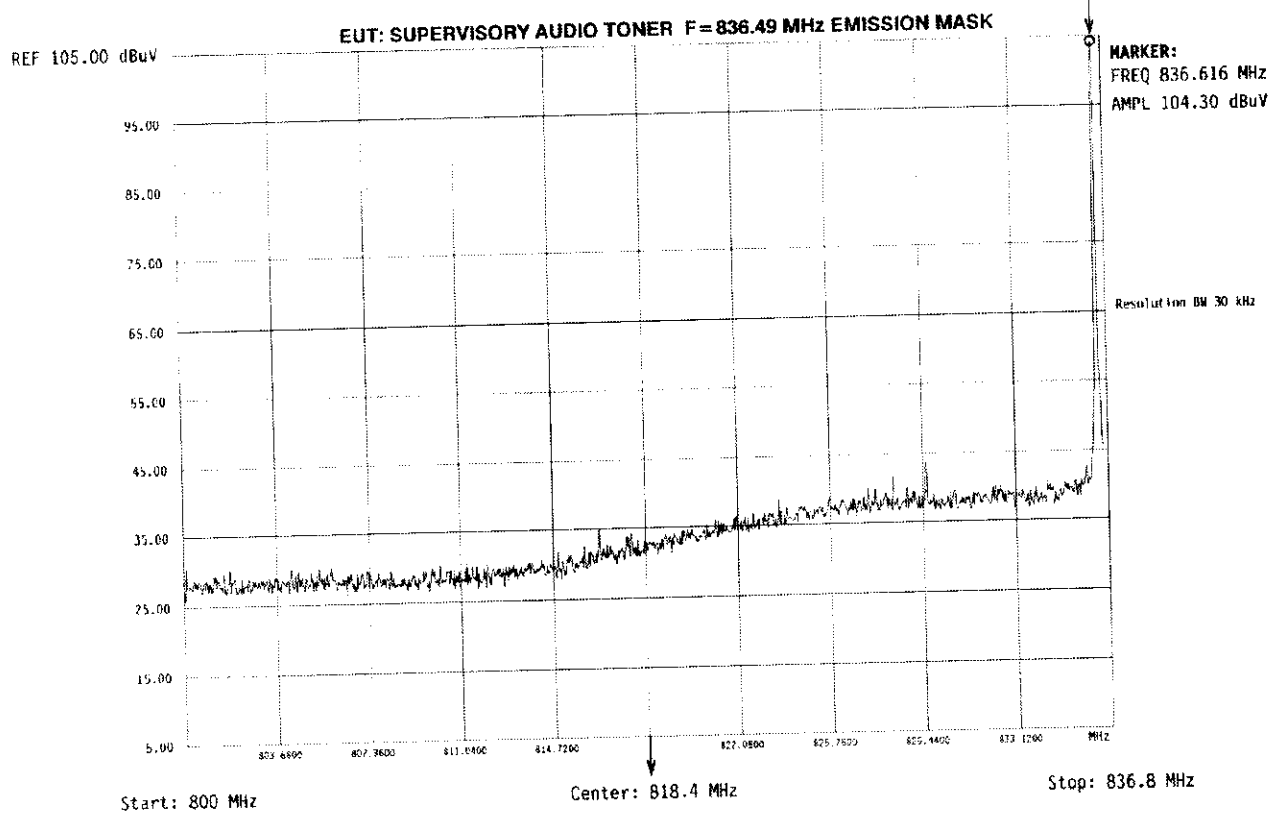
Date: April, 1998

FCC ID: ARACET-10

Plot 3.5.13
Emission mask test

A. 12663

Tuesday, 18/2/199.
Time: 18:35:50





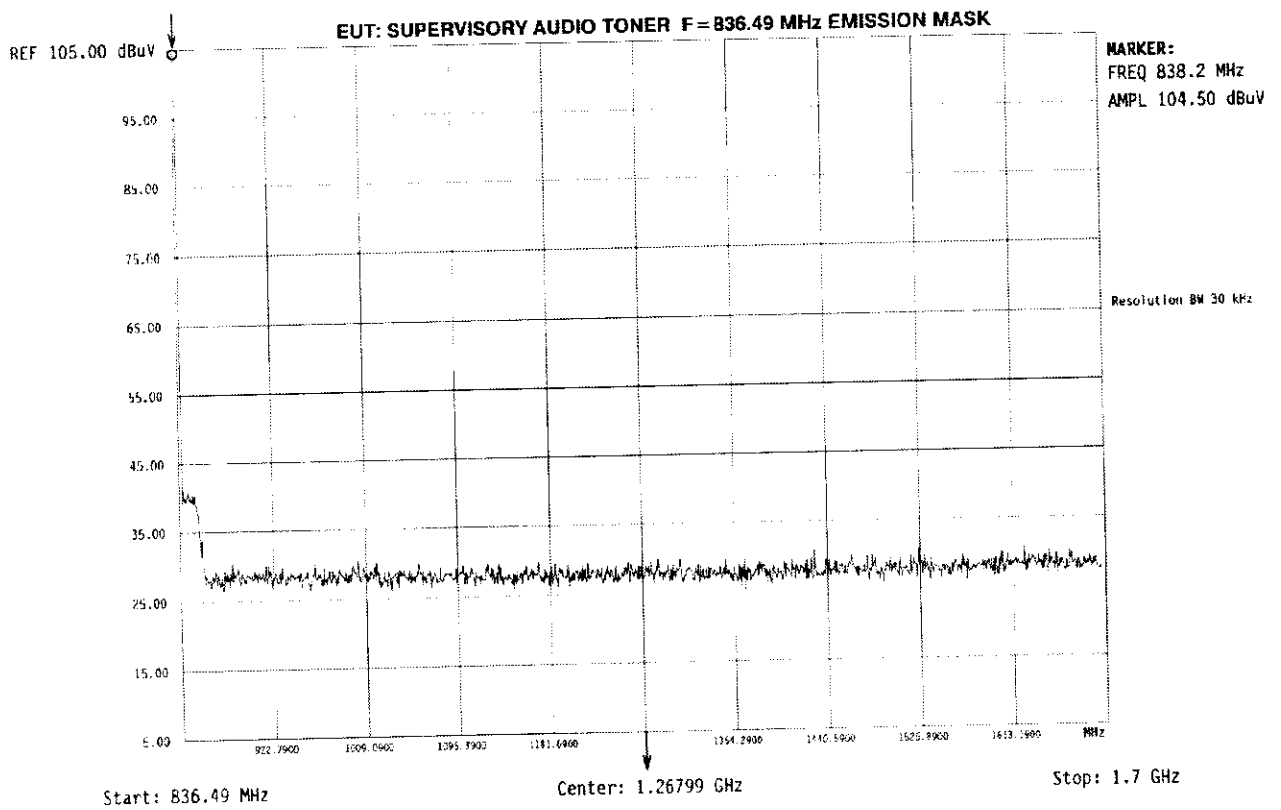
HERMON LABORATORIES

Test Report: TLR FCC.12663
Date: April, 1998
FCC ID: ARACET-10

Plot 3.5.14
Emission mask test

Tuesday, 18/2/199
Time: 18:22:31

A.12663





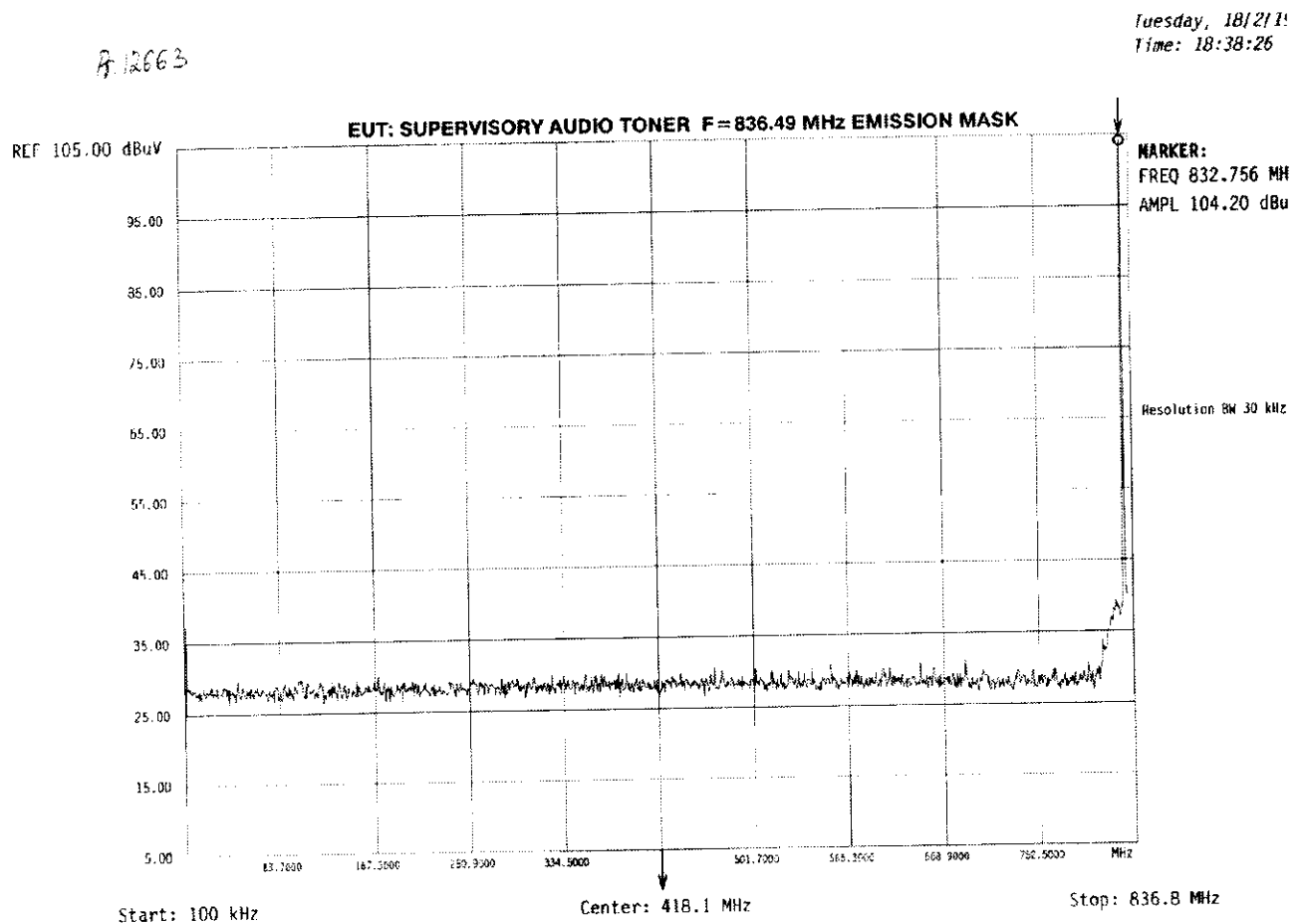
HERMION LABORATORIES

Test Report: TLR FCC.12663

Date: April, 1998

FCC ID: ARACET-10

Plot 3.5.15
Emission mask test



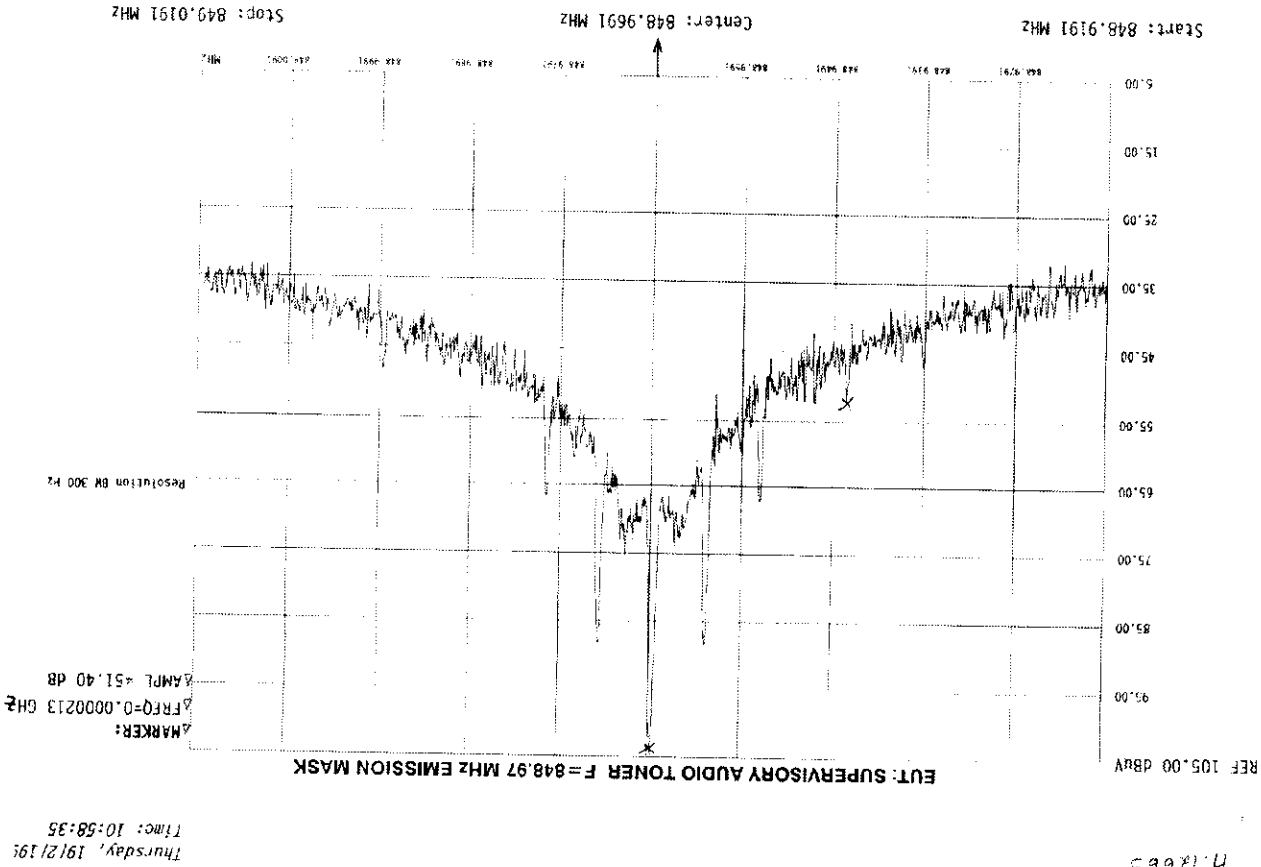


HERMON LABORATORIES

Test Report: TLR FCC 12663
Date: April, 1998
FCC ID: ARACET-10

Plot 3.5.16 Emission mask test

H 12663





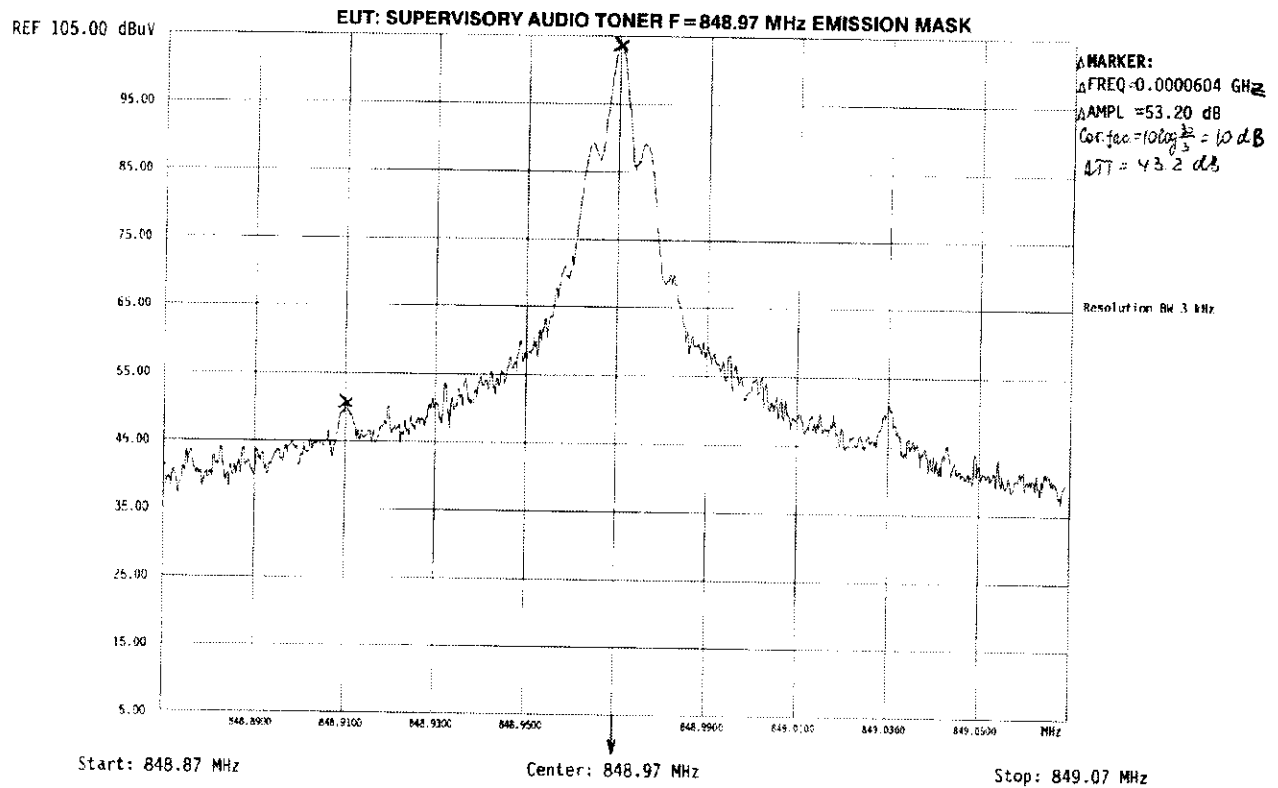
HERMON LABORATORIES

Test Report: TLR FCC.12663
Date: April, 1998
FCC ID: ARACET-10

Plot 3.5.17
Emission mask test

R 12663

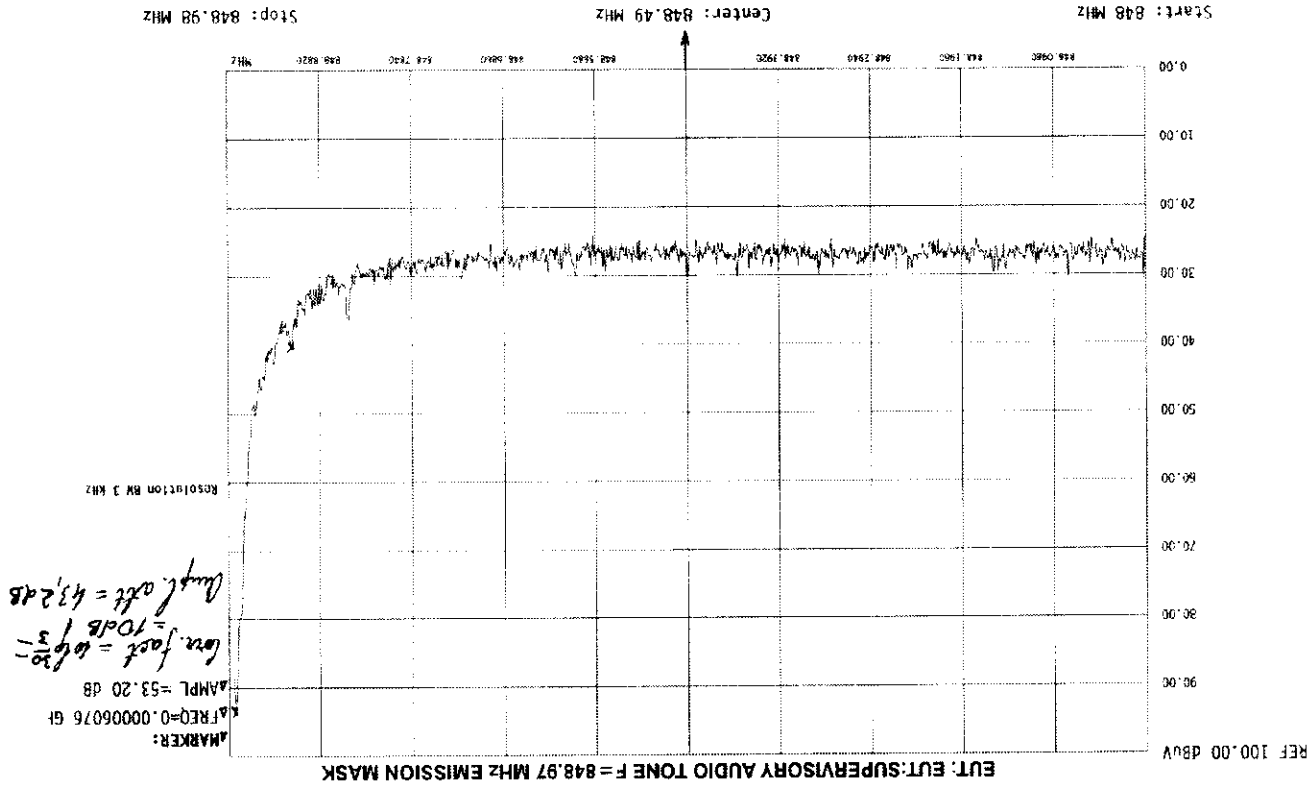
Tuesday, 24/2/1998
Time: 10:26:46



Plot 3.5.18
 Emission mask test

Monday, 9/31/1998
 Time: 14:19:17

Pl. 12663

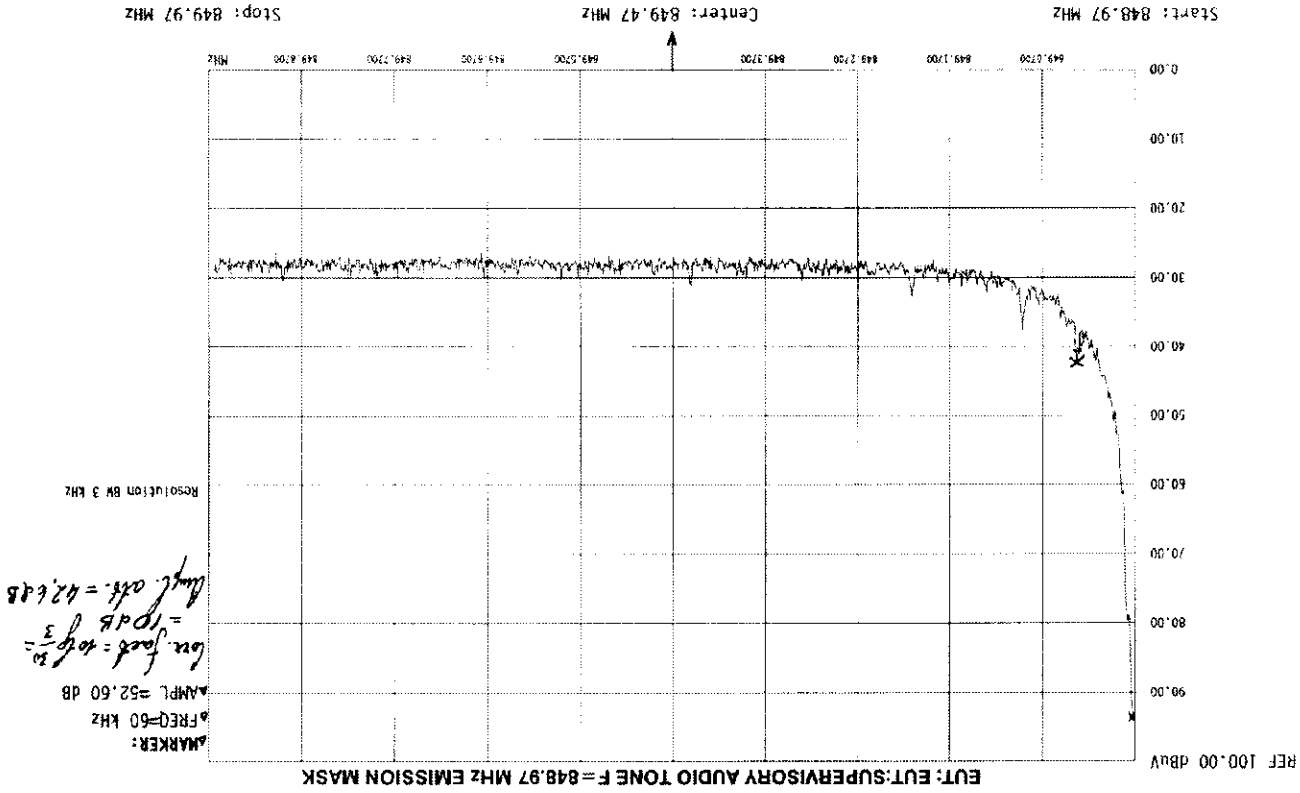




Plot 3.5.19
 Emission mask test

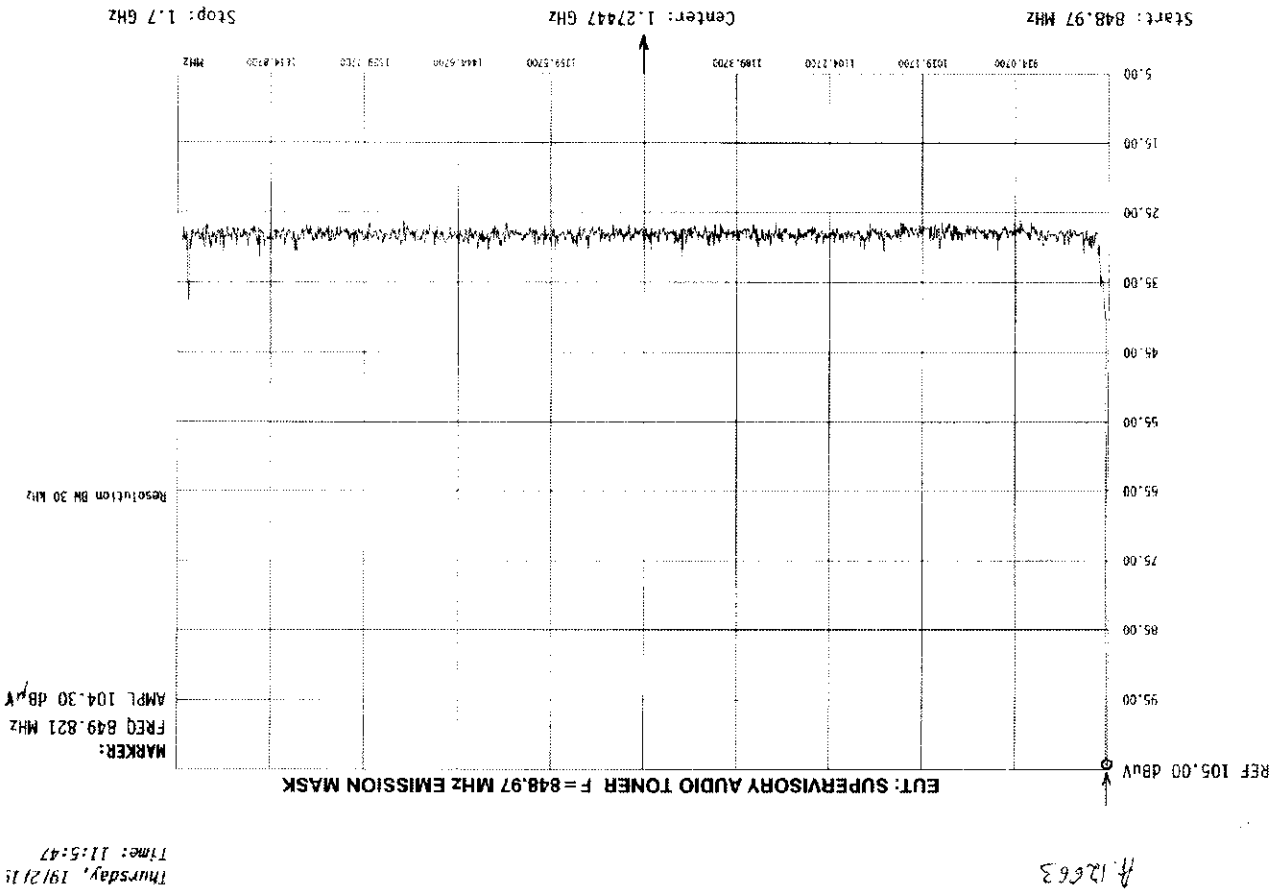
P. 12663

Monday, 9/31/1998
 time: 14:16:32





Plot 3.5.20
Emission mask test



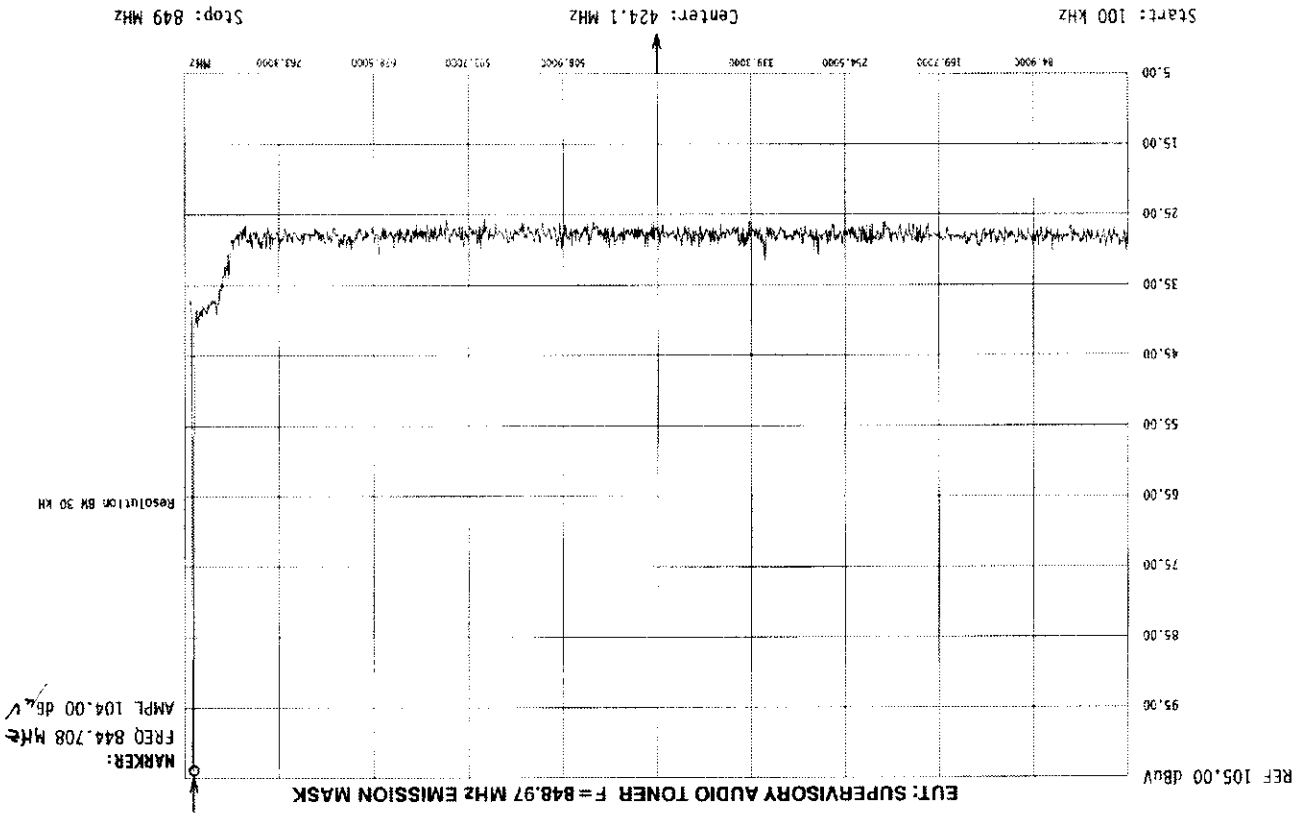


Test Report: TLRFCC.12663
Date: April, 1998
FCC ID: ARACFT-10

Plot 3.5.21
Emission mask test

8.12663

Thursday, 19/2
Time: 11:16:43





HERMION LABORATORIES

Test Report: TLR FCC.12663

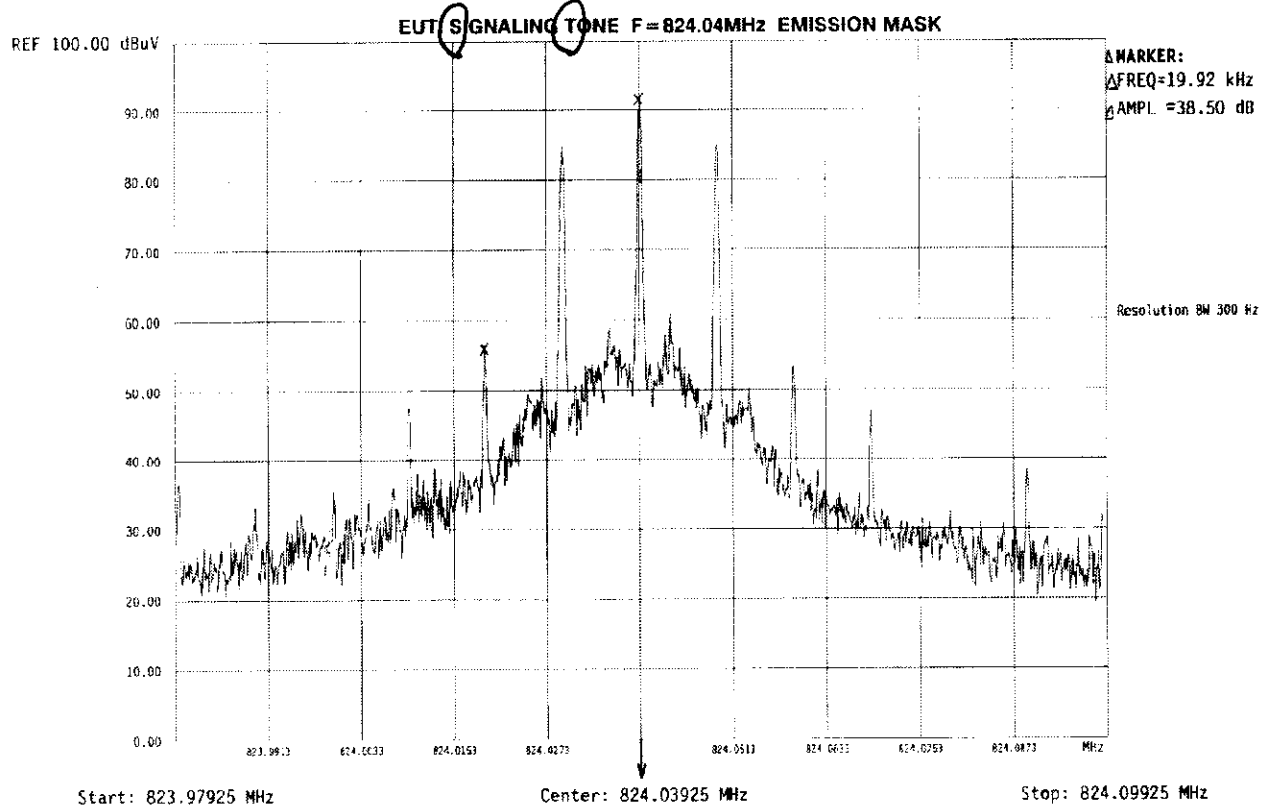
Date: April, 1998

FCC ID: ARACET-10

Plot 3.5.22
Emission mask test

Pr. 1266.3

Tuesday, 18/2/1998
Time: 11:32:9





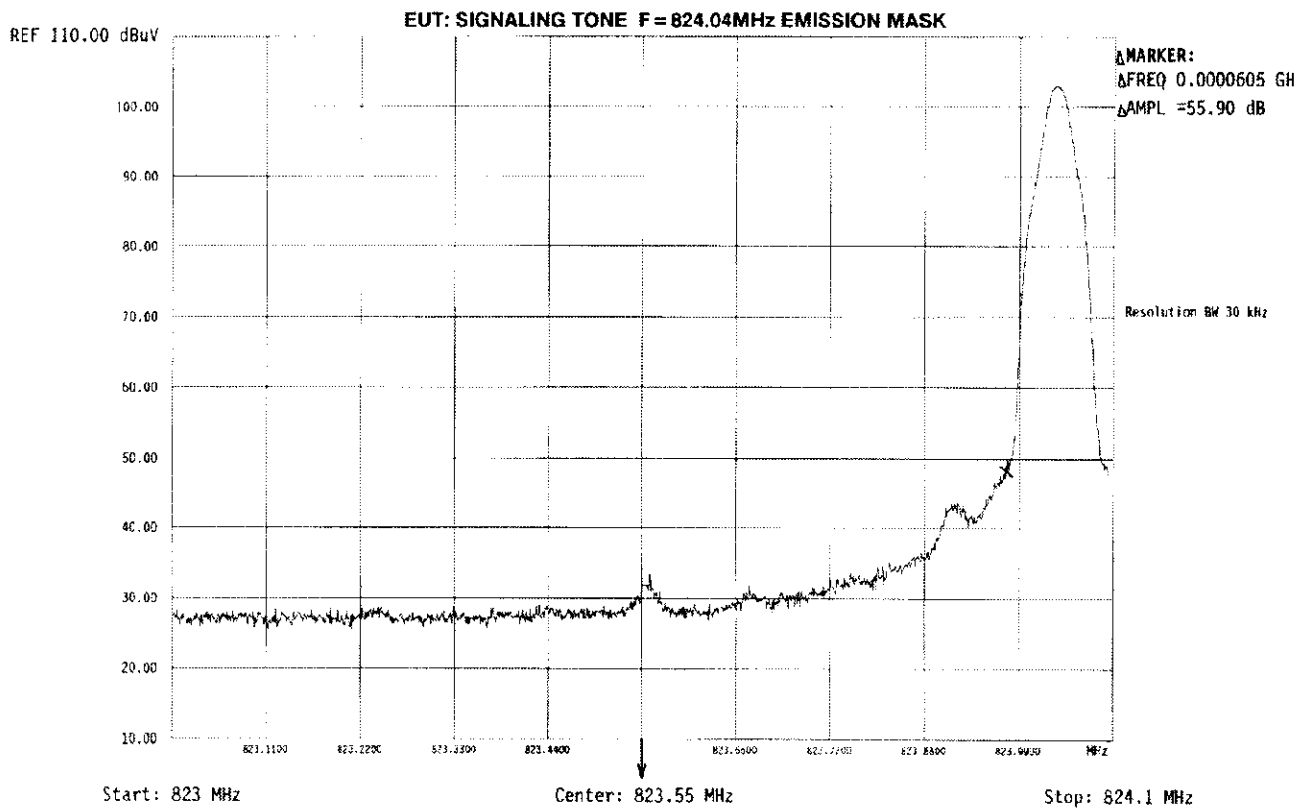
HERMON LABORATORIES

Test Report: TLR FCC.12663
Date: April, 1998
FCC ID: ARACET-10

Plot 3.5.24
Emission mask test

A 12663

Tuesday, 18/2/199.
Time: 13:19:45





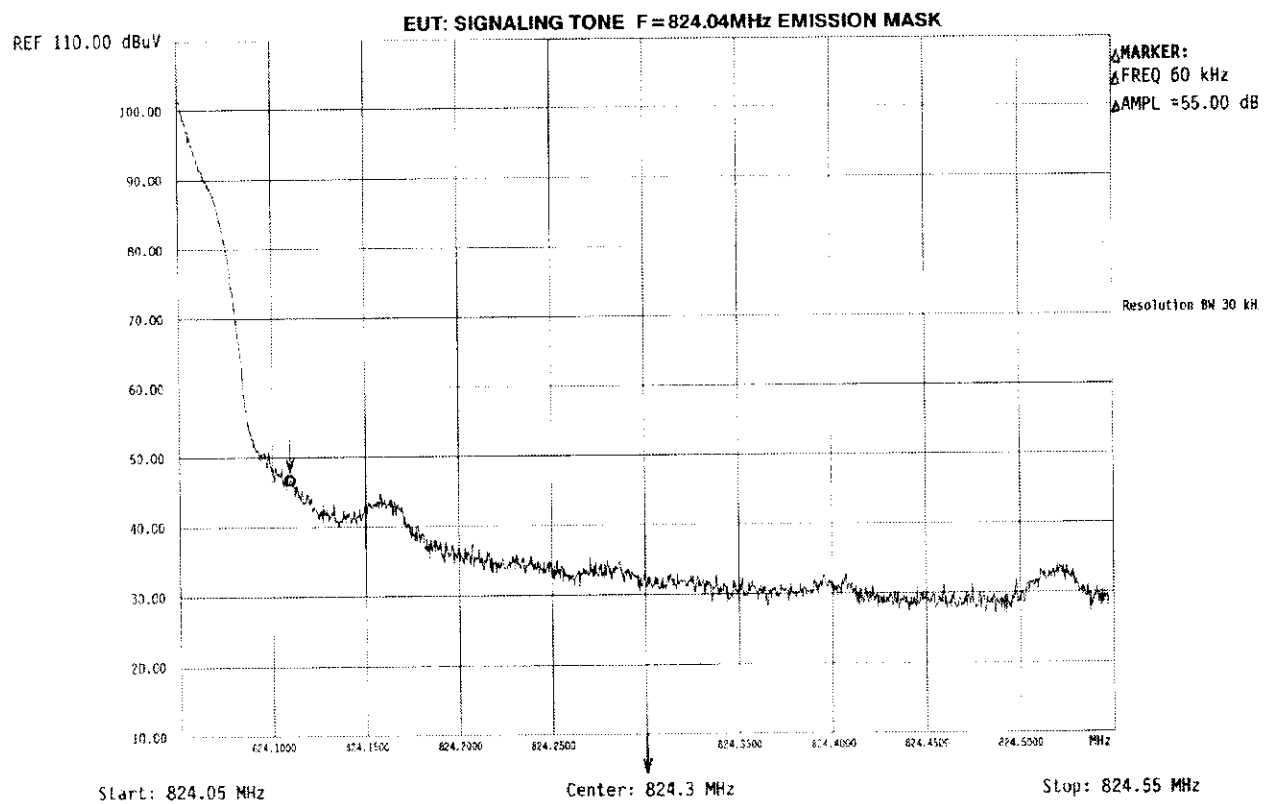
HERMION LABORATORIES

Test Report: TLR FCC.12663
Date: April, 1998
FCC ID: ARACET-10

Plot 3.5.25
Emission mask test

A. 12663

Tuesday, 18/2/98
Time: 13:23:47





HERMON LABORATORIES

Test Report: TLR FCC.12663

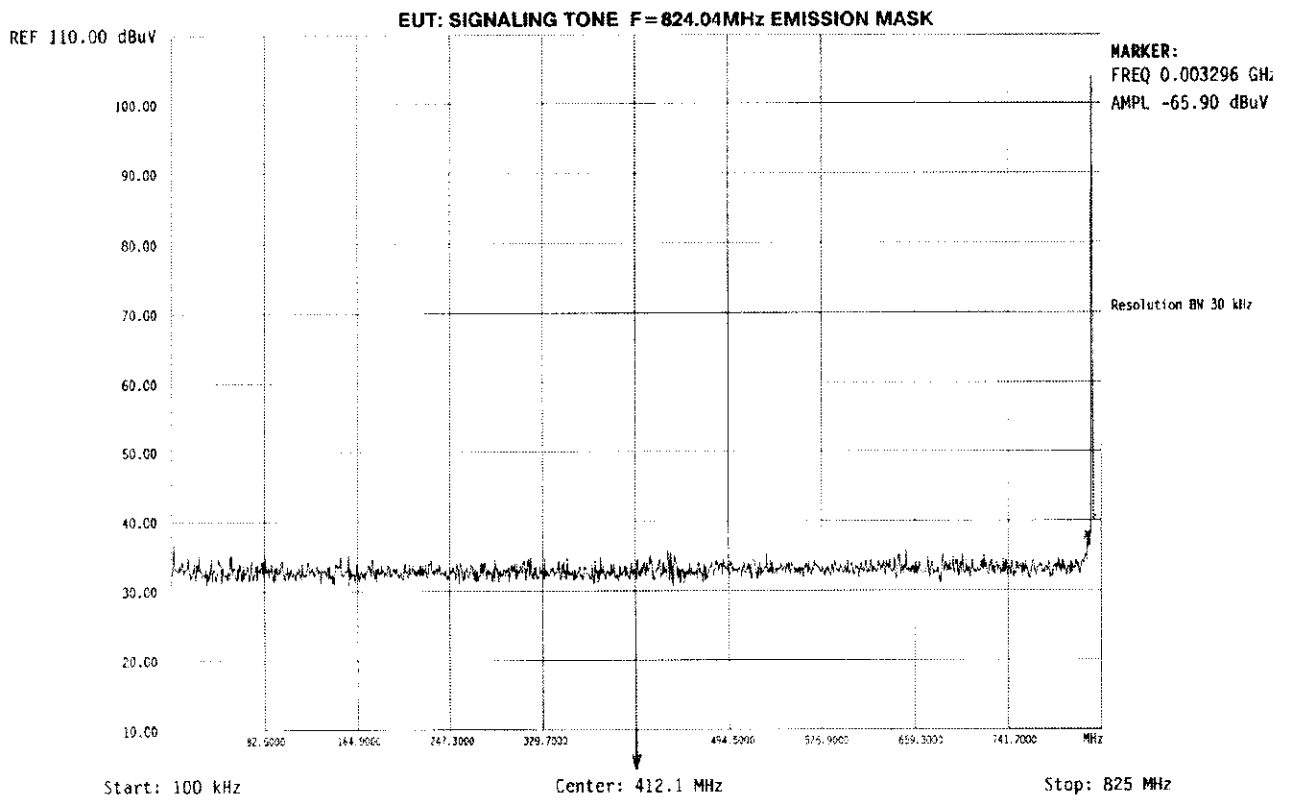
Date: April, 1998

FCC ID:ARACET-10

Plot 3.5.26
Emission mask test

Fig. 12663

Tuesday, 18/2/199
Time: 13:8:24





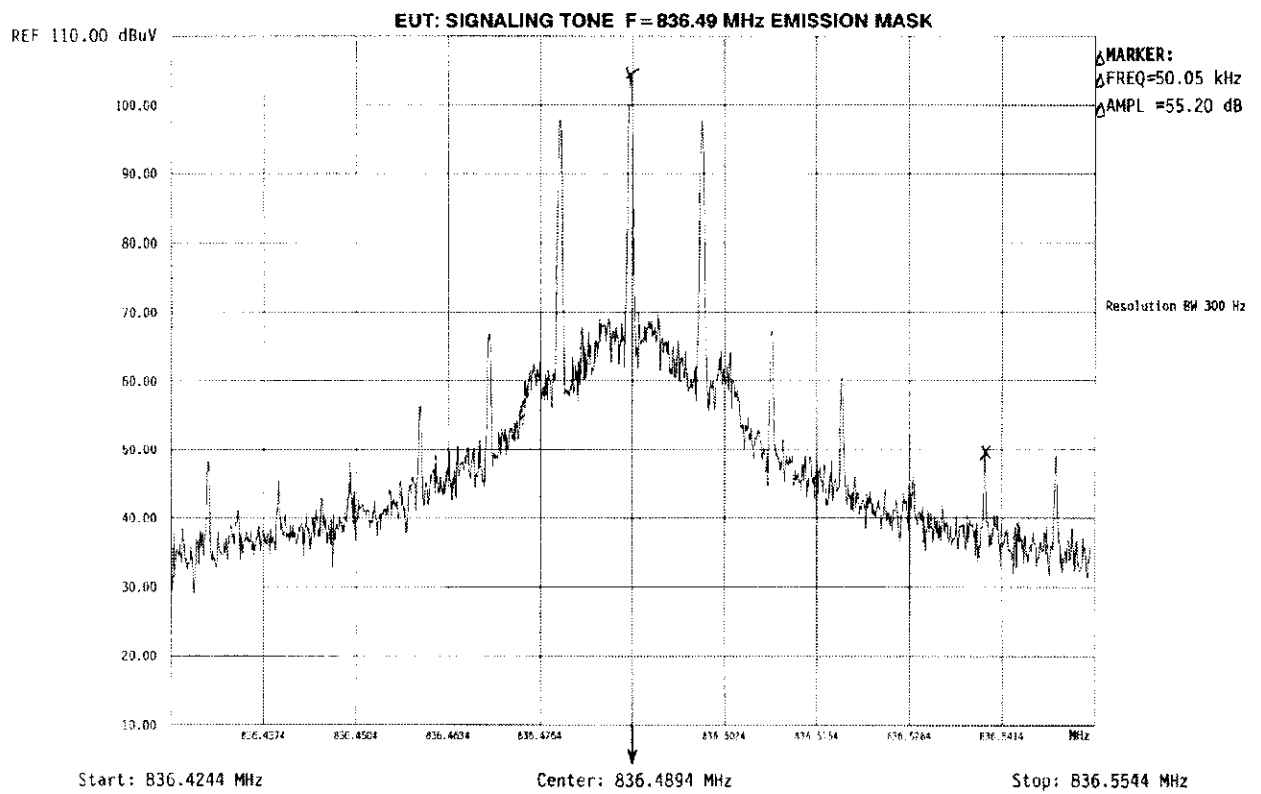
HERMON LABORATORIES

Test Report: TLR FCC.12663
Date: April, 1998
FCC ID: ARACET-10

Plot 3.5.29
Emission mask test

Pt. 12663

Tuesday, 18/2/1997
Time: 13:36:34





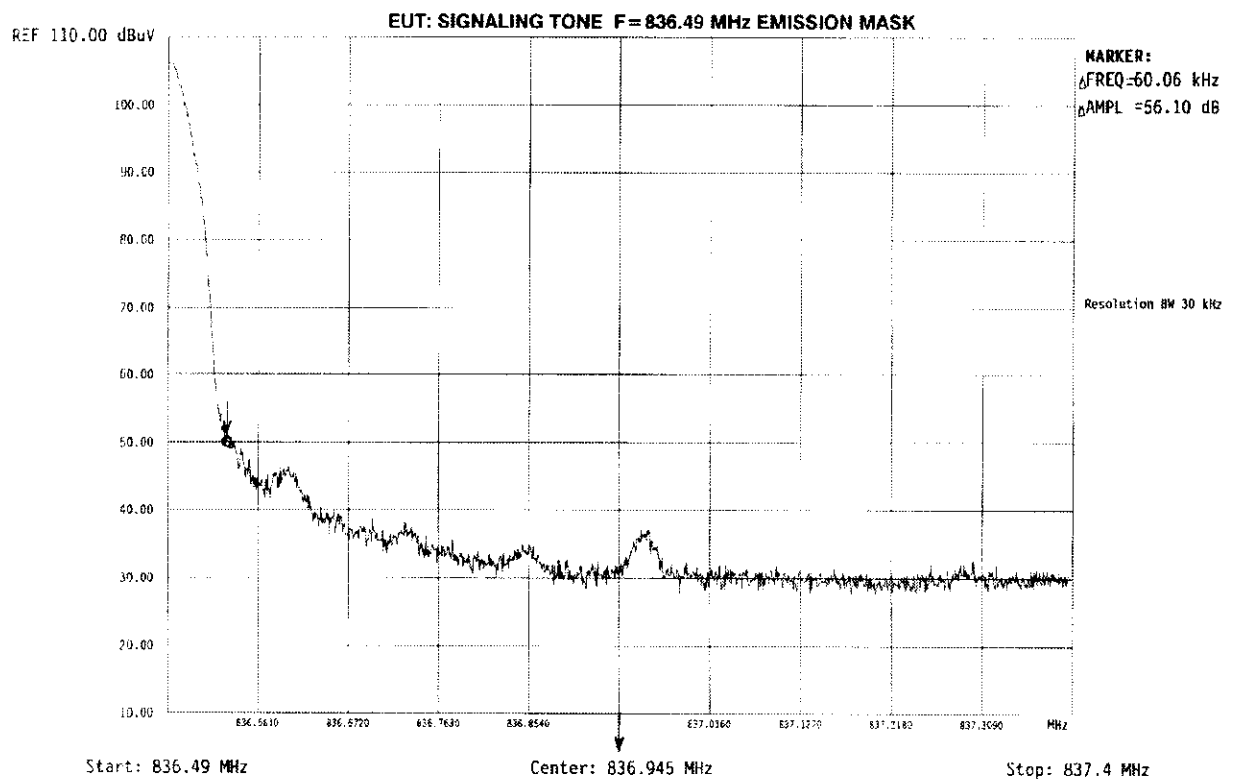
HERMON LABORATORIES

Test Report: TLR FCC.12663
Date: April, 1998
FCC ID: ARACET-10

Plot 3.5.30
Emission mask test

Dr. 12663

Tuesday, 18/2/1997
Time: 13:44:2





HERMON LABORATORIES

Test Report: TLR FCC.12663

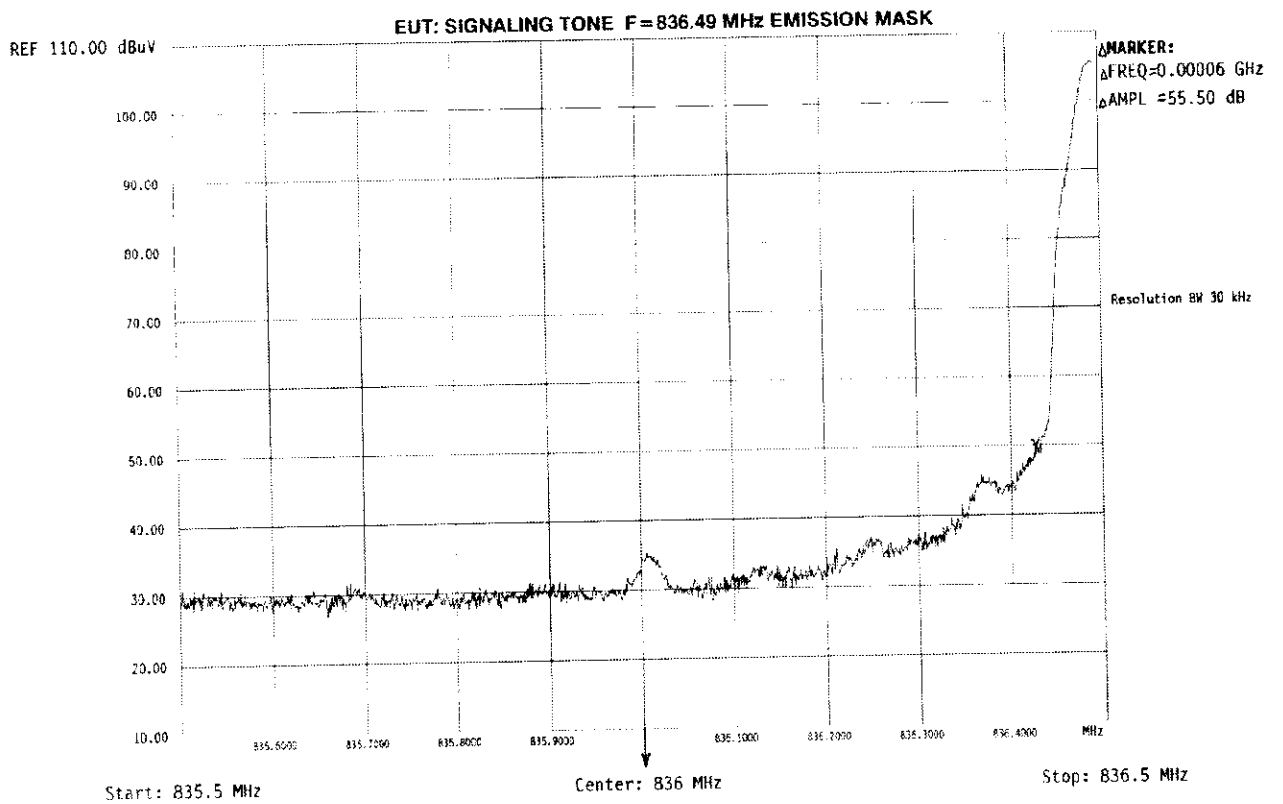
Date: April, 1998

FCC ID: ARACET-10

Plot 3.5.31
Emission mask test

P. 12663

Tuesday, 18/2/199.
Time: 13:50:54





HERMON LABORATORIES

Test Report: TLR FCC.12663

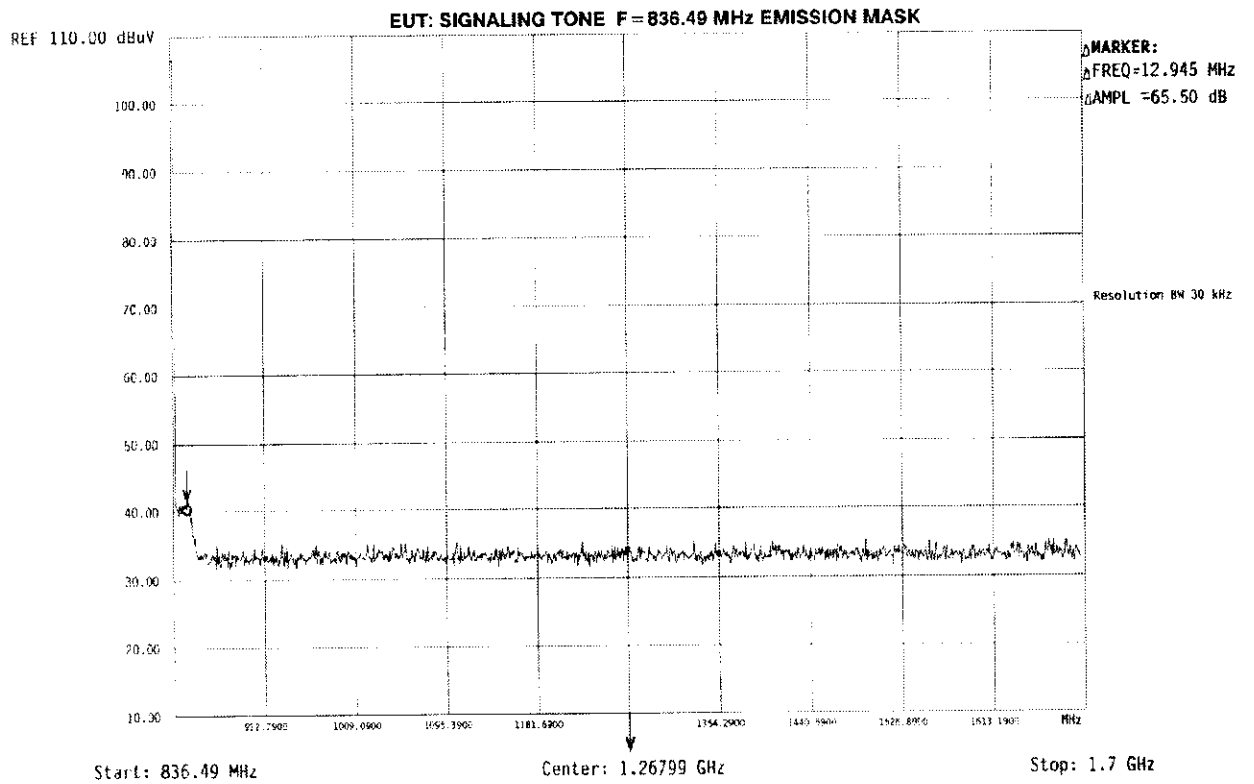
Date: April, 1998

FCC ID: ARACET-10

Plot 3.5.32
Emission mask test

P. 12663

Tuesday, 18/2/199
Time: 13:47:37





HERMON LABORATORIES

Test Report: TLR FCC.12663

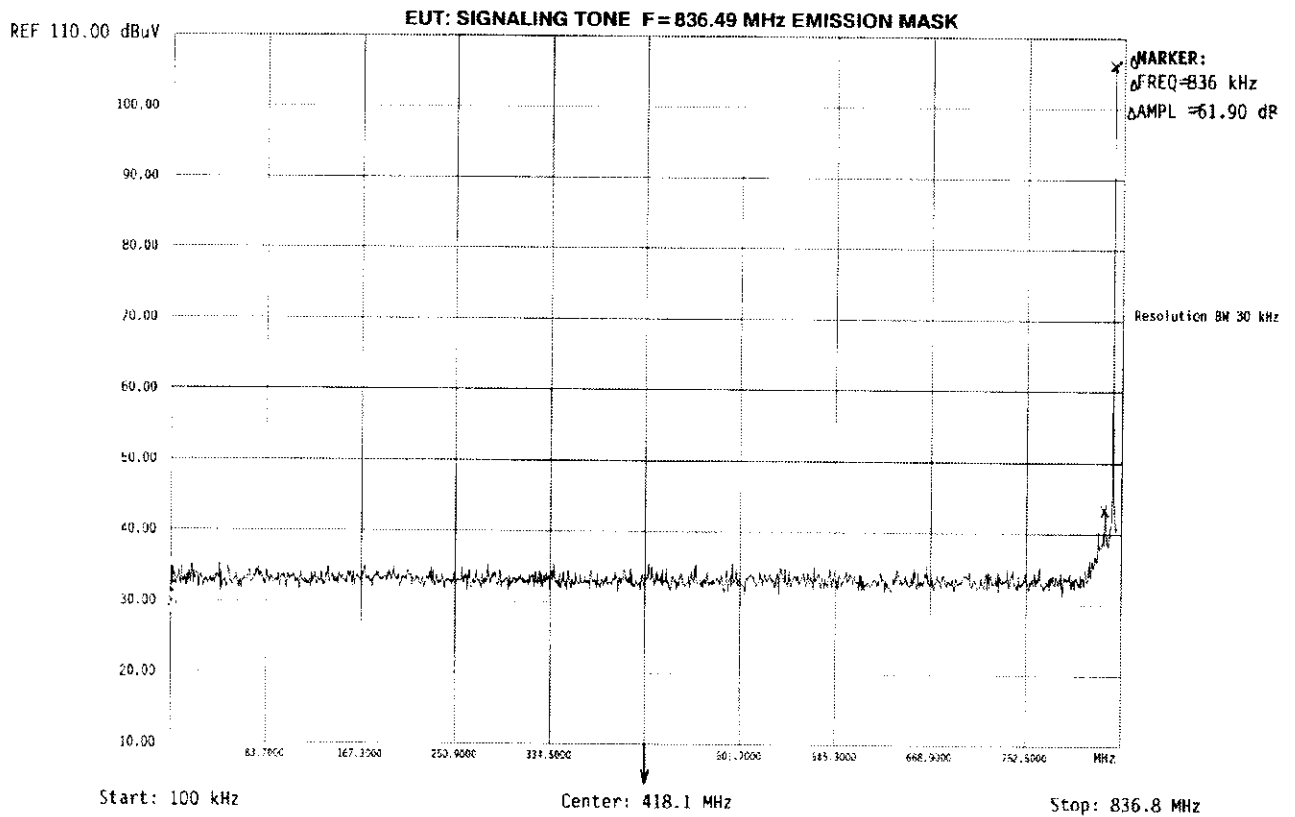
Date: April, 1998

FCC ID: ARACET-10

Plot 3.5.33
Emission mask test

A.12663

Tuesday, 18/2/11
Time: 13:55:59





HERMION LABORATORIES

Test Report: TLR FCC.12663

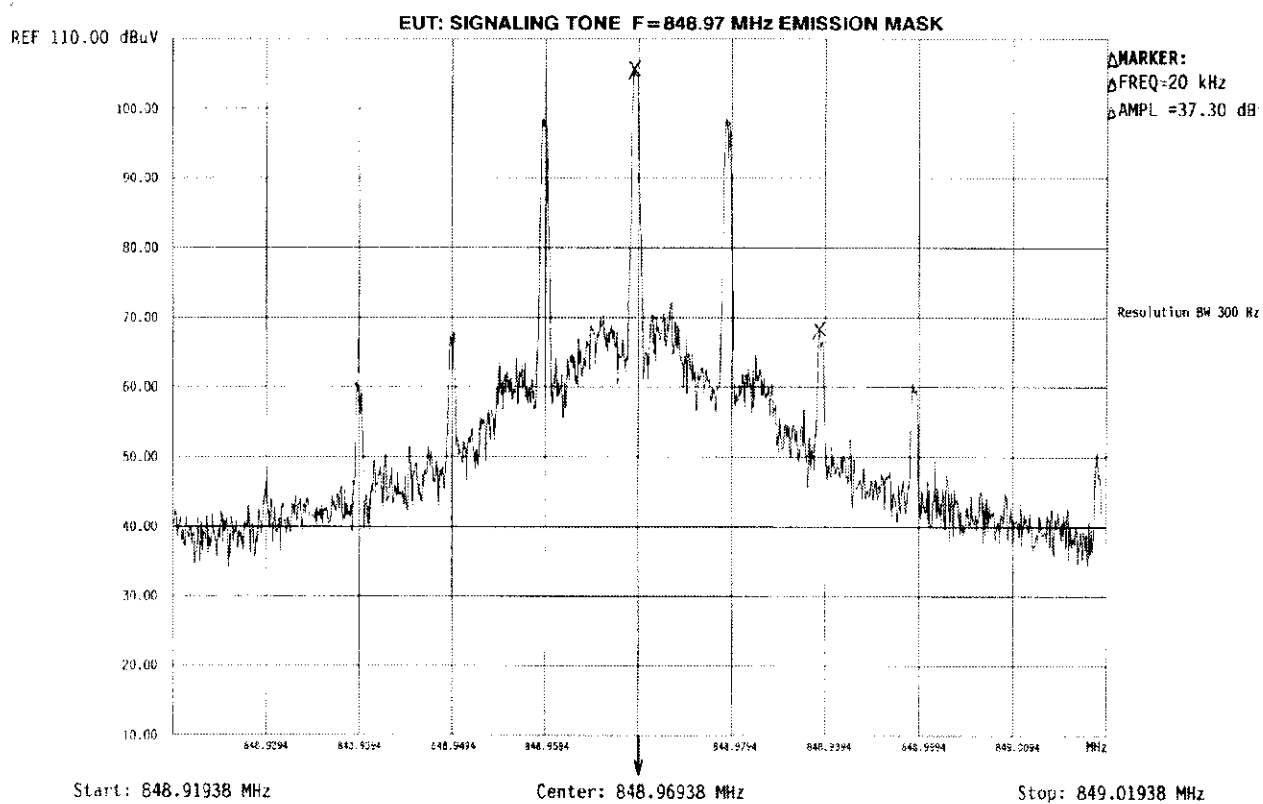
Date: April, 1998

FCC ID: ARACET-10

Plot 3.5.34
Emission mask test

Pt. 12663

Tuesday, 18/2/19:
Time: 14:12:51





HERMON LABORATORIES

Test Report: TLR FCC.12663

Date: April, 1998

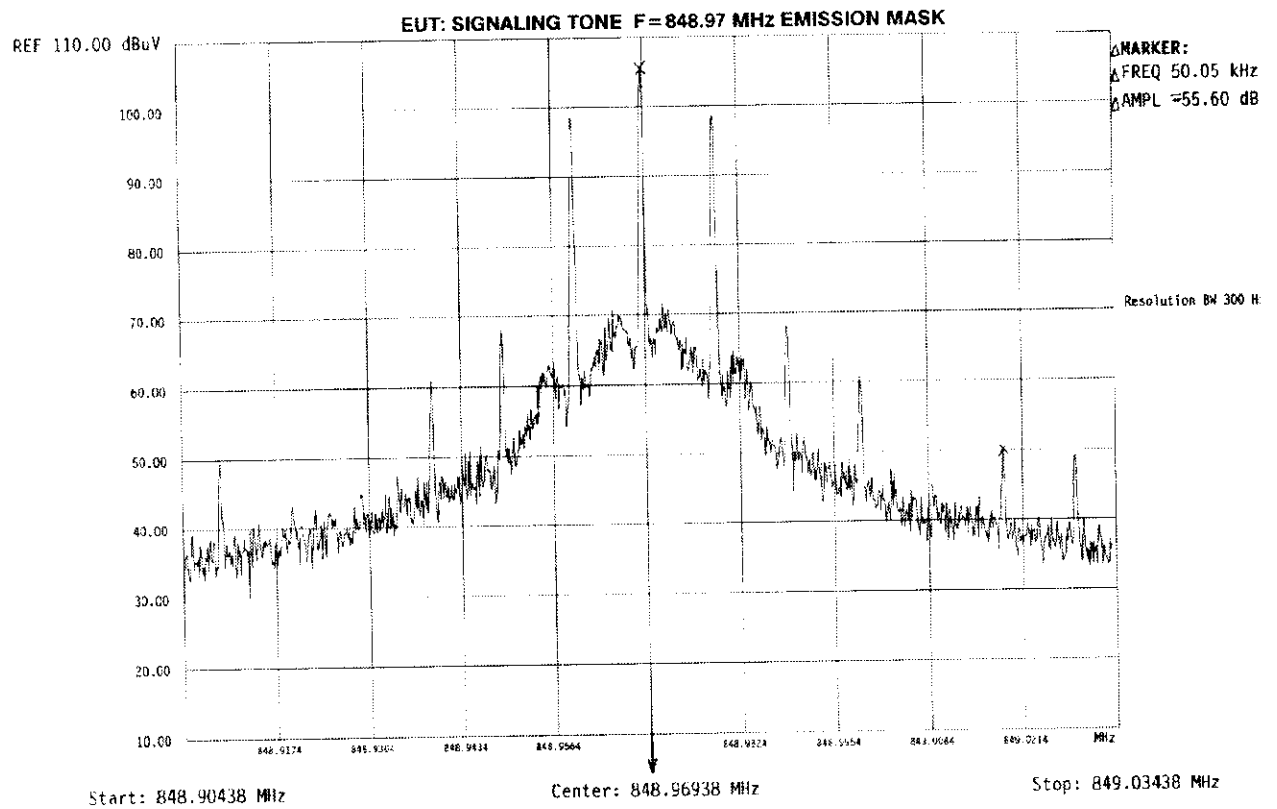
FCC ID: ARACET-10

Plot 3.5.35
Emission mask test

Tuesday, 18/2/

Time: 14:17:33

Fig. 12663





HERMION LABORATORIES

Test Report: TLR FCC.12663

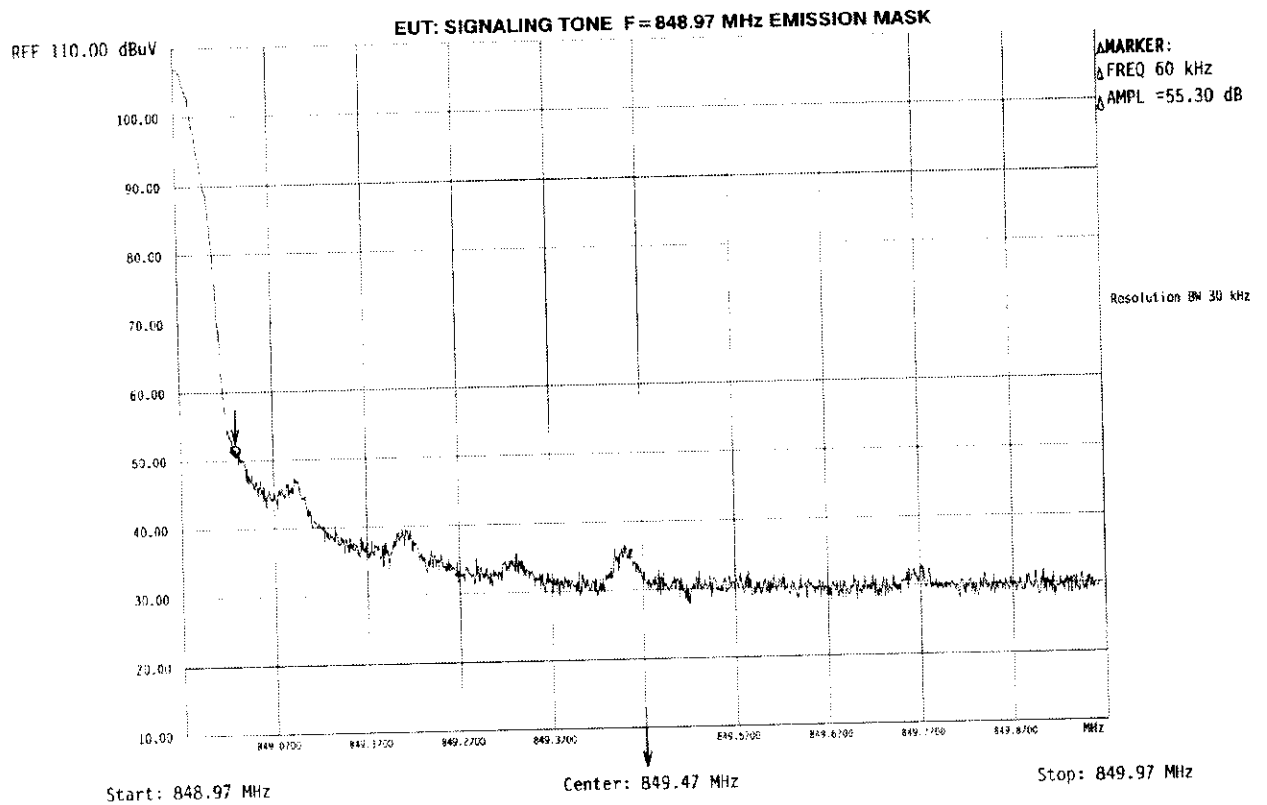
Date: April, 1998

FCC ID: ARACET-10

Plot 3.5.36
Emission mask test

Tuesday, 18/2/199
Time: 14:20:56

H. 12663





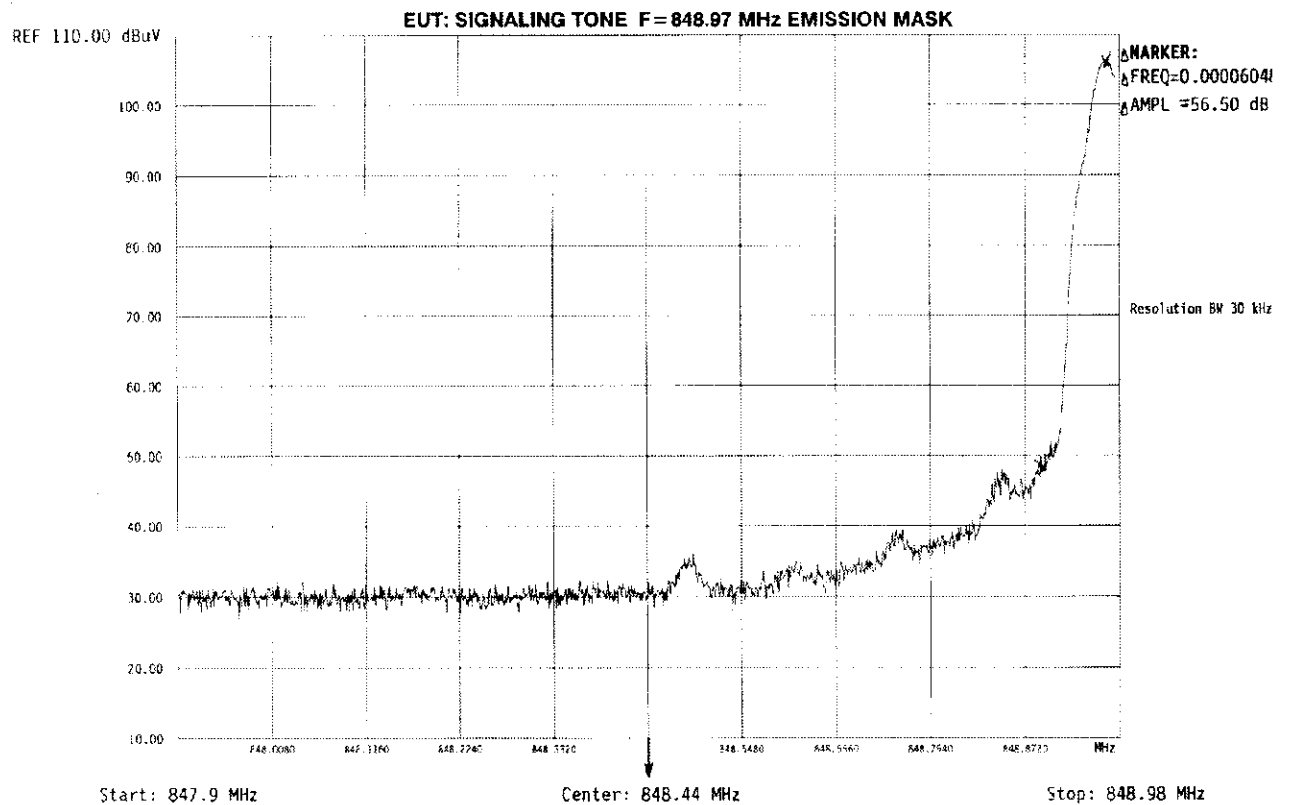
HERMON LABORATORIES

Test Report: TLR FCC.12663
Date: April, 1998
FCC ID: ARACET-10

Plot 3.5.37
Emission mask test

P. 12663

Tuesday, 18/2/1
Time: 14:31:46





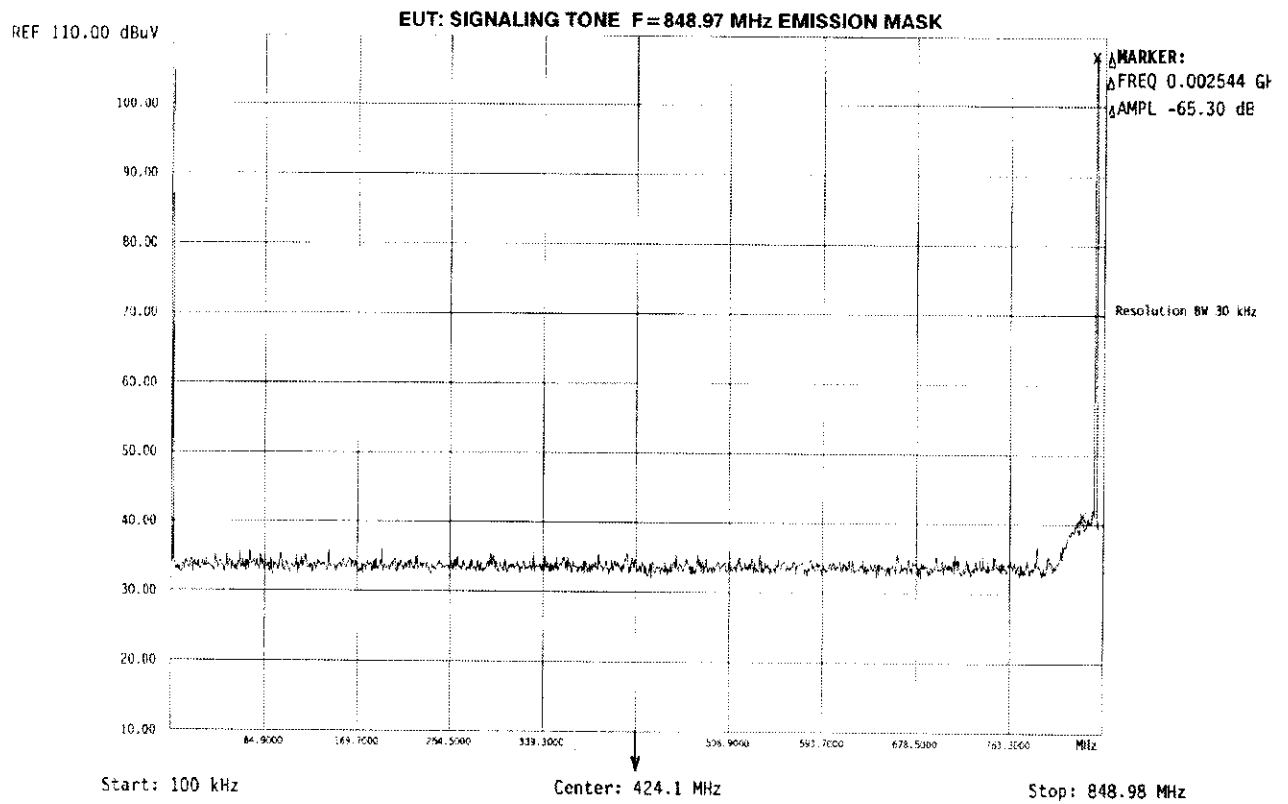
HERMION LABORATORIES

Test Report: TLR FCC.12663
Date: April, 1998
FCC ID: ARACET-10

Plot 3.5.38
Emission mask test

A. 12663

Tuesday, 18/2/19
Time: 14:28:14



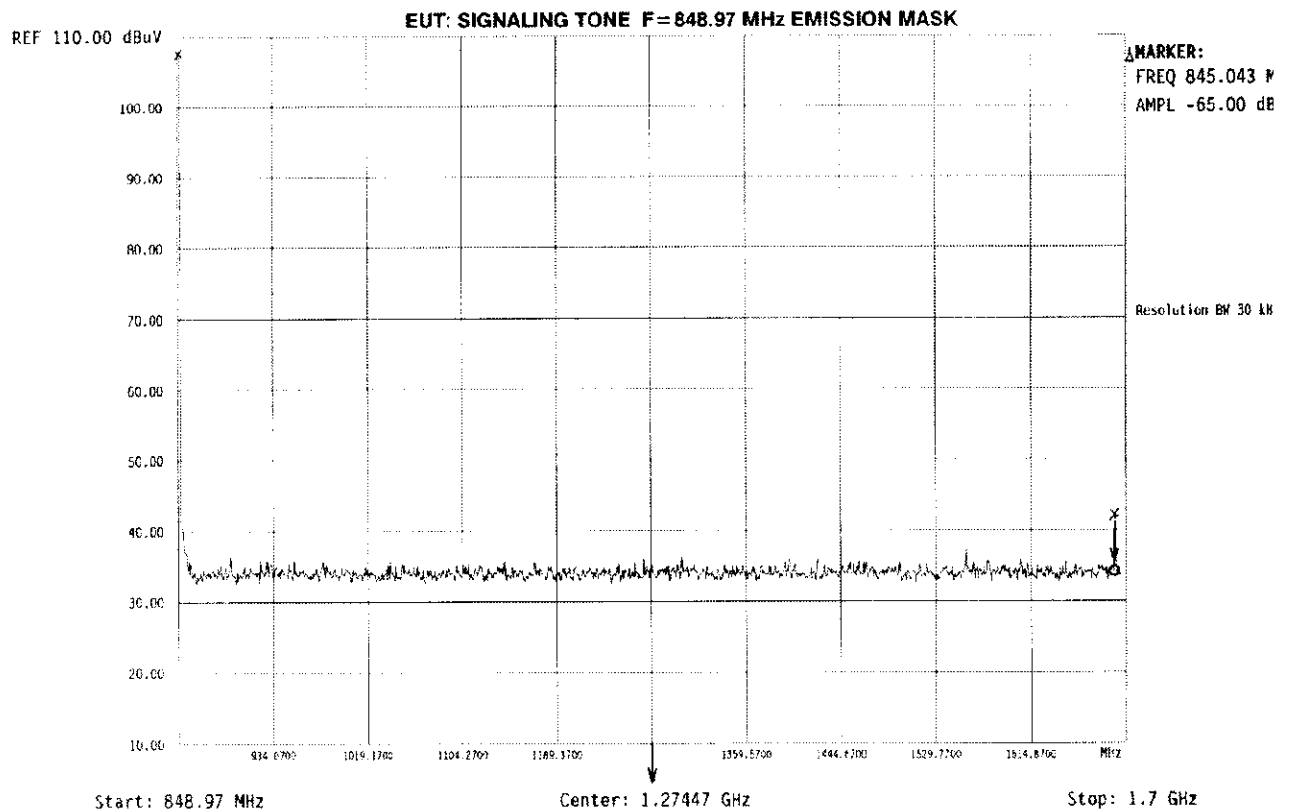


HERMION LABORATORIES

Test Report: TLR FCC.12663
Date: April, 1998
FCC ID: ARACET-10

Plot 3.5.39
Emission mask test

Tuesday, 18/2/98
Time: 14:24:35





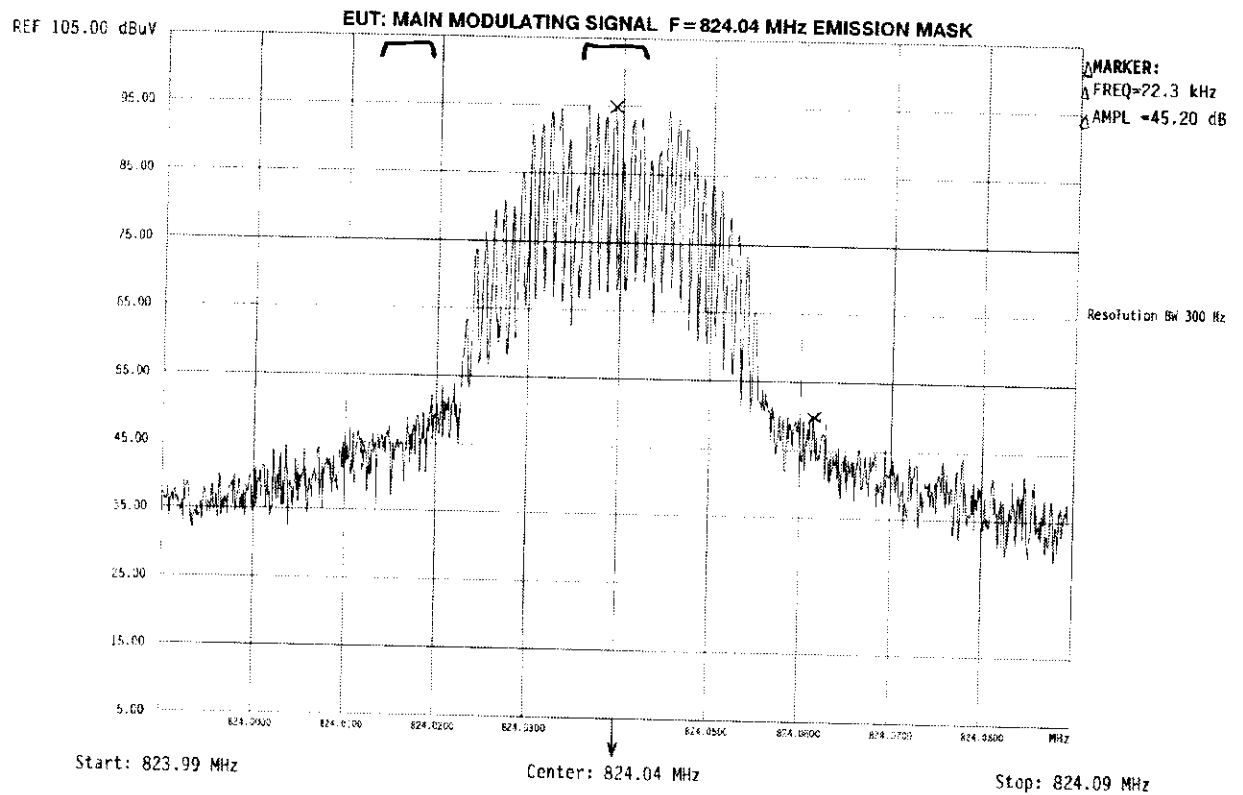
HERMON LABORATORIES

Test Report: TLR FCC.12663
Date: April, 1998
FCC ID: ARACET-10

Plot 3.5.40
Emission mask test

Fr. 12663

Thursday, 19/2/19
Time: 9:37:56





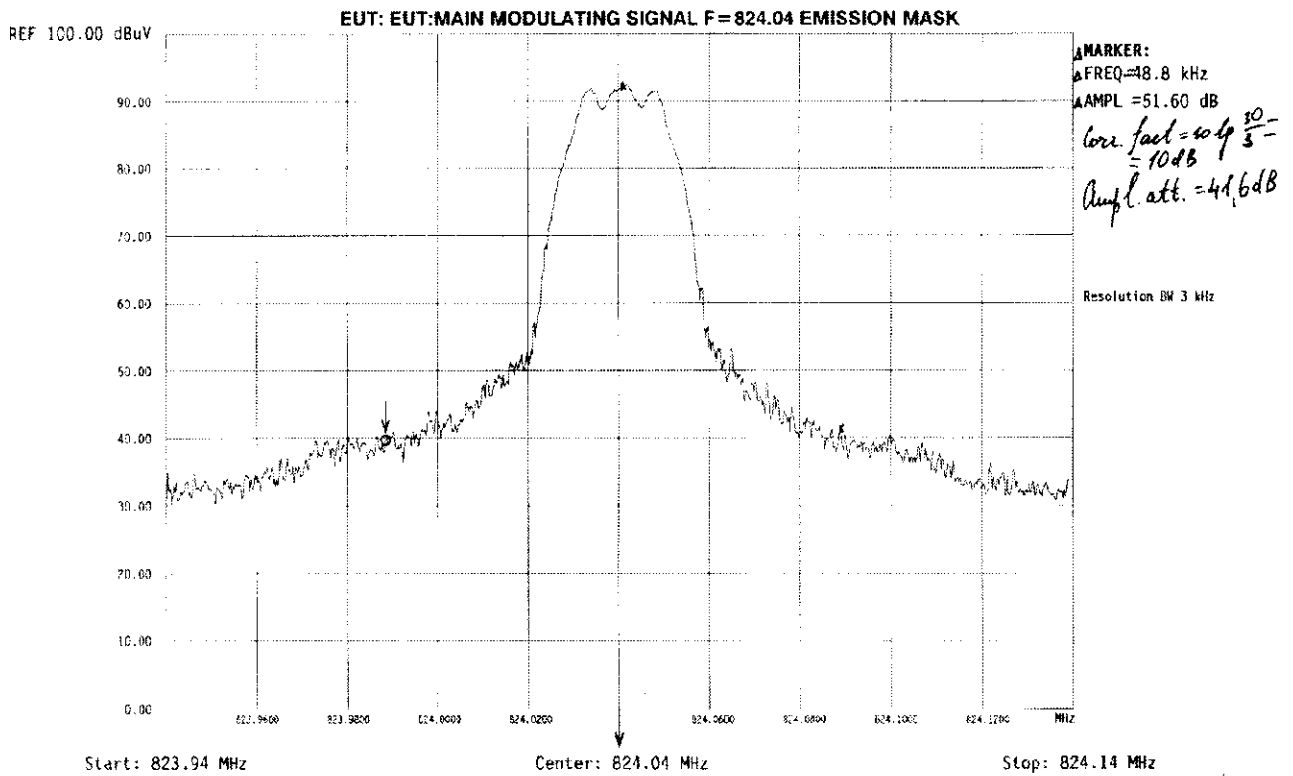
HERMION LABORATORIES

Test Report: TLR FCC.12663
Date: April, 1998
FCC ID: ARACET-10

Plot 3.5.41
Emission mask test

P₁ 12663

Monday, 9/3/1998
Time: 14:45:12





HERMION LABORATORIES

Test Report: TLR FCC.12663

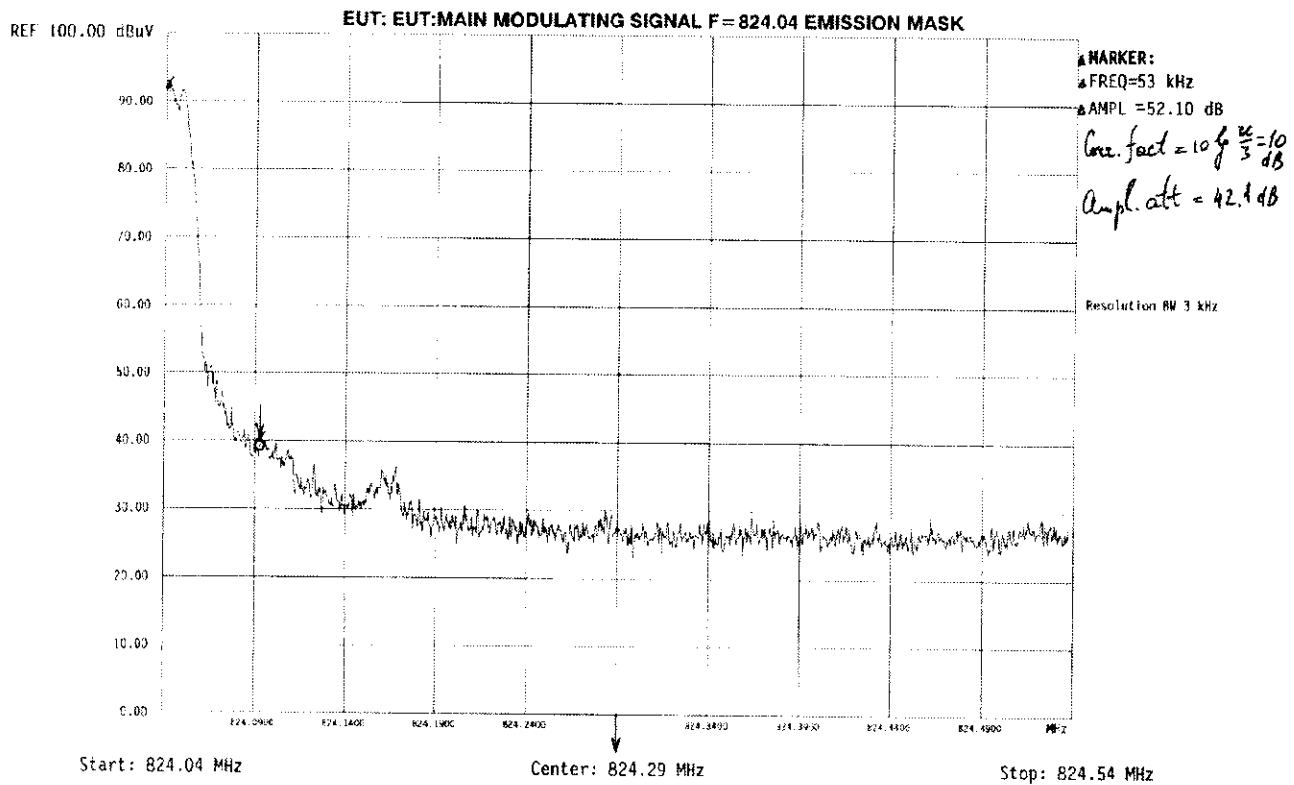
Date: April, 1998

FCC ID: ARACET-10

Plot 3.5.42
Emission mask test

12663

Monday, 9/3/1998
Time: 14:49:49





HERMION LABORATORIES

Test Report: TLR FCC.12663

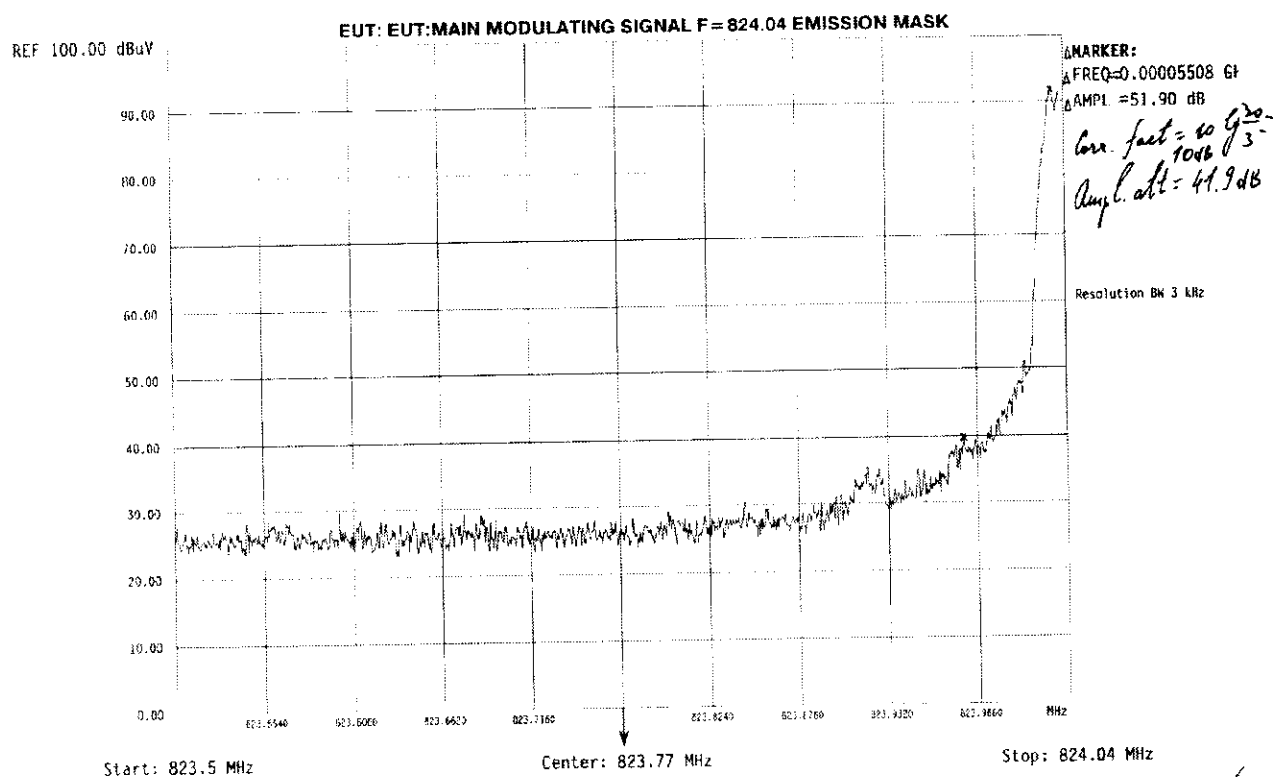
Date: April, 1998

FCC ID: ARACET-10

Plot 3.5.43
Emission mask test

Pc 12663

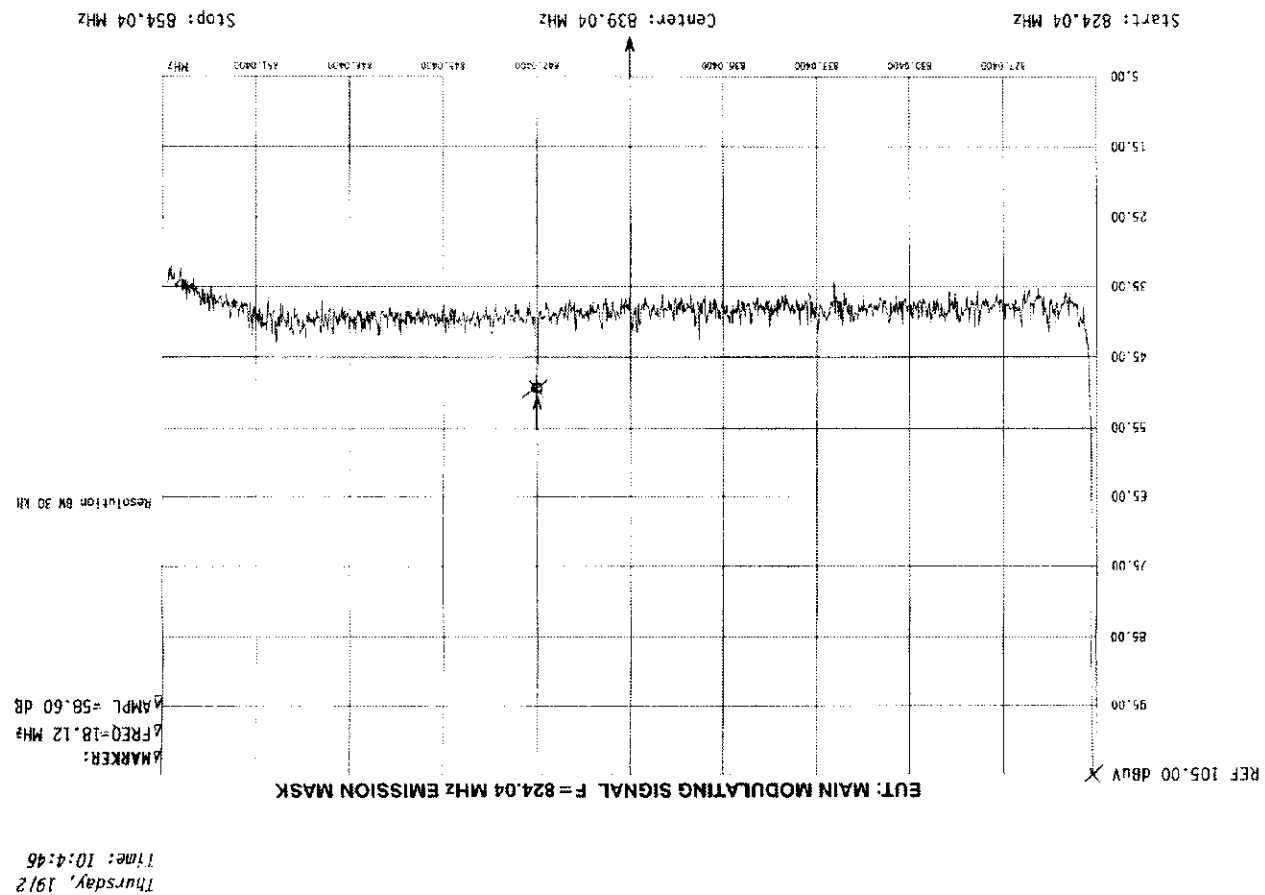
Monday, 9/3/1998
Time: 14:52:41



[Handwritten signature]

Date: April, 1998
FCC ID:ARACFT-10

Emission mask test



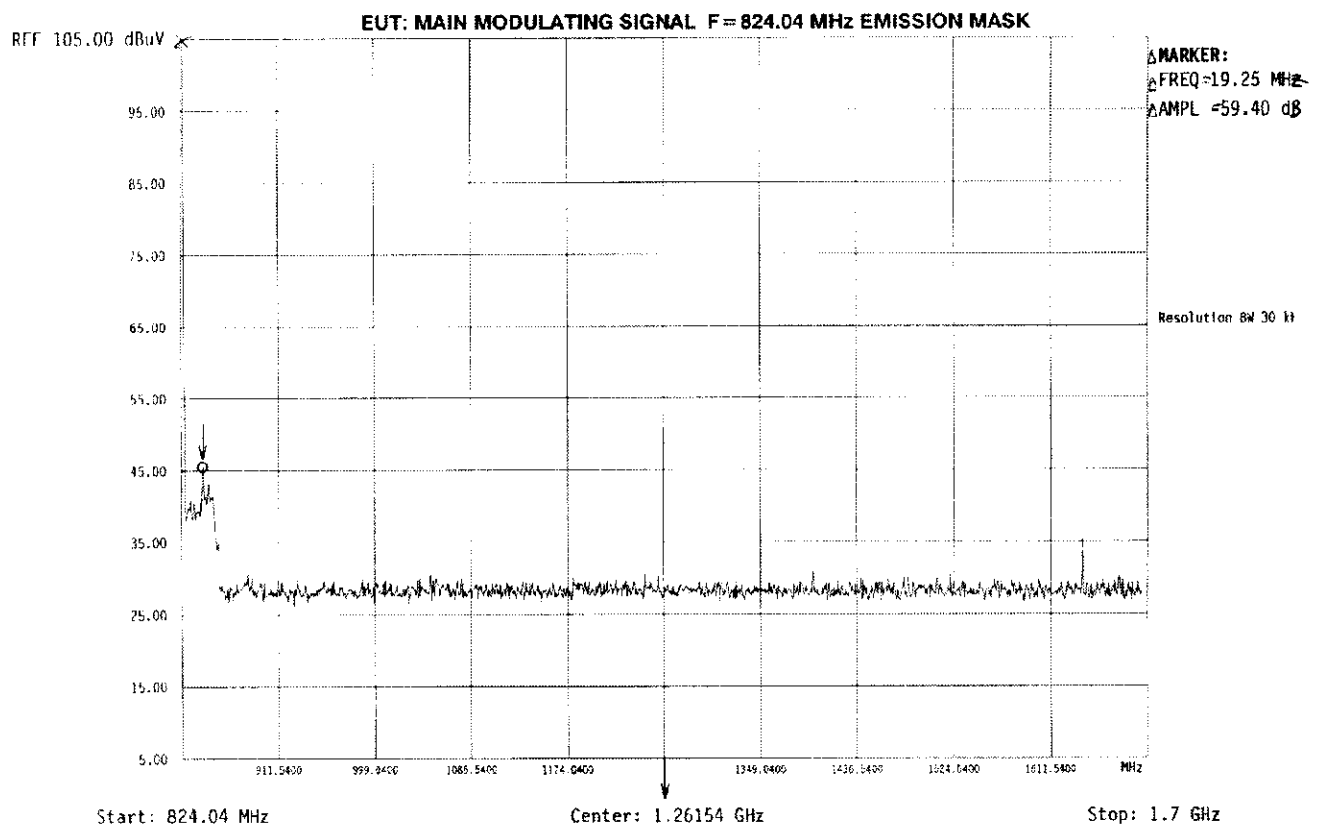


HERMON LABORATORIES

Test Report: TLR FCC.12663
Date: April, 1998
FCC ID: ARACET-10

Plot 3.5.45
Emission mask test

Thursday, 19/2
Time: 9:52:21





HERMION LABORATORIES

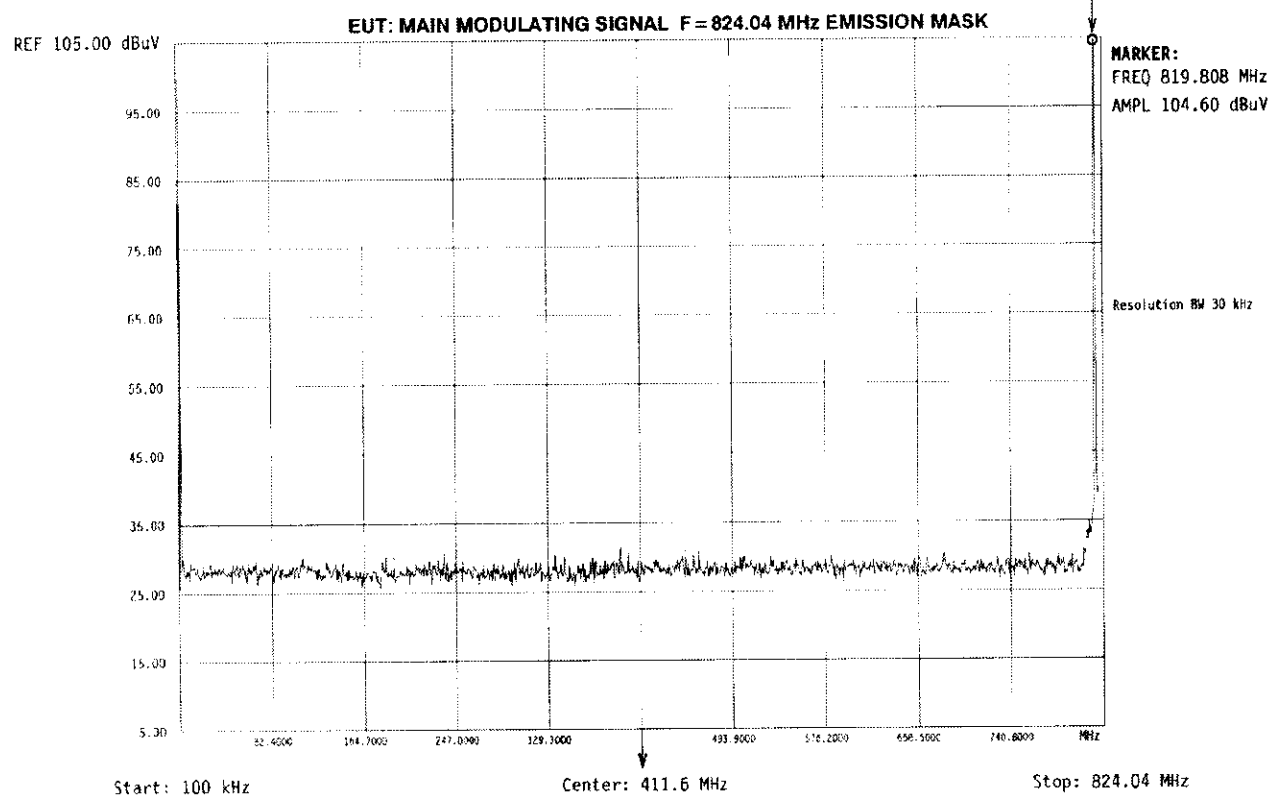
Test Report: TLR FCC.12663

Date: April, 1998

FCC ID: ARACET-10

Plot 3.5.46
Emission mask test

Thursday, 19/2/19
Time: 10:11:29





HERMON LABORATORIES

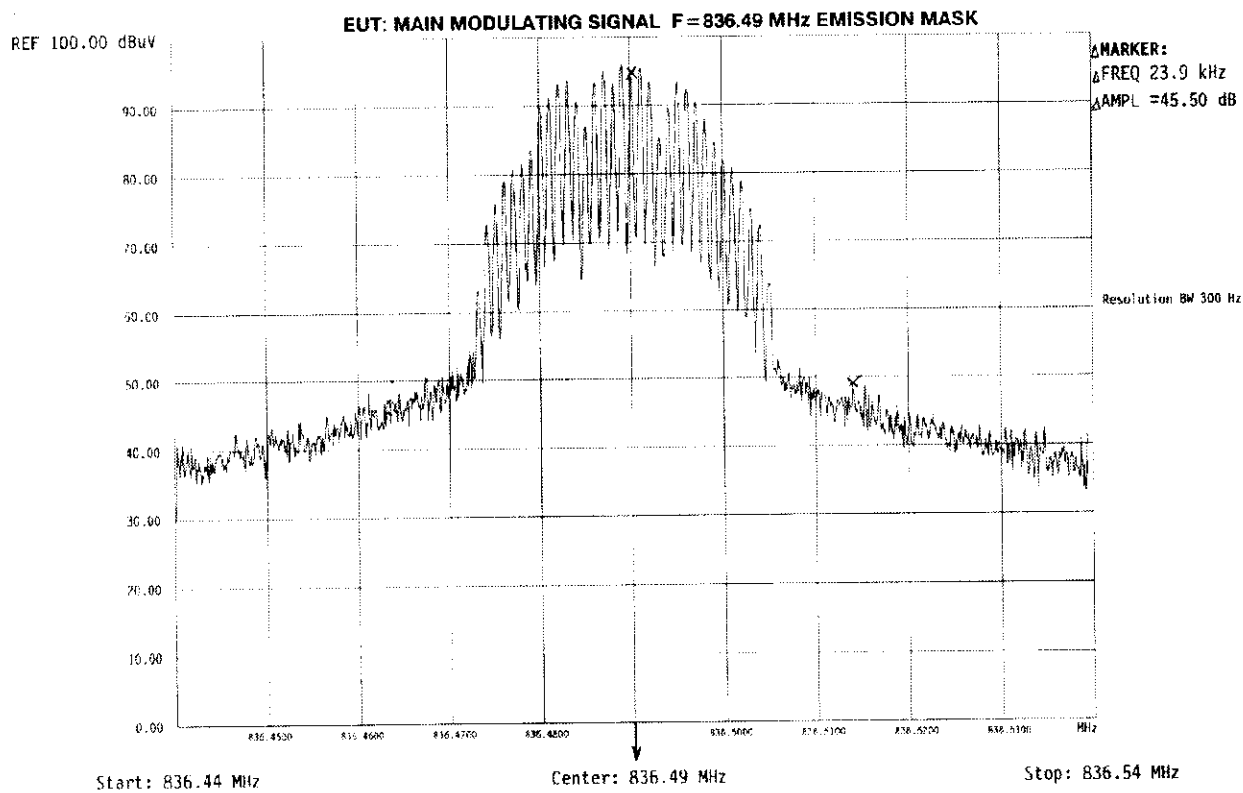
Test Report: TLR FCC.12663

Date: April, 1998

FCC ID: ARACET-10

Plot 3.5.47
Emission mask test

Tuesday, 18/2/1998
Time: 17:13:33





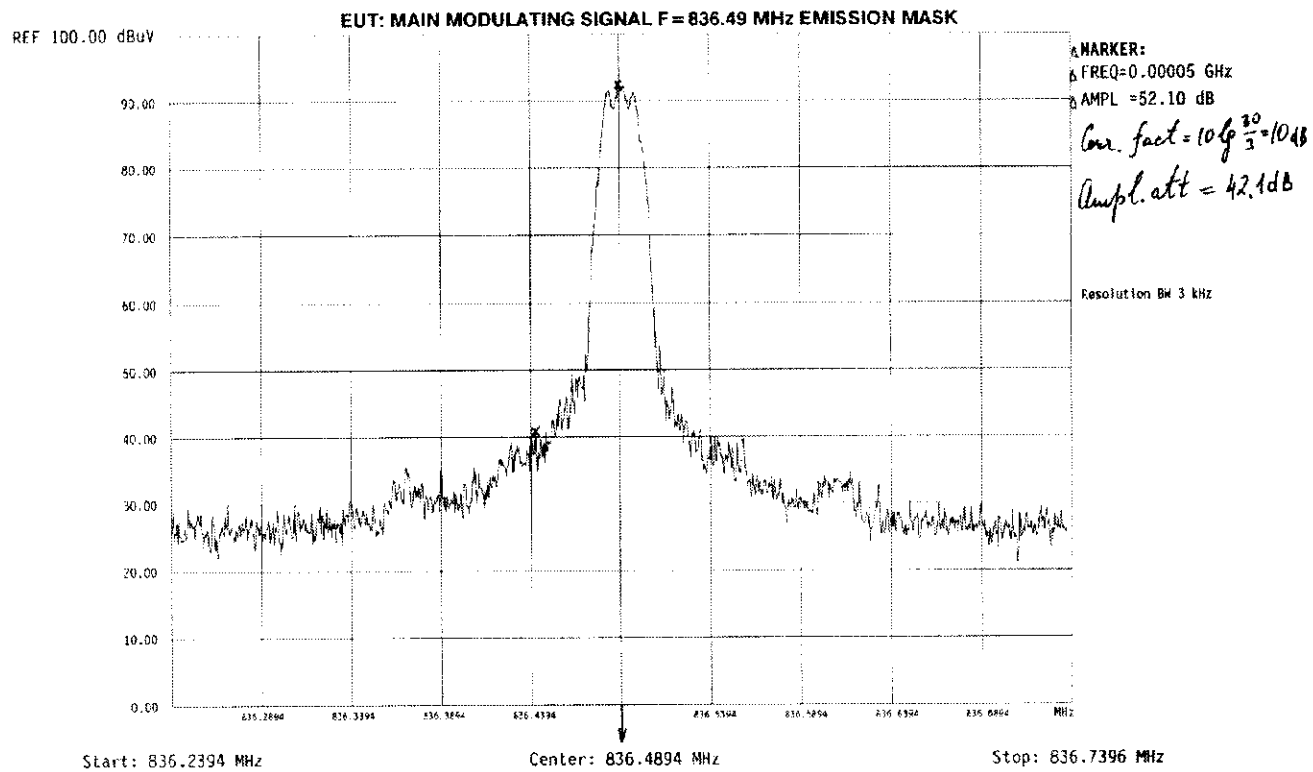
HERMION LABORATORIES

Test Report: TLR FCC.12663
Date: April, 1998
FCC ID: ARACET-10

Plot 3.5.48
Emission mask test

P2 12663

Monday, 9/3/1998
Time: 15:0:53



8/8



HERMION LABORATORIES

Test Report: TLR FCC.12663

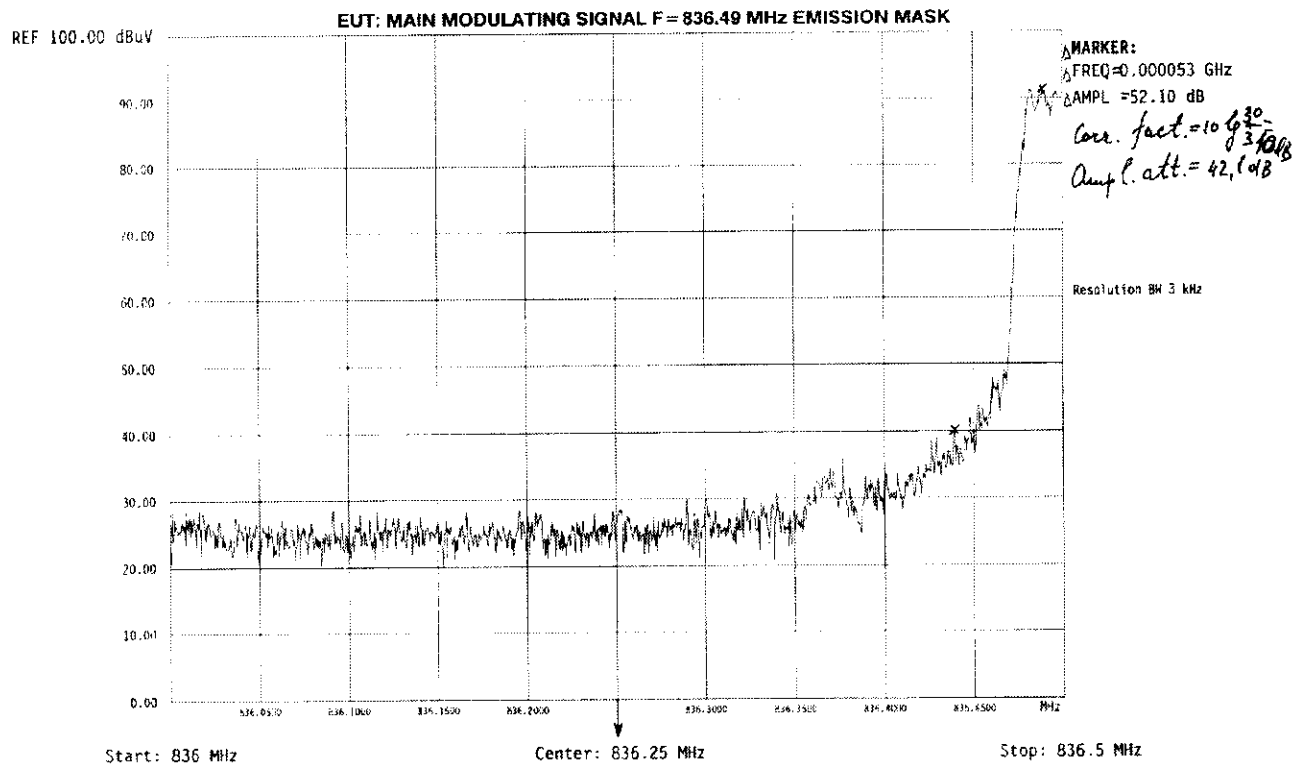
Date: April, 1998

FCC ID: ARACET-10

Plot 3.5.49
Emission mask test

P2.12663

Monday, 9/3/1998
Time: 15:4:40



RA



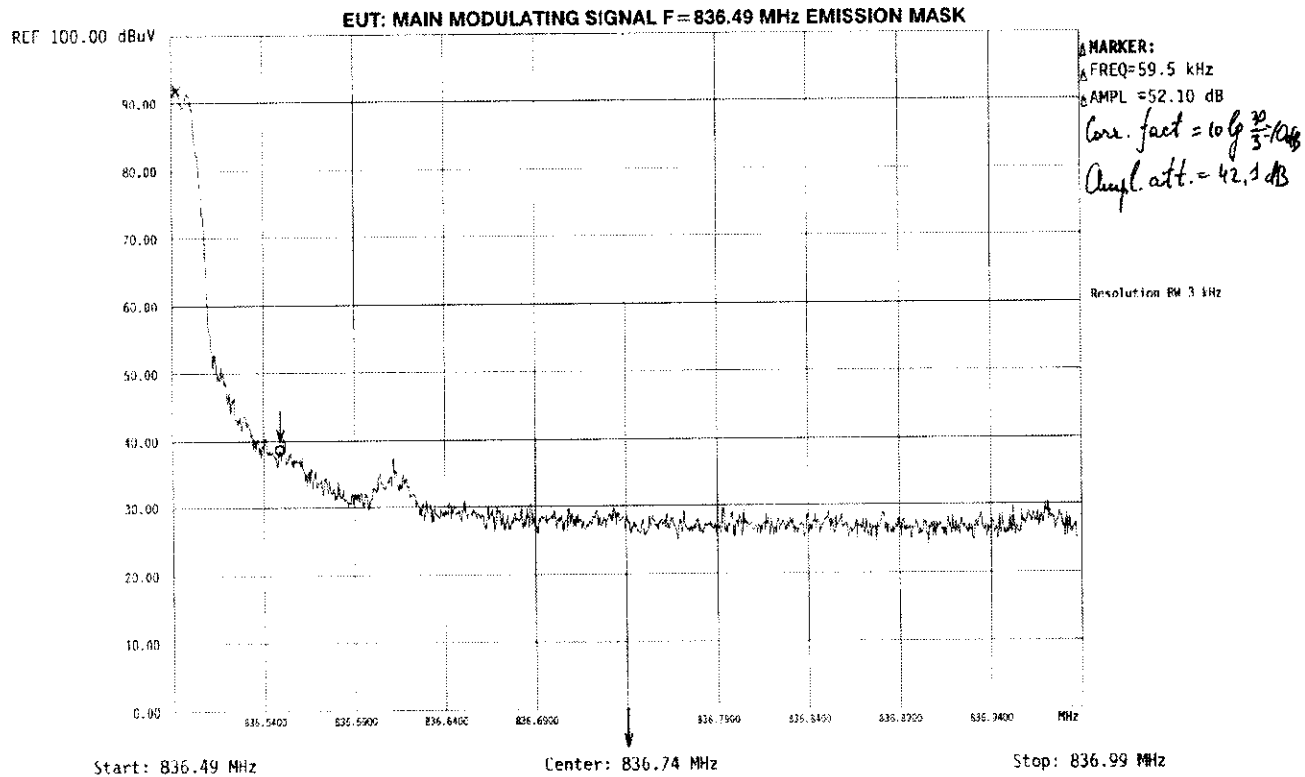
HERMON LABORATORIES

Test Report: TLR FCC.12663
Date: April, 1998
FCC ID: ARACET-10

Plot 3.5.50
Emission mask test

P2.12663

Monday, 9/3/1998
Time: 15:9:15



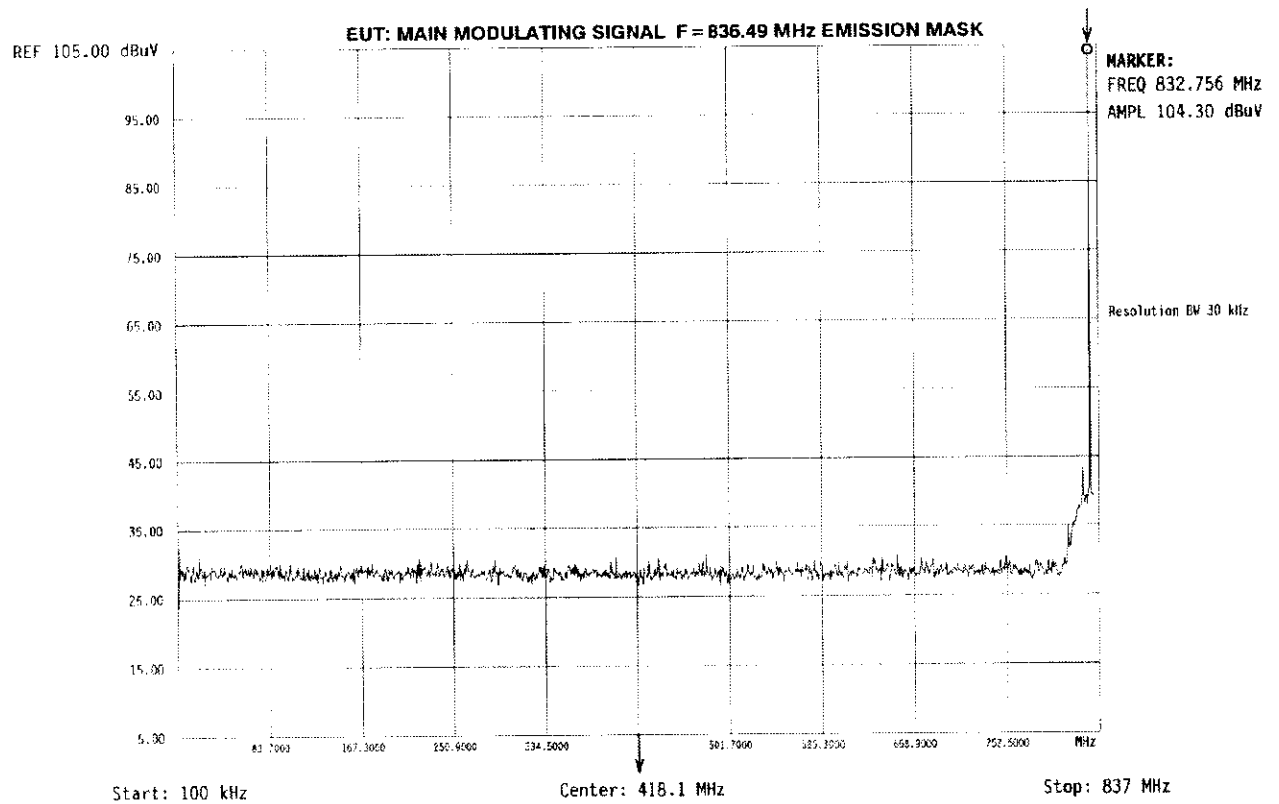


HERMON LABORATORIES

Test Report: TLR FCC.12663
Date: April, 1998
FCC ID: ARACET-10

Plot 3.5.51
Emission mask test

Thursday, 19/2/1998
Time: 12:6:27



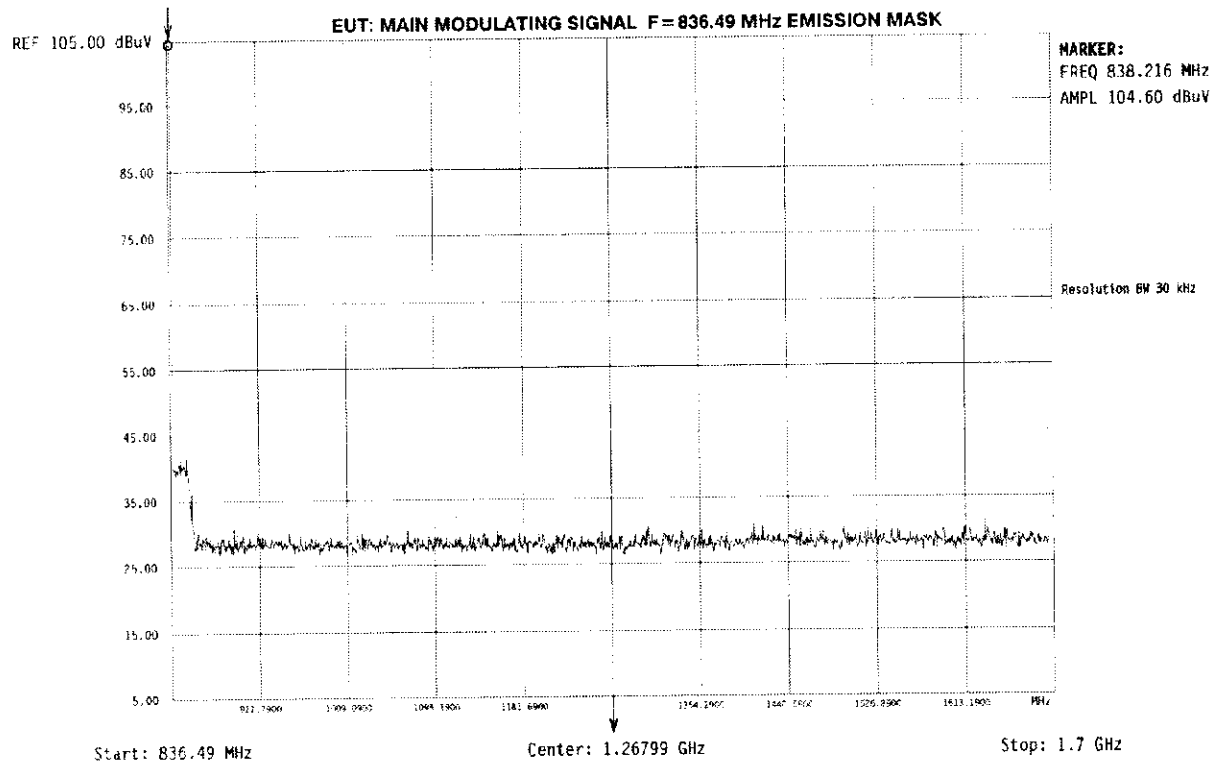


HERMON LABORATORIES

Test Report: TLR FCC.12663
Date: April, 1998
FCC ID: ARACET-10

Plot 3.5.52
Emission mask test

Thursday, 19/2/1998
Time: 11:50:59





HERMION LABORATORIES

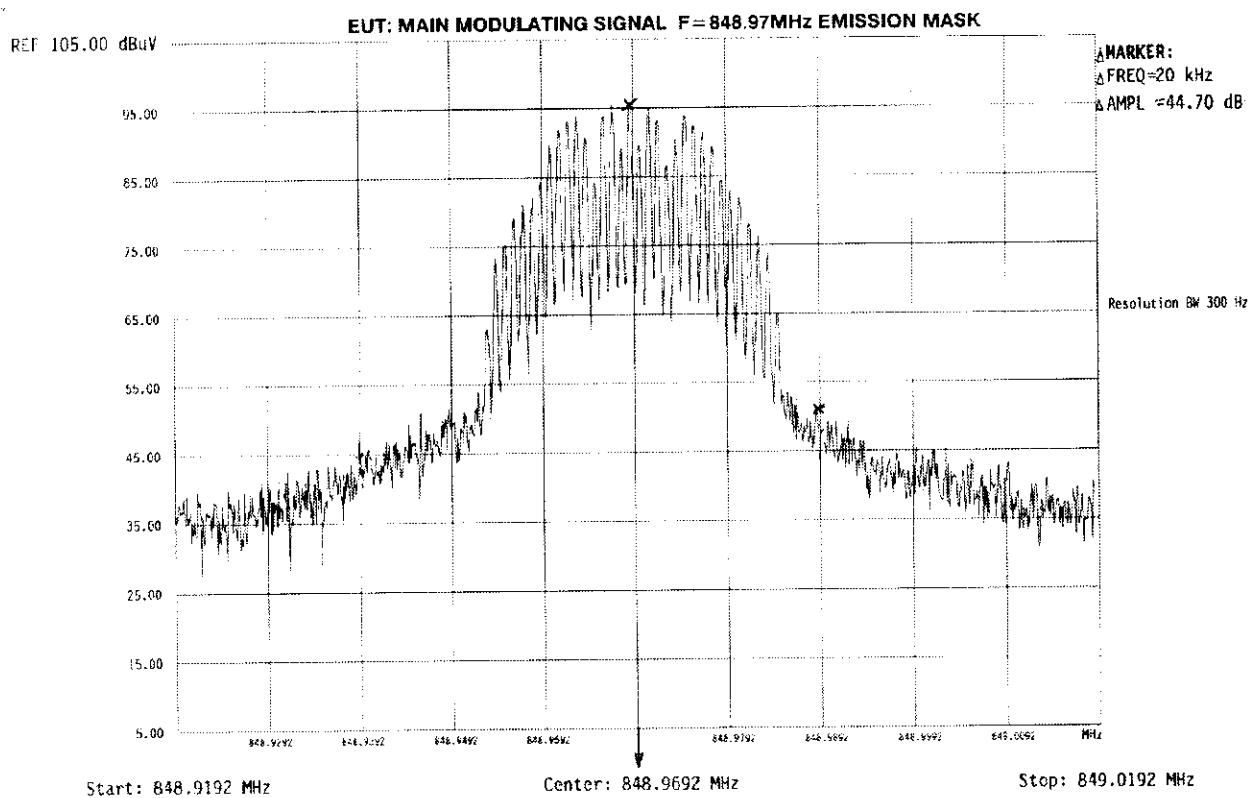
Test Report: TLR FCC.12663

Date: April, 1998

FCC ID: ARACET-10

Plot 3.5.53
Emission mask test

Thursday, 19/2/
Time: 10:33:2





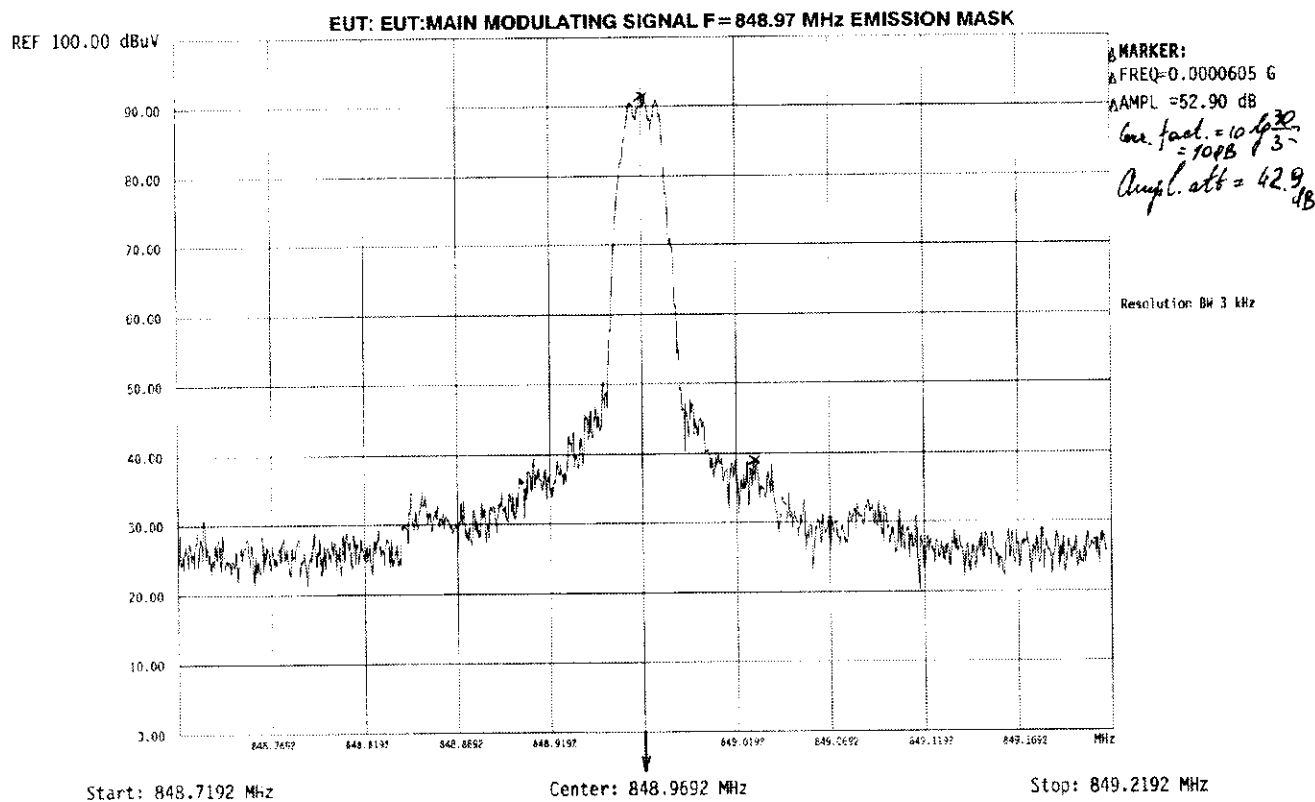
HERMON LABORATORIES

Test Report: TLR FCC.12663
Date: April, 1998
FCC ID: ARACET-10

Plot 3.5.54
Emission mask test

P2.12663

Monday, 9/3/1998
Time: 15:17:34





HERMON LABORATORIES

Test Report: TLR FCC.12663

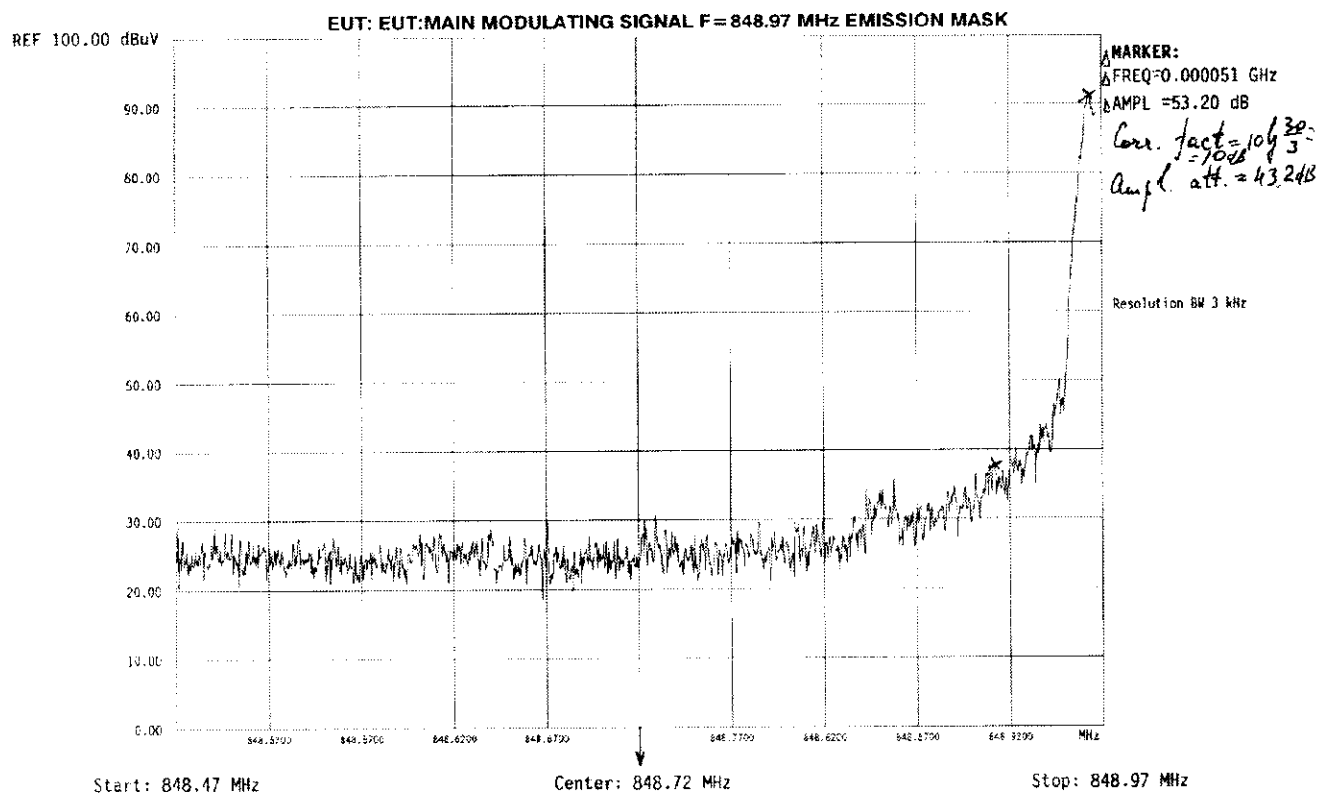
Date: April, 1998

FCC ID: ARACET-10

Plot 3.5.55
Emission mask test

PL 12663

Monday, 9/3/1998
Time: 15:21:32





HERMION LABORATORIES

Test Report: TLR FCC.12663

Date: April, 1998

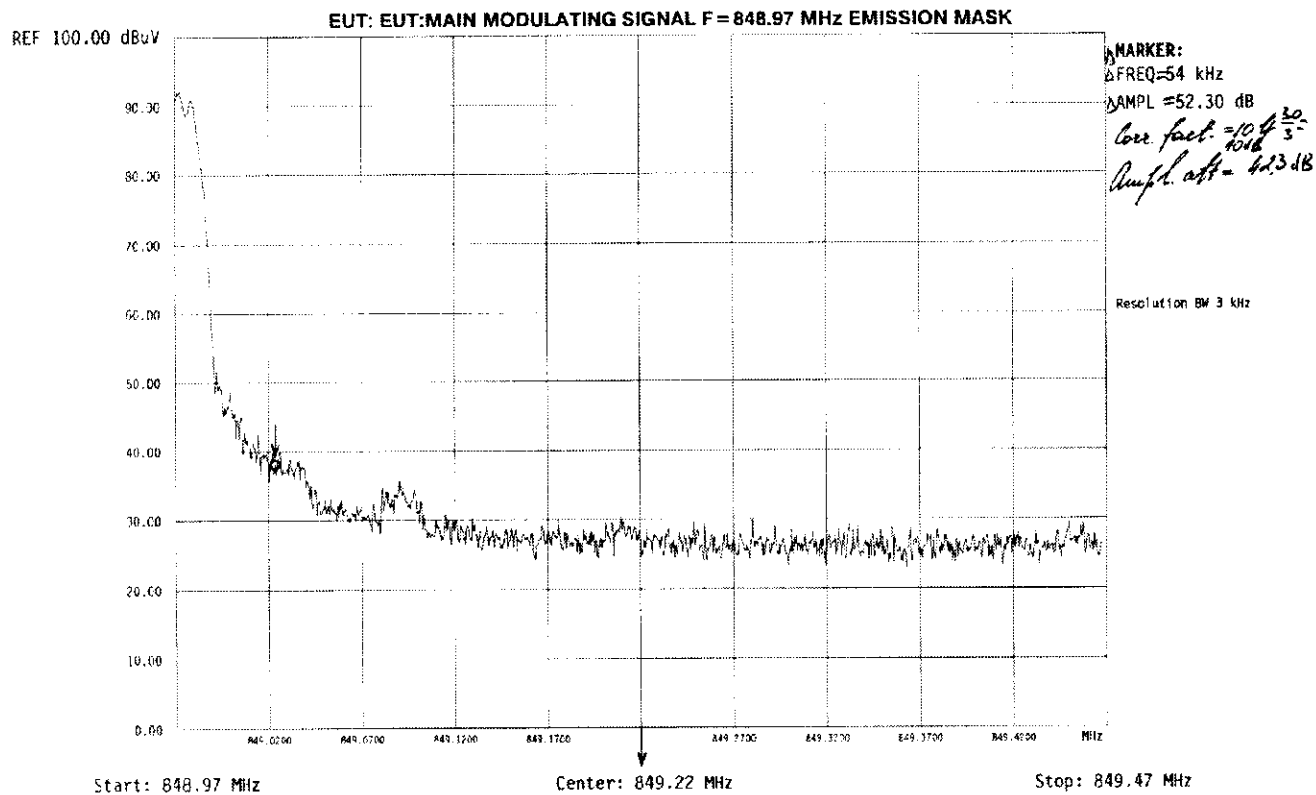
FCC ID:ARACET-10

Plot 3.5.56
Emission mask test

P2. 12663

Monday, 9/3/1998

Time: 15:25:9



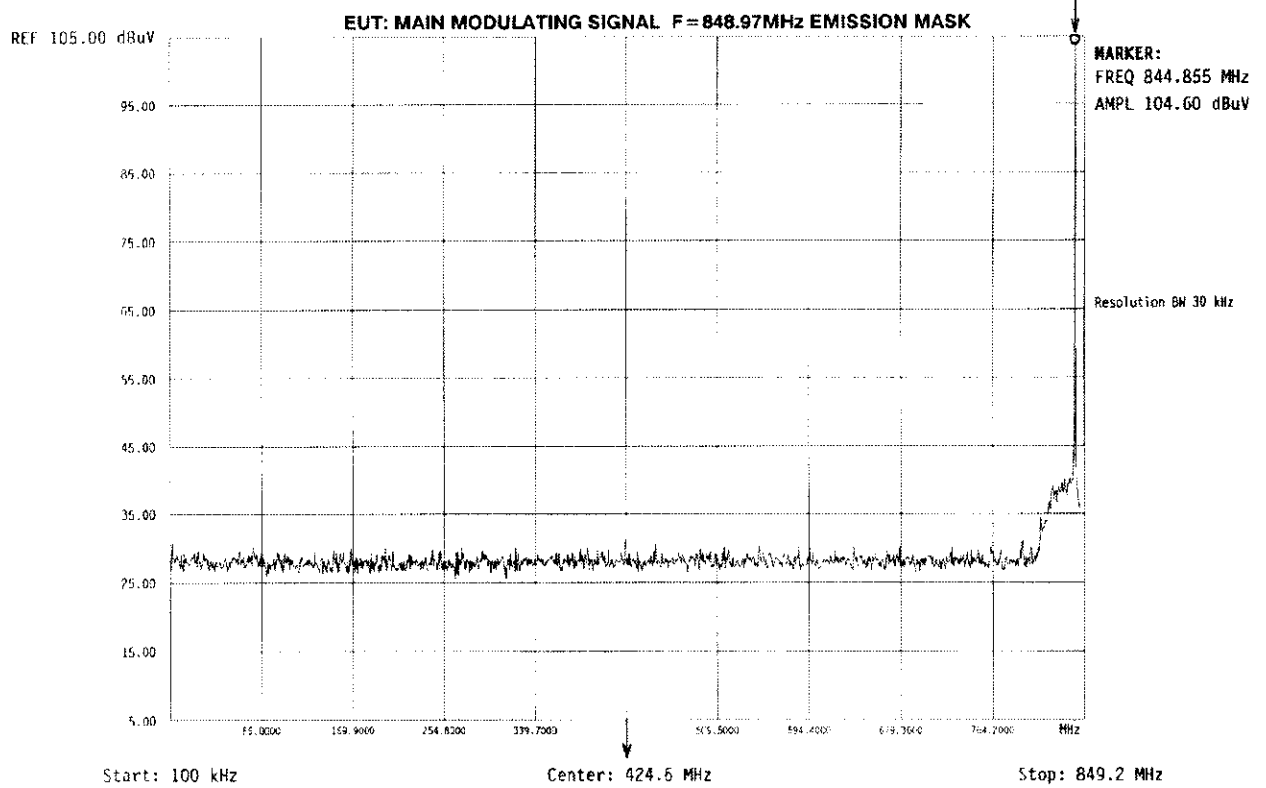


HERMION LABORATORIES

Test Report: TLR FCC.12663
Date: April, 1998
FCC ID: ARACET-10

Plot 3.5.57
Emission mask test

Thursday, 19/2/15
Time: 10:49:33





HERMION LABORATORIES

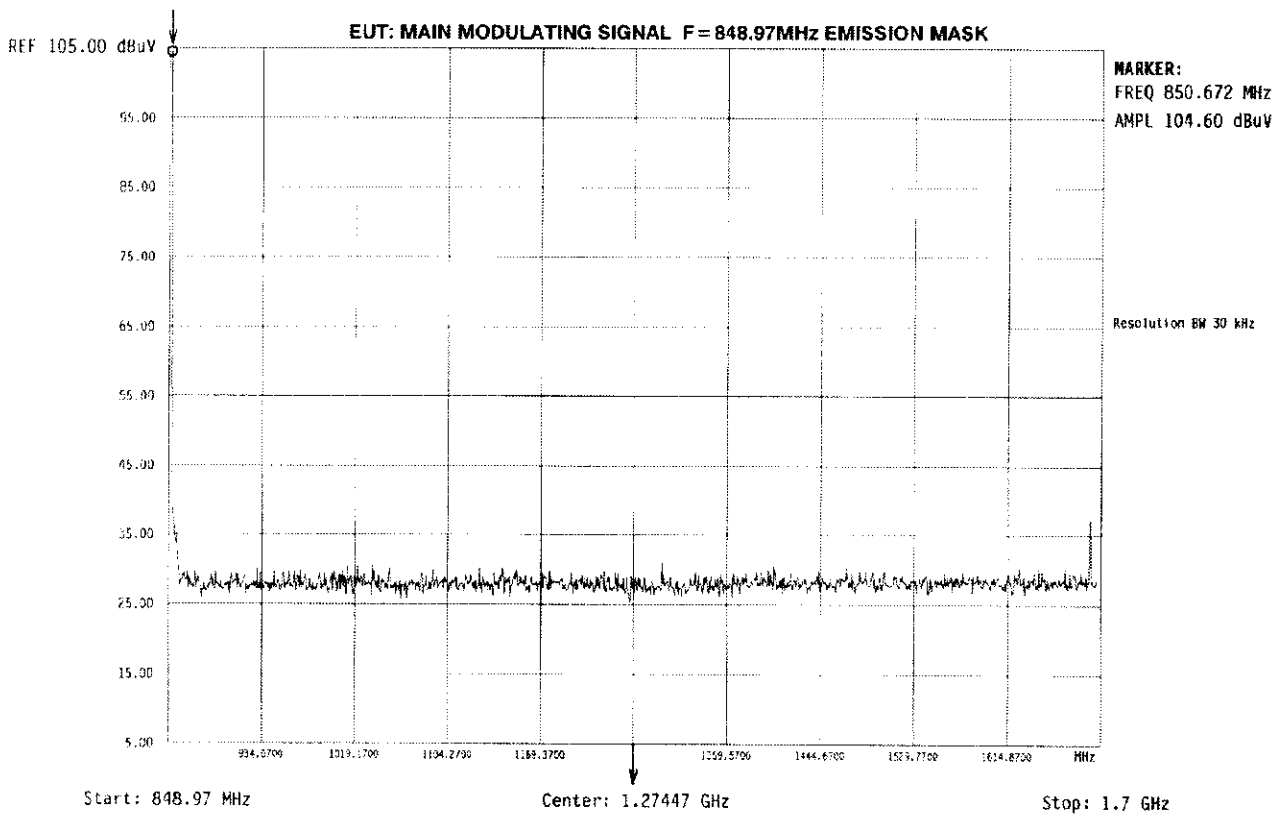
Test Report: TLRFCC.12663

Date: April, 1998

FCC ID:ARACET-10

Plot 3.5.58
Emission mask test

Thursday, 19/2/19
Time: 10:43:40





HERMION LABORATORIES

Test Report: TLR FCC.12663

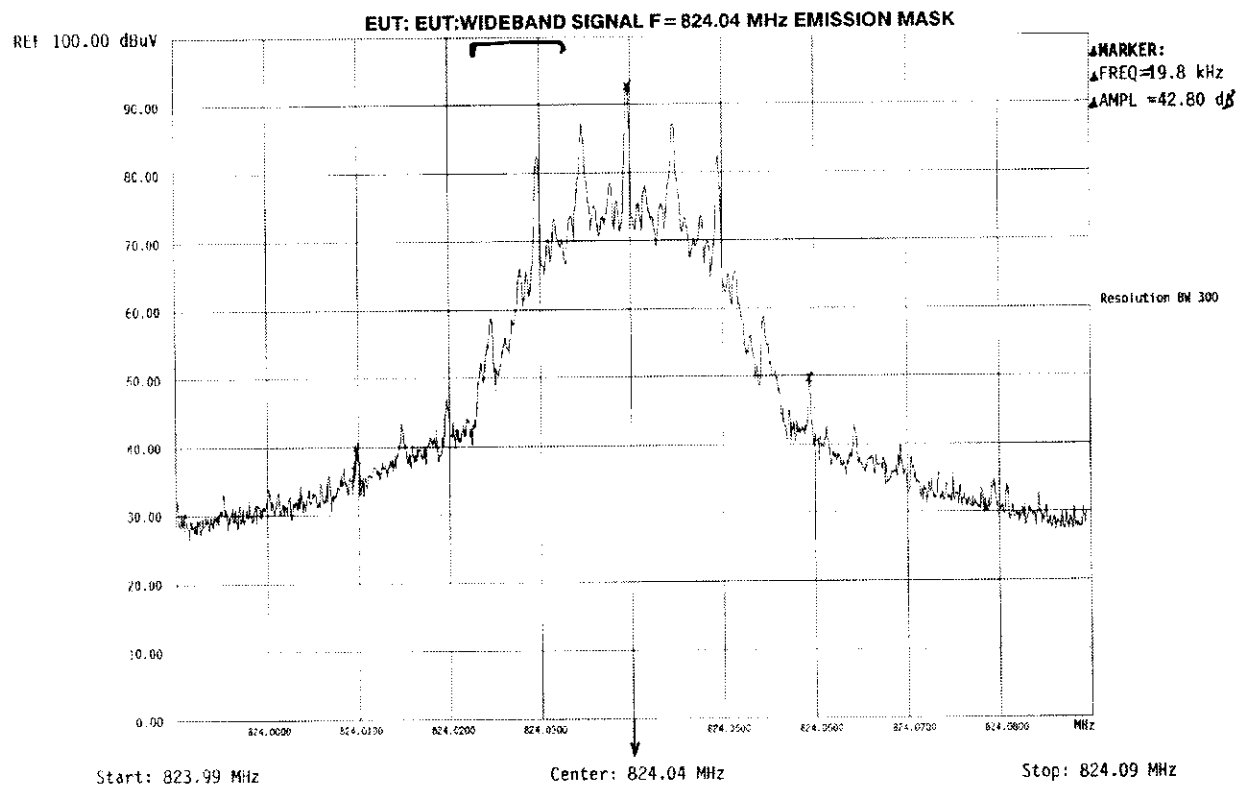
Date: April, 1998

FCC ID: ARACET-10

Plot 3.5.59
Emission mask test

PL12663

Monday, 9/3/1
Time: 10:51:2





HERMION LABORATORIES

Test Report: TLR FCC.12663

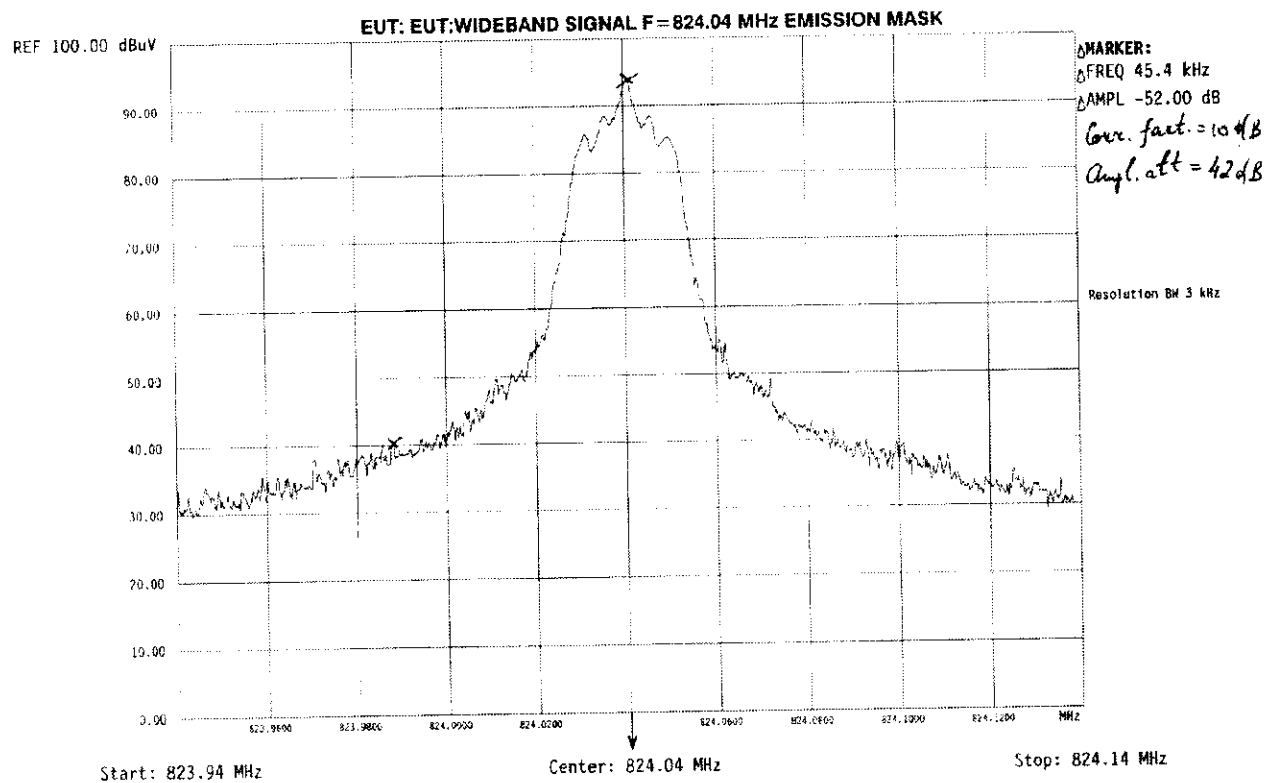
Date: April, 1998

FCC ID:ARACET-10

Plot 3.5.60
Emission mask test

PL 12663

Monday, 9/3/1998
Time: 10:55:25





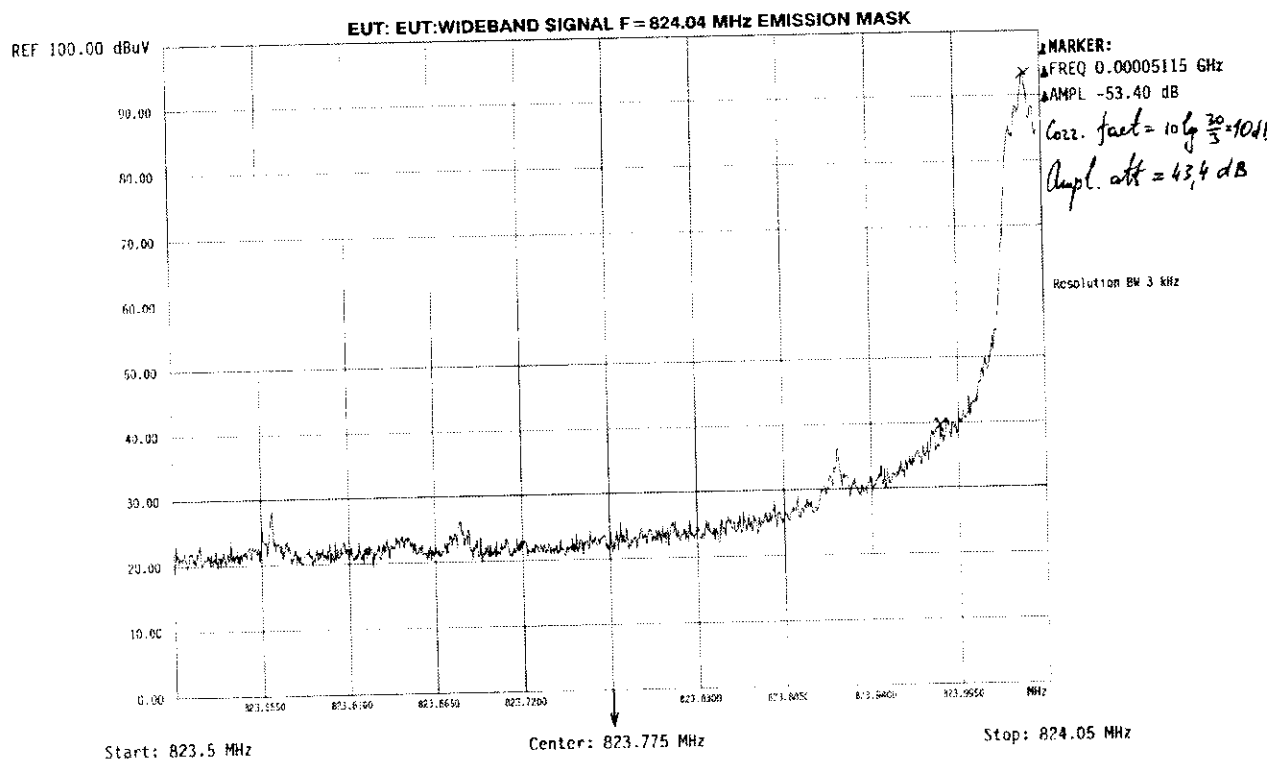
HERMION LABORATORIES

Test Report: TLR FCC.12663
Date: April, 1998
FCC ID: ARACET-10

Plot 3.5.61
Emission mask test

Pl. 12663

Monday, 9/3/1998
Time: 11:0:41



44



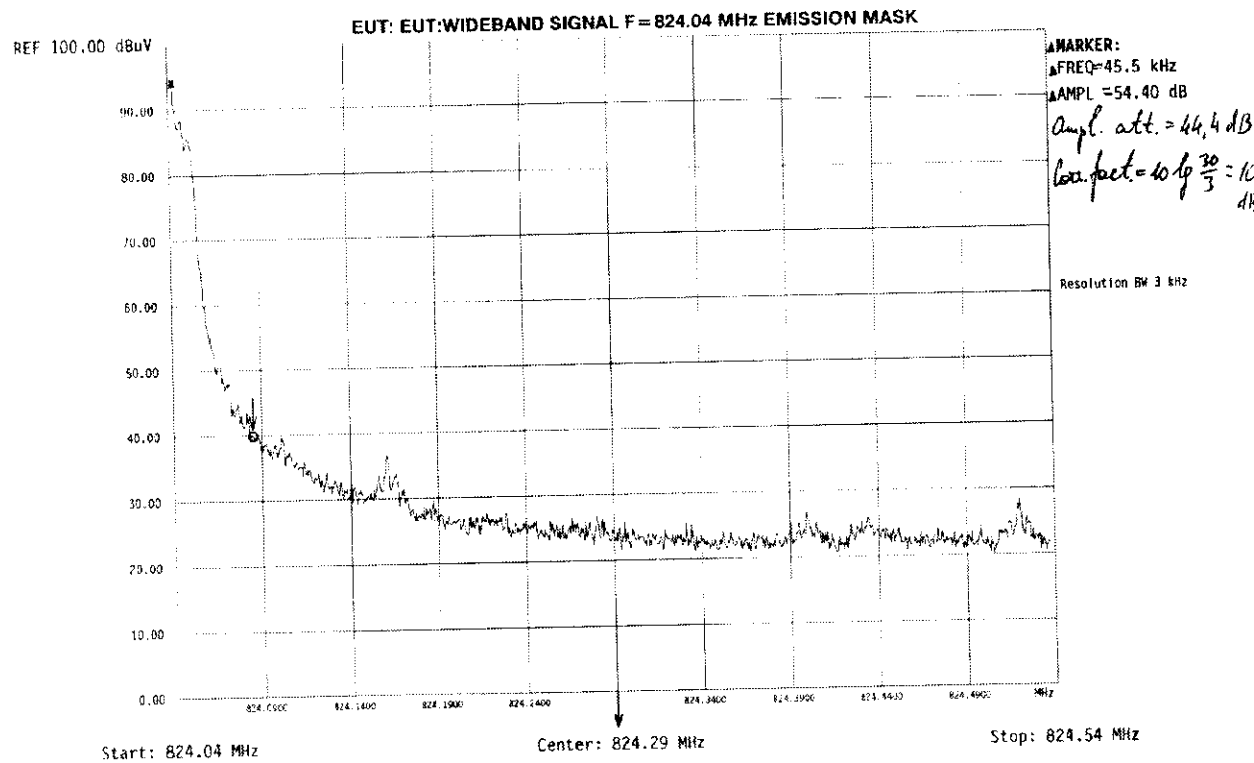
HERMON LABORATORIES

Test Report: TLR FCC.12663
Date: April, 1998
FCC ID: ARACET-10

Plot 3.5.62
Emission mask test

P2.12663

Monday, 9/3/1998
Time: 11:4:42



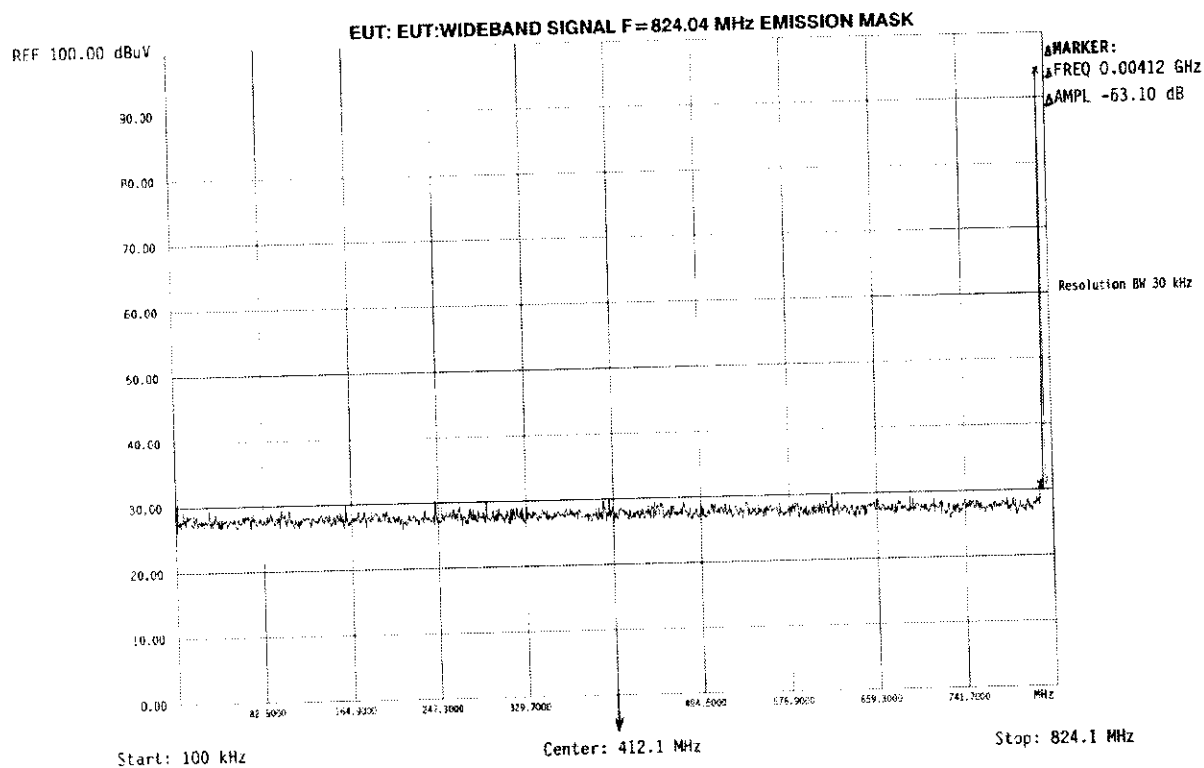


HERMON LABORATORIES

Test Report: TLR FCC.12663
Date: April, 1998
FCC ID: ARACET-10

Plot 3.5.63
Emission mask test

Monday, 9/3/1998
Time: 11:8:31



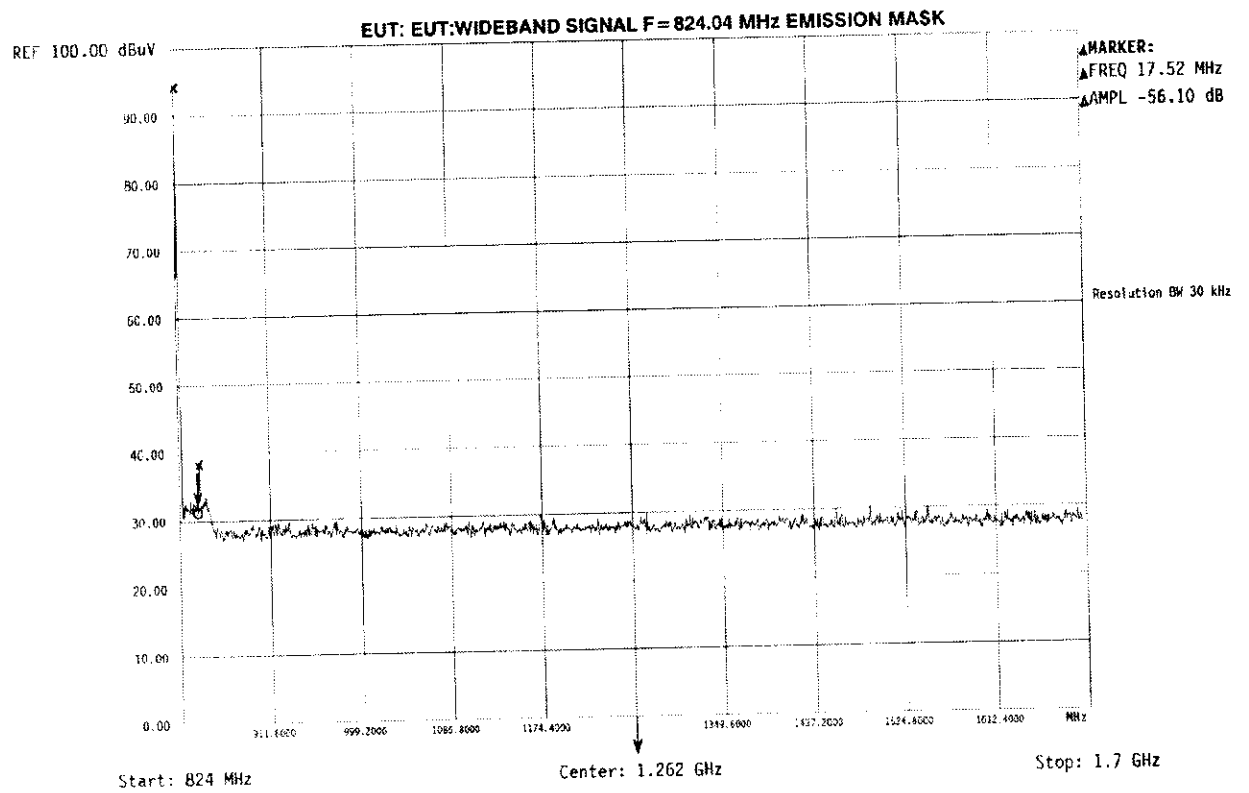


HERMION LABORATORIES

Test Report: TLR FCC.12663
Date: April, 1998
FCC ID: ARACET-10

Plot 3.5.64
Emission mask test

Monday, 9/3/1998
Time: 11:11:43





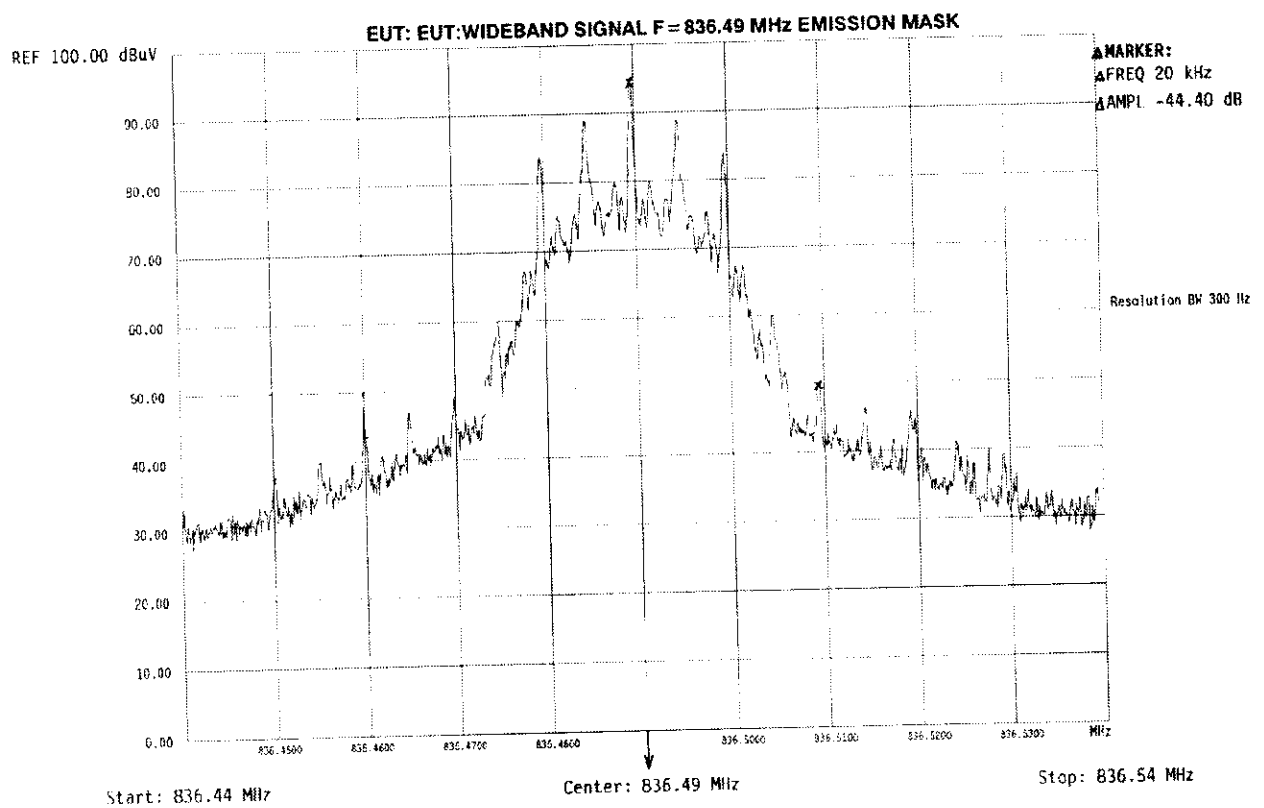
HERMION LABORATORIES

Test Report: TLR FCC.12663
Date: April, 1998
FCC ID: ARACET-10

Plot 3.5.65
Emission mask test

P₂ 12663

Monday, 9/3/1998
Time: 9:40:20





HERMON LABORATORIES

Test Report: TLR FCC.12663

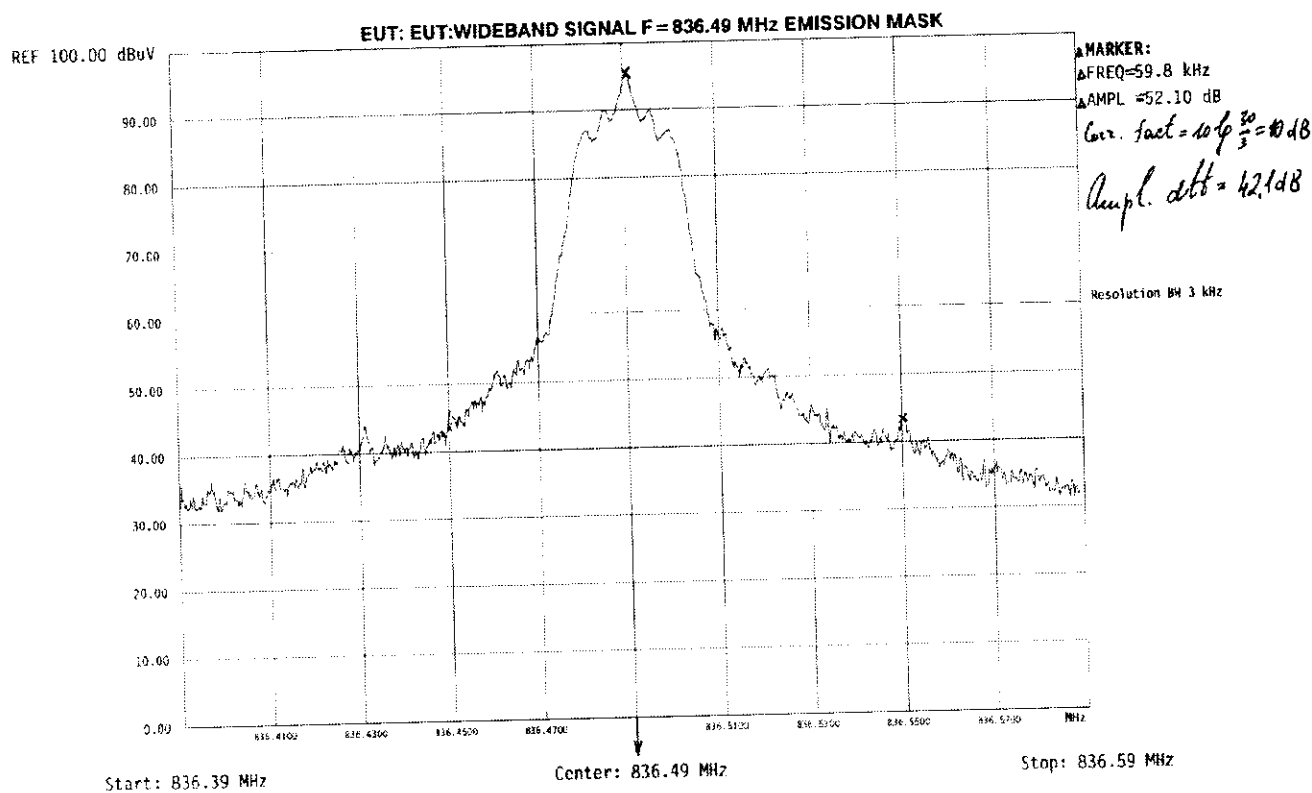
Date: April, 1998

FCC ID:ARACET-10

Plot 3.5.66
Emission mask test

P2 12663

Monday, 9/3/1998
Time: 9:47:51





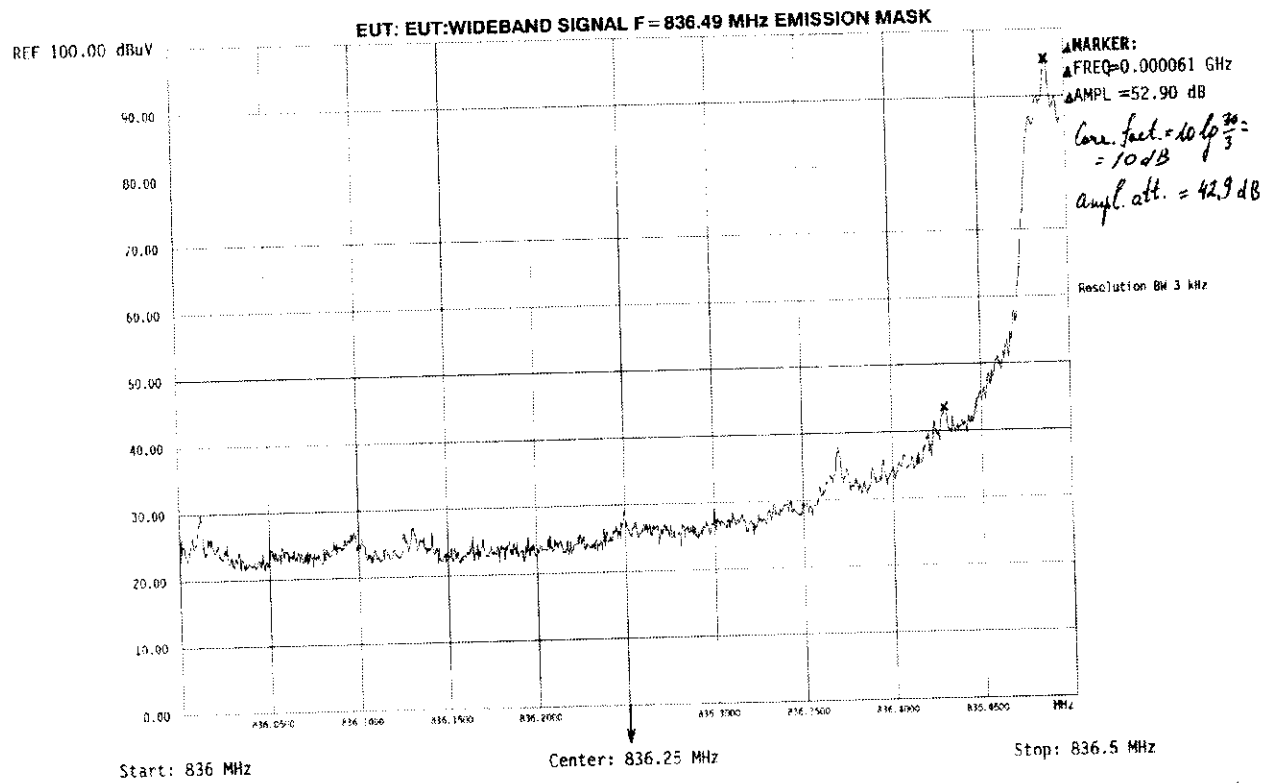
HERMON LABORATORIES

Test Report: TLR FCC.12663
Date: April, 1998
FCC ID: ARACET-10

Plot 3.5.67
Emission mask test

P₂ 12663

Monday, 9/3/1998
Time: 9:52:45





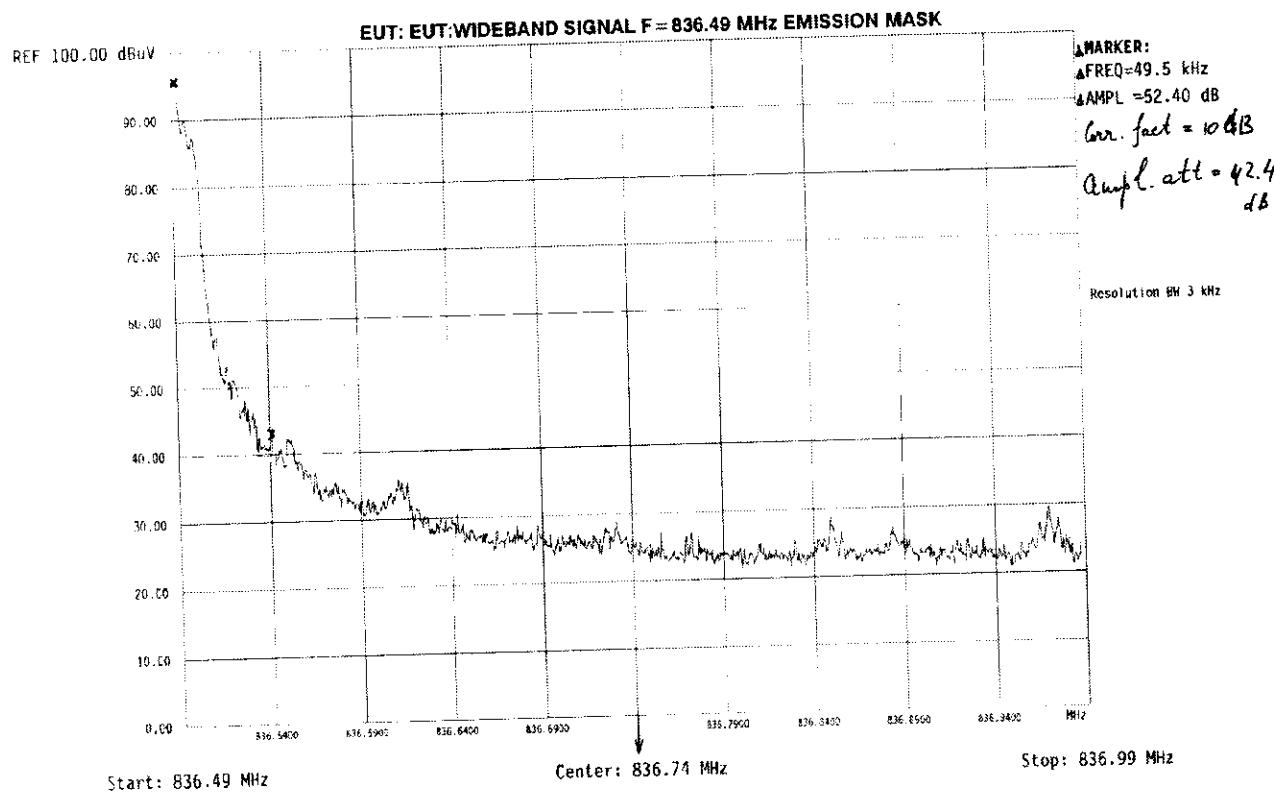
HERMION LABORATORIES

Test Report: TLR FCC.12663
Date: April, 1998
FCC ID: ARACET-10

Plot 3.5.68
Emission mask test

P₂ 12663

Monday, 9/3/1998
Time: 9:55:57



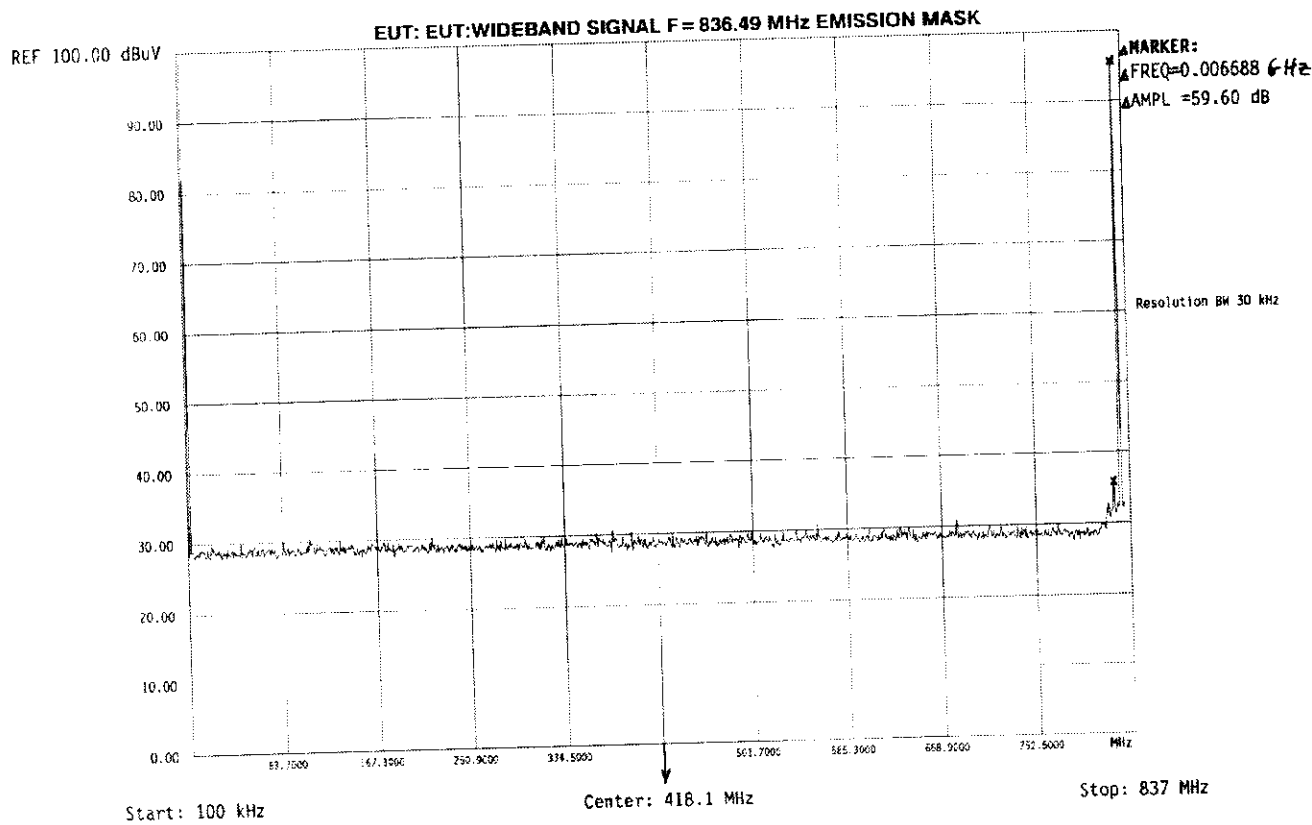


HERMON LABORATORIES

Test Report: TLR FCC.12663
Date: April, 1998
FCC ID: ARACET-10

Plot 3.5.69
Emission mask test

Monday, 9/3/1995
Time: 9:59:44



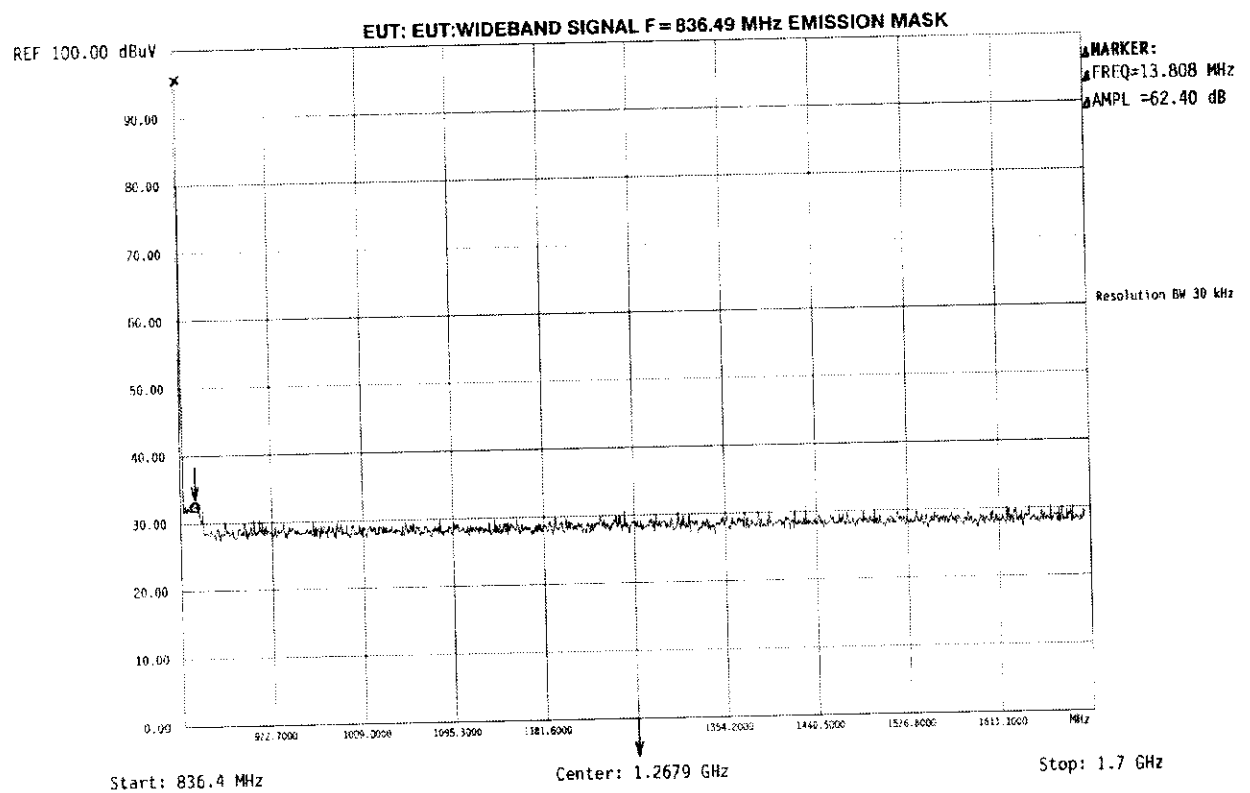


HERMION LABORATORIES

Test Report: TLR FCC.12663
Date: April, 1998
FCC ID: ARACET-10

Plot 3.5.70
Emission mask test

Monday, 9/3/1998
Time: 10:33





HERMON LABORATORIES

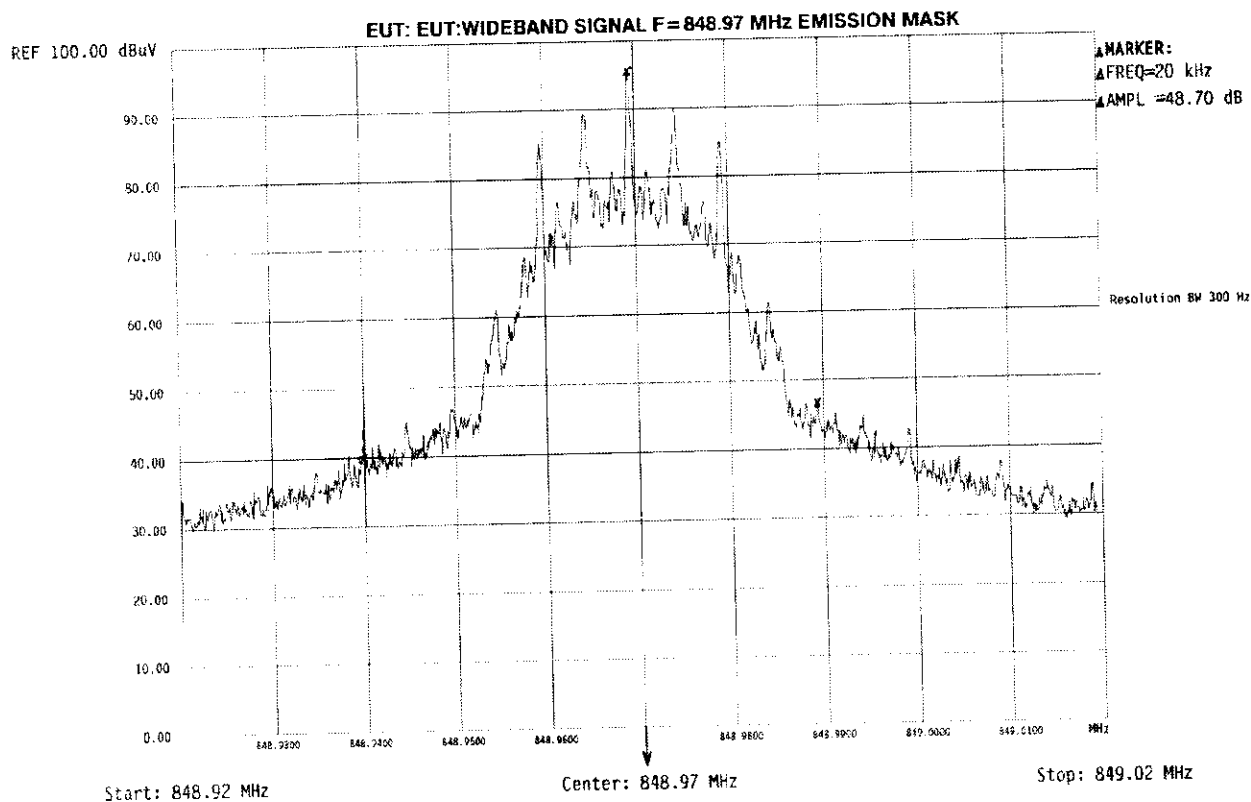
Test Report: TLRFCC.12663
Date: April, 1998
FCC ID:ARACET-10

Plot 3.5.71
Emission mask test

PL 12663

Hermon Labs EMC LTD

Monday, 9/3/1998
Time: 10:13:18



Generated by HERMON LABS EMC LTD Plot Generator program

14



HERMON LABORATORIES

Test Report: TLR FCC.12663

Date: April, 1998

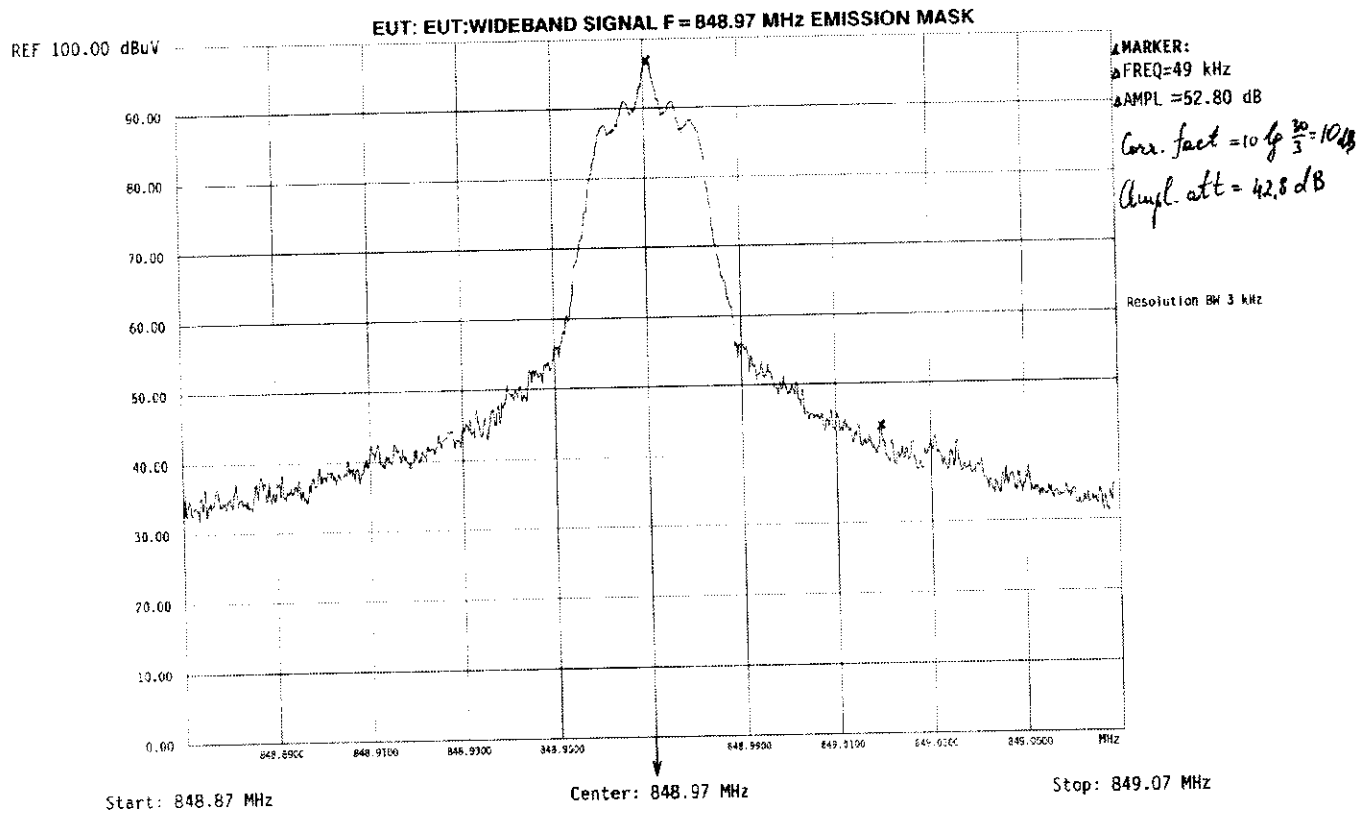
FCC ID:ARACET-10

Plot 3.5.72
Emission mask test

Pt 12663

Monday, 9/3/1998

Time: 10:17:58



10/1



HERMION LABORATORIES

Test Report: TLR FCC.12663

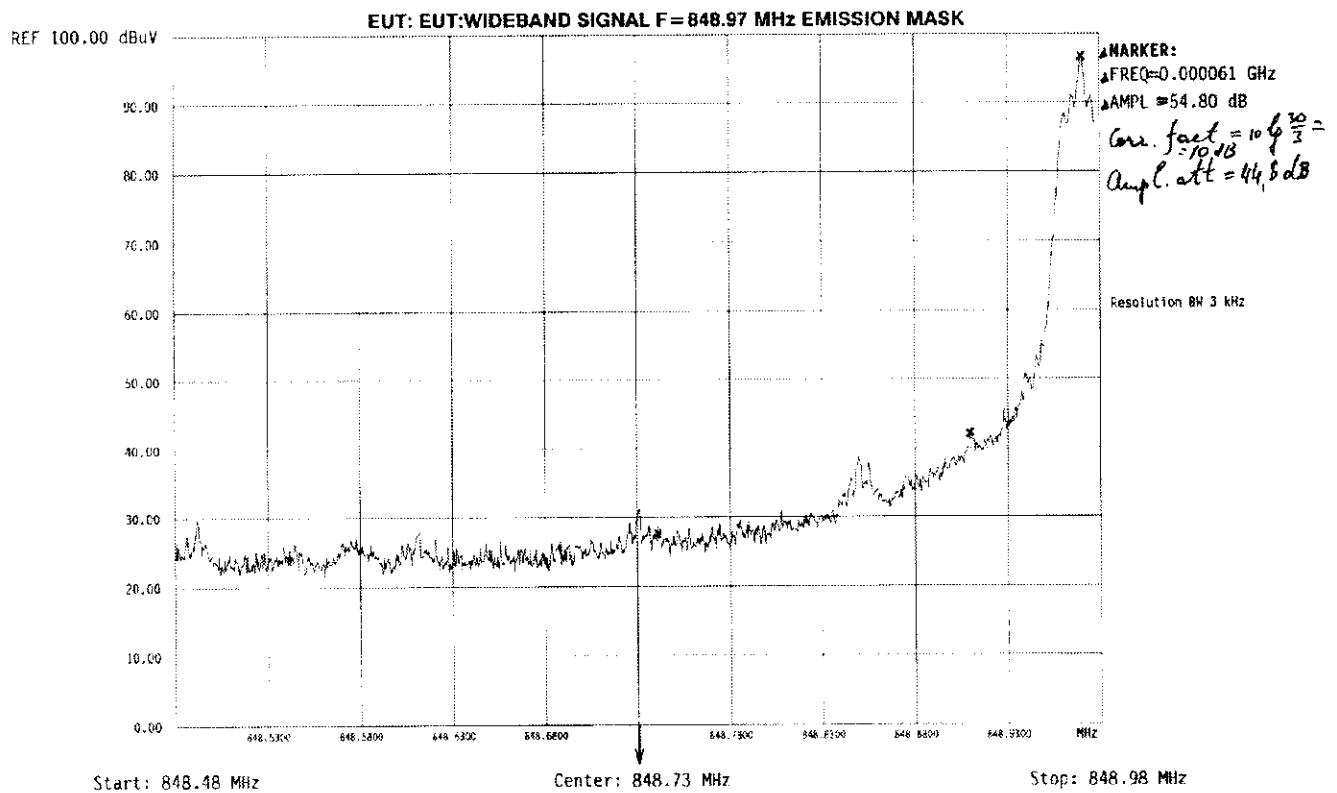
Date: April, 1998

FCC ID: ARACET-10

Plot 3.5.73
Emission mask test

PL 12663

Monday, 9/3/1998
Time: 10:31:41



Handwritten signature



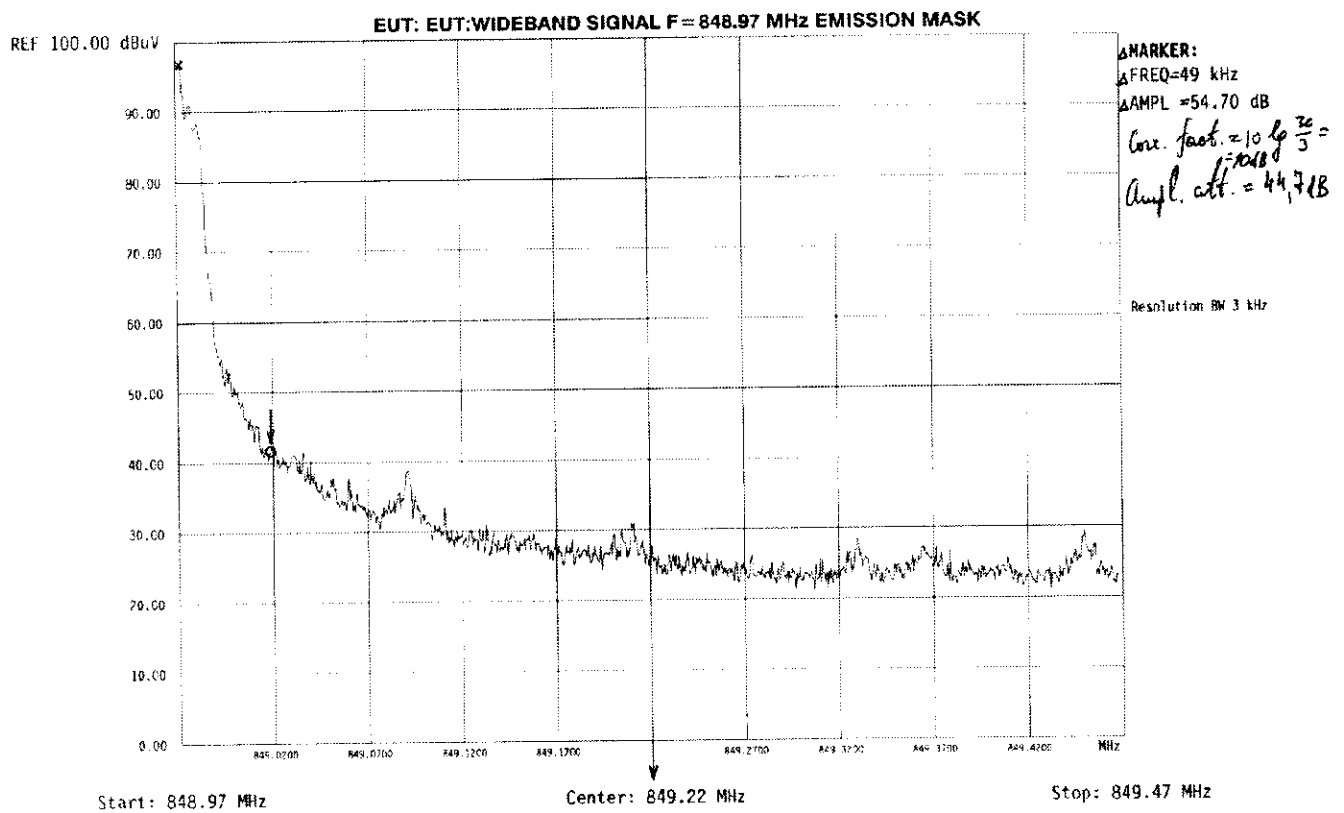
HERMION LABORATORIES

Test Report: TLR FCC.12663
Date: April, 1998
FCC ID: ARACET-10

Plot 3.5.74
Emission mask test

P2.12663

Monday, 9/3/1998
Time: 10:27:7





HERMON LABORATORIES

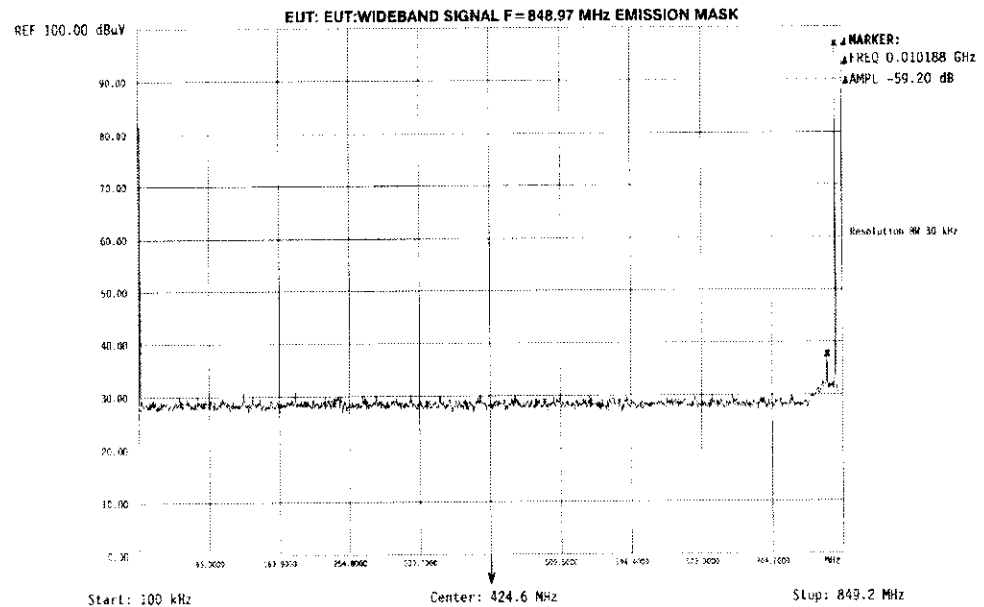
Test Report: TLR FCC.12663

Date: April, 1998

FCC ID:ARACET-10

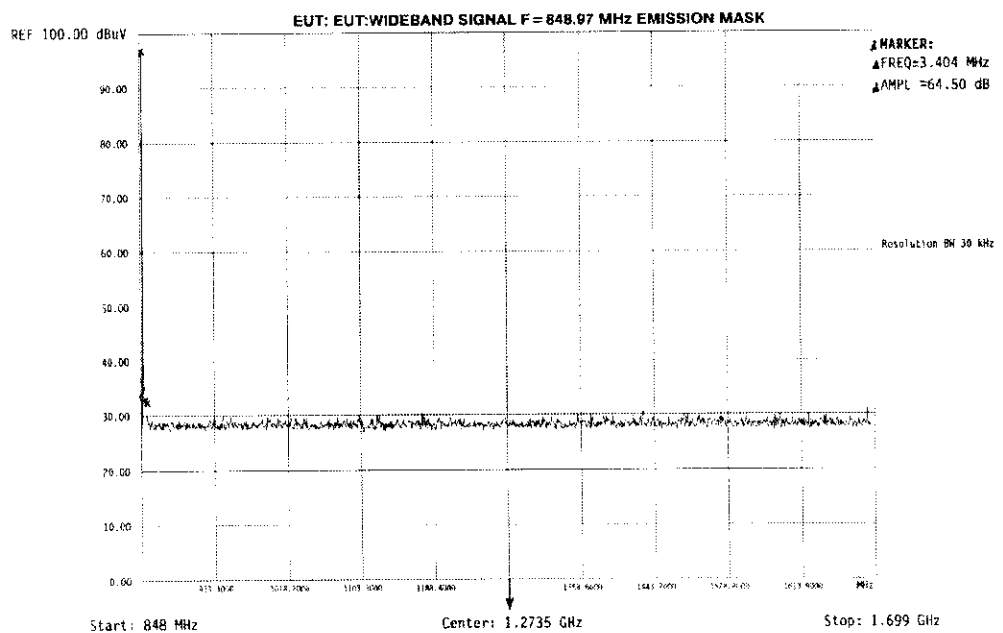
Plot 3.5.75 Emission mask test

Monday, 9/3/1998
Time: 10:36:19



Plot 3.5.76 Emission mask test

Monday, 9/3/1998
Time: 10:39:50





3.6 Effective radiated power test according to Part 2, §22.913 and field strength of spurious radiation test according to Part 2, § 2.993 and Part 22, § 22.917 (e)

3.6.1 Effective radiated power test

3.6.1.1 Definition of the test

This test was performed to demonstrate that the EUT maximum effective radiated power (ERP) of mobile transmitter is not more than 7 W.

3.6.1.2 The test set-up configuration

The radiated emissions measurements were performed with the Biconilog antenna, installed on the variable height antenna mast in the Hermon Laboratories anechoic chamber at 3 meters measuring distance as shown in Photographs 3.6.1, 3.6.2.

The EUT was installed on the 0.8 m high wooden table which was on the top of the metal turntable flush mounted with the ground plane. To find the maximum radiation measuring antenna height was changed from 1 to 4 m, the turntable was rotated 360° and the antennas polarization was changed from vertical to horizontal.

3.6.1.3 Test results

The EUT was tested according to the substitution method with dipole antenna. The field strength generated by the EUT was measured at 3 unmodulated carrier frequencies (824.04, 836.49, 848.97 MHz) in analog and digital mode of operation.

The transmitting antenna was installed in the position where approximately the center of the EUT was to be placed. The transmitting antenna was fed by the generator signal with enough power ($P_{out\ gen}$) to give a suitable reading on the measuring set for each test frequency.

The maximum measured field strength result was 136.5 dB(μ V/m) at frequency of 848.97 MHz that corresponds to 36.5 dBm output power of the signal generator. Maximum ERP was calculated from equation:

$$P_{out\ gen} - \text{Cable loss} + \text{Antenna gain} = 36.5\text{ dBm} - 2.8\text{ dB} + 1.47\text{ dB} = 35.2\text{ dBm} = 3.3\text{ W}$$

3.6.1.4 Exposure limit according to part 1, §1.1310

Limit for power density for general population/uncontrolled exposure is $f/1500 = 824/1500 = 0.55\text{ mW/cm}^2 = 5.5\text{ W/m}^2$ - this is equal to the field strength $E_{lim} = 45.5\text{ V/m} = 153.2\text{ dB}(\mu\text{V/m})$. The maximum measured field strength result is $E_{max} = 136.5\text{ dB}(\mu\text{V/m})$ at 3 meter distance. Thus the distance where the public will not be exposed to RF level in excess of the FCC requirements is 0.44 m - from the following equation:

$$E_{lim} = E_{max} + 20 \log D_1/D_2$$

where $D_1 = 3\text{ m}$, D_2 is the minimal allowed distance.

Reference numbers of test equipment used

HL 0029	HL 0465	HL 0521	HL 0557	HL 0604	
---------	---------	---------	---------	---------	--

Full description is given in Appendix A.



3.6.2 Field strength of spurious radiation test

3.6.2.1 Definition of the test

This test was performed to determine that the mean power of emissions should be attenuated below the mean power of the unmodulated carrier (P) on any frequency twice or more than twice the fundamental frequency by at least $[43 + 10\log(P \text{ in watts})]$ dB.

3.6.2.2 The test set-up configuration

The radiated emissions measurements were performed with the Biconilog and Double Ridged Guide antennas, installed on the variable height antenna mast in the Hermon Laboratories anechoic chamber at 3 meters measuring distance as shown in Photographs 3.6.1, 3.6.2.

The EUT was installed on the 0.8 m high wooden table which was on the top of the metal turntable flush mounted with the ground plane. To find the maximum radiation measuring antenna height was changed from 1 to 4 m, the turntable was rotated 360° and the antennas polarization was changed from vertical to horizontal.

3.6.2.3 Test results

To detect spurious emissions the test was performed with the transmitter operating with modulation at 3 carrier frequencies in analog mode. The frequency range from 9 kHz to 6.5 GHz was investigated. All the measured emissions were more than 60 dB below the fundamental frequency.

The test results for 836.49 MHz carrier frequency are given in Plots 3.6.1 to 3.6.5. Marker frequencies 834.1 MHz and 839 MHz in Plots 3.6.3 and 3.6.4 correspond to 836.49 carrier frequency (due to large spectrum analyzer span the marker readings are inaccurate).

Reference numbers of test equipment used

HL 0041	HL 0465	HL 0521	HL 0604			
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Full description is given in Appendix A.



HERMON LABORATORIES

Test Report: TLR FCC.12663

Date: April, 1998

FCC ID:ARACET-10

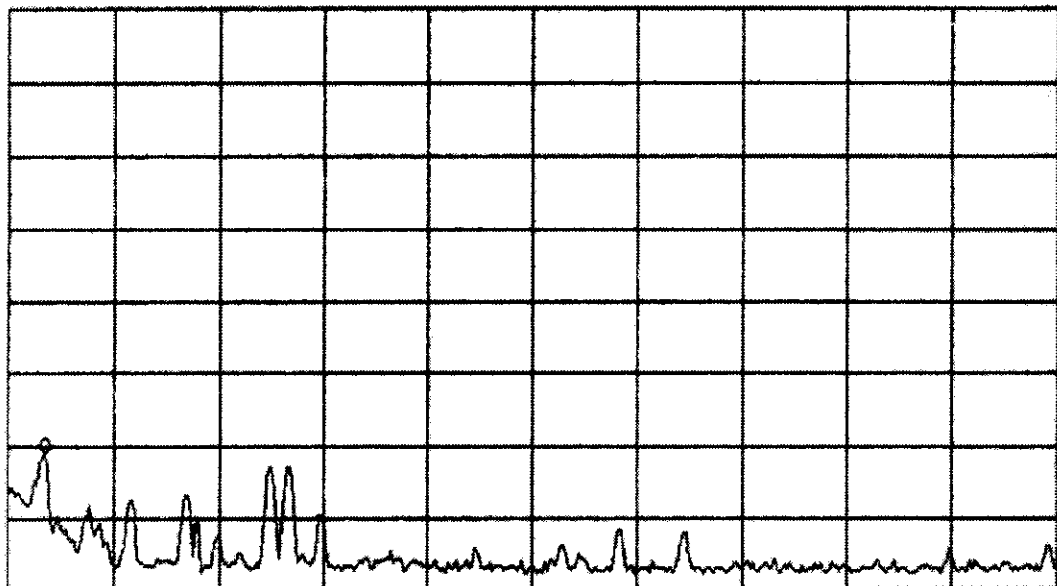
Plot 3.6.1
Out of band emissions test
(analog mode, with modulation)

17:30:00 MON 00, 1000
TELRAD, CET-10, Pr. 12663, SPURIOUS FIELD STRENGTH.
ACTV DET: PEAK
MEAS DET: PEAK QP AVG
MKR 15.7 kHz
8.75 dBμV

LOG REF 70.0 dBμV

10
dB/
ATN
10 dB

MA SB
SC FC
CORR



START 9.0 kHz

#IF BW 1.0 kHz

AVG BW 1 kHz

STOP 200.0 kHz

SWP 573 msec

MEAS
AT M

ADD
LI

MARK
↓

MARK

NE
PE

NEXT
RIC

NEXT
LE

Mc

1 of



HERMON LABORATORIES

Test Report: TLR FCC.12663
Date: April, 1998
FCC ID: ARACET-10

Plot 3.6.2
Out of band emissions test
(analog mode, with modulation)



08:56:46 APR 1, 1998

TELRAD, CET-10, Pr. 12663, SPURIOUS FIELD STRENGTH.

ACTV DET: PEAK

MEAS DET: PEAK QP AVG

MKR 200 kHz

36.07 dBμV

MEASUR
AT MI

ADD
LI

MARKI
↓

MARKI

NE
PE

NEXT
RIG

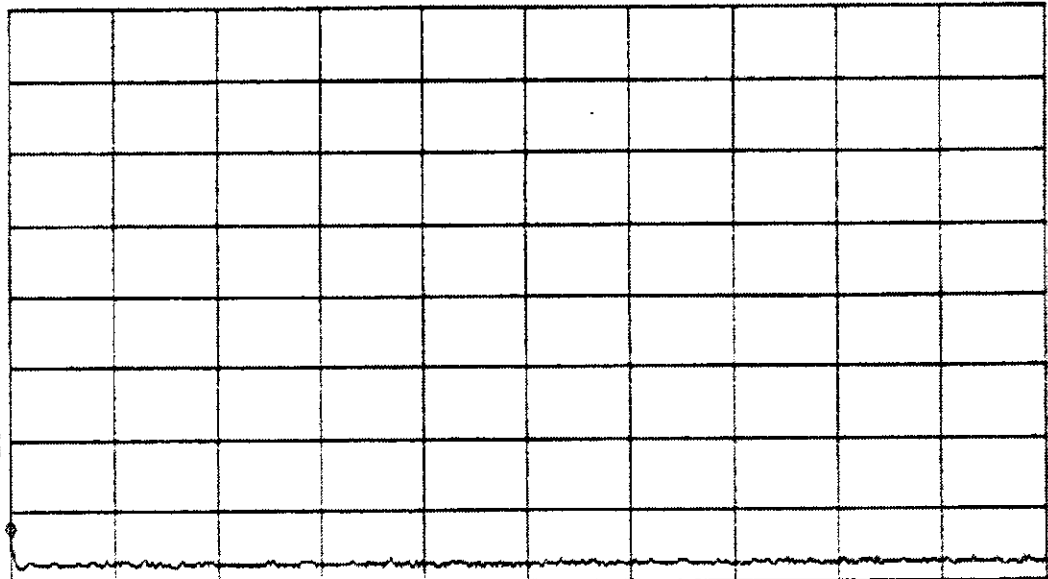
NEXT
LE

Mo
1 of

LOG REF 110.0 dBμV

10
dB/
ATN
30 dB

MA SB
SC FC
CORR



START 200 kHz

#IF BW 30 kHz

AVG BW 30 kHz

STOP 20.00 MHz

SWP 66.0 msec



HERMON LABORATORIES

Test Report: TLR FCC.12663

Date: April, 1998

FCC ID:ARACET-10

Plot 3.6.3
Out of band emissions test
(analog mode, with modulation)



14:31:41 FEB 26, 1998

TELRAD, CET-10, Pr. 12663, SPURIOUS FIELD STRENGTH.

ACTV DET: PEAK

MEAS DET: PEAK QP AVG

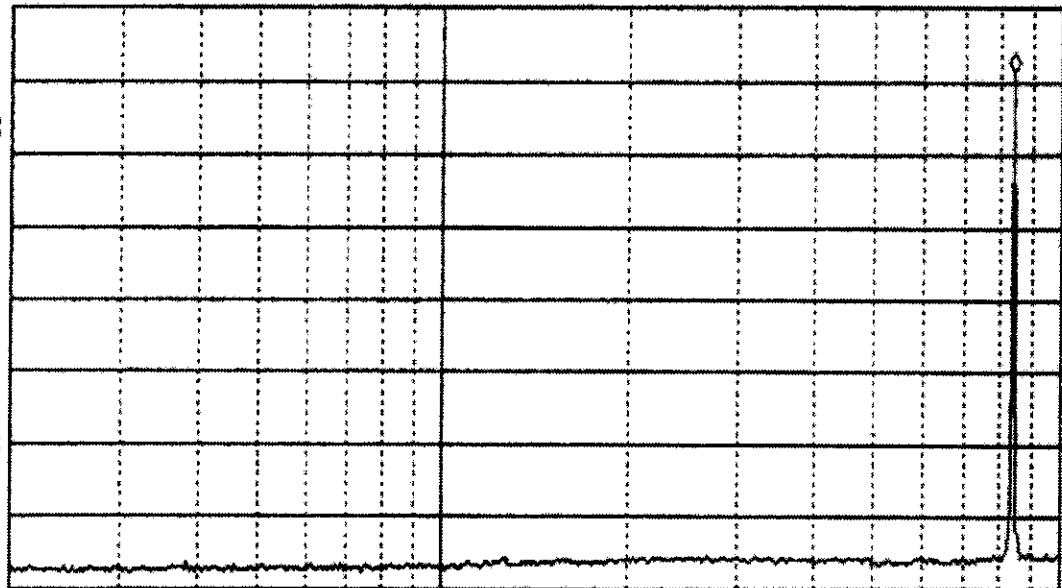
MKR 834.1 MHz

101.10 dBμV

LOG REF 110.0 dBμV

10
dB/
ATN
30 dB

MA SB
SC FC
CORR



START 20.0 MHz

#IF BW 30 kHz

AVG BW 30 kHz

STOP 1.0000 GHz

SWP 3.27 sec

MEAS
AT

ADD
L

CLE
WRITE

HOLD

VIEW

BLANK

Tr
A B

Mc
1 of



HERMON LABORATORIES

Test Report: TLR FCC.12663

Date: April, 1998

FCC ID:ARACET-10

Plot 3.6.4
Out of band emissions test
(analog mode, with modulation)

14:40:41 FEB 26, 1998
TEL RAD, CET-10, Pr. 12663, SPURIOUS FIELD STRENGTH.

ACTV DET: PEAK
MEAS DET: PEAK QP AVG
MKR 839 MHz
100.69 dB μ V

MEASU
AT M

ADD
LI

MARK
↓

MARK

NE
PE

NEXT
RIG

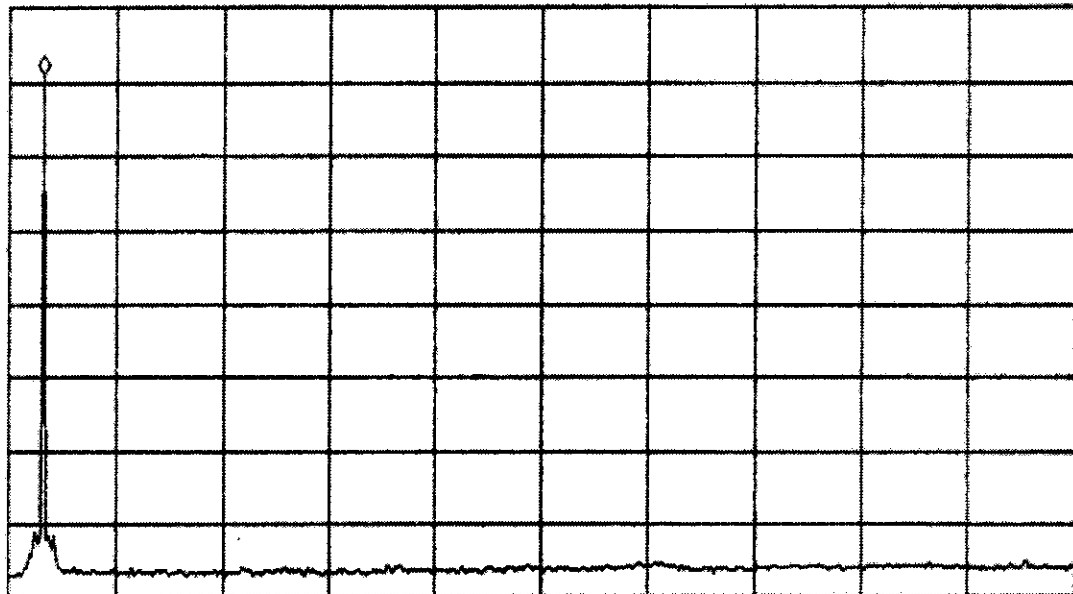
NEXT
LE

No
1 of

LOG REF 110.0 dB μ V

10
dB/
ATN
30 dB

WA SB
SC FC
CORR



START 800 MHz
#IF BW 30 kHz

AVG BW 30 kHz

STOP 2.000 GHz
SWP 4.00 sec



HERMION LABORATORIES

Test Report: TLR FCC.12663

Date: April, 1998

FCC ID: ARACET-10

Plot 3.6.5
Out of band emissions test
(analog mode, with modulation)

09:47:20 APR 1, 1998
TELRAO, CET-10, Pr. 12663, SPURIOUS FIELD STRENGTH.

ACTU DET: PEAK
MEAS DET: PEAK OP AVG
MKR 2.785 GHz
49.43 dBμV

MEASU
AT M

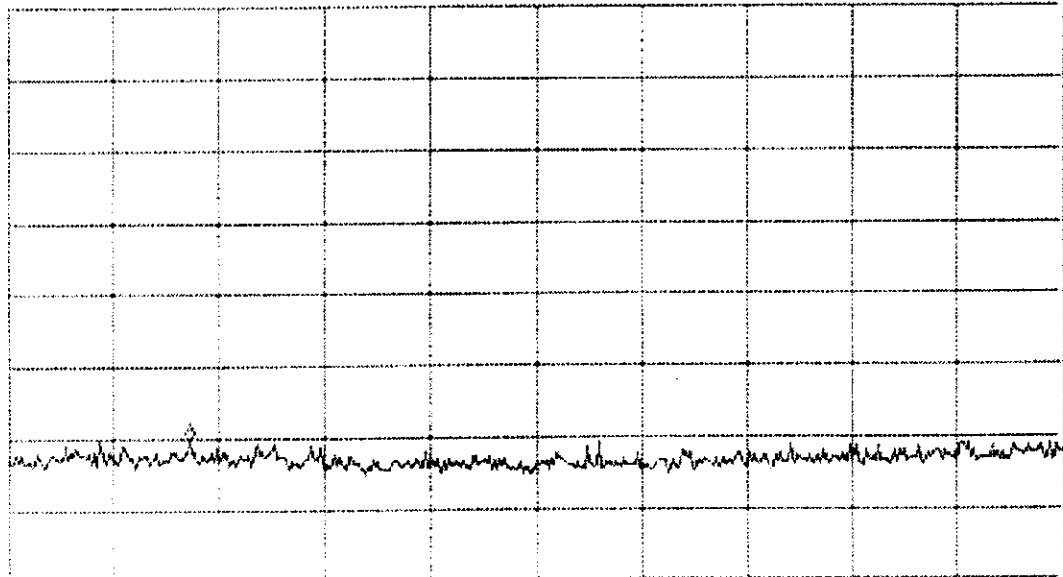
ADD
LJ

LOG REF 110.0 dBμV

PREAMP ON

10
dB
ATN
40 dB

UA SB
SC FC
CORR



START 2.000 GHz

STOP 6.500 GHz

RL #IF BW 1.0 MHz

#AVG BW 1 MHz

SWP 91.6 msec

MARK
↓

MARK

NE
PE

NEXT
RIG

NEXT
LE

Mo

1 of



3.7 Spurious emissions at antenna terminals (except emission mask) test according to Part 2, § 2.991, Part 22, § 22.917(e)

3.7.1 Definition of the test

This test was performed to determine that the mean power of emissions should be attenuated below the mean power of the unmodulated carrier (P) on any frequency by at least $43 + 10\log(P \text{ in watts})$ dB.

3.7.2 The test set-up configuration

The test setup is the same as in Test 3.1.

3.7.3 Test results

To detect spurious emissions the test was performed with transmitter operating with modulation at 3 carrier frequencies 824.04, 836.49, 848.97 MHz in analog MMS and digital mode. The measurements were performed in frequency range from 10 kHz to 150 kHz and from twice the fundamental frequency up to 23 GHz.

The test results are given in Plots 3.7.1 to 3.7.24. All measured spurious signals were more than 45 dB below carrier.

Reference numbers of test equipment used

HL 0507	HL 0557	HL 0577	HL 0604			
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Full description is given in Appendix A.



HERMON LABORATORIES

Test Report: TLR FCC.12663

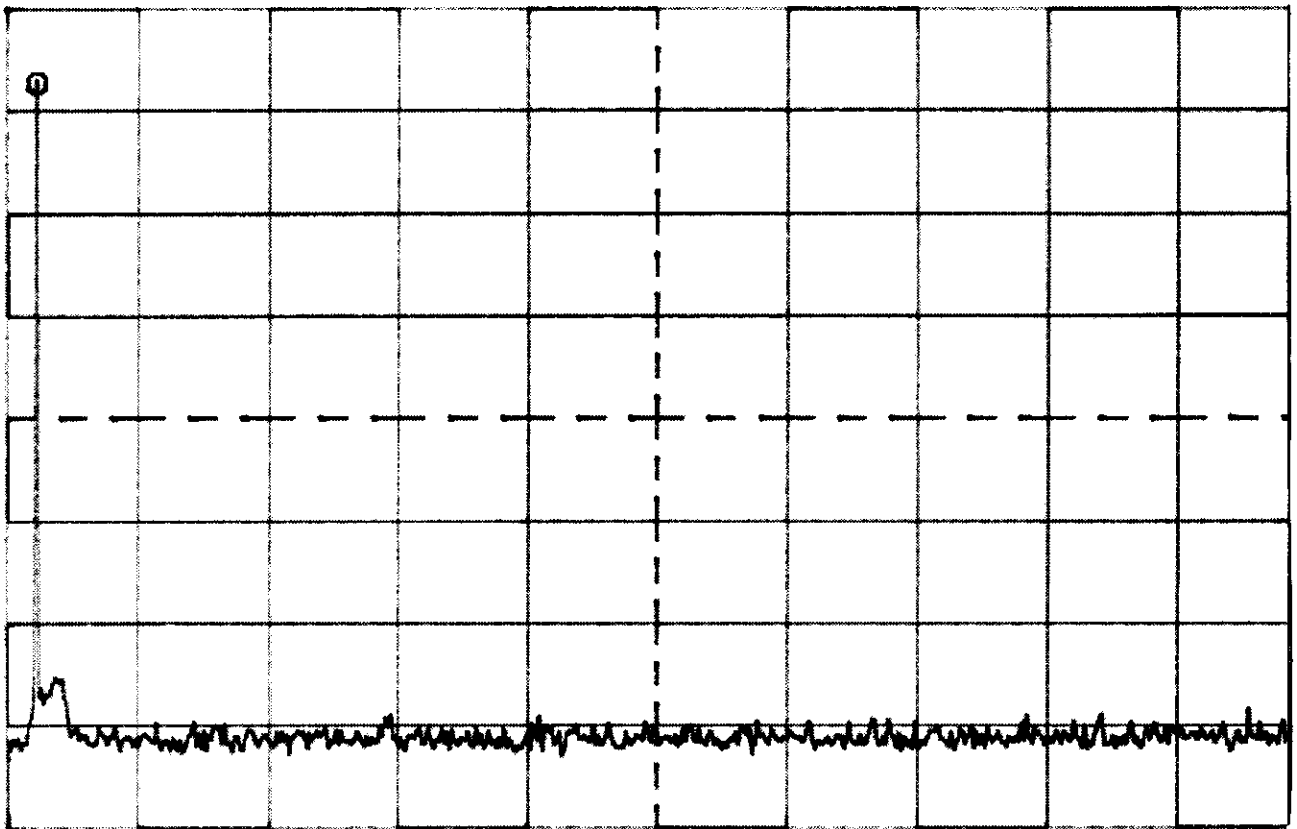
Date: April, 1998

FCC ID: ARACET-10

Plot 3.7.1
Spurious emissions at antenna terminals test
MMS analog mode, 824.04 MHz frequency

MK: 826.4MHz - 7.0dBm

F: 800M- 2000MHz RL: + 0 dBm 10dB/ 1-

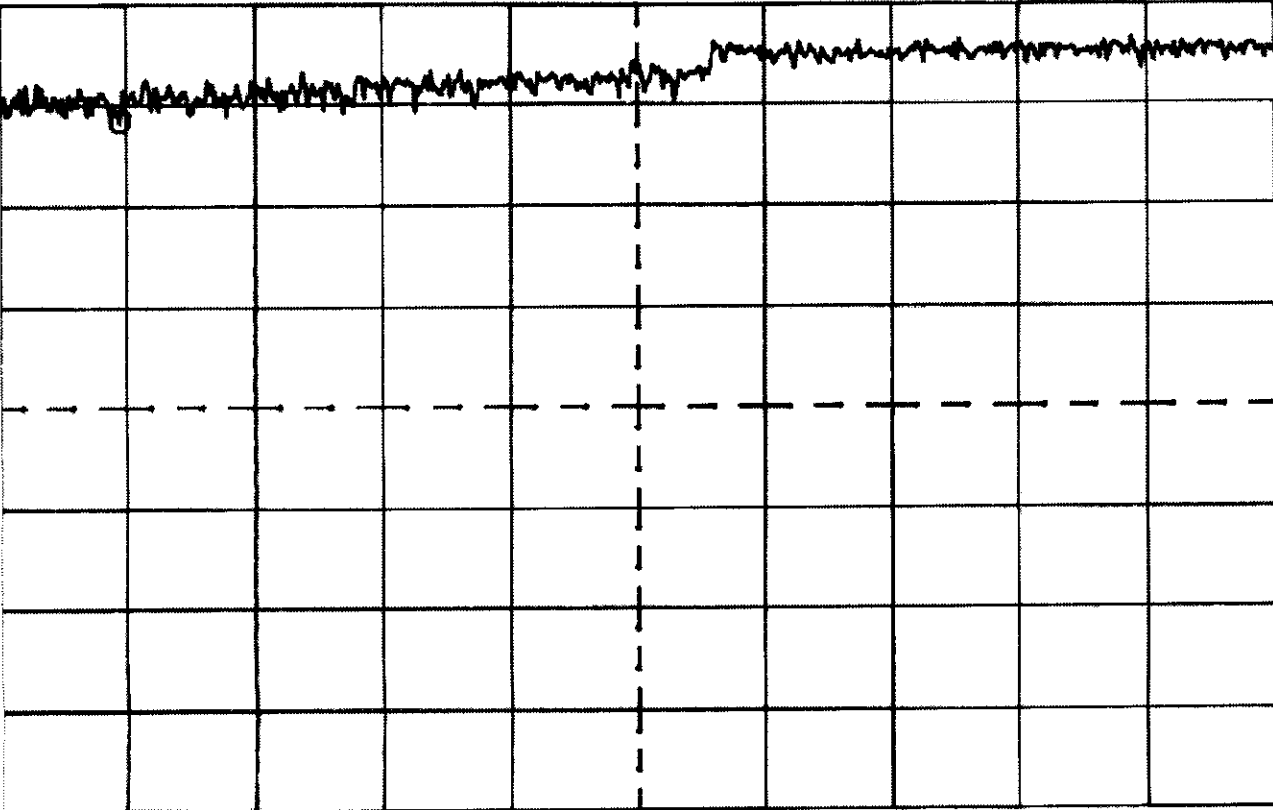


RBW: 30kHz VBW: 100kHz@ SWP: 800mS/@ ATT: 20dB

RH

7/16

RBW: 30kHz VBW: 100kHz SWP: ***** ATT: 10dB



F: 1.906- 10.000GHz RL: + 0 dBm 10dB/ 1-

MK: 9.2224GHz - 68.2dBm

Plot 3.7.2
Spurious emissions at antenna terminals test
MMS analog mode, 824.04 MHz frequency





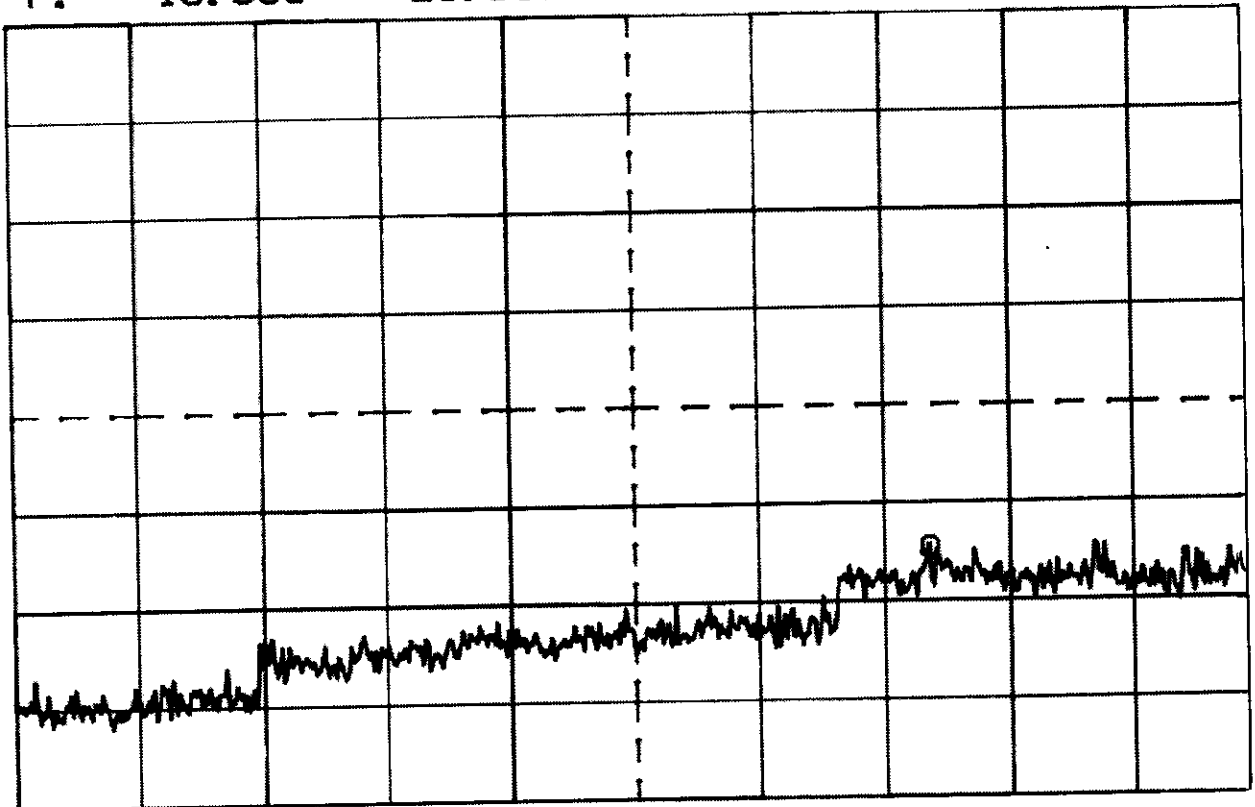
HERMON LABORATORIES

Test Report: TLR FCC.12663
Date: April, 1998
FCC ID: ARACET-10

Plot 3.7.3
Spurious emissions at antenna terminals test
MMS analog mode, 824.04 MHz frequency

MK: 19.5680GHz - 54.3dBm

F: 10.00G- 23.00GHz RL: + 0 dBm 10dB/ 3+

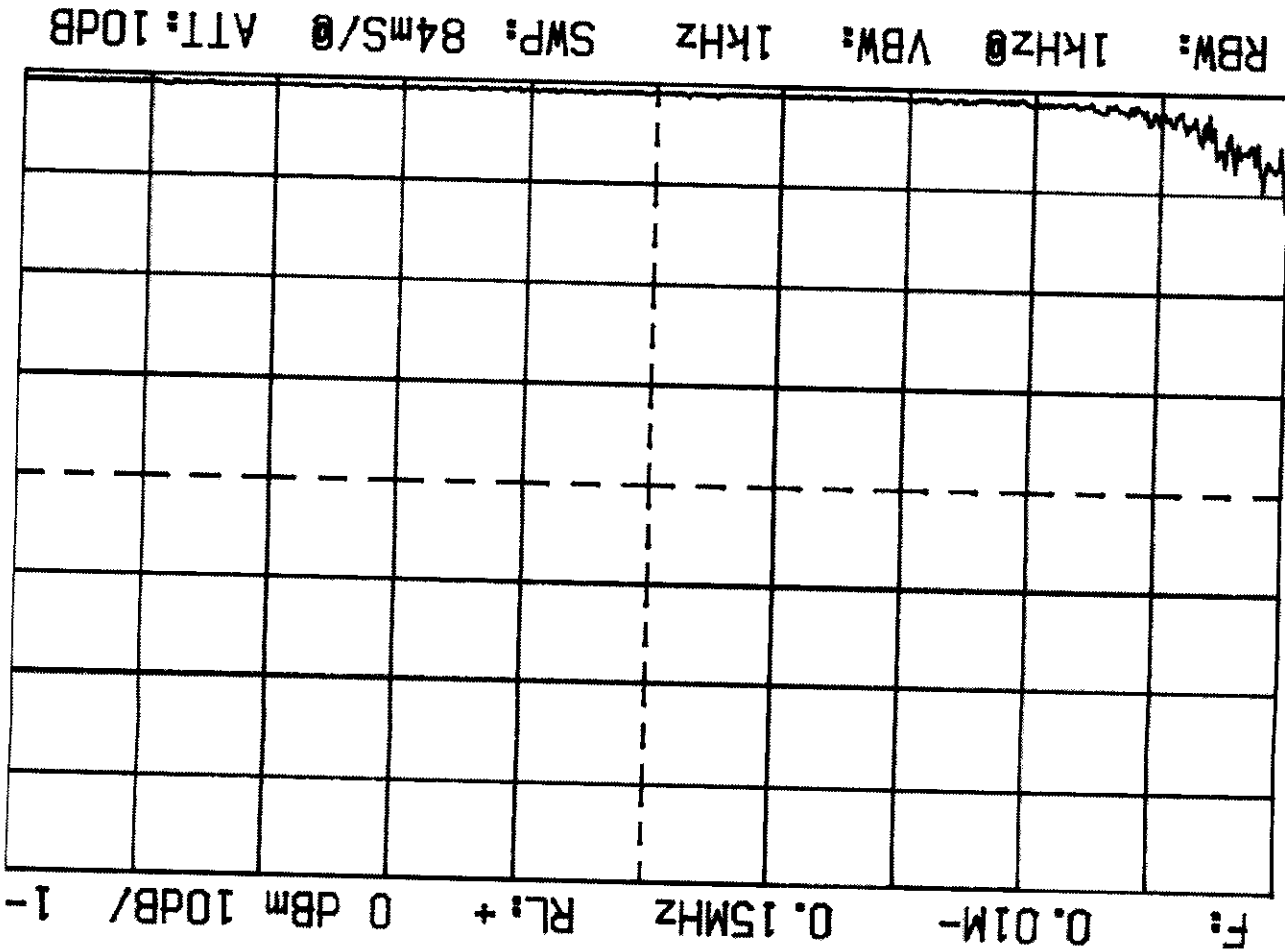


RBW: 30kHz VBW: 30kHz SWP: *****@ ATT: 10dB

BH



Plot 3.7.4
Spurious emissions at antenna terminals test
MMS analog mode, 824.04 MHz frequency



RH



HERMION LABORATORIES

Test Report: TLR FCC.12663

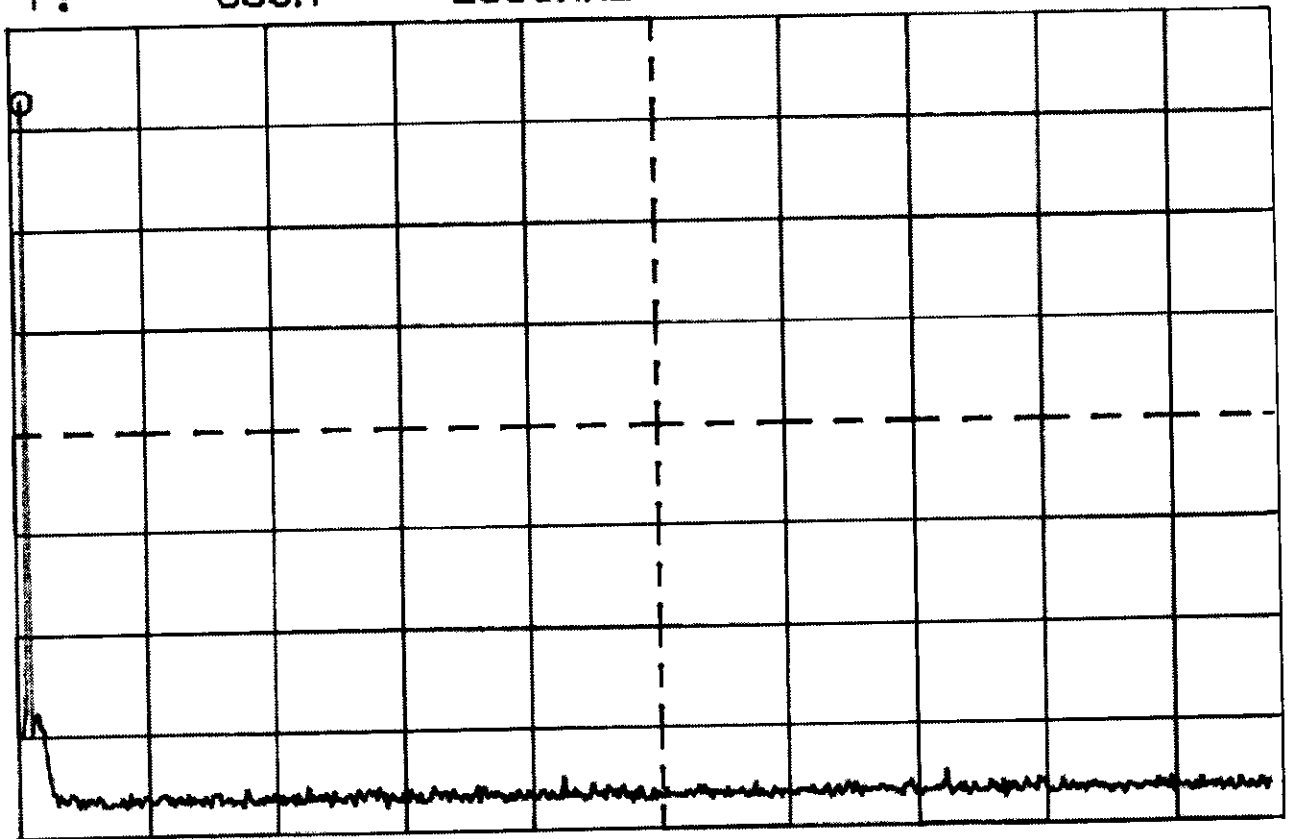
Date: April, 1998

FCC ID: ARACET-10

Plot 3.7.5
Spurious emissions at antenna terminals test
MMS analog mode, 836.49 MHz frequency

MK: 839.3MHz - 7.1dBm

F: 830M- 2000MHz RL: + 0 dBm 10dB/ 1-



RBW: 30kHz VBW: 30kHz SWP: 780mS/0 ATT: 10dB

241



HERMON LABORATORIES

Test Report: TLR FCC.12663

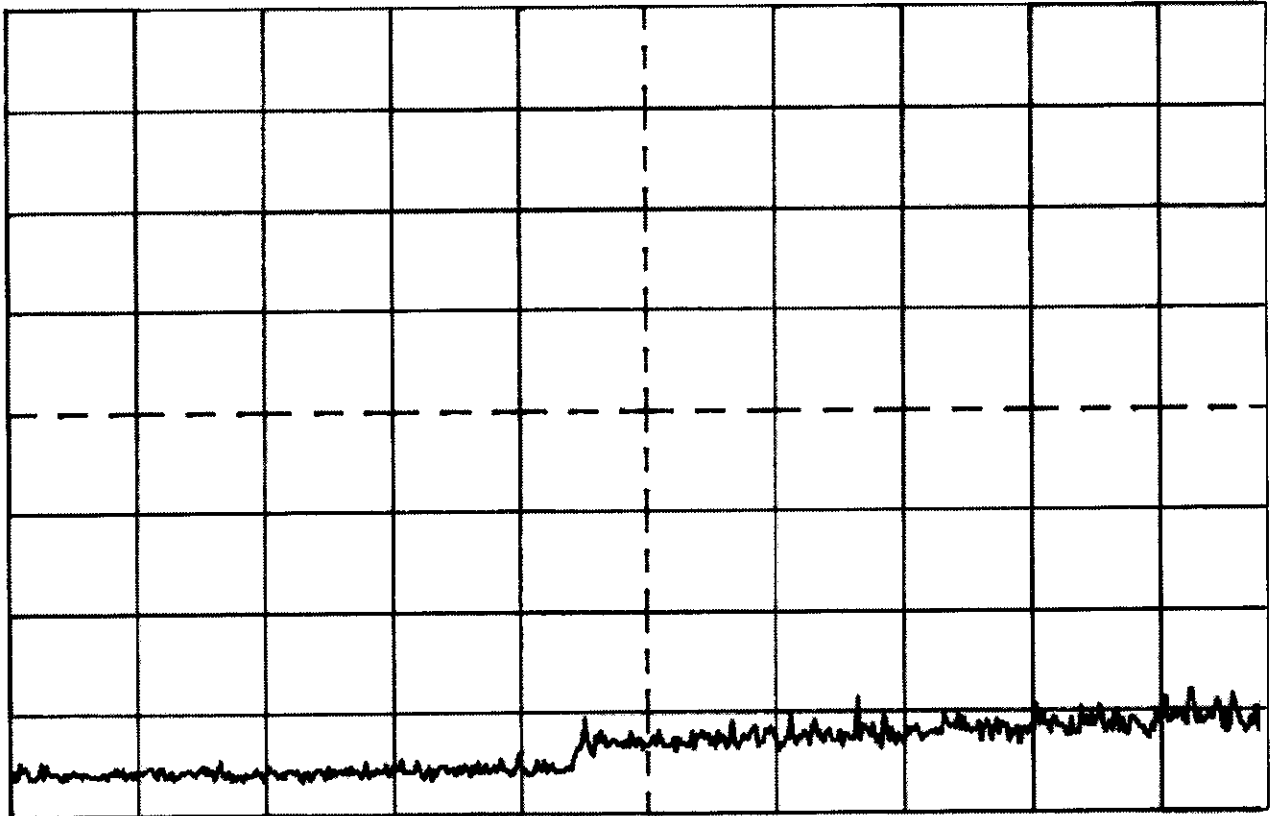
Date: April, 1998

FCC ID: ARACET-10

Plot 3.7.6
Spurious emissions at antenna terminals test
MMS analog mode, 836.49 MHz frequency

MK: 10.0000GHz - 67.6dBm

F: 1.90G- 10.00GHz RL: + 0 dBm 10dB/ 2+



RBW: 30kHz VBW: 30kHz SWP: *****@ ATT: 10dB

24



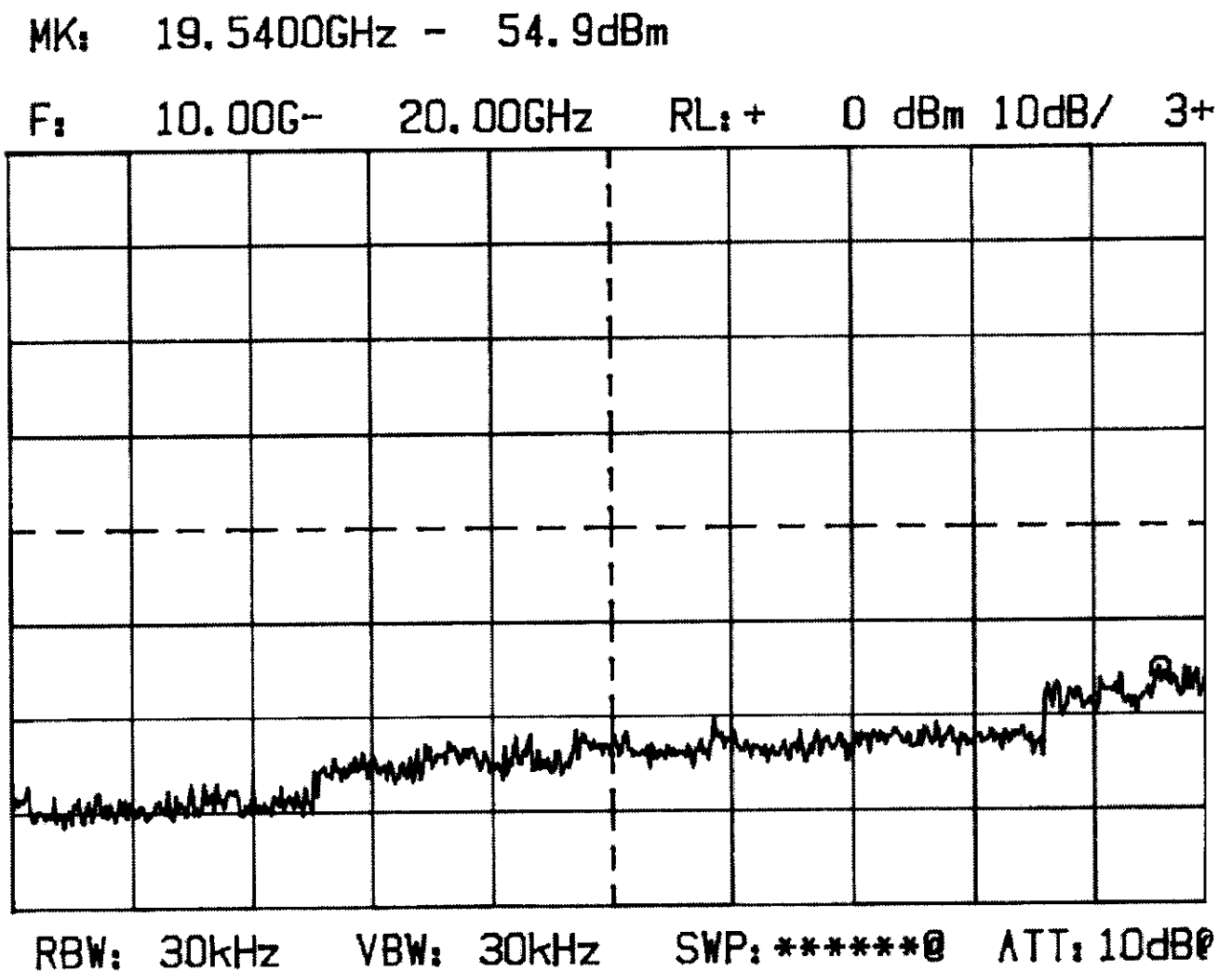
HERMON LABORATORIES

Test Report: TLR FCC.12663

Date: April, 1998

FCC ID: ARACET-10

Plot 3.7.7
Spurious emissions at antenna terminals test
MMS analog mode, 836.49 MHz frequency





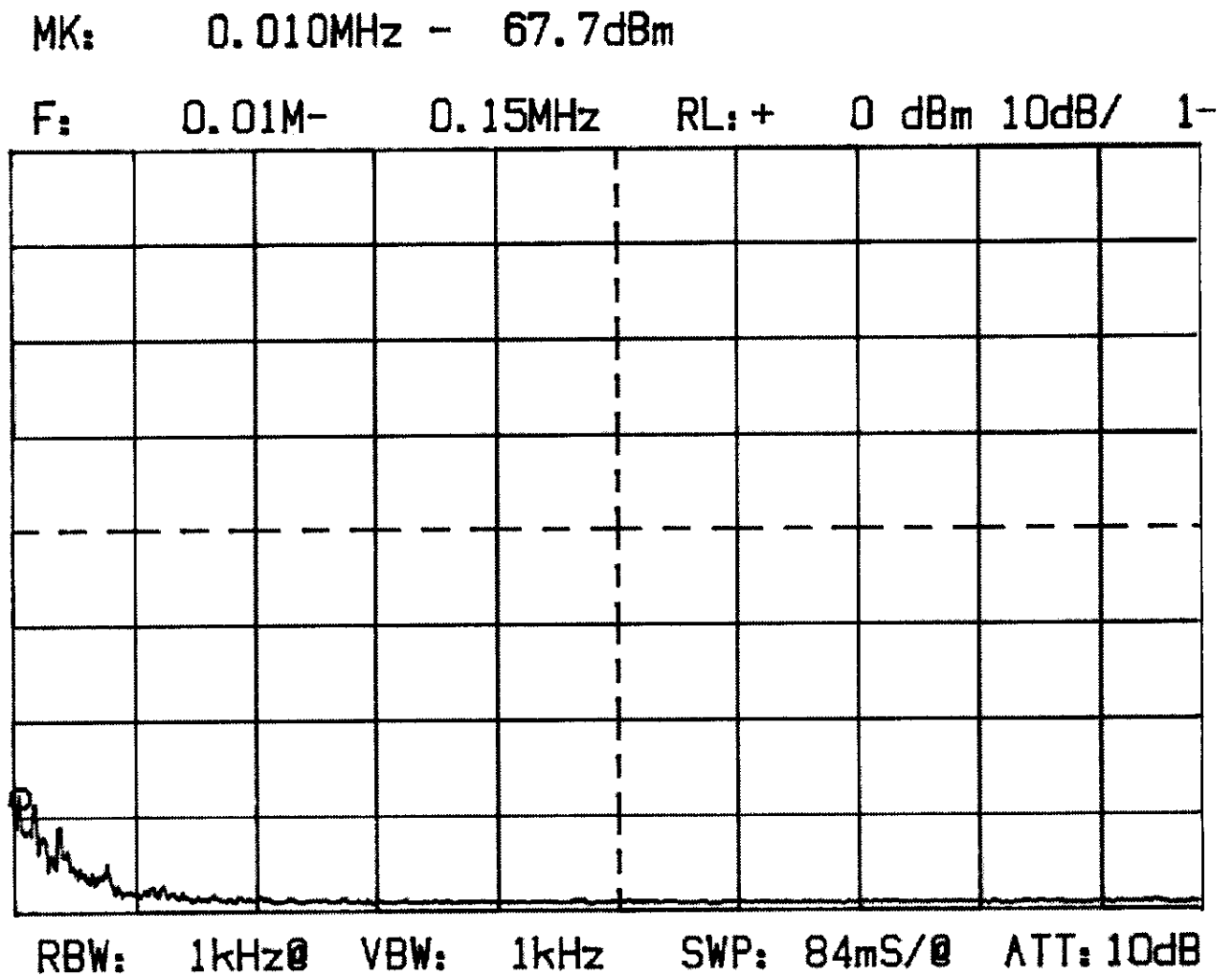
HERMON LABORATORIES

Test Report: TLR FCC.12663

Date: April, 1998

FCC ID: ARACET-10

Plot 3.7.8
Spurious emissions at antenna terminals test
MMS analog mode, 836.49 MHz frequency



254



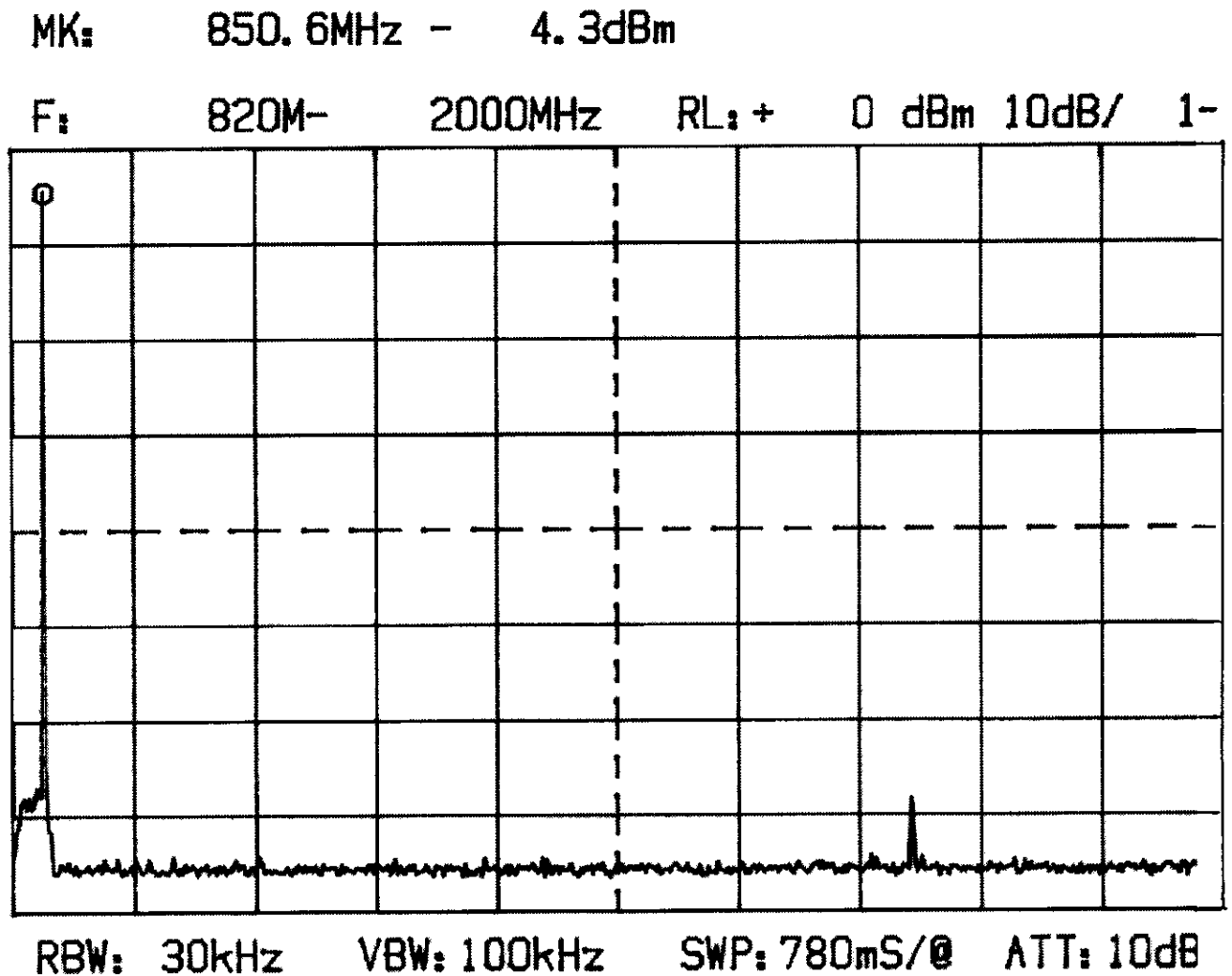
HERMION LABORATORIES

Test Report: TLR FCC.12663

Date: April, 1998

FCC ID: ARACET-10

Plot 3.7.9
Spurious emissions at antenna terminals test
MMS analog mode, 848.97 MHz frequency



PH



HERMON LABORATORIES

Test Report: TLR FCC.12663

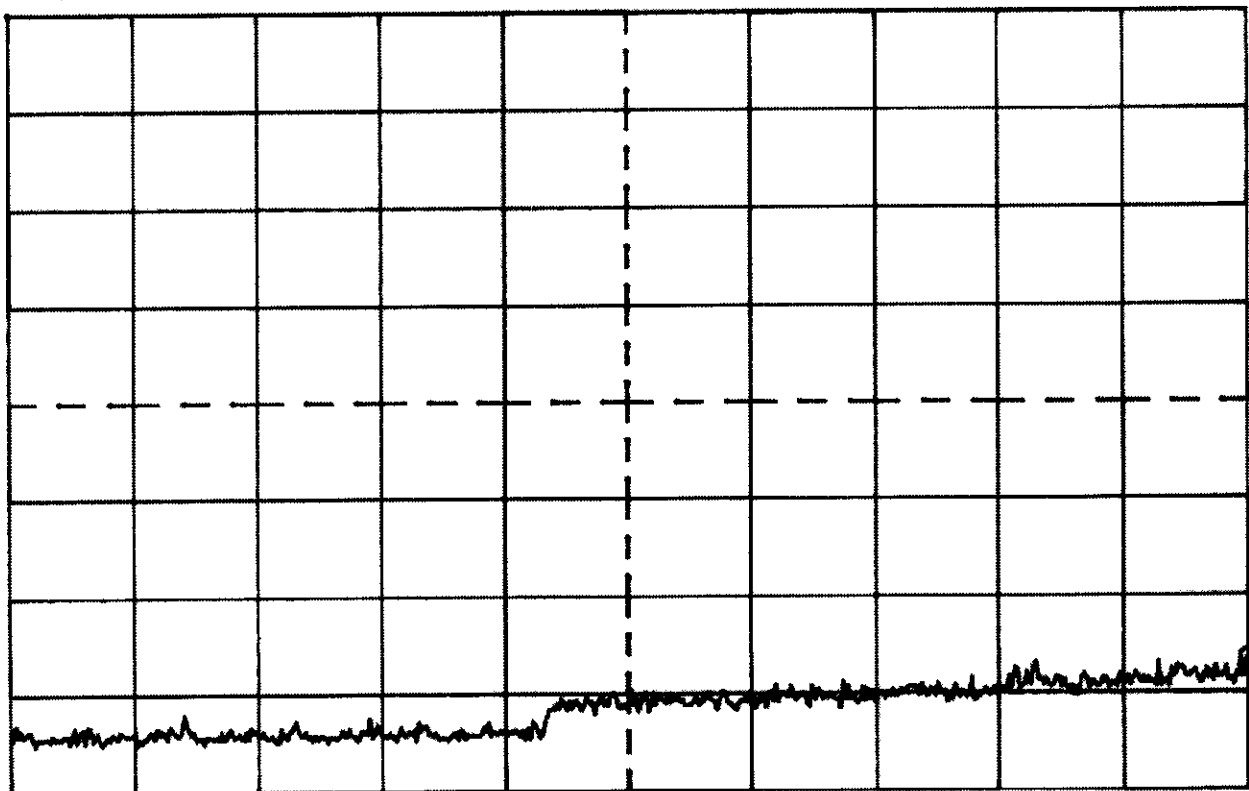
Date: April, 1998

FCC ID: ARACET-10

Plot 3.7.10
Spurious emissions at antenna terminals test
MMS analog mode, 848.97 MHz frequency

MK: 10.0000GHz - 66.4dBm

F: 2.00G- 10.00GHz RL: + 0 dBm 10dB/ 1-



RBW: 30kHz VBW: 100kHz SWP: *****@ ATT: 10dB@

244



HERMON LABORATORIES

Test Report: TLR FCC.12663

Date: April, 1998

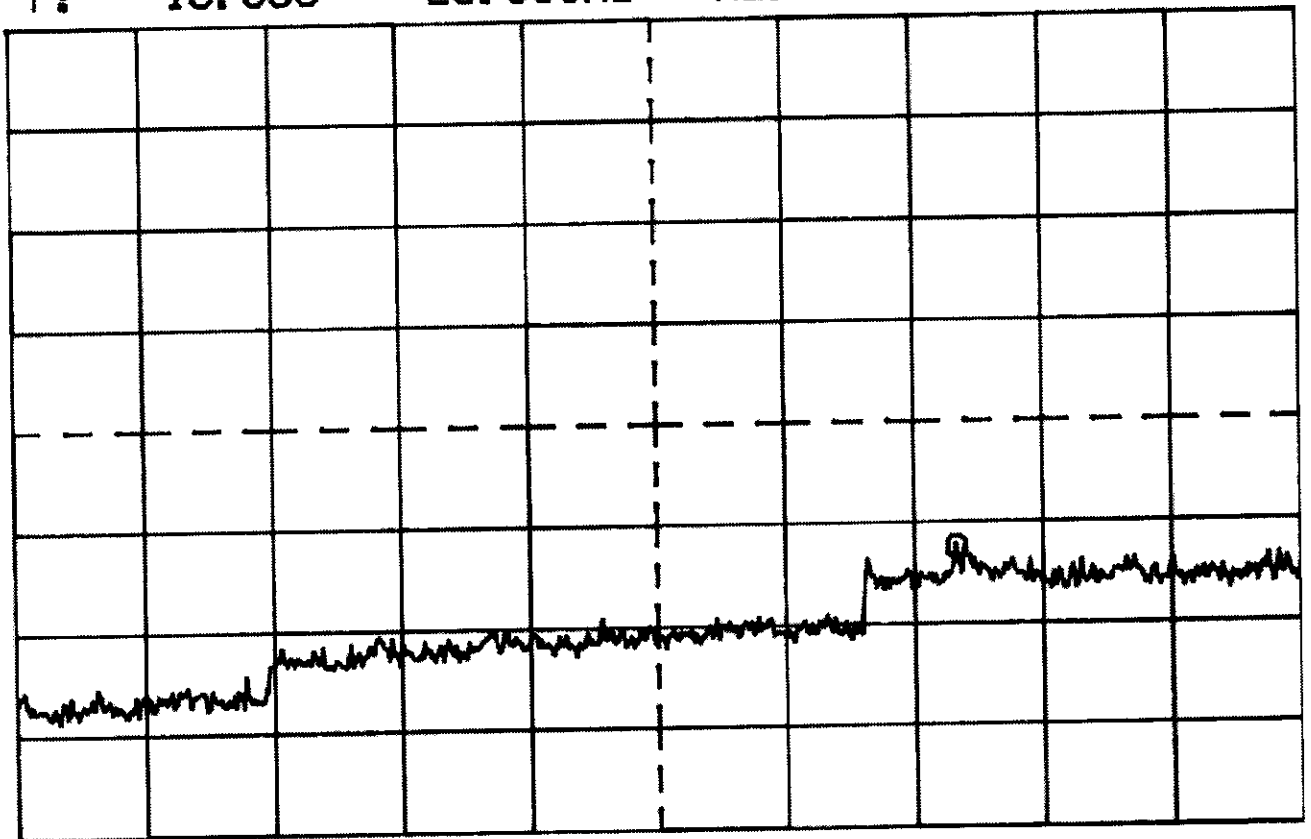
FCC ID: ARACET-10

Plot 3.7.11

Spurious emissions at antenna terminals test
MMS analog mode, 848.97 MHz frequency

MK: 19.5160GHz - 52.2dBm

F: 10.00G- 23.00GHz RL: + 0 dBm 10dB/ 2+



RBW: 30kHz VBW: 100kHz SWP: *****@ ATT: 10dB@



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Test Report: TLR FCC.12663

Date: April, 1998

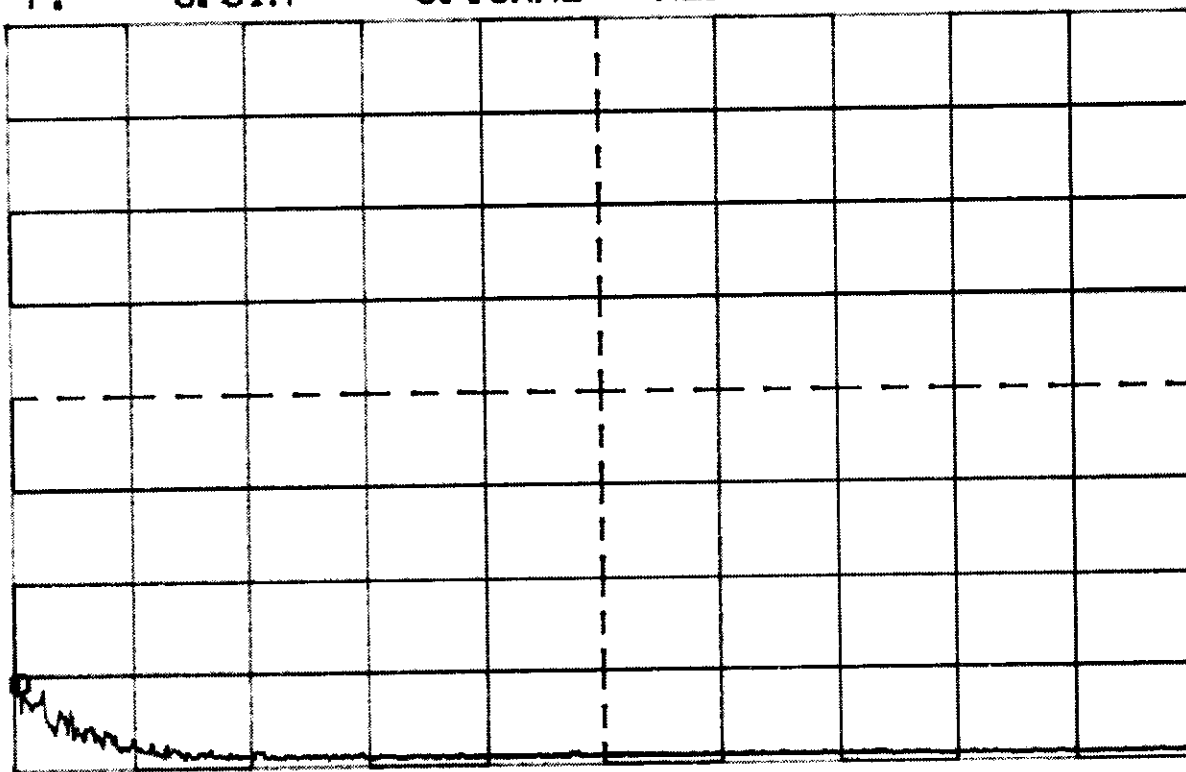
FCC ID: ARACET-10

Plot 3.7.12

Spurious emissions at antenna terminals test
MMS analog mode, 848.97 MHz frequency

MK: 0.010MHz - 70.5dBm

F: 0.01M- 0.15MHz RL: + 0 dBm 10dB/ 1-



RBW: 1kHz VBW: 1kHz SWP: 84mS/0 ATT: 10dB

Pitt



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Test Report: TLR FCC.12663

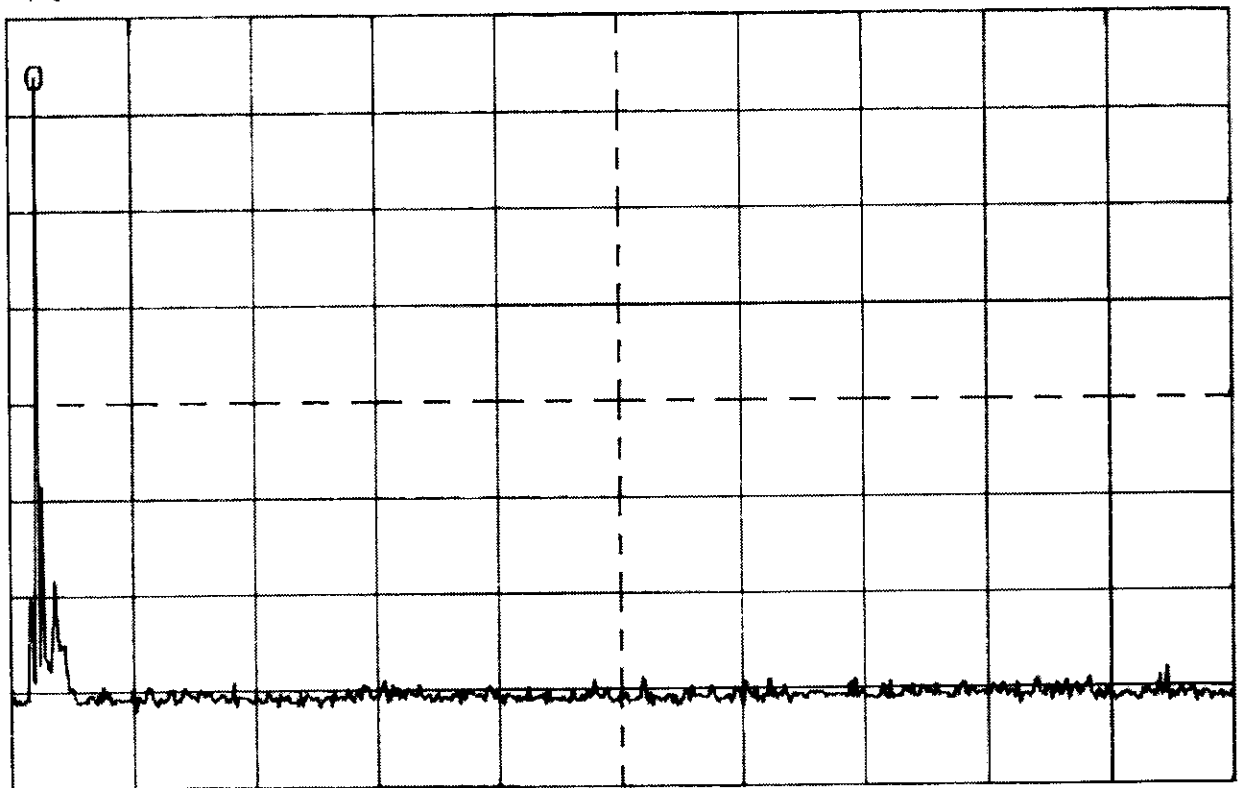
Date: April, 1998

FCC ID: ARACET-10

Plot 3.7.13
Spurious emissions at antenna terminals test
digital mode, 824.04 MHz frequency

MK: 826.4MHz - 6.0dBm

F: 800M- 2000MHz RL: + 0 dBm 10dB/ 1-



RBW: 30kHz VBW: 30kHz SWP: 800mS/@ ATT: 20dB

Pitt



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Test Report: TLR FCC.12663

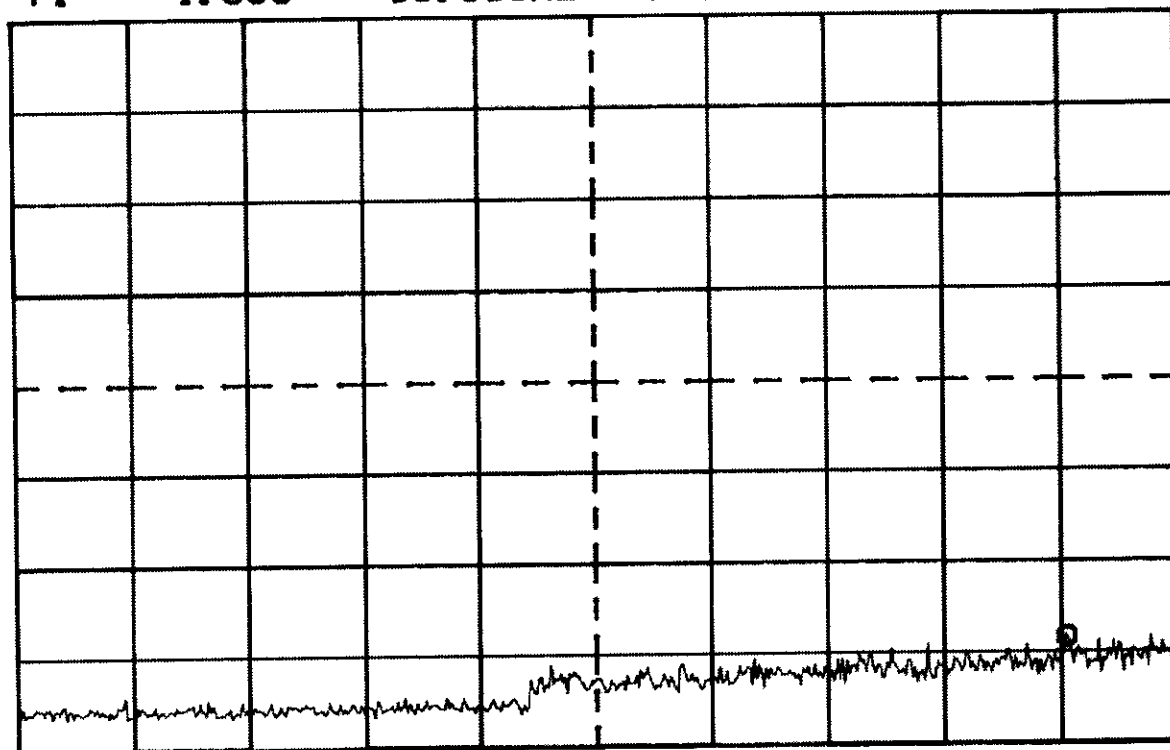
Date: April, 1998

FCC ID: ARACET-10

Plot 3.7.14
Spurious emissions at antenna terminals test
digital mode, 824.04 MHz frequency

MK: 9.2224GHz - 68.1dBm

F: 1.90G- 10.00GHz RL: + 0 dBm 10dB/ 1-



RBW: 30kHz VBW: 30kHz SWP: *****@ ATT: 10dB@



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Test Report: TLR FCC.12663

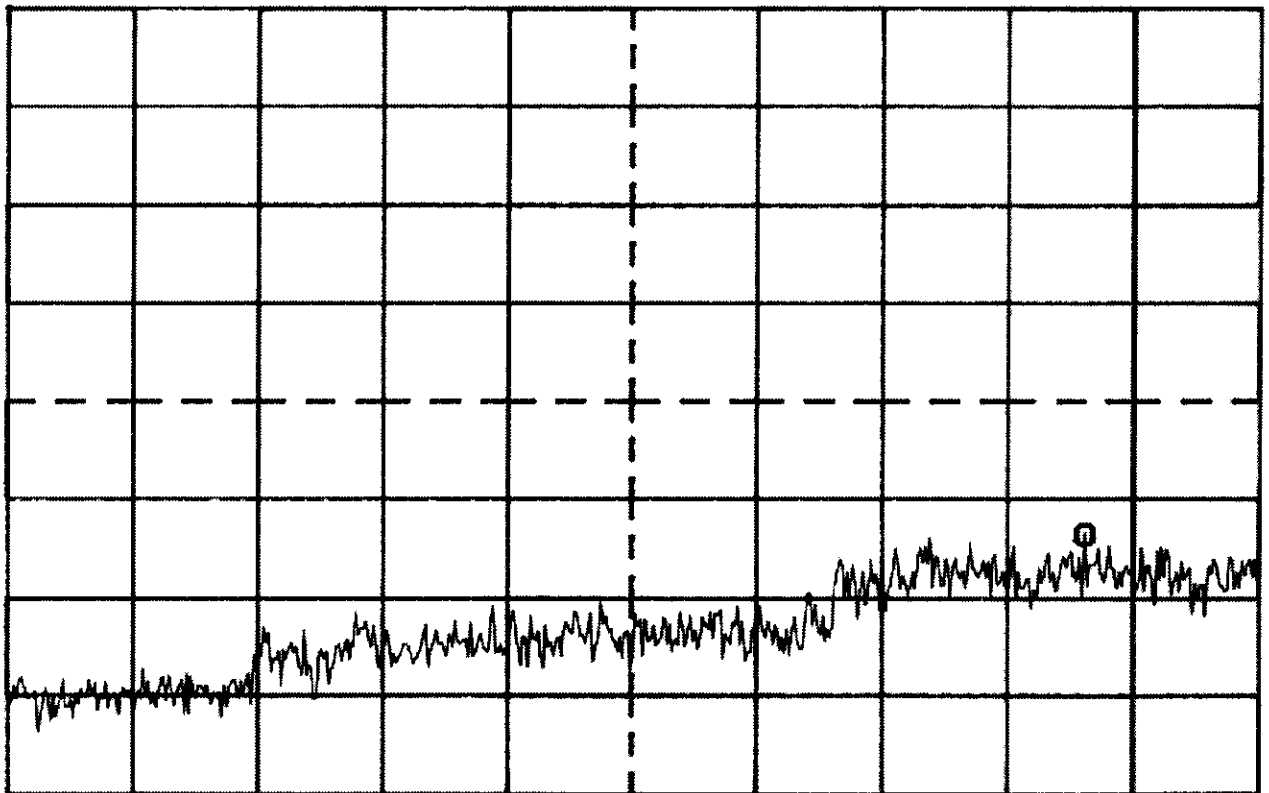
Date: April, 1998

FCC ID: ARACET-10

Plot 3.7.15
Spurious emissions at antenna terminals test
digital mode, 824.04 MHz frequency

MK: 21.1800GHz - 63.4dBm

F: 10.00G- 23.00GHz RL: - 10 dBm 10dB/ 2+



RBW: 30kHz VBW: 30kHz SWP: *****@ ATT: 10dB@

244



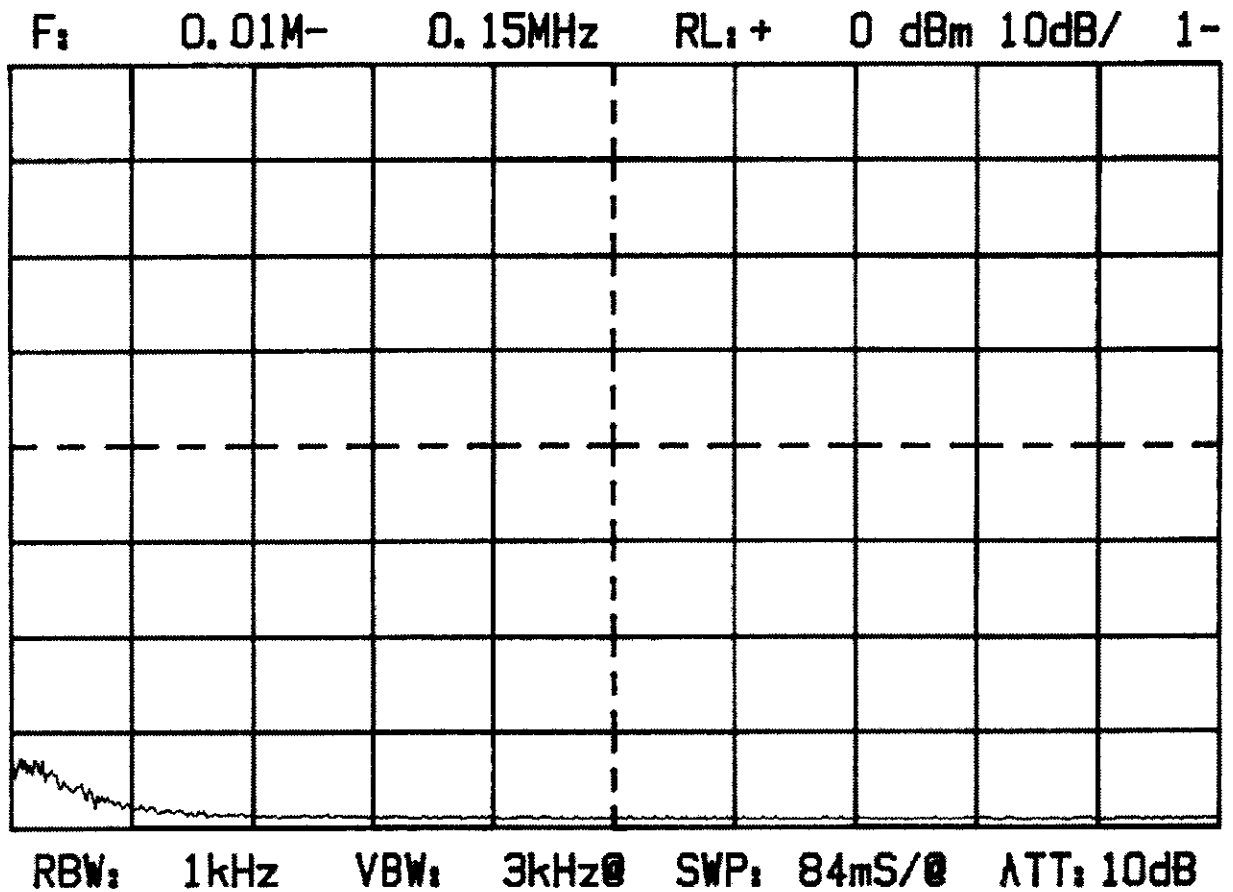
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Test Report: TLR FCC.12663

Date: April, 1998

FCC ID:ARACET-10

Plot 3.7.16
Spurious emissions at antenna terminals test
digital mode, 824.04 MHz frequency





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Test Report: TLR FCC.12663

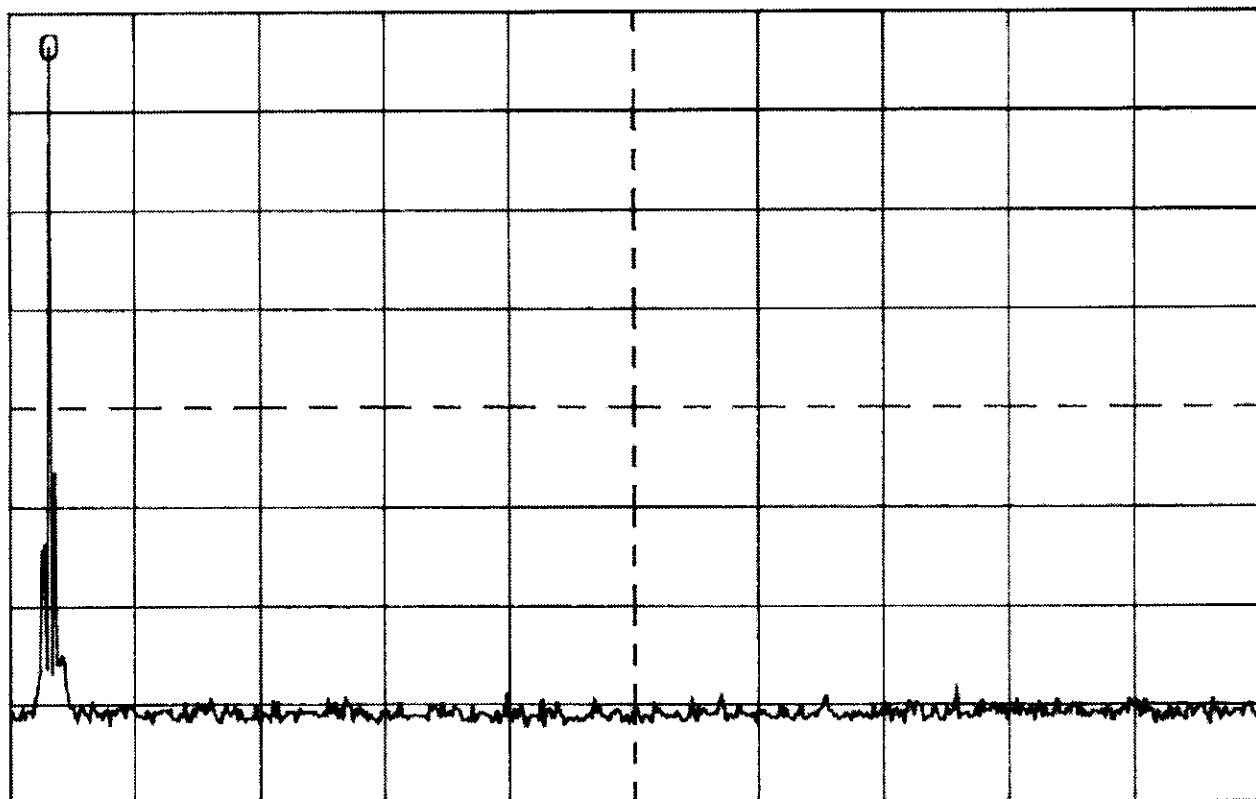
Date: April, 1998

FCC ID: ARACET-10

Plot 3.7.17
Spurious emissions at antenna terminals test
digital mode, 836.49 MHz frequency

MK: 838.4MHz - 3.4dBm

F: 800M- 2000MHz RL: + 0 dBm 10dB/ 1-



RBW: 30kHz VBW: 30kHz SWP: 800mS/@ ATT: 20dB

RH



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Test Report: TLR FCC.12663

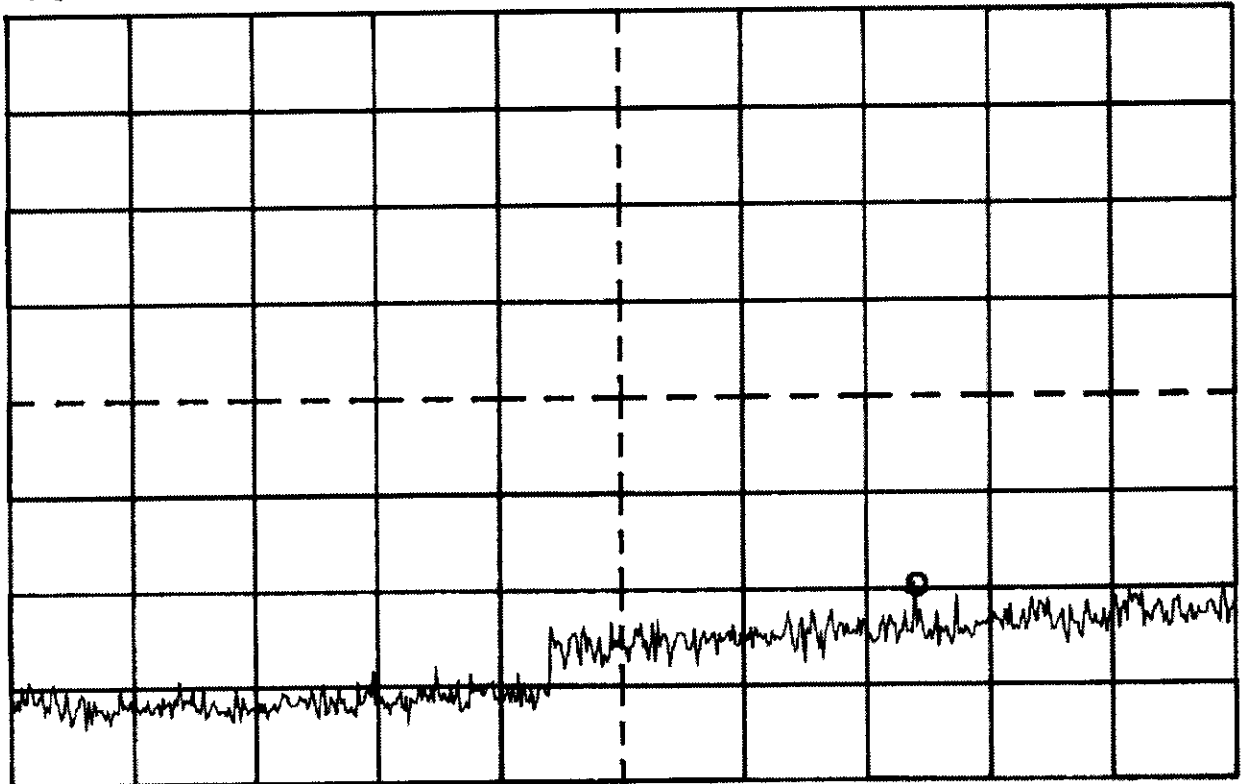
Date: April, 1998

FCC ID: ARACET-10

Plot 3.7.18
Spurious emissions at antenna terminals test
digital mode, 836.49 MHz frequency

MK: 7.8940GHz - 69.4dBm

F: 1.90G- 10.00GHz RL: - 10 dBm 10dB/ 2+



RBW: 30kHz VBW: 30kHz SWP: *****@ ATT: 10dB

2/11



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Test Report: TLR FCC.12663

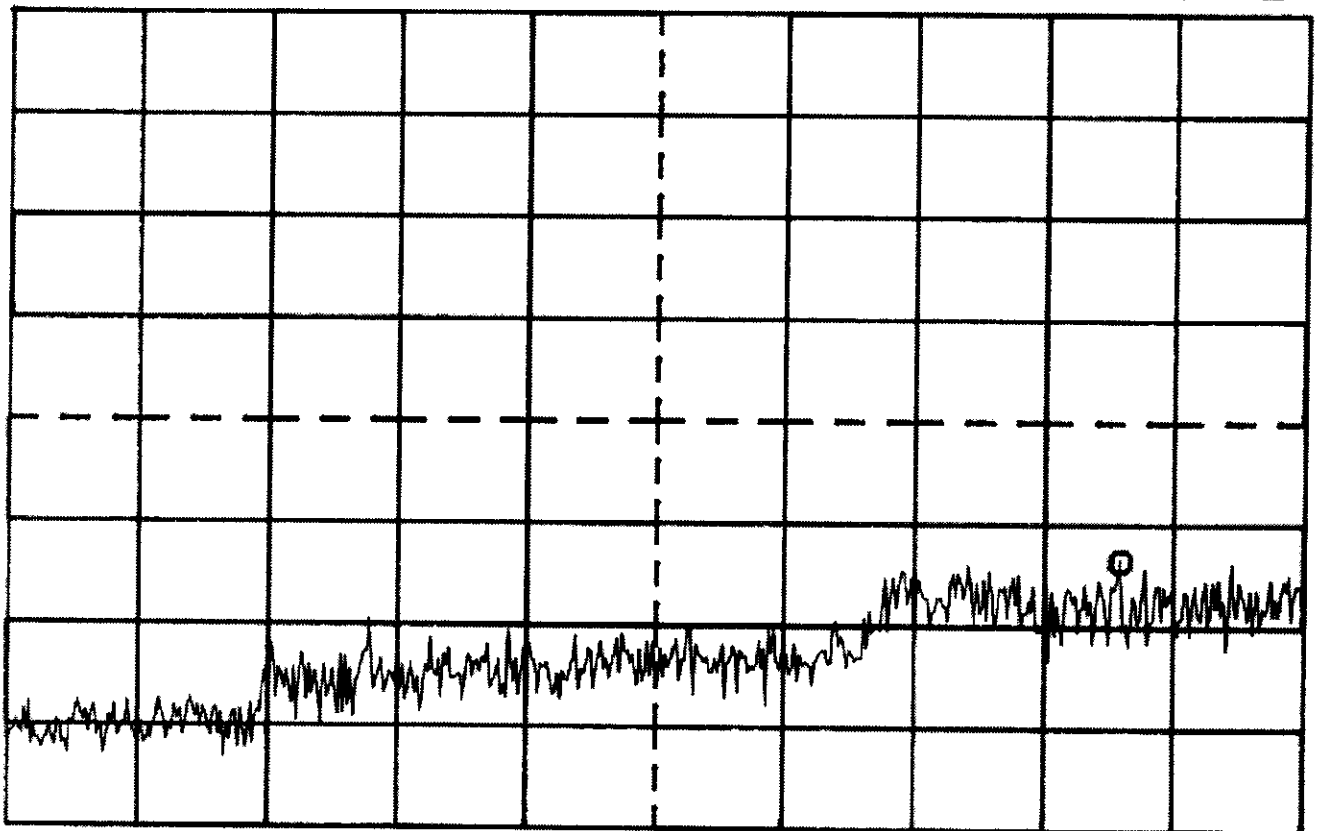
Date: April, 1998

FCC ID: ARACET-10

Plot 3.7.19
Spurious emissions at antenna terminals test
digital mode, 836.49 MHz frequency

MK: 21.1540GHz - 63.3dBm

F: 10.00G- 23.00GHz RL: - 10 dBm 10dB/ 2+



RBW: 30kHz VBW: 30kHz SWP: *****@ ATT: 10dB@

241



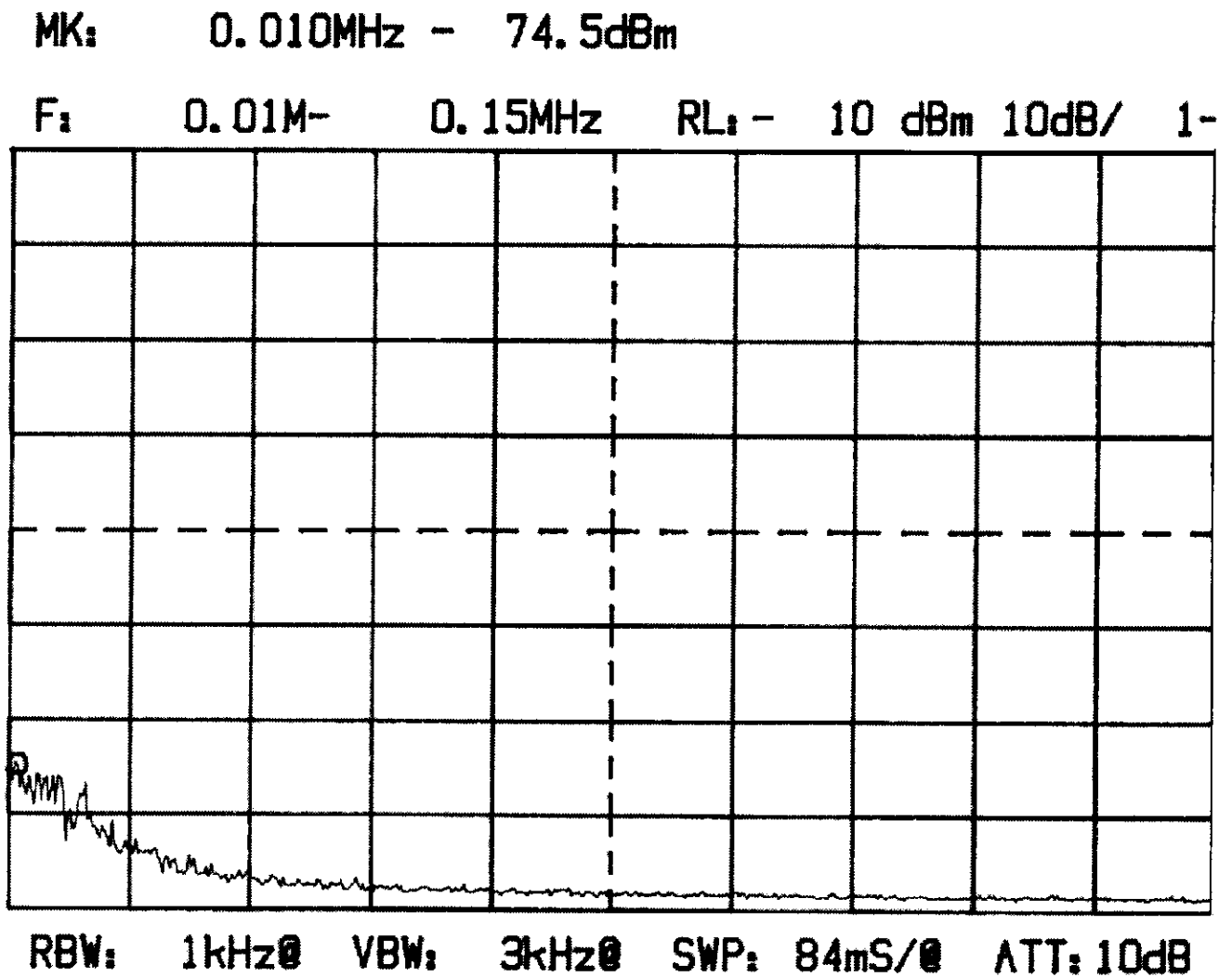
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Test Report: TLR FCC.12663

Date: April, 1998

FCC ID:ARACET-10

Plot 3.7.20
Spurious emissions at antenna terminals test
digital mode, 836.49 MHz frequency



24



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Test Report: TLR FCC.12663

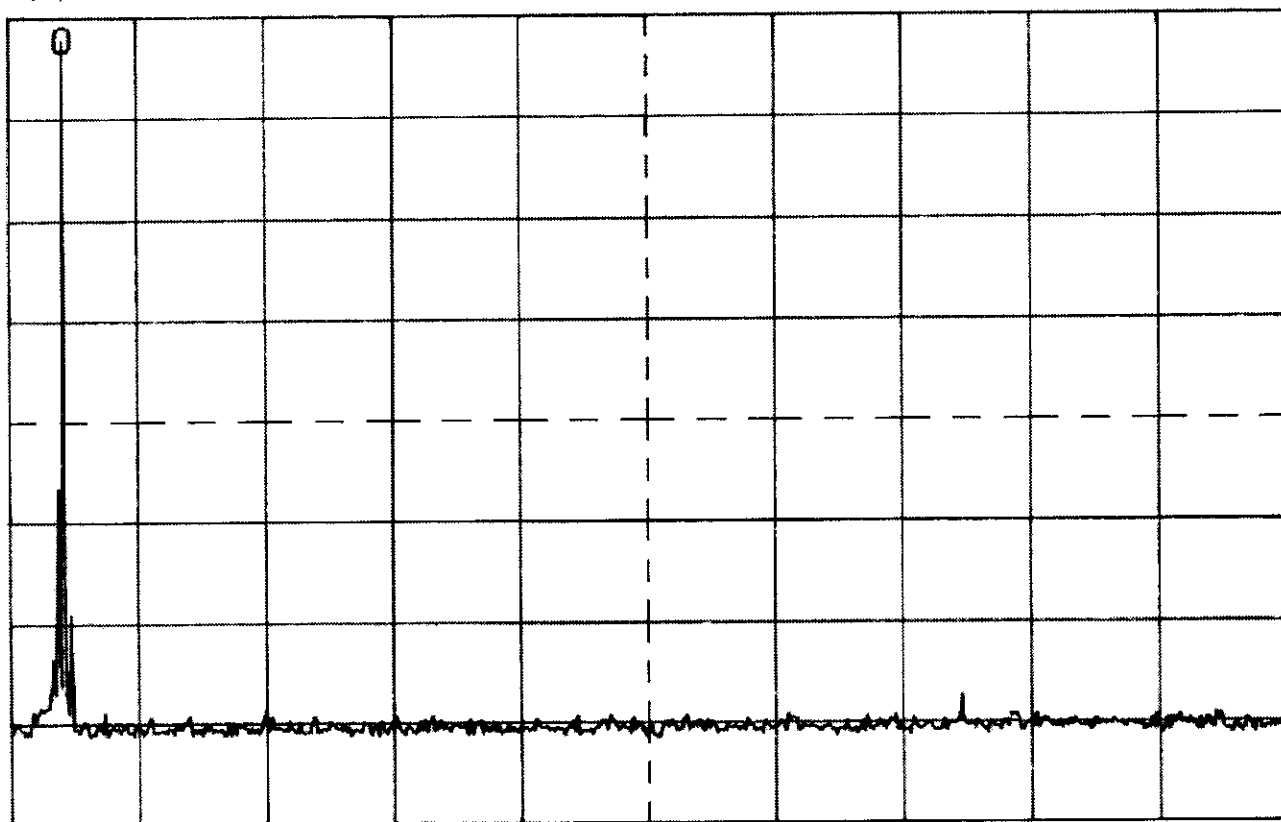
Date: April, 1998

FCC ID: ARACET-10

Plot 3.7.21
Spurious emissions at antenna terminals test
digital mode, 848.97 MHz frequency

MK: 850.4MHz - 2.1dBm

F: 800M- 2000MHz RL: + 0 dBm 10dB/ 1-



RBW: 30kHz VBW: 30kHz SWP: 800mS/@ ATT: 20dB

BH



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Test Report: TLR FCC.12663

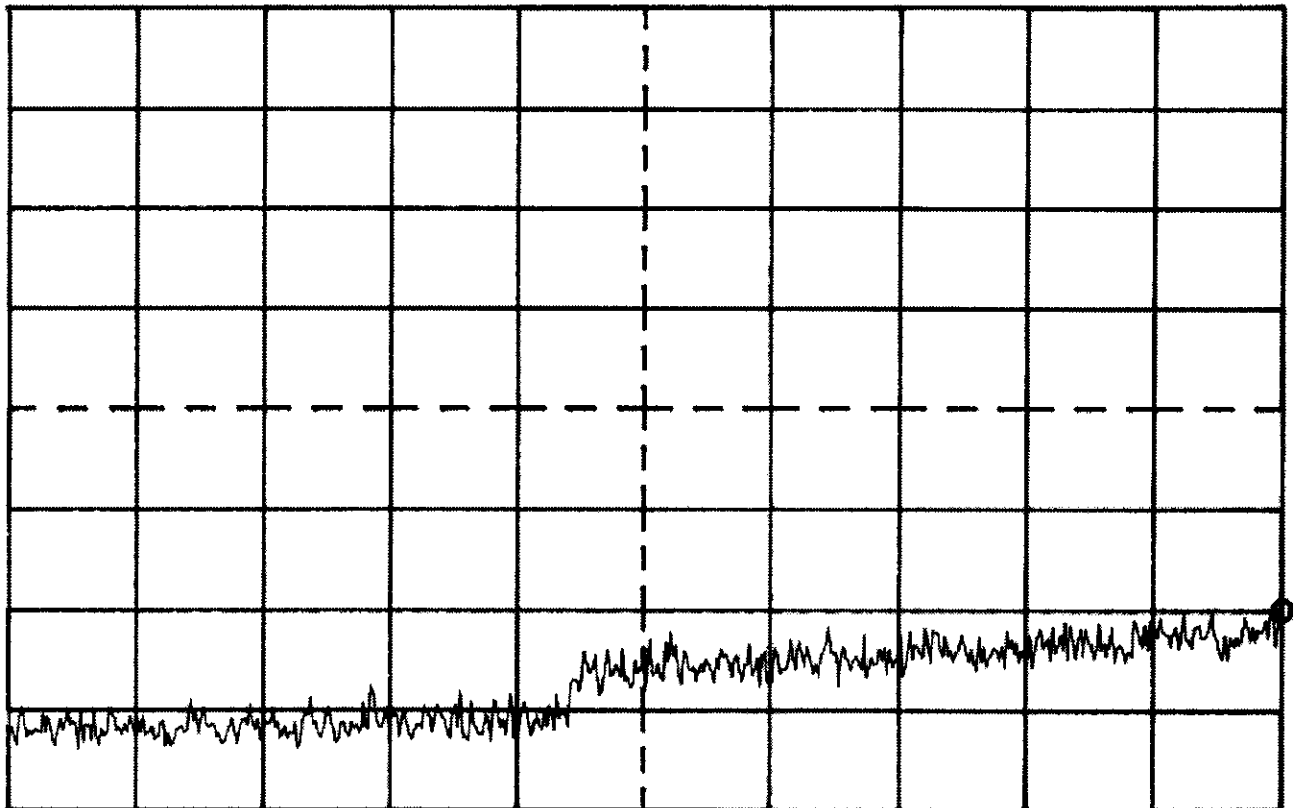
Date: April, 1998

FCC ID: ARACET-10

Plot 3.7.22
Spurious emissions at antenna terminals test
digital mode, 848.97 MHz frequency

MK: 10.0000GHz - 69.8dBm

F: 1.90G- 10.00GHz RL: - 10 dBm 10dB/ 1-



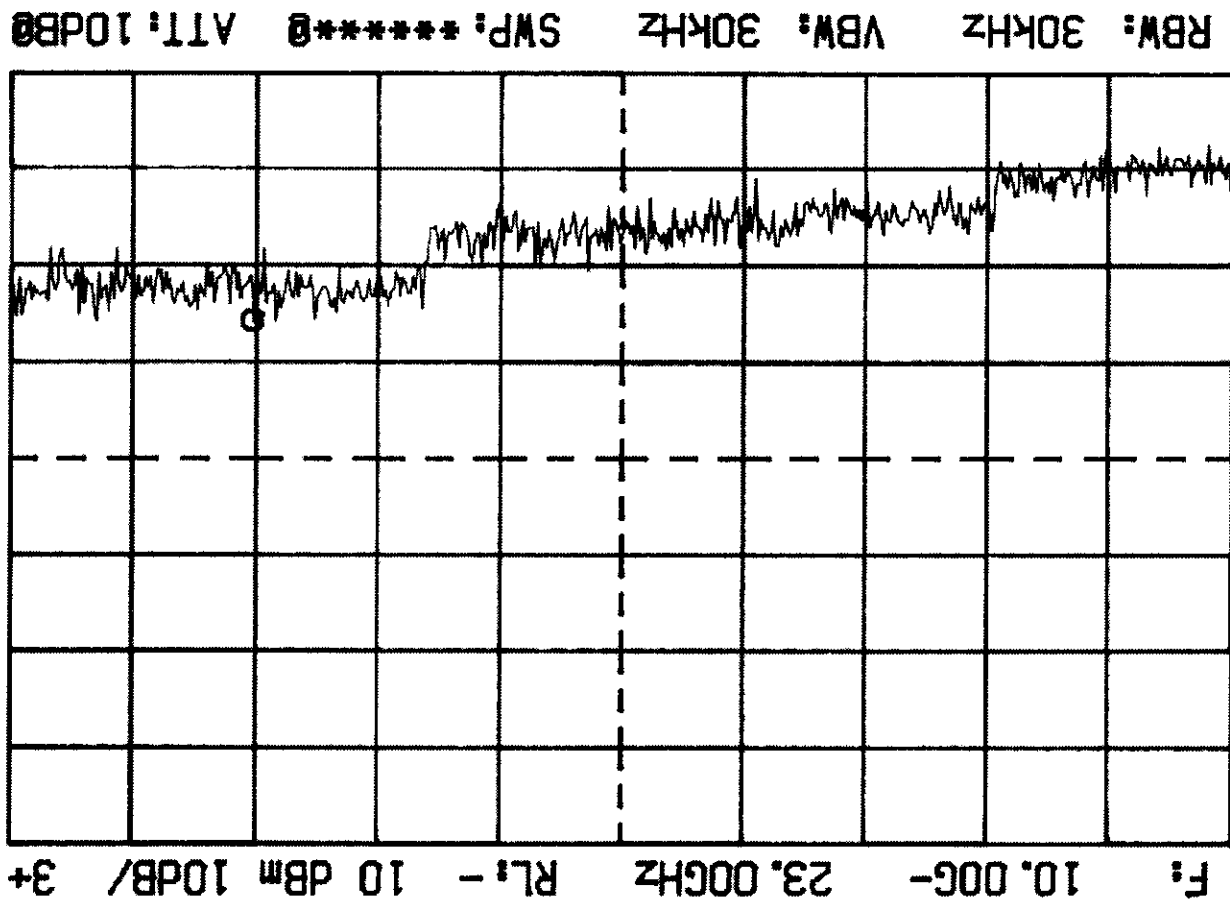
RBW: 30kHz VBW: 30kHz SWP: *****@ ATT: 10dB@

Handwritten signature



Plot 3.7.23
Spurious emissions at antenna terminals test
digital mode, 848.97 MHz frequency

MK: 20.4260GHz - 64.2dBm



7/2



3.8 Mobile emissions in base frequency range test according to Part 22, § 22.917

3.8.1 Definition of the test

This test was performed to determine that the mean power of any emissions appearing in the base station frequency range from cellular mobile transmitter operated should be attenuated to a level not to exceed - 80 dBm at the transmit antenna connector.

3.8.2 The test set-up configuration

The test setup is the same as in Test 3.1.

3.8.3 Test results

The test was performed with transmitter operating with modulation at 3 carrier frequencies 824.04, 836.49, 848.97 MHz in analog and digital mode. The measurements were performed at appropriate channel frequencies to detect emissions appearing in the base frequency range.

The test results are given in Plots 3.8.1 to 3.8.12. External attenuation was taken into account. All measured emissions in the base frequency range were more than 80 dB below transmitted carrier.

Reference numbers of test equipment used

HL 0027	HL 0604					
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Full description is given in Appendix A.



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Test Report: TLR FCC.12663

Date: April, 1998

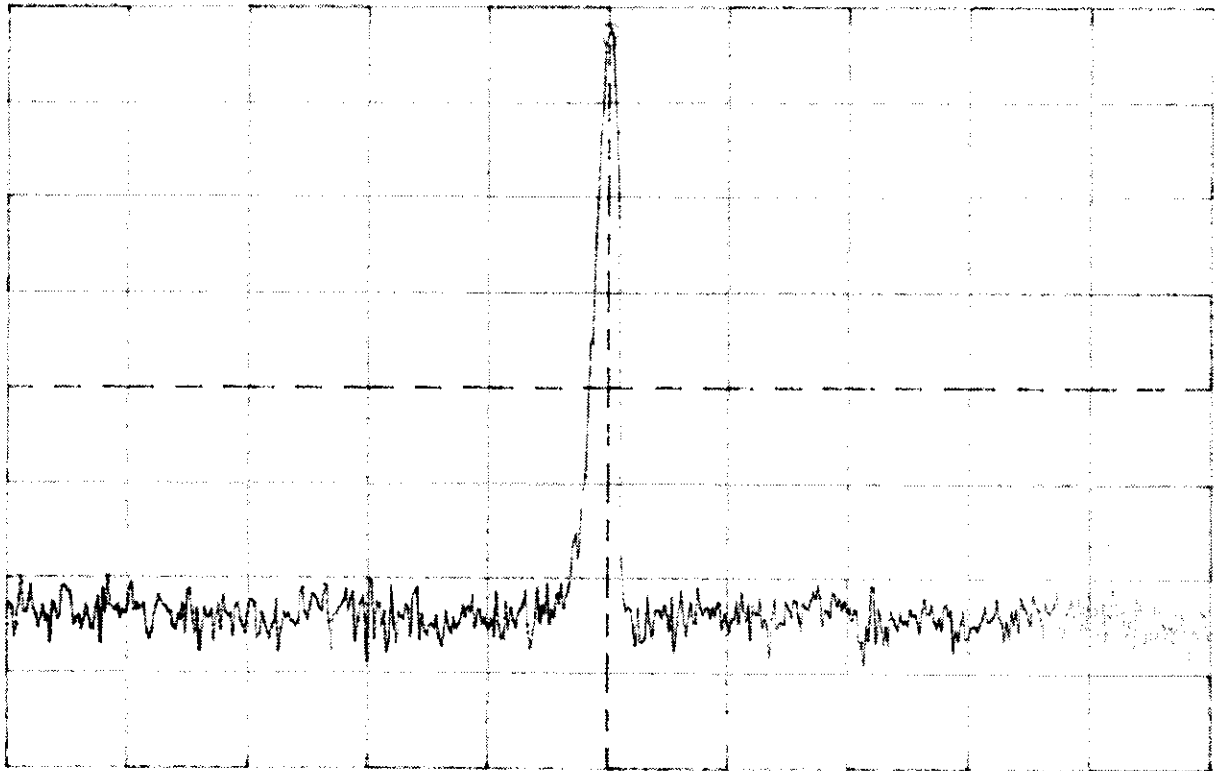
FCC ID: ARACET-10

Plot 3.8.1

Emissions in base frequency range test
Mobile transmitter emissions (analog mode)
external attenuation 31 dB, test result 28.2 dBm

MK: 848.980MHz - 2.8dBm

F: 848.98MHz SP: 500kHz/ RL: + 0 dBm 10dB/ 1-



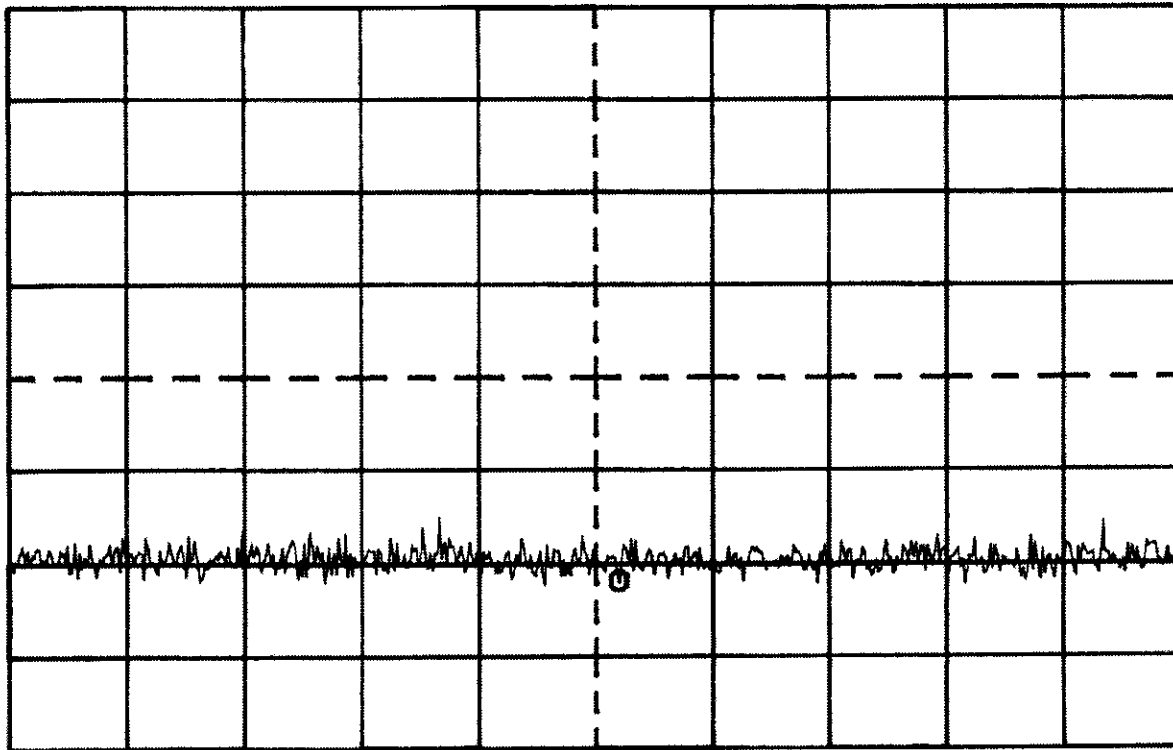
RBW: 30kHz@ VBW: 100kHz@ SWP: 10mS/@ ATT: 30dB@



Plot 3.8.2
 Emissions in base frequency range test
 Emissions in base station frequency range @ mobile transmitter operating
 (reference to Plot 3.8.1)
 external attenuation 11 dB, test result -87 dBm

MK: 893.930MHz - 98.0dBm

F: 893.97MHz SP: 200kHz / RL: - 80 dBm 10dB / 1-



RBW: 30kHz VBW: 30kHz SWP: 10ms/0 ATT: 0dB



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Test Report: TLR FCC.12663

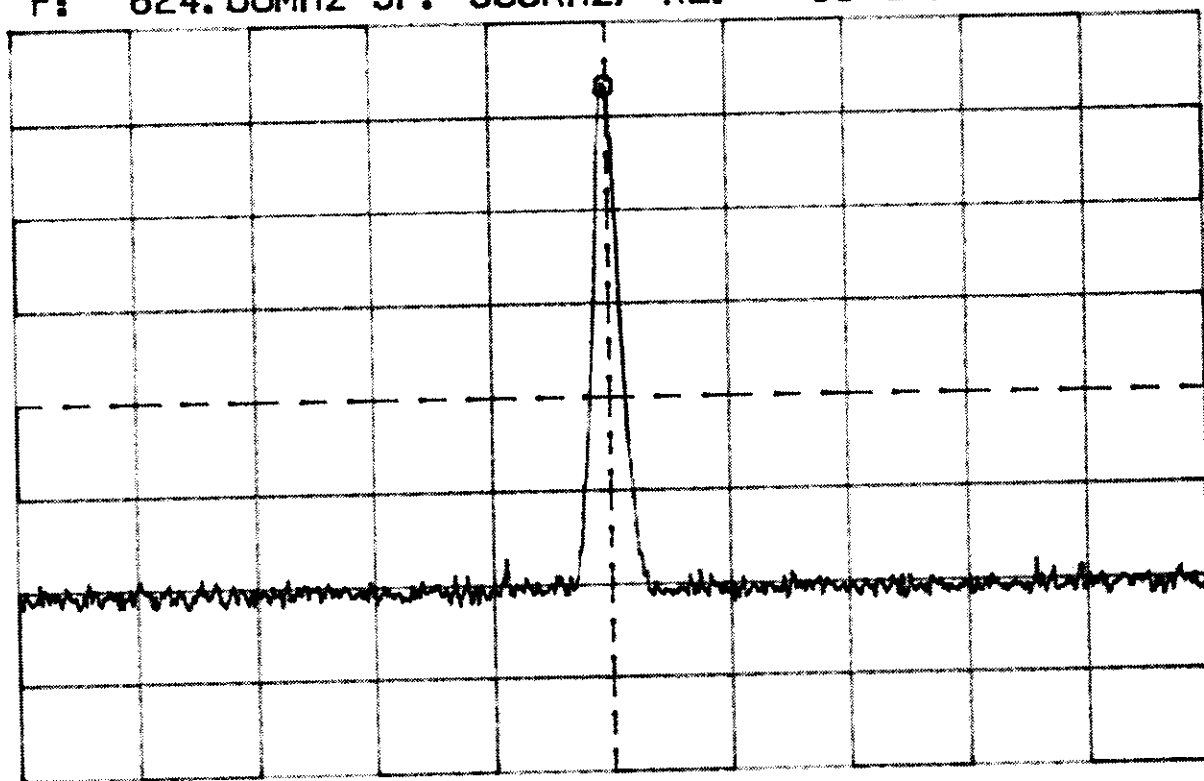
Date: April, 1998

FCC ID: ARACET-10

Plot 3.8.3
Emissions in base frequency range test
Mobile transmitter emissions (analog mode)
external attenuation 31 dB, test result 14.5 dBm

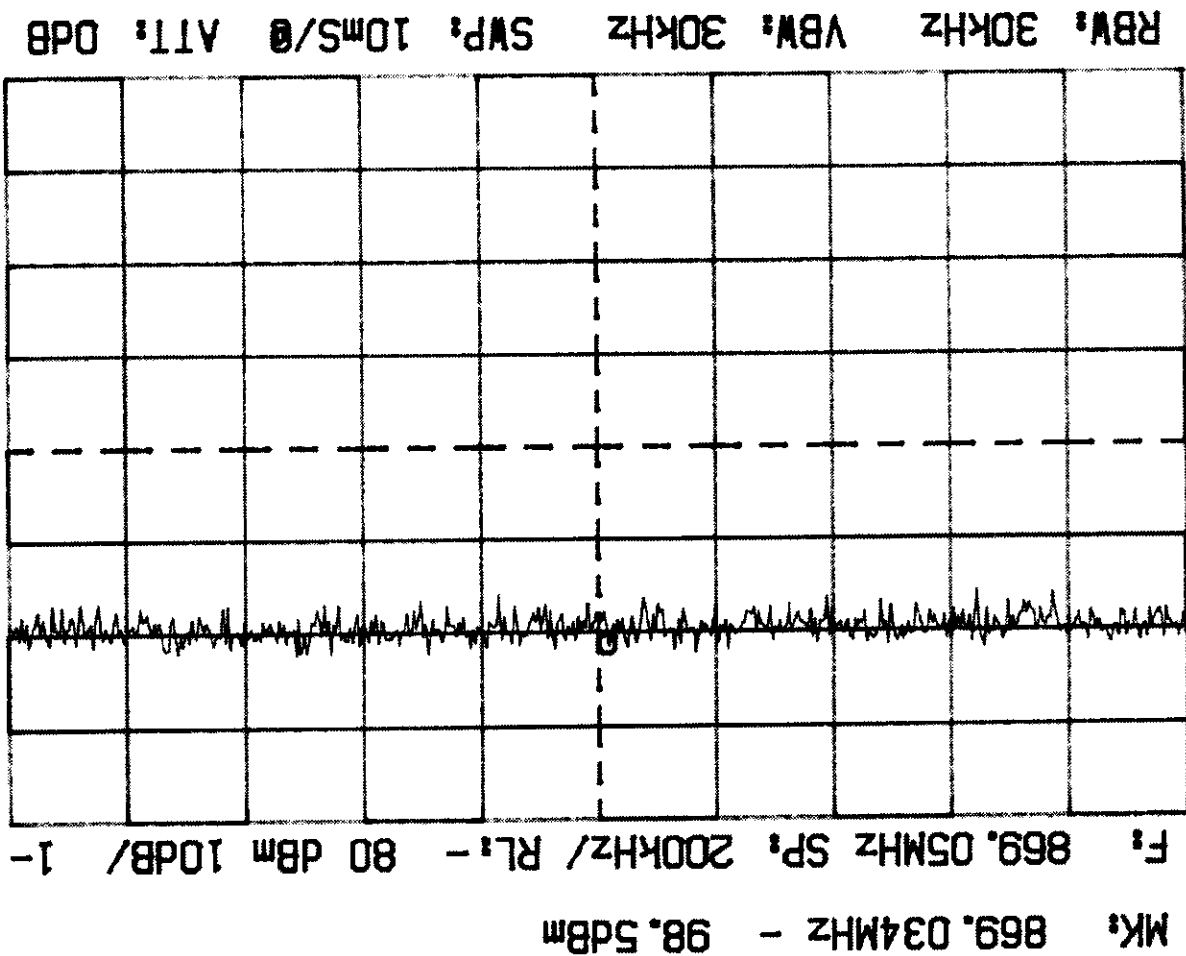
MK: 824.050MHz - 16.5dBm

F: 824.06MHz SP: 500kHz/ RL: - 10 dBm 10dB/ 1-



RBW: 30kHz@ VBW: 100kHz@ SWP: 10mS/@ ATT: 20dB@

Plot 3.8.4
 Emissions in base frequency range test
 Emissions in base station frequency range @ mobile transmitter operating
 (reference to Plot 3.8.3)
 external attenuation 11 dB, test result -86.5 dBm





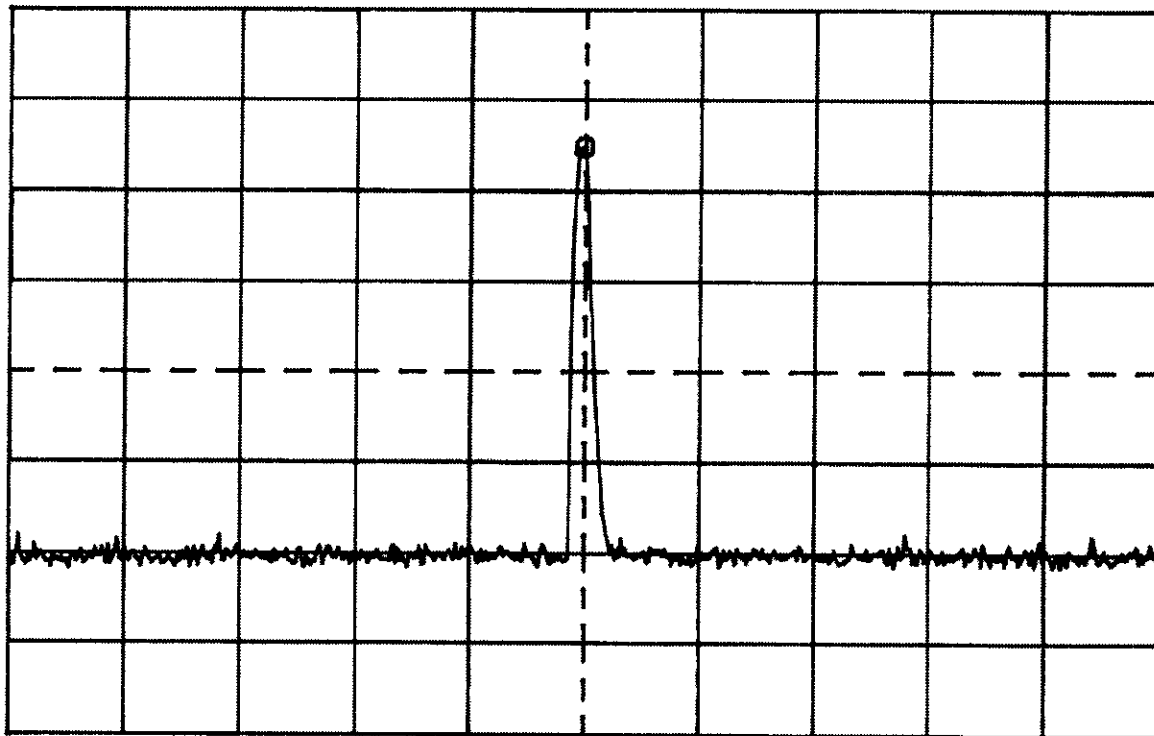
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Test Report: TLR FCC.12663
Date: April, 1998
FCC ID: ARACET-10

Plot 3.8.5
Emissions in base frequency range test
Mobile transmitter emissions (analog mode)
external attenuation 31 dB, test result 16.1 dBm

MK: 836.510MHz - 14.9dBm

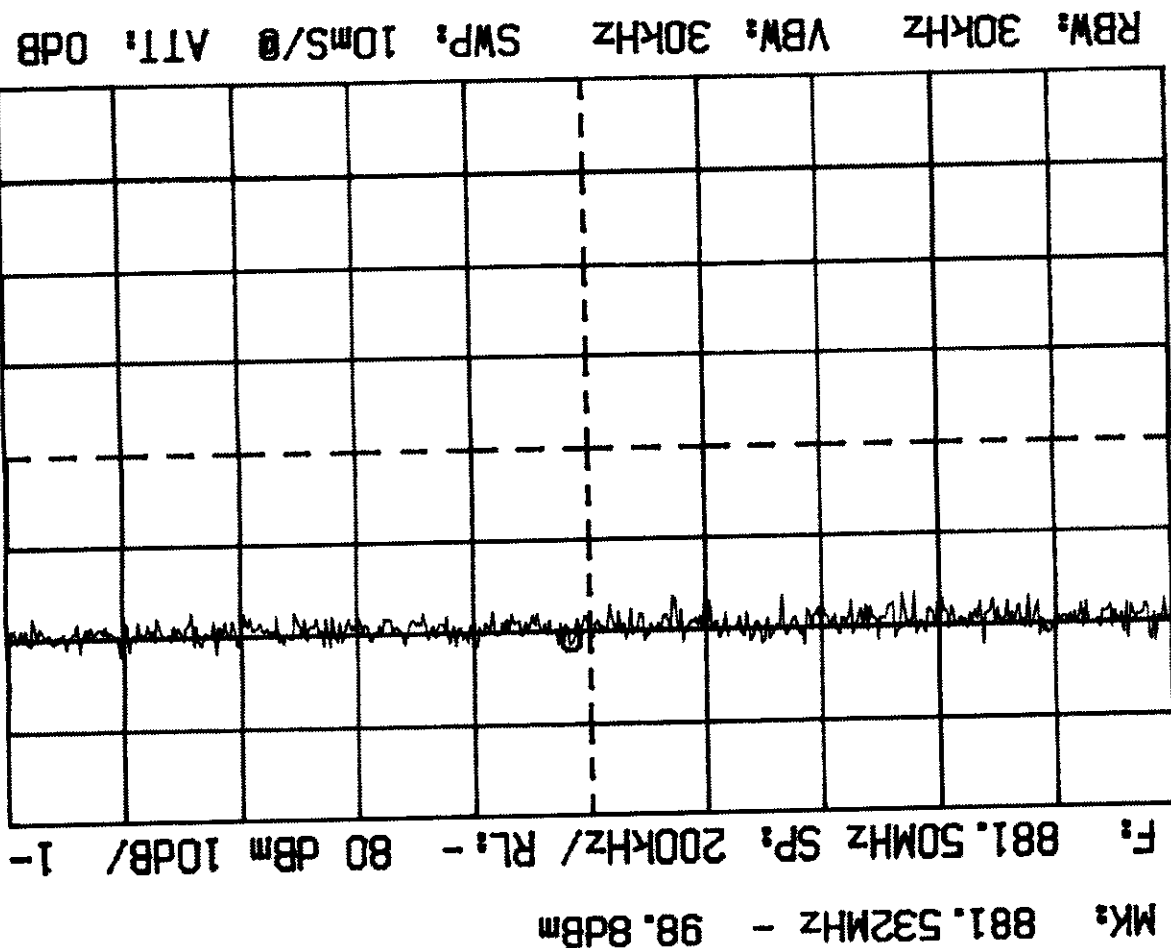
F: 836.52MHz SP: 500kHz/ RL: + 0 dBm 10dB/ 1-



RBW: 30kHz@ VBW: 100kHz@ SWP: 10mS/0 ATT: 30dB@



Plot 3.8.6
 Emissions in base frequency range test
 Emissions in base station frequency range @ mobile transmitter operating
 (reference to Plot 3.8.5)
 external attenuation 11 dB, test result -87.8 dBm

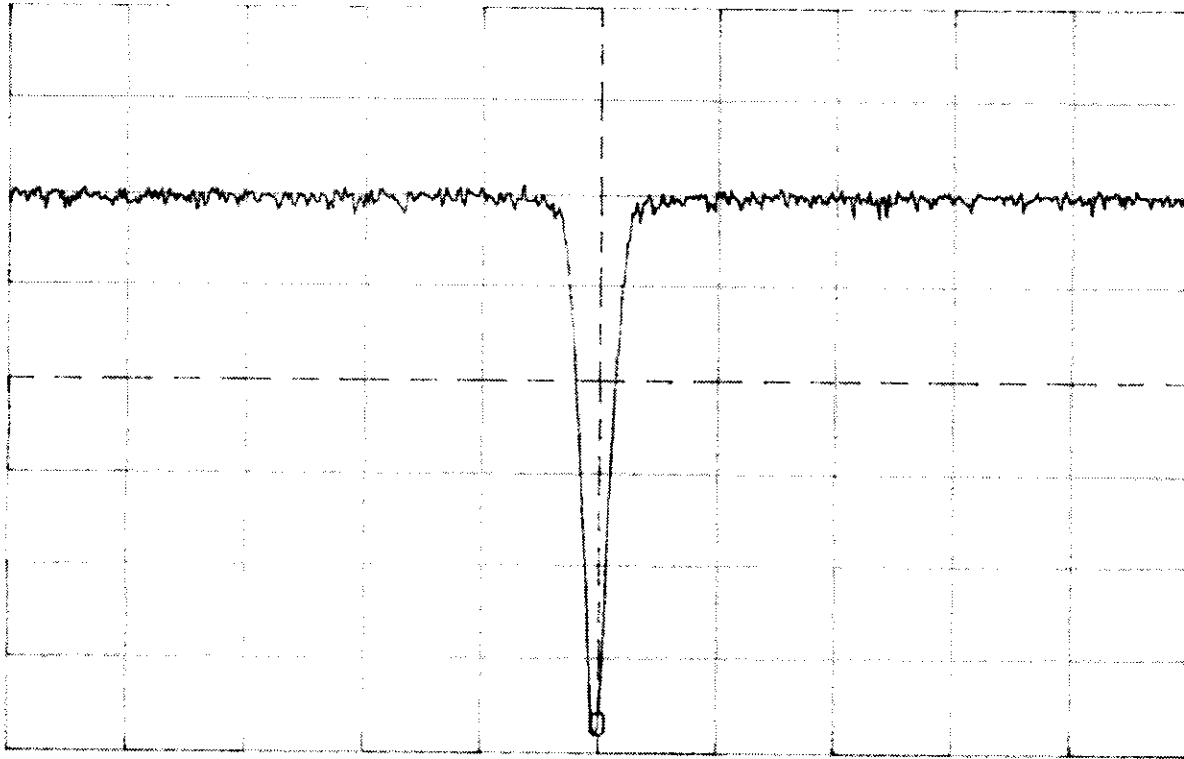




Plot 3.8.7
Emissions in base frequency range test
Mobile transmitter emissions (digital mode)
external attenuation 31 dB, test result 28 dBm

MK: 824.040MHz - 3.0dBm

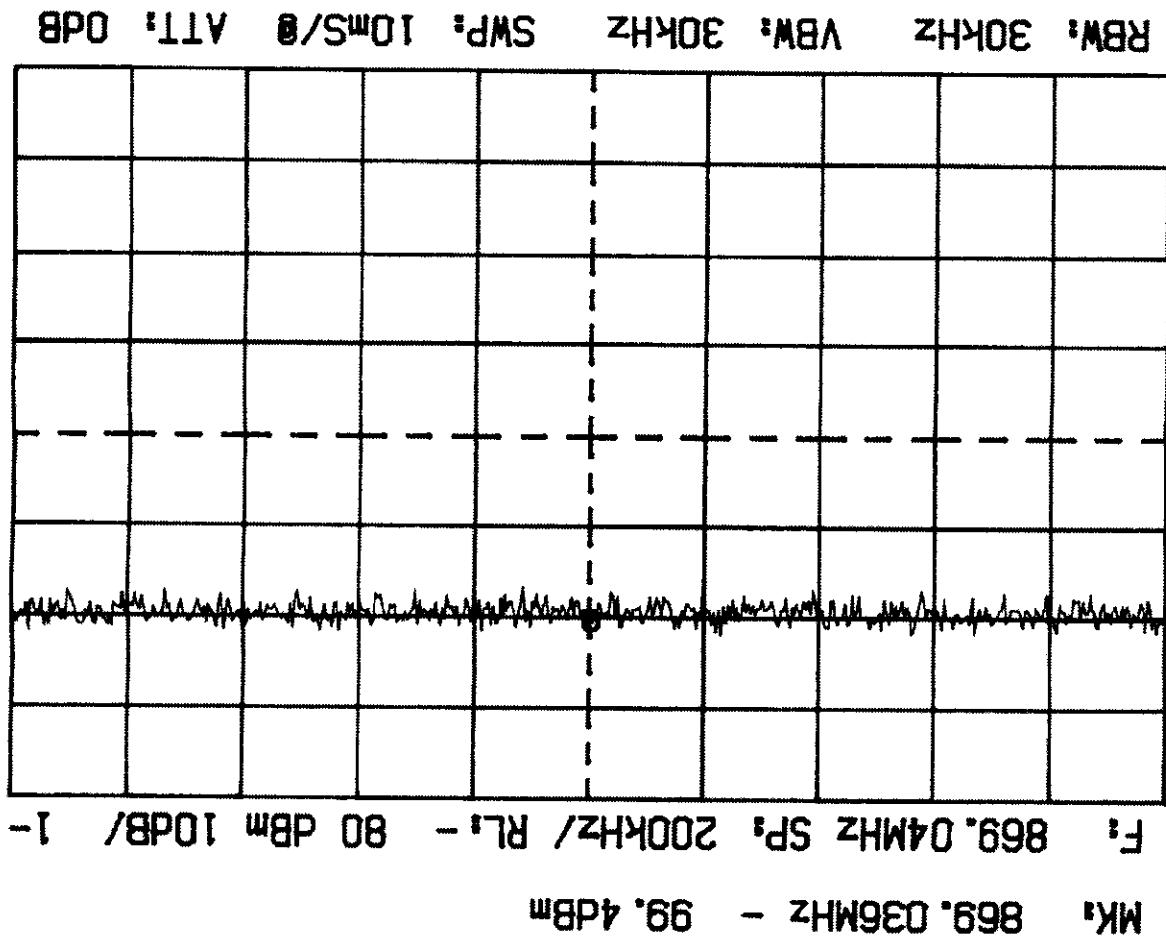
F: 824.04MHz SP: 500kHz / RL: + 0 dBm 10dB / 1-



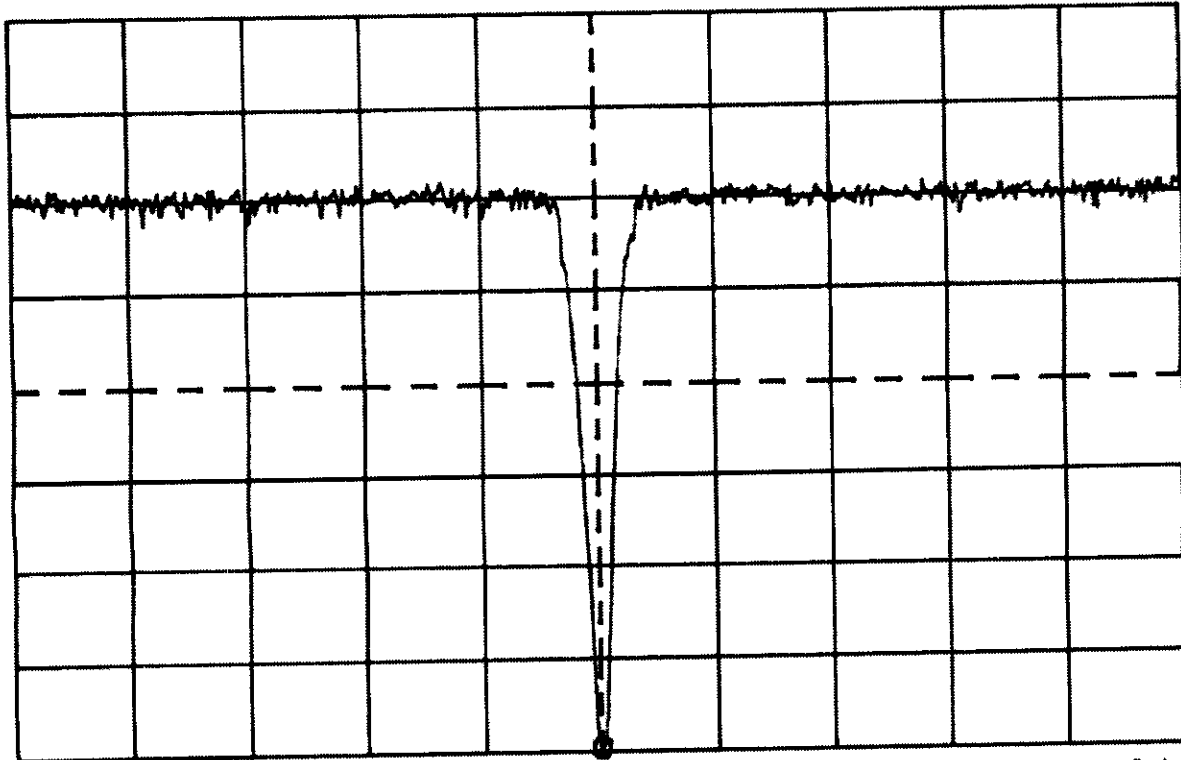
RBW: 30kHz VBW: 100kHz SWP: 10ms/g ATT: 30dB



Plot 3.8.8
 Emissions in base frequency range test
 Emissions in base station frequency range @ mobile transmitter operating
 (reference to Plot 3.8.7)
 external attenuation 11 dB, test result -88.4 dBm



RBW: 30kHz VBW: 100kHz SVP: 10ms/0 ATT: 30dB



MK: 836.500MHz - 0.2dBm
F: 836.50MHz SP: 500kHz / RL: + 0 dBm 10dB / 1-

Plot 3.8.9
Emissions in base frequency range test
Mobile transmitter emissions (digital mode)
external attenuation 31 dB, test result 30.8 dBm





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Test Report: TLR FCC.12663

Date: April, 1998

FCC ID: ARACET-10

Plot 3.8.10

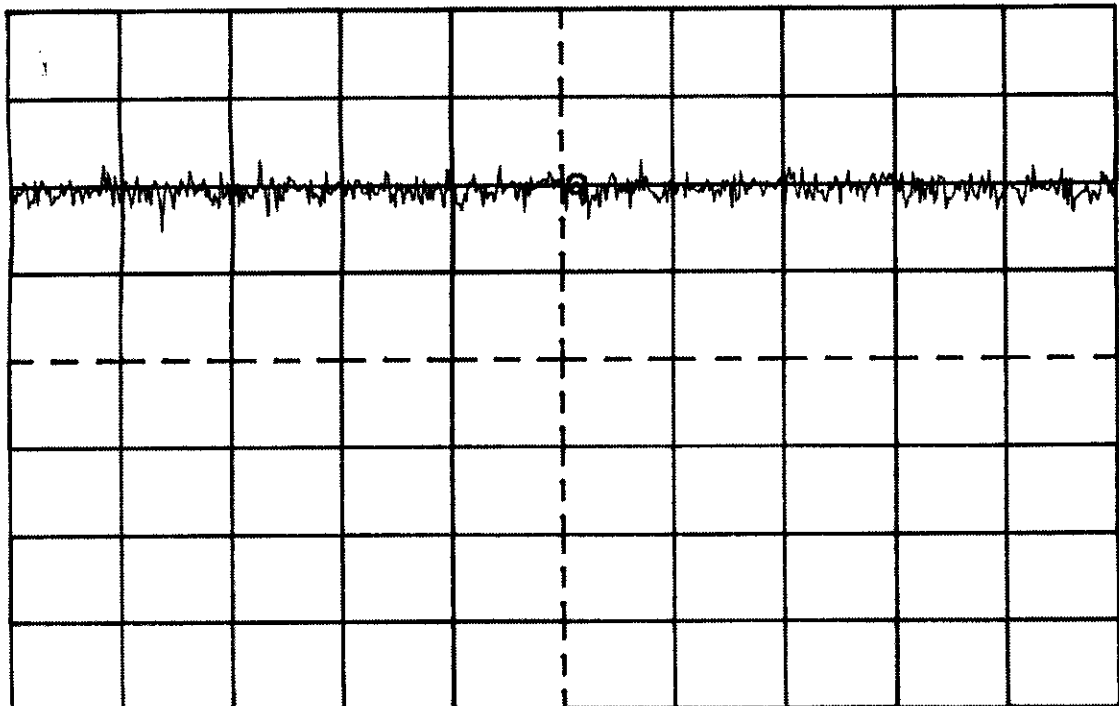
Emissions in base frequency range test

Emissions in base station frequency range @ mobile transmitter operating
(reference to Plot 3.8.9)

external attenuation 11 dB, test result -88.7 dBm

MK: 881.524MHz - 99.7dBm

F: 881.50MHz SP: 200kHz/ RL: - 80 dBm 10dB/ 1-



RBW: 30kHz VBW: 30kHz SWP: 10mS/0 ATT: 0dB



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Test Report: TLR FCC.12663

Date: April, 1998

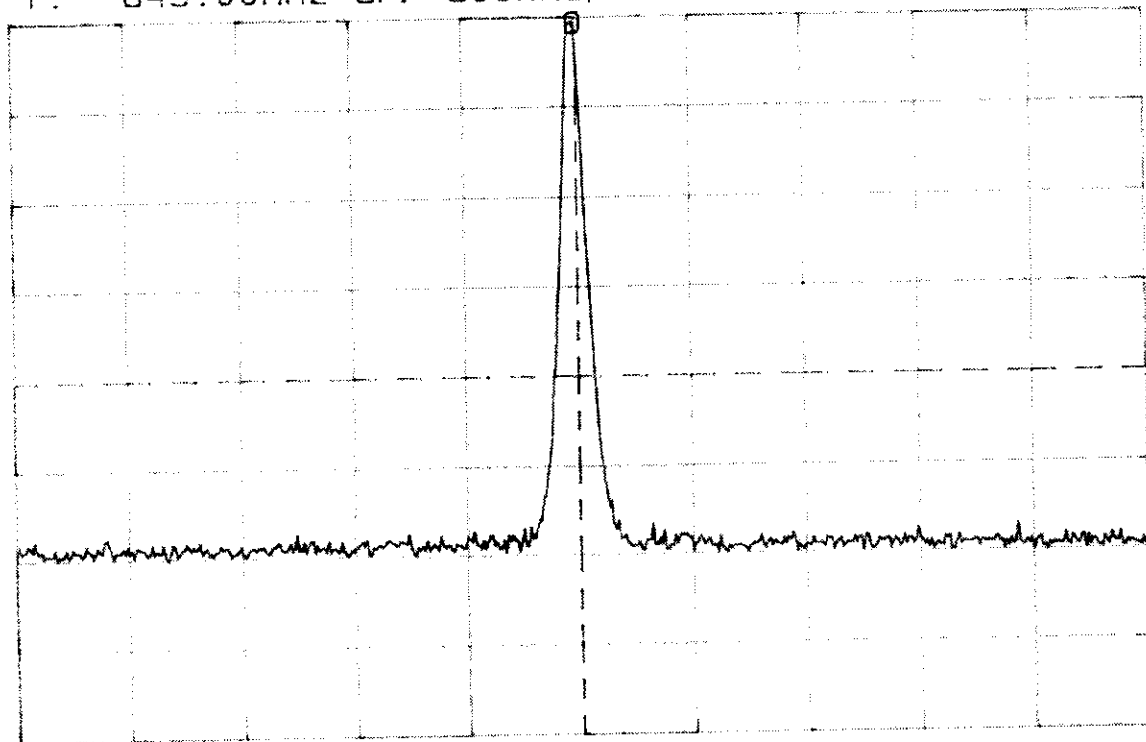
FCC ID: ARACET-10

Plot 3.8.11

Emissions in base frequency range test
Mobile transmitter emissions (digital mode)
external attenuation 31 dB, test result 30.4 dBm

MK: 848.990MHz - 0.6dBm

F: 849.00MHz SP: 500kHz/ RL: + 0 dBm 10dB/ 1-



RBW: 30kHz@ VBW: 100kHz@ SWP: 10mS/@ ATT: 30dB@

3.9 Audio filter characteristics test according to Part 22, § 22.915 (d)

3.9.1 Definition of the test

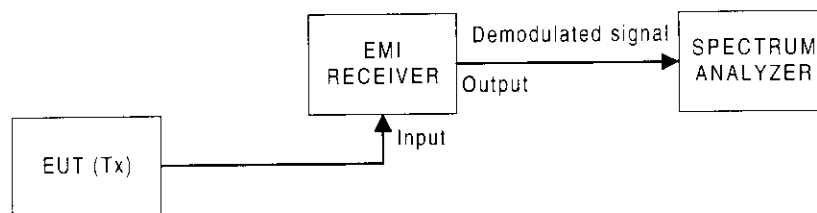
This test was performed to determine that the radiotelephony signals applied to the modulator from the modulation limiter should be attenuated (relative to the level at 1 kHz) as a function of the frequency as follows:

- in the frequency ranges of 3.0 to 5.9 kHz and 6.1 to 15.0 kHz, signals should be attenuated by at least $40 \log(f+3)$ dB, where f is the frequency of the signal in kHz;
- in the frequency range of 5.9 to 6.1 kHz signals should be attenuated at least 35 dB;
- in the frequency range above 15 kHz signals should be attenuated at least 28 dB.

3.9.2 The test set-up configuration

The test setup is shown below in Figure 3.9.

Figure 3.9
Audio filter characteristics measurement setup



Reference numbers of test equipment used

HL 0027	HL 0028					
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Full description is given in Appendix A.



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Test Report: TLR FCC.12663

Date: April, 1998

FCC ID:ARACET-10

3.9.3 Test results

The measurements were performed to show modulation limiting capability throughout the range of modulating frequencies. The EUT passed the test requirements. The test results are given in Table 3.9.1 and Plots 3.9.1 to 3.9.17.

Table 3.9.1
Audio filter characteristics test results

Frequency, kHz	Specified Limit, dB	Attenuation, dB	Pass/ Fail
3.0	0	2.15	Pass
3.5	2.68	7.75	Pass
4.0	5.00	21.40	Pass
4.5	7.04	27.40	Pass
5.0	8.87	19.15	Pass
5.5	10.53	21.00	Pass
5.9	35	38.0	Pass
6.0	35	39.74	Pass
6.1	35	37.00	Pass
7.0	14.72	38.00	Pass
8.0	17.04	38.50	Pass
9.0	19.08	39.20	Pass
10.0	20.92	38.00	Pass
15.0	27.96	37.75	Pass
20	28	38.20	Pass

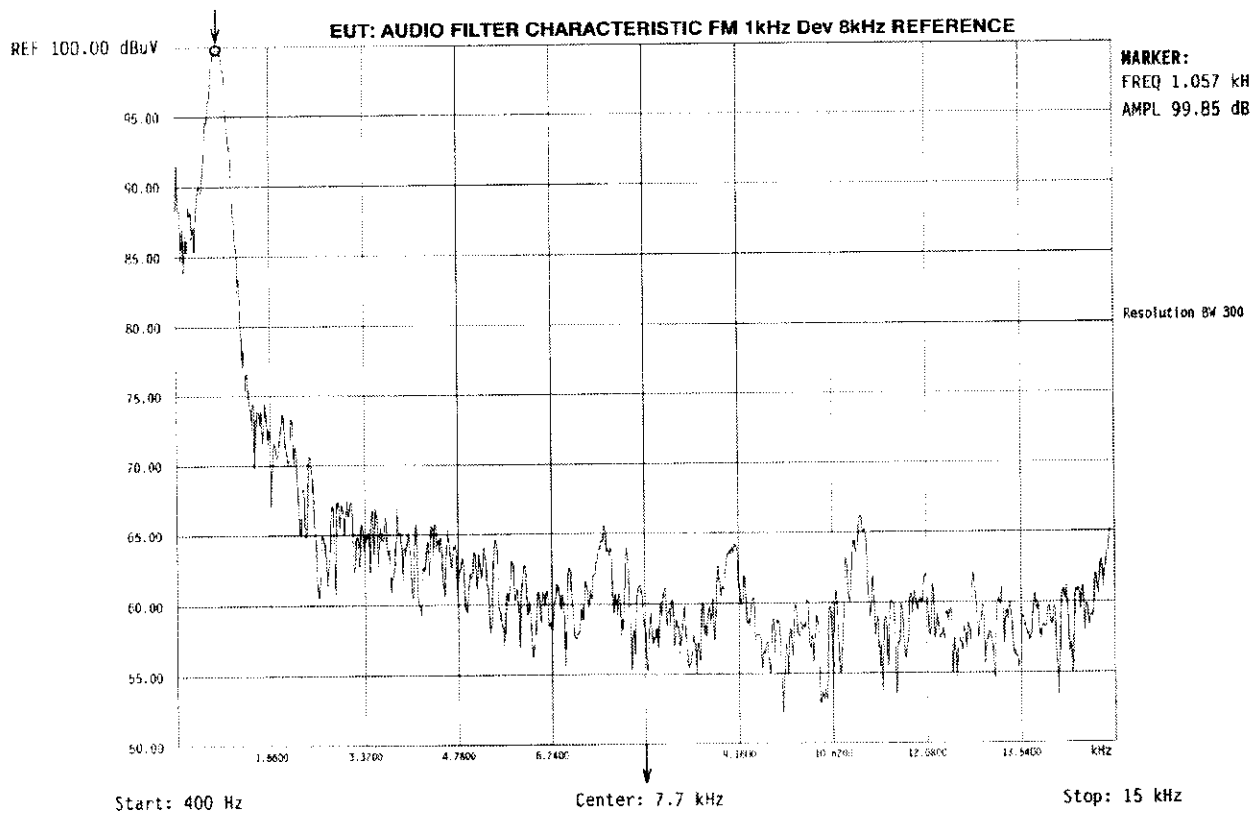


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Test Report: TLRFCC.12663
Date: April, 1998
FCC ID:ARACET-10

Plot 3.9.1
Audio filter characteristics test

Wednesday, 4/1
Time: 18:27



RA

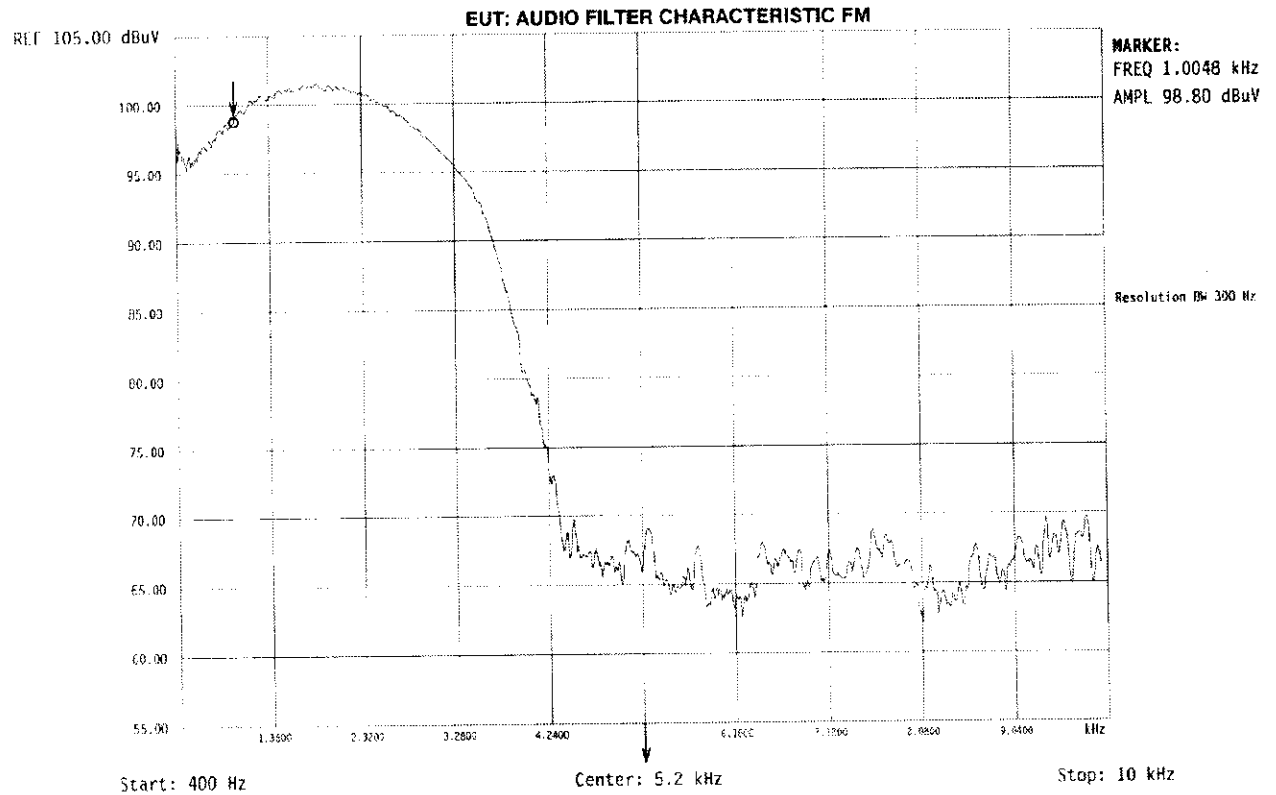


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Test Report: TLRFCC.12663
Date: April, 1998
FCC ID:ARACET-10

Plot 3.9.2
Audio filter characteristics test

Wednesday, 4/3/15
Time: 18:55:5



RH

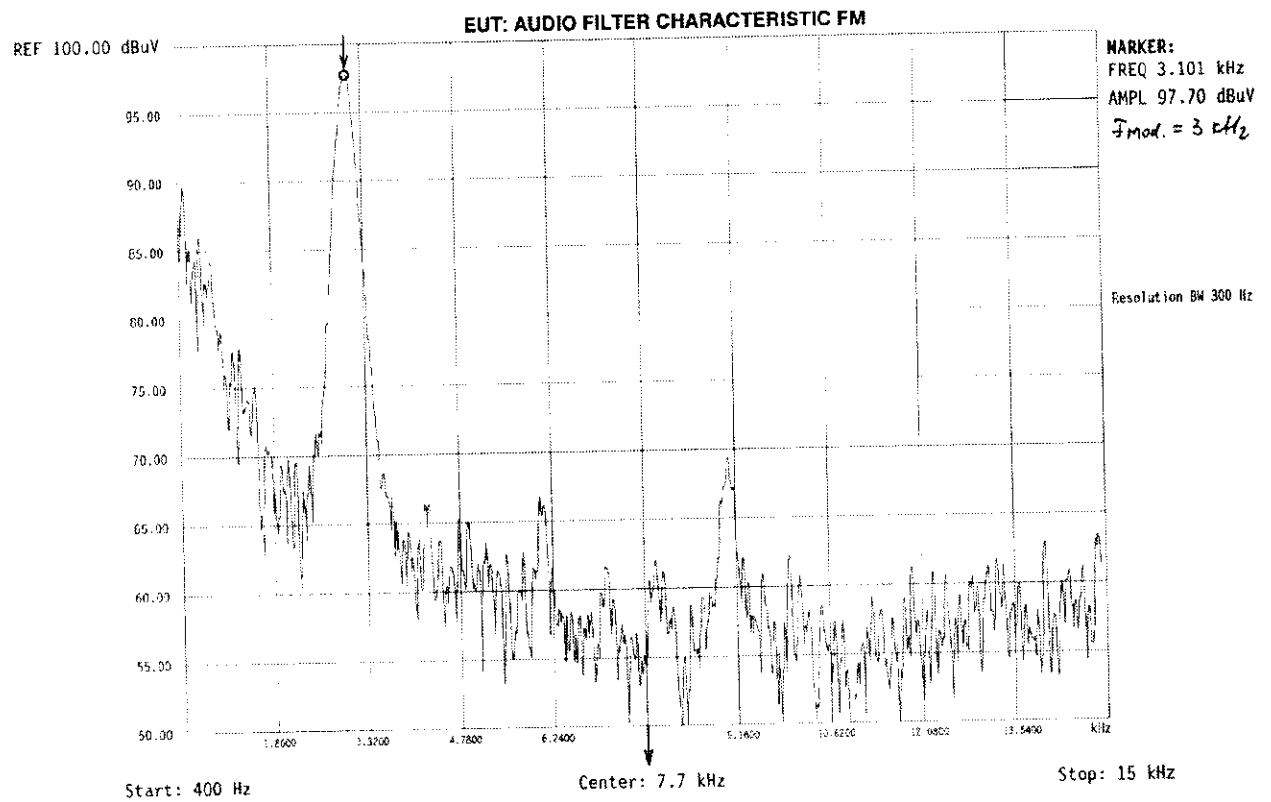


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Test Report: TLR FCC.12663
Date: April, 1998
FCC ID: ARACET-10

Plot 3.9.3
Audio filter characteristics test

Wednesday, 4/3/1998
Time: 18:5:12





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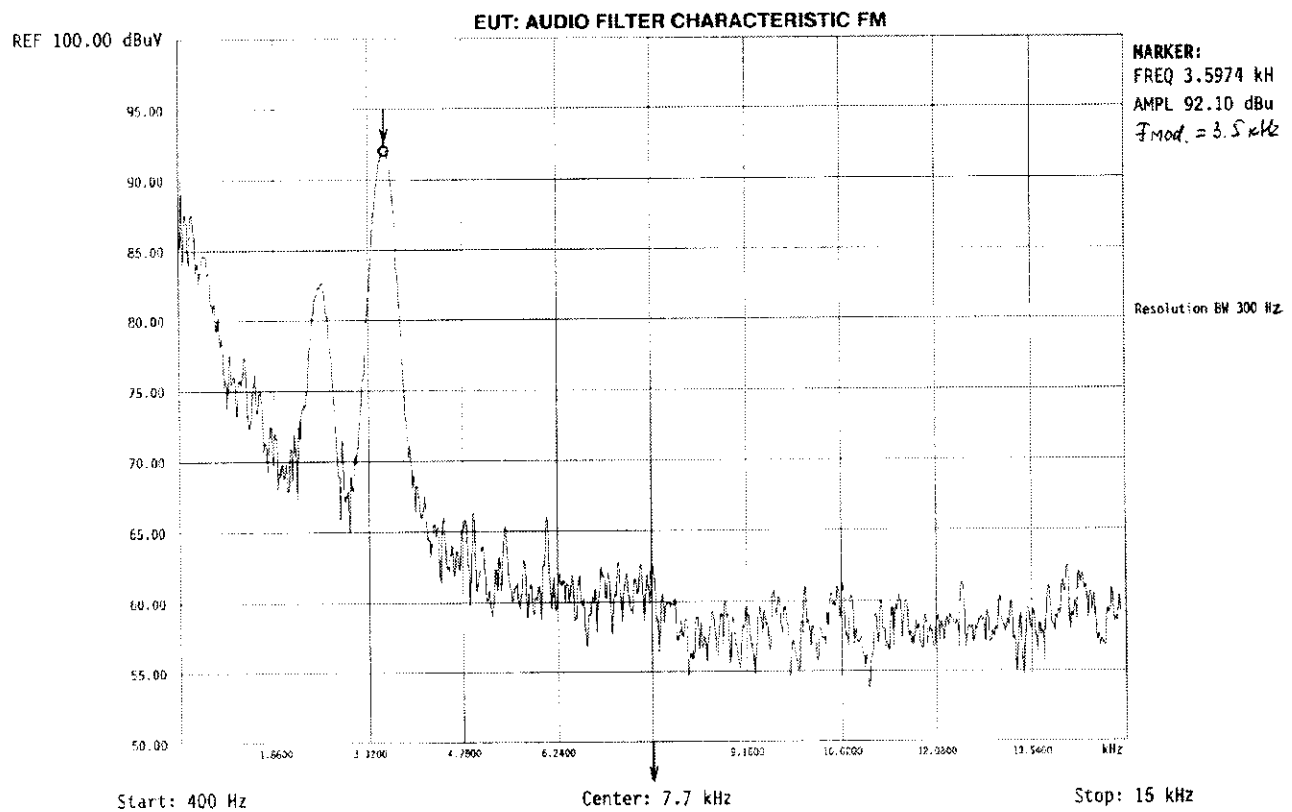
Test Report: TLR FCC.12663

Date: April, 1998

FCC ID: ARACET-10

Plot 3.9.4
Audio filter characteristics test

Wednesday, 4/3,
Time: 18:7:14



RH



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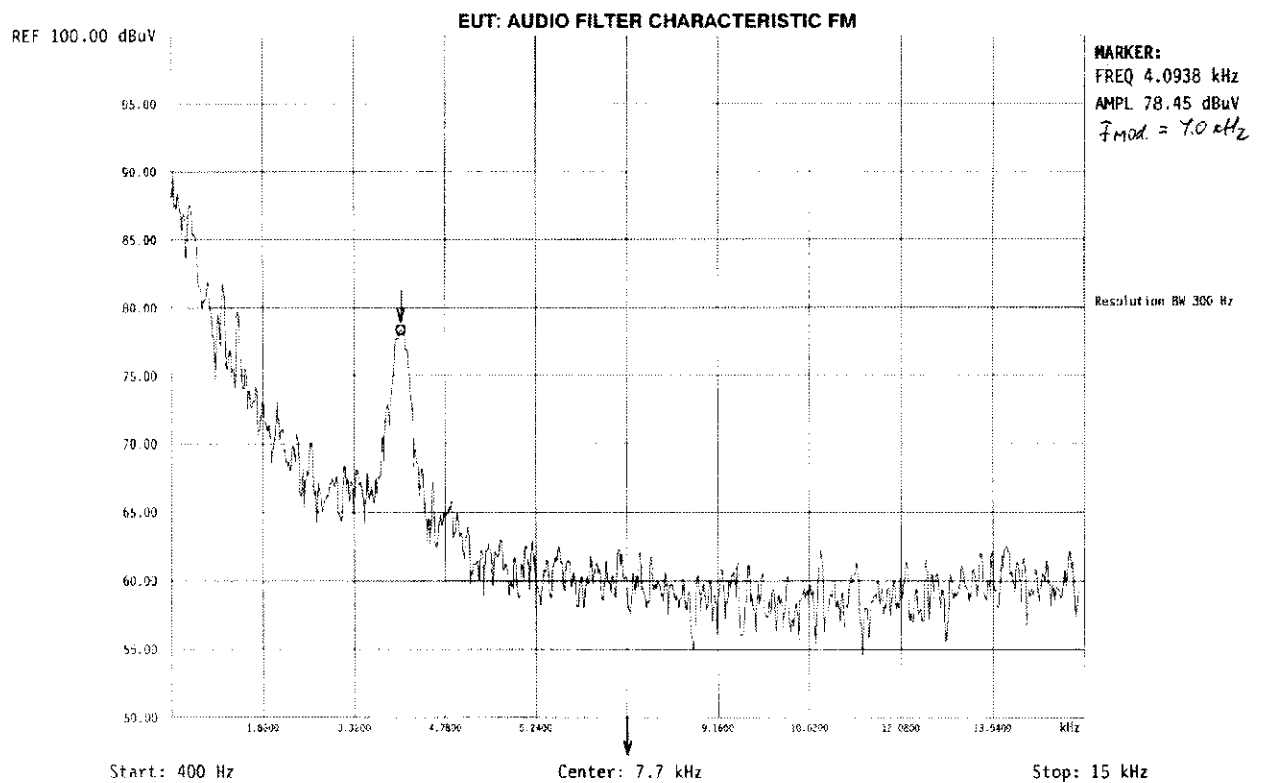
Test Report: TLR FCC.12663

Date: April, 1998

FCC ID: ARACET-10

Plot 3.9.5
Audio filter characteristics test

Wednesday, 4/3/19
Time: 18:9:31



21

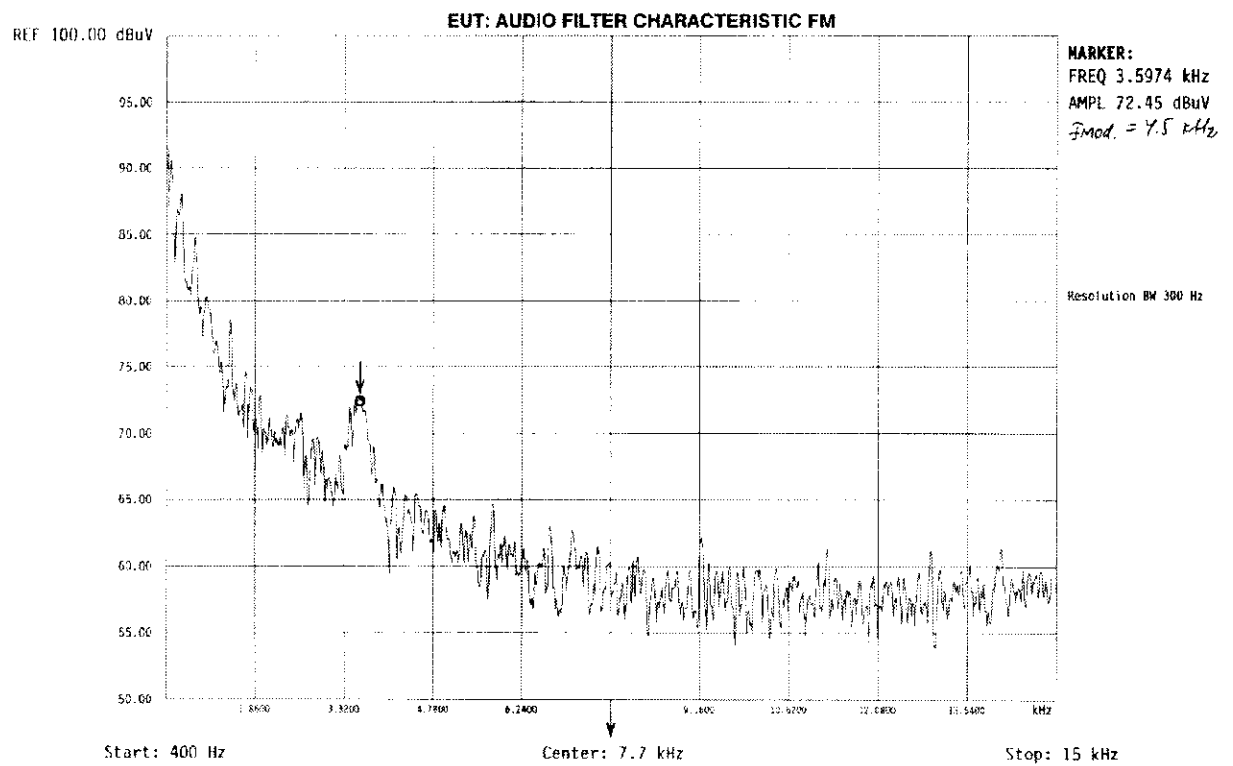


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Test Report: TLRFCC.12663
Date: April, 1998
FCC ID:ARACET-10

Plot 3.9.6
Audio filter characteristics test

Wednesday, 4/3/1998
Time: 18:12:33

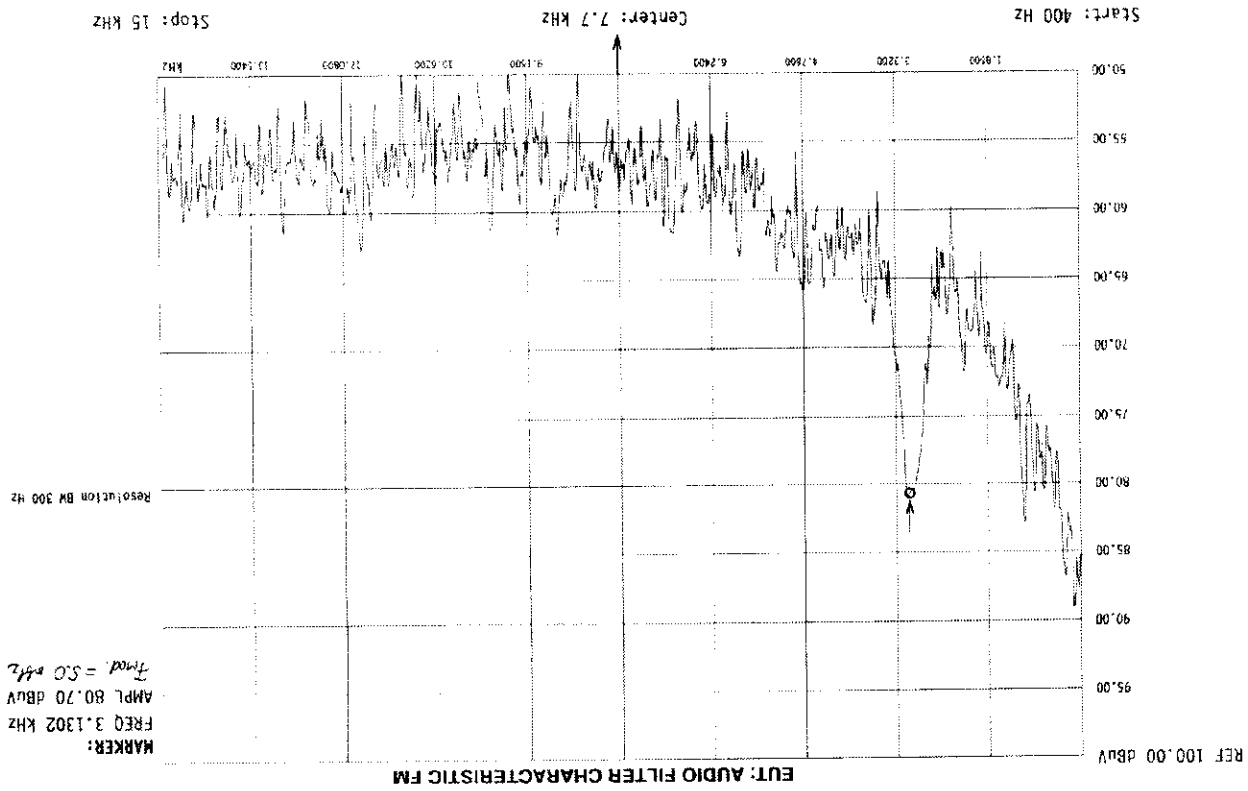


ptt



Plot 3.9.7
Audio filter characteristics test

Wednesday, 4/3/1998
Time: 18:14:47





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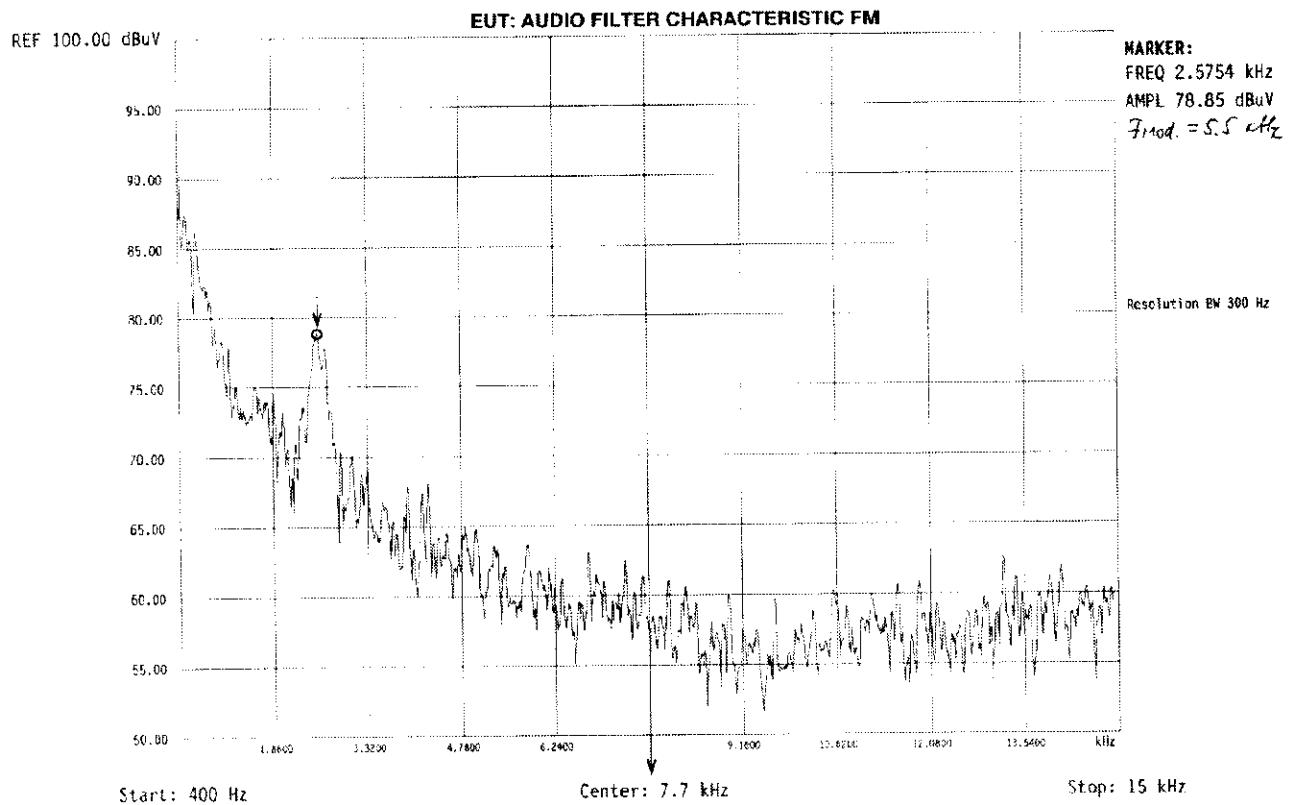
Test Report: TLR FCC.12663

Date: April, 1998

FCC ID: ARACET-10

Plot 3.9.8
Audio filter characteristics test

Wednesday, 4/3/1998
Time: 18:17:2



16

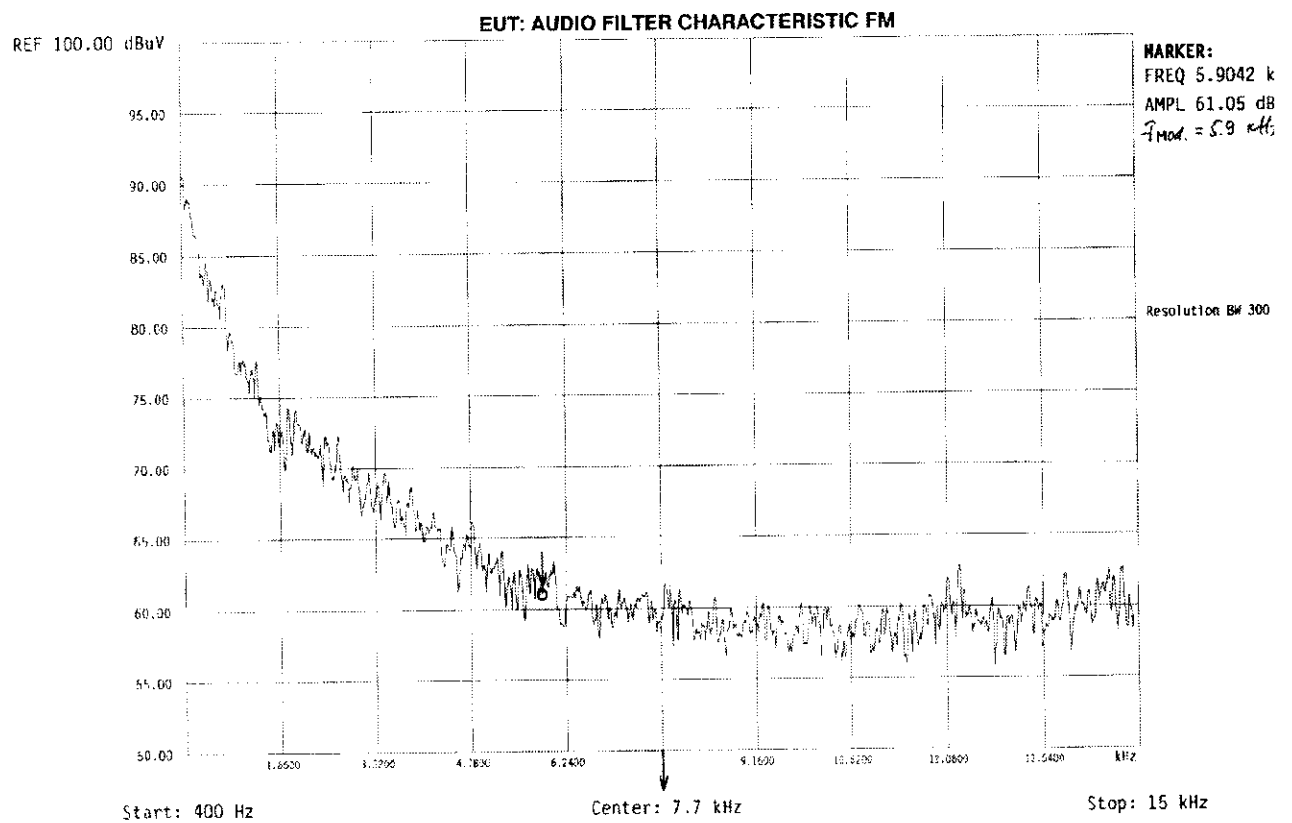


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Test Report: TLR FCC.12663
Date: April, 1998
FCC ID: ARACET-10

Plot 3.9.9
Audio filter characteristics test

Wednesday, 4/1/
Time: 18:19:41



RLH

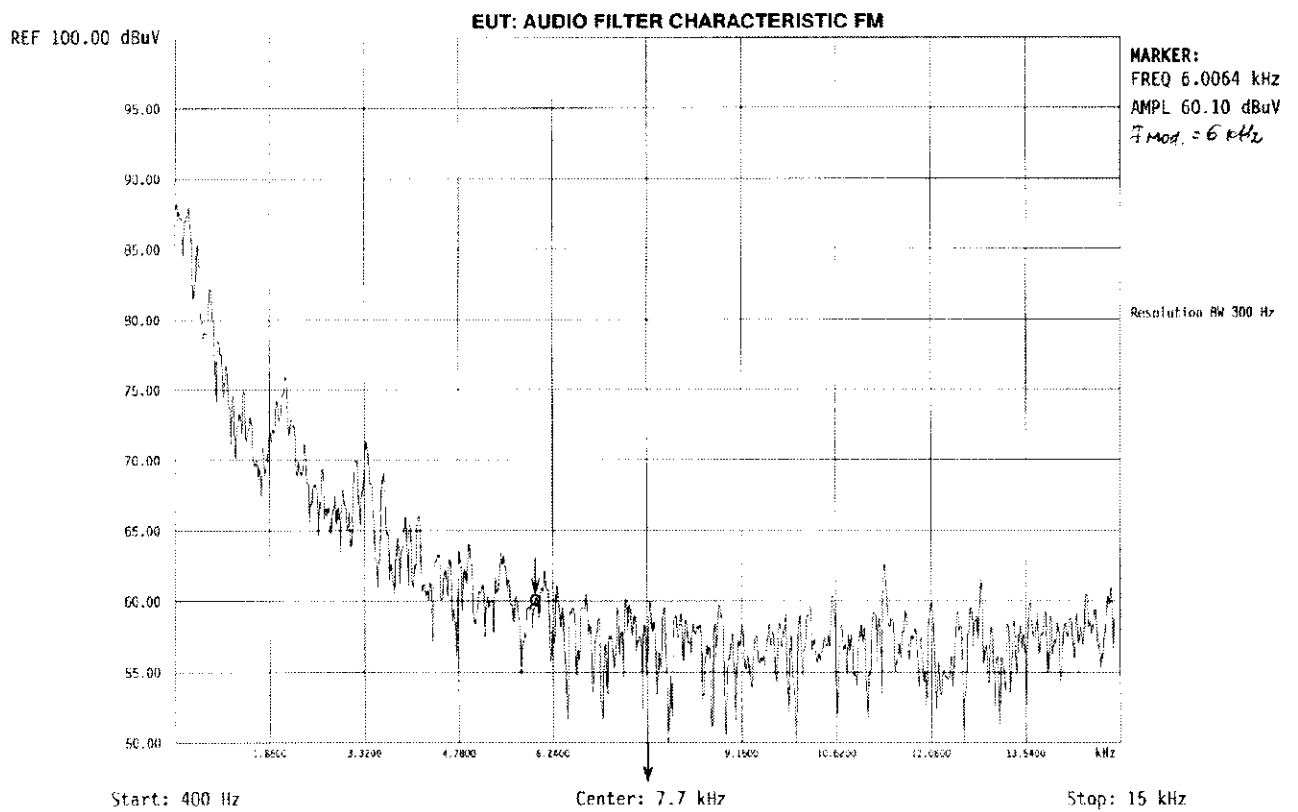


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Test Report: TLR FCC.12663
Date: April, 1998
FCC ID: ARACET-10

Plot 3.9.10
Audio filter characteristics test

Wednesday, 4/3/19
Time: 18:22:27





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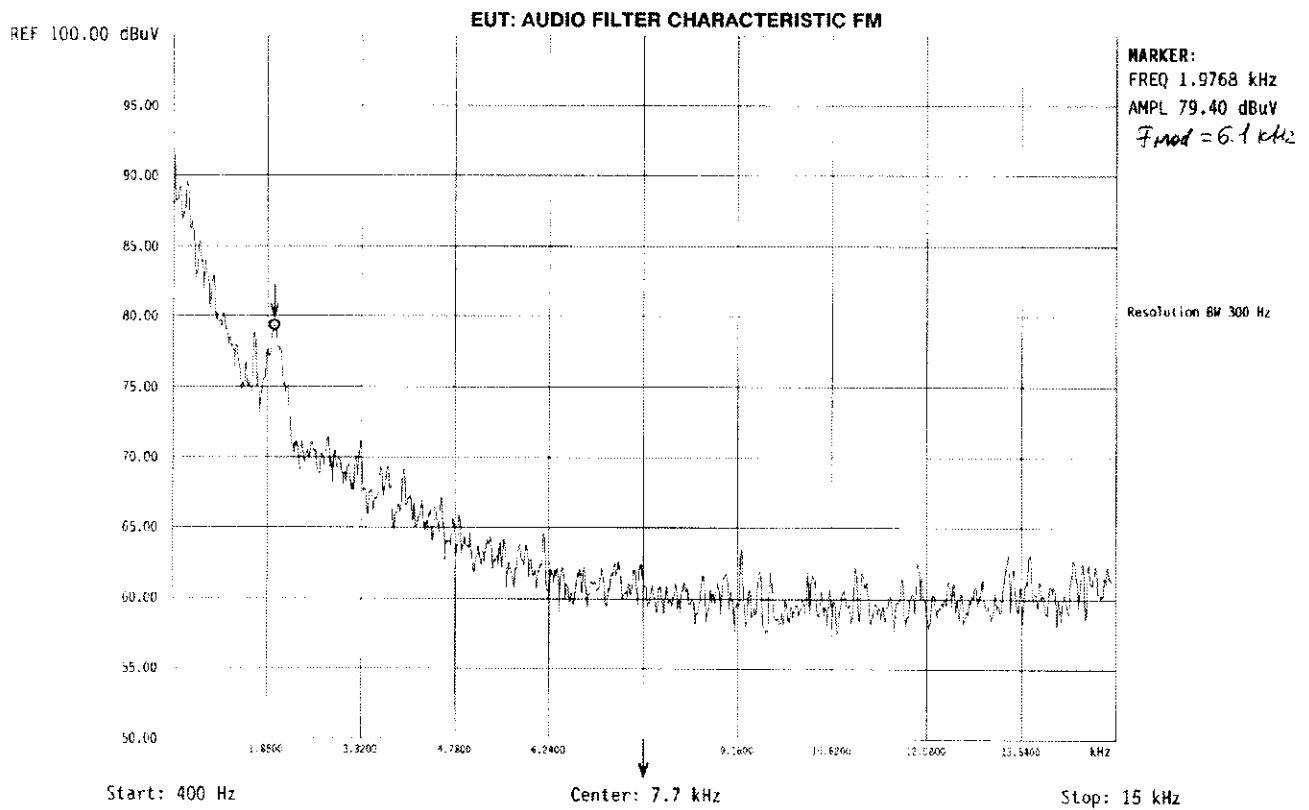
Test Report: TLR FCC.12663

Date: April, 1998

FCC ID: ARACET-10

Plot 3.9.11
Audio filter characteristics test

Wednesday, 4/3/11
Time: 18:25:47



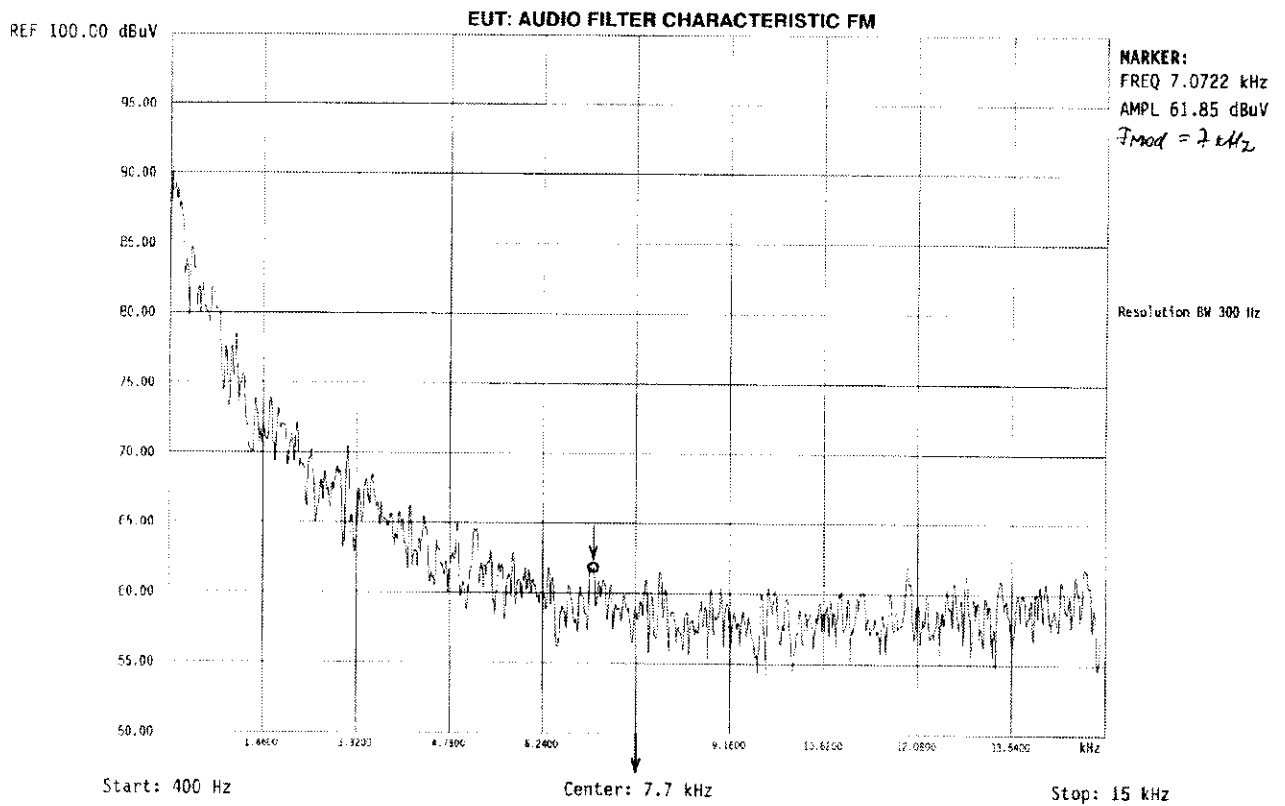


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Test Report: TLR FCC.12663
Date: April, 1998
FCC ID: ARACET-10

Plot 3.9.12
Audio filter characteristics test

Wednesday, 4/3/1
Time: 18:30:43





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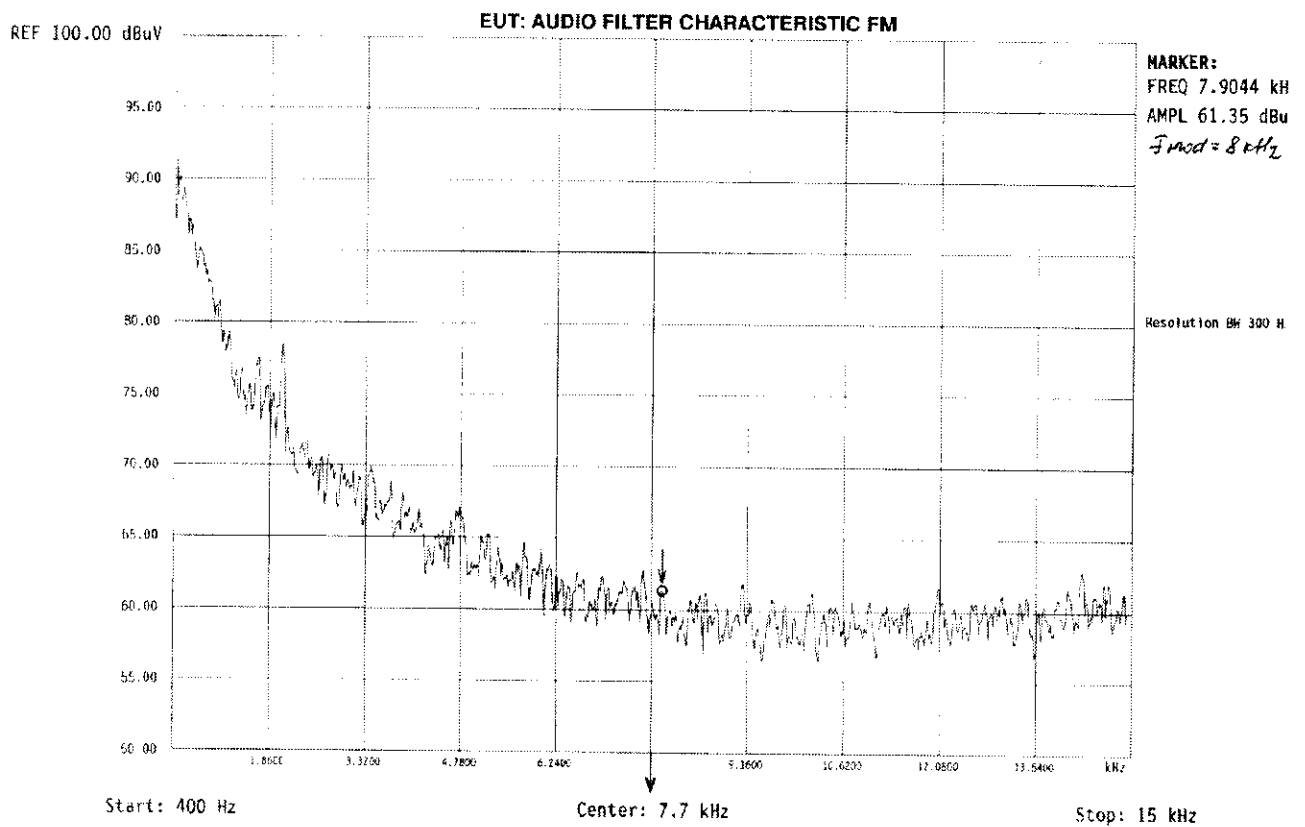
Test Report: TLR FCC.12663

Date: April, 1998

FCC ID: ARACET-10

Plot 3.9.13
Audio filter characteristics test

Wednesday, 4/3,
Time: 18:33:13



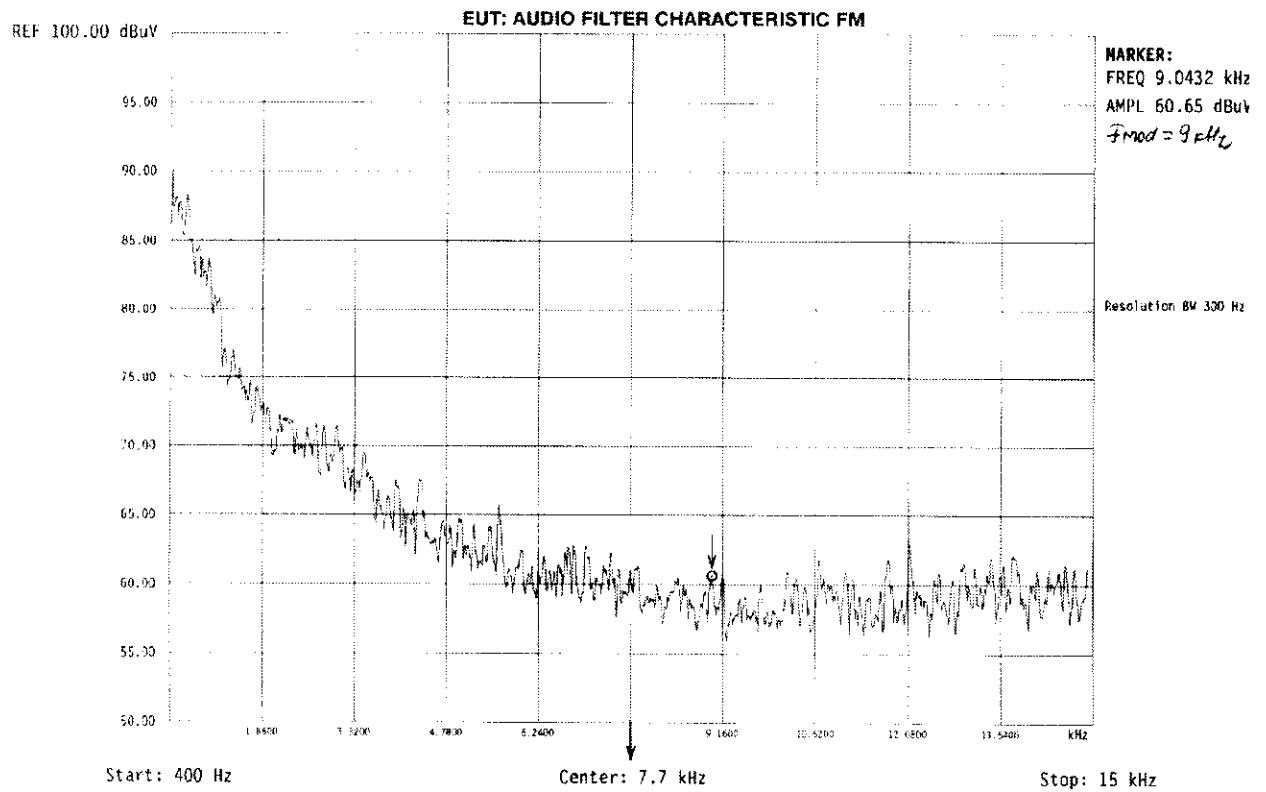


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Test Report: TLR FCC.12663
Date: April, 1998
FCC ID: ARACET-10

Plot 3.9.14
Audio filter characteristics test

Wednesday, 4/3/98
Time: 18:35:28



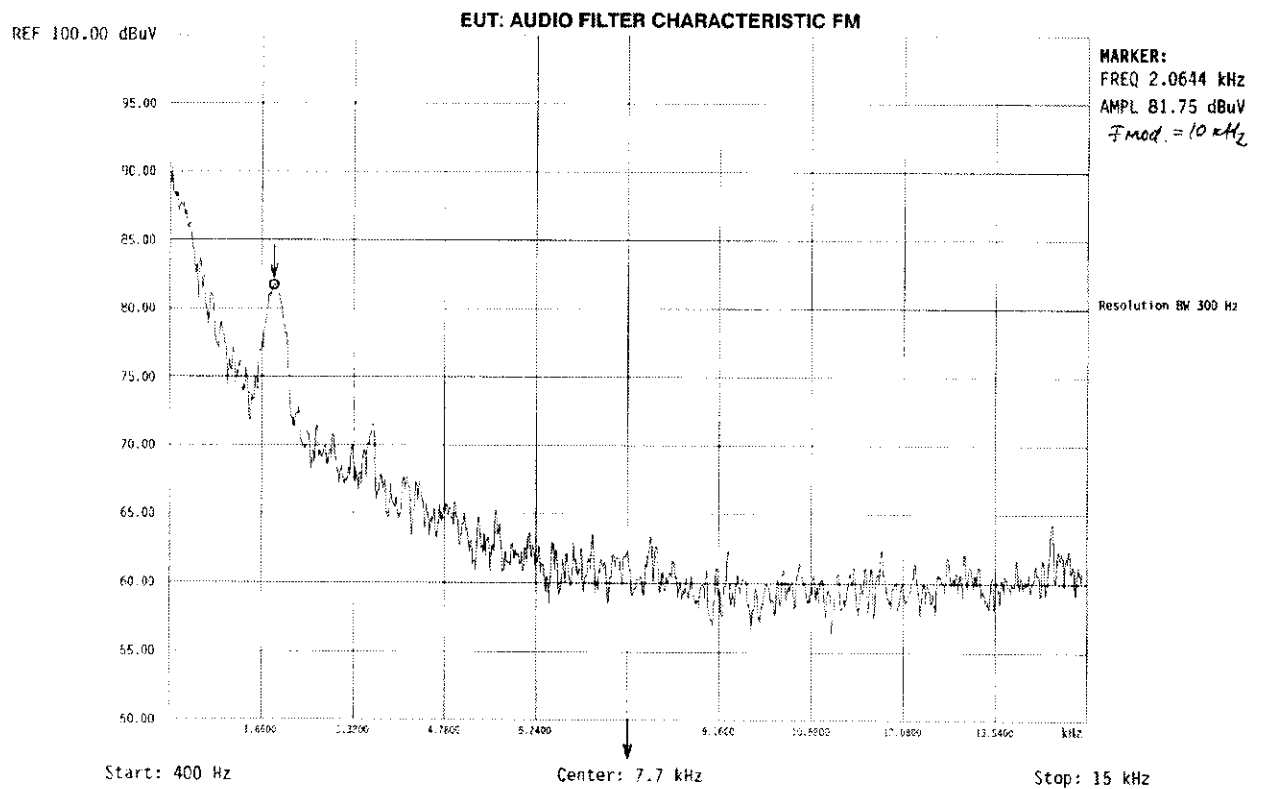


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Test Report: TLR FCC.12663
Date: April, 1998
FCC ID: ARACET-10

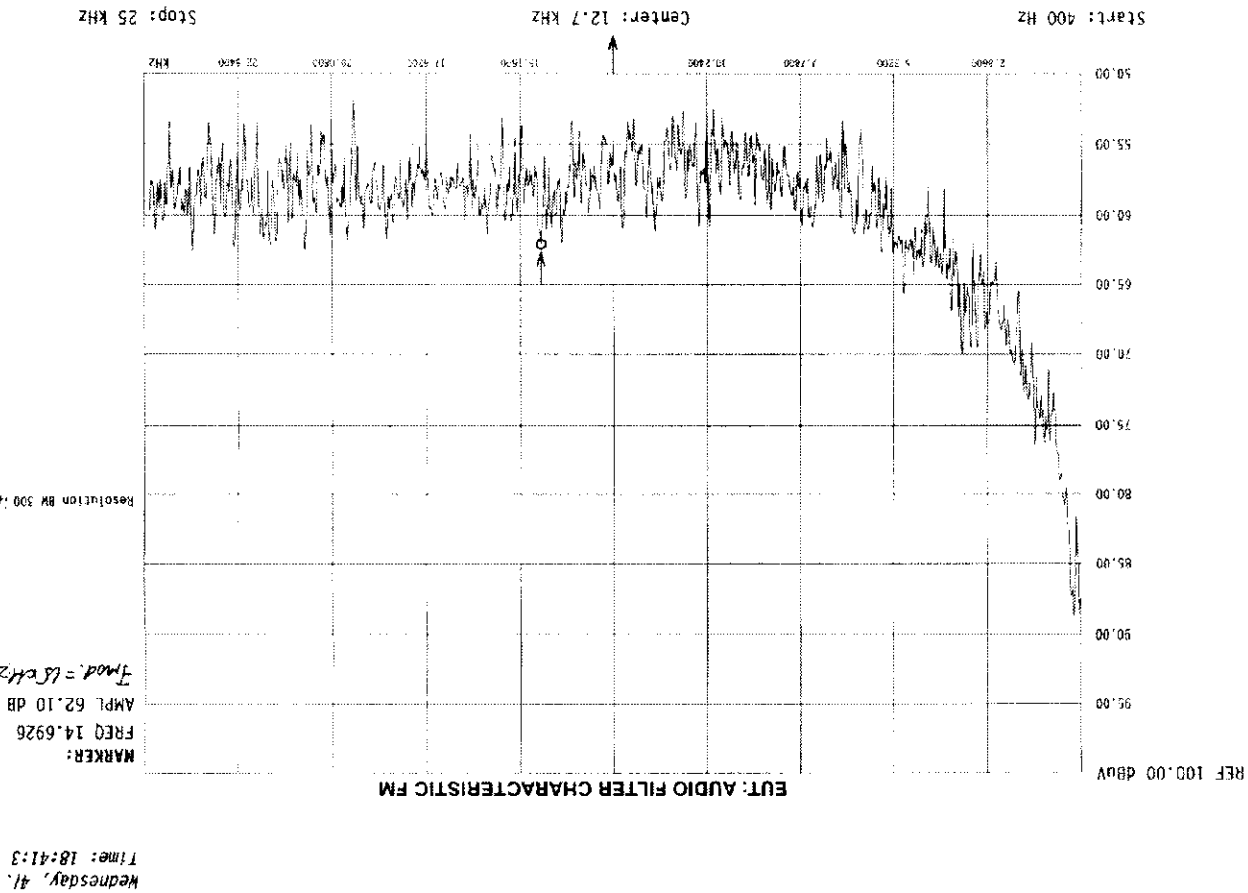
Plot 3.9.15
Audio filter characteristics test

Wednesday, 4/3/1998
Time: 18:38:11





Plot 3.9.16
 Audio filter characteristics test



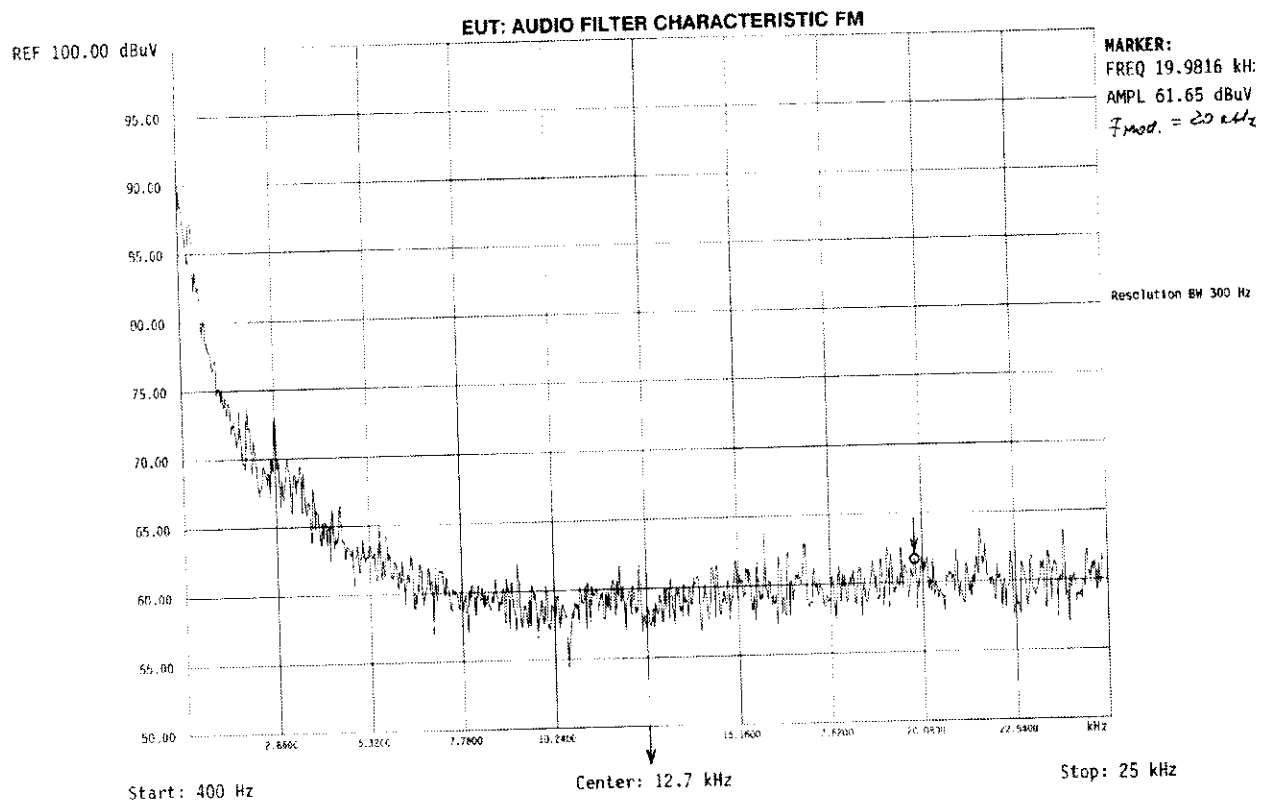


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Test Report: TLR FCC.12663
Date: April, 1998
FCC ID: ARACET-10

Plot 3.9.17
Audio filter characteristics test

Wednesday, 4/3/1
Time: 18:43:55





3.10 Unintentional Radiated emissions (class A digital device) test according to §15.109

3.10.1 Definition of the test

This test was performed to measure radiated emissions from the incorporated digital schematic of the EUT.

3.10.2 The test set-up configuration

The radiated emissions measurements of the EUT incorporated digital schematic in the frequency range from 30 MHz to 1 GHz were performed in the anechoic chamber at 3 meters measuring distance. The EUT was configured as shown in Figure 1.1 and placed on the wooden table as shown in Figure 3.10.1.

The Biconilog antenna was used. To find maximum radiation the turntable was rotated 360°, the cables position was varied, the measuring antenna height changed from 1 to 4 m, and the antennas polarization was changed from vertical to horizontal. The EMI receiver settings were: RBW=120 kHz, quasi-peak detector. The EUT was found to be within §15.109 class A limits. The results of measurements are shown in Plot 3.10.1.

Reference numbers of test equipment used

HL 0038	HL 0041	HL 0275	HL 0287	HL 0465	HL 0521	HL 0604
---------	---------	---------	---------	---------	---------	---------

Full description is given in Appendix A.



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Test Report: TLR FCC.12663

Date: April, 1998

FCC ID:ARACET-10

Plot 3.10.1

Test Specification: § 15.109, class A

Radiated emissions of incorporated digital device test



10:07:00 JUN 07, 1998

TELRAD EUT-CET 10 Pr.12663 FCC cl.A

ACTU DET: PEAK

MEAS DET: PEAK QP

MKR 233.2 MHz

55.91 dB μ V/m

MEASU
AT M

ADD
LI

MARK
↓

MARK

NE
PE

NEXT
RIG

NEXT
LE

Ma

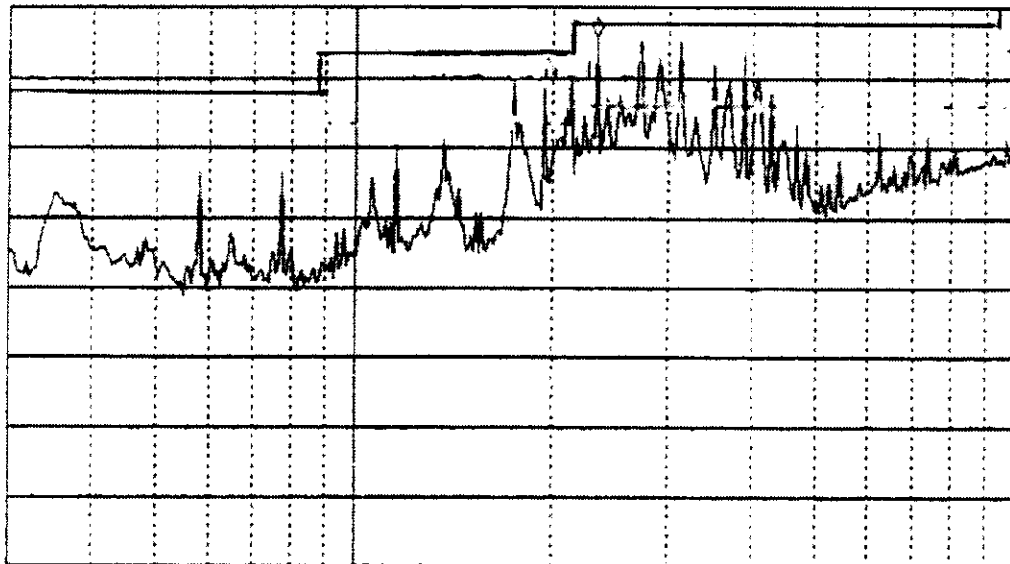
1 of

LOG REF 60.0 dB μ V/m

PREAMP ON

10
dB/
ATN
10 dB

MA SB
SC FC
ACORR



START 30.0 MHz

IF BW 120 kHz

AVG BW 300 kHz

STOP 1.0000 GHz

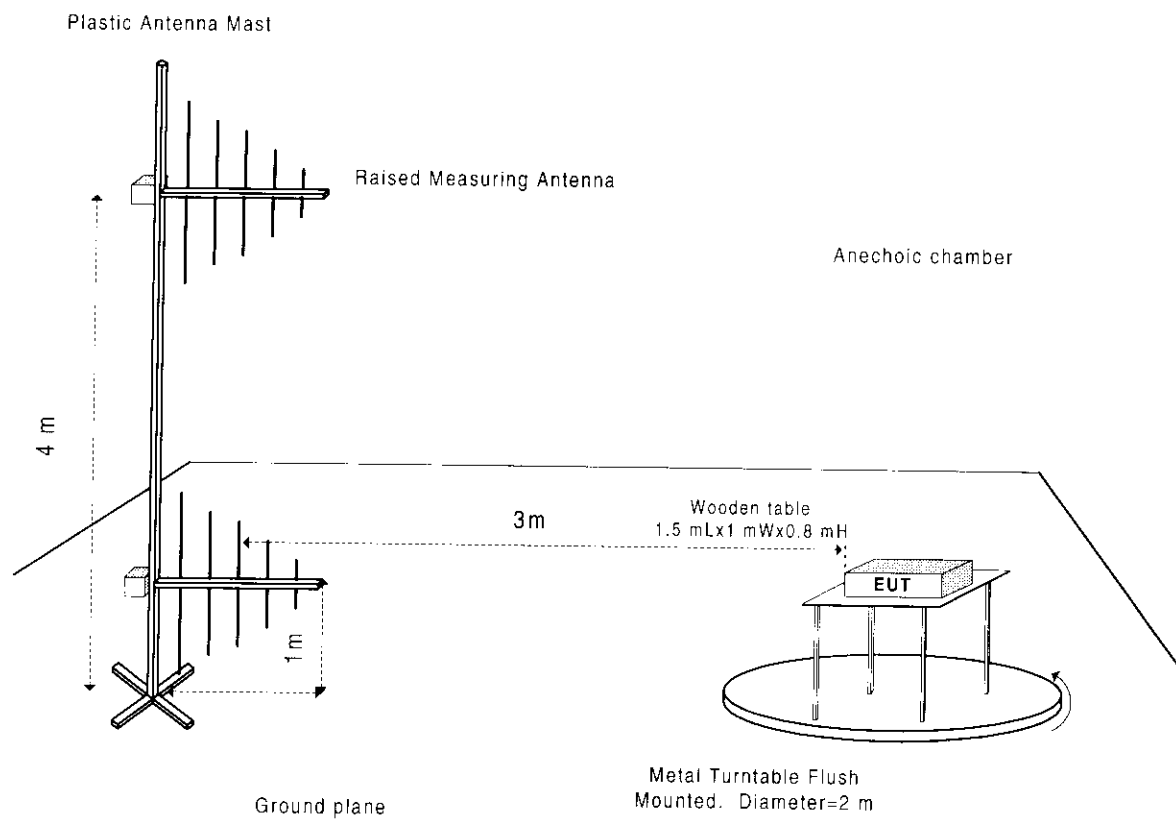
SWP 909 msec



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Test Report: TLRFCC.12663
Date: April, 1998
FCC ID:ARACET-10

Figure 3.10.1
Radiated Emission Test Setup





3.11 Conducted Emission Measurements according to §15.107, §15.207

3.11.1 Definition of the test

This test was performed to measure conducted emissions.

3.11.2 The test set-up configuration

The EUT was configured as shown in Figure 1.1. The test was performed in the shielded room. The EUT was setup as shown in Figure 3.11.1.

The frequency range from 450 kHz to 30 MHz was investigated.

The measurements were performed on the 120 V AC power lines (both neutral and phase) by means of the LISN, connected to the spectrum analyzer. The unused 50 Ω connector of the LISN was resistively terminated in 50 Ω when not connected to the measuring instrument. The position of the EUT cables was varied to determine maximum emission level. The peak detector (Resolution Bandwidth = 9 kHz) was used. All the measured emissions were found at least 20 dB below limit. The test results are shown in Plots 3.11.1 and 3.11.2.

Reference numbers of test equipment used

HL 0026	HL 0163	HL 0185	HL 0447	HL 0466		
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Full description is given in Appendix A.



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Test Report: TLR FCC.12663

Date: April, 1998

FCC ID:ARACET-10

Plot 3.11.1

Test Specification: § 15.107, § 15.207, class A
Conducted Emission Measurements on power line
Frequency range: 450 kHz-30 MHz
Line: phase
Detector: Peak



13:53:21 DEC 23, 1997

PR.12663 TELRAD CET-10 s/n0000083 FCC A NEUTRAL

ACTV DET: PEAK

MEAS DET: PEAK QP

MKR 14.99 MHz

51.17 dB μ V

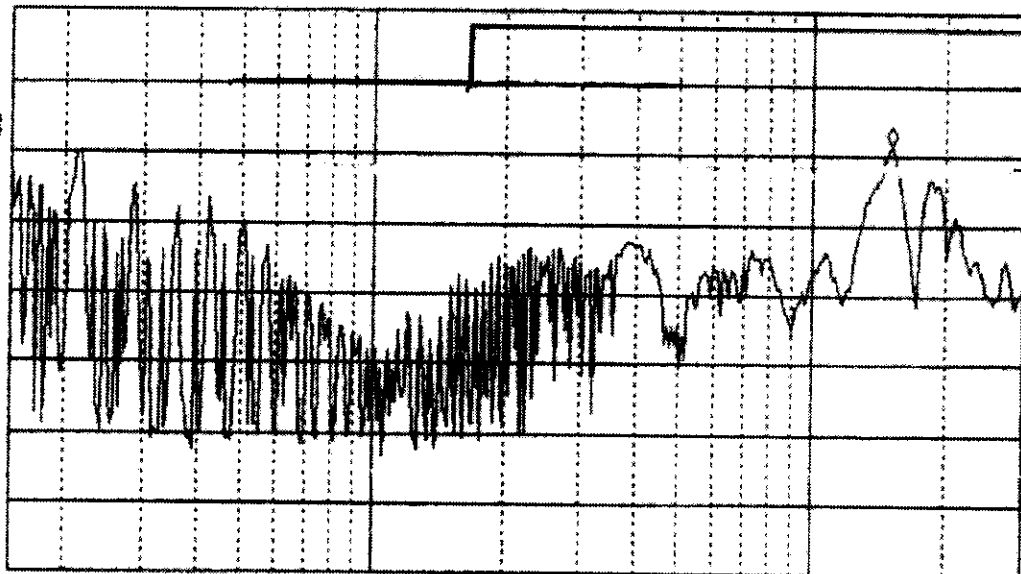
MEASU
AT M

ADD
LI

LOG REF 70.0 dB μ V

10
dB/
ATN
10 dB

VA SB
SC FC
ACORR



START 150 kHz

#IF BW 9.0 kHz

AVG BW 30 kHz

STOP 30.00 MHz

SWP 2.49 sec

CO
SCPL

OUTP
REPO

Def i
Repo

Def i
LI

EO
ANNO TA



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Test Report: TLR FCC.12663
Date: April, 1998
FCC ID: ARACET-10

Plot 3.11.2

Test Specification: § 15.107, § 15.207, class A
Conducted Emission Measurements on power line
Frequency range: 450 kHz-30 MHz
Line: neutral
Detector: Peak

13:49:12 DEC 23, 1997

PR.12663 TELRAD CET-10 s/n00000083 FCC A PHASE

ACTV DET: PEAK

MEAS DET: PEAK QP

MKR 14.76 MHz

51.22 dB μ V

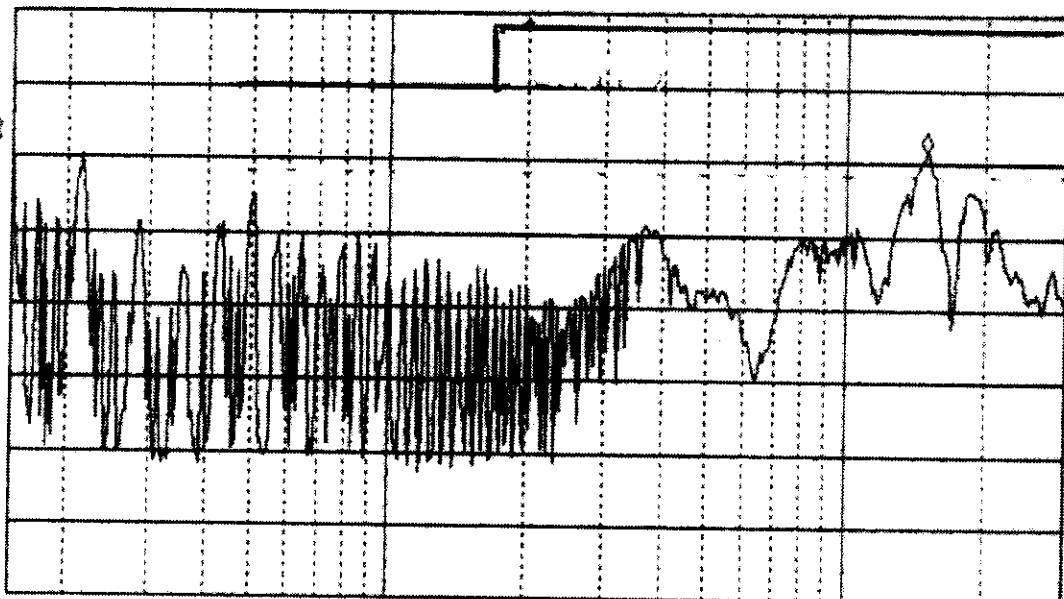
MEAS
AT

ADD
L

LOG REF 70.0 dB μ V

10
dB/
ATN
10 dB

VA SB
SC FC
ACORR



START 150 kHz

#IF BW 9.0 kHz

AUG BW 30 kHz

STOP 30.00 MHz

SWP 2.49 sec

OUT
REP

Def
Rep

Def
L

E
ANNOT



HERMON LABORATORIES

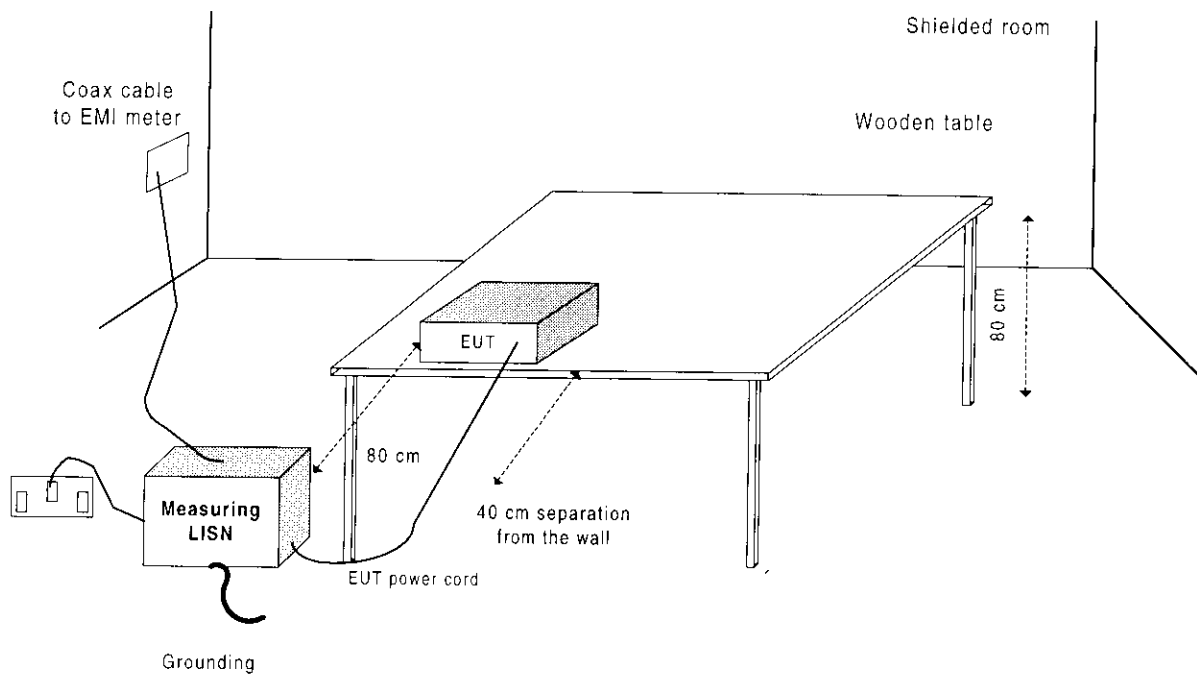
Test Report: TLR FCC.12663

Date: April, 1998

FCC ID: ARACET-10

Figure 3.11.1

Conducted Emission Test Setup





HERMON LABORATORIES

Test Report: TLR FCC.12663

Date: April, 1998

FCC ID:ARACET-10

4 Summary and Signatures

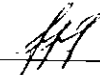
The digital radio telephone CET-10 was found to be in compliance with the requirements of FCC Part 2, §§, 2.985, 2.987, 2.989, 2.991, 2.993, 2.995, 2.997, Part 1, §1.1310, Part 22, §§ 22.905, 22.913, 22.915, 22.917 and within Part 15, §§15.107, 15.109, 15.207 class A limits.

Test performed by:

Mrs. Eleonora Pitt, test engineer



Mr. Michael Nikishin, test engineer



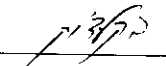
Approved by:

Dr. Edward Usoskin, C.E.O.



Responsible person from
TEL RAD Telecommunication and Electronic Industries Ltd.

Mr. J. Bakalzuk, Department Manager





HERMON LABORATORIES

Test Report: TLR FCC.12663
Date: April, 1998
FCC ID:ARACET-10

APPENDIX A - Test equipment and ancillaries used for tests

HL Serial No.	Serial No.	Description	Manufacturer	Model No.	Due Calibr.
0025	5837	Spectrum Analyzer, 10 kHz-23 GHz	Anritsu	MS-710A	10/98
0026	3460	Spectrum Analyzer, 100 Hz-2.2 GHz	Anritsu	MS 2601A	8/99
0027	4838	Spectrum Analyzer, 50 Hz-2 GHz	Anritsu	MS-611A	10/98
0028	4147	Interference Analyzer, 9KHz-1GHz	Electro-Metrics	EMC 30MKIV	7/98
0029	297	Antenna Dipole, Tunable, 200 - 1000 MHz	Electro-Metrics	TDS 30/1	2/99
0041	2811	Double Ridged Guide Antenna, 1 - 18 GHz	Electro-Metrics	RGA 50/60	8/98
0056	2627	Attenuator, 50 Ohm, 2 W, 0 -18 GHz, 30 dB	Hewlett Packard	8492A	4/99
0163	1314	LISN, 9kHz-100MHz	Electro-Metrics	ANS-25/2	11/98
0185	1765	Graphics Plotter	Hewlett Packard	7475A	NA
0447	447	LISN, 16/2, 300 V RMS	Hermon Labs	NA	2/98
0465	0465	Anechoic Chamber 9 mL x 6.5 mW x 5.5 mH	Hermon Labs	NA	10/99
0466	0466	Shielded Room 3 mL x 3 mW x 2.4 mH	Hermon Labs	NA	10/99
0500	25-2893-05	Oven temperature	Thermotron	S-16 Mini-Max	11/98
0521	3617A 00319	Analyzer, Spectrum with RF filter section - HP EMI Receiver 9 kHz - 8 GHz	Hewlett Packard	HP 8546A	7/98
0557	112225 /080	Generator Signal	Marconi Instruments	52023-002E	11/98
0593	593	Antenna Mast, 1-4/1-6 m Pneumatic	Hermon Laboratories	HL AM-F1	4/99
0594	594	Turn Table for Anechoic Chamber	Hermon Laboratories	HL TT-EDC1	11/98
0604	1011	Antenna Log-Periodic/T Bow-Tie 26-2000 MHz	Emco	3141 BICONILOG ANTENNA	7/98



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Test Report: TLR FCC.12663

Date: April, 1998

FCC ID:ARACET-10

APPENDIX B-Test Equipment Correction Factors

**Correction Factor
Line Impedance Stabilization Network
Model ANS-25/2
Electro-Metrics**

Frequency, kHz	Correction Factor
10	4.9
15	2.86
20	1.83
25	1.25
30	0.91
35	0.69
40	0.53
50	0.35
60	0.25
70	0.18
80	0.14
90	0.11
100	0.09
125	0.06
150	0.04

The correction factor dB is to be added to the meter readings (dB/ μ V) of the interference analyzer or spectrum analyzer.



HERMION LABORATORIES

Test Report: TLR FCC.12663

Date: April, 1998

FCC ID:ARACET-10

Antenna Factor at 3 m test distance
Biconilog Antenna EMCO Model 3141
Ser.No.1011

Frequency, MHz	Antenna Factor, dB(1/m)	Frequency, MHz	Antenna Factor, dB(1/m)
26	7.8	940	24.0
28	7.8	960	24.1
30	7.8	980	24.5
40	7.2	1000	24.9
60	7.1	1020	25.0
70	8.5	1040	25.2
80	9.4	1060	25.4
90	9.8	1080	25.6
100	9.7	1100	25.7
110	9.3	1120	26.0
120	8.8	1140	26.4
130	8.7	1160	27.0
140	9.2	1180	27.0
150	9.8	1200	26.7
160	10.2	1220	26.5
170	10.4	1240	26.5
180	10.4	1260	26.5
190	10.3	1280	26.6
200	10.6	1300	27.0
220	11.6	1320	27.8
240	12.4	1340	28.3
260	12.8	1360	28.2
280	13.7	1380	27.9
300	14.7	1400	27.9
320	15.2	1420	27.9
340	15.4	1440	27.8
360	16.1	1460	27.8
380	16.4	1480	28.0
400	16.6	1500	28.5
420	16.7	1520	28.9
440	17.0	1540	29.6
460	17.7	1560	29.8
480	18.1	1580	29.6
500	18.5	1600	29.5
520	19.1	1620	29.3
540	19.5	1640	29.2
560	19.8	1660	29.4
580	20.6	1680	29.6
600	21.3	1700	29.8
620	21.5	1720	30.3
640	21.2	1740	30.8
660	21.4	1760	31.1
680	21.9	1780	31.0
700	22.2	1800	30.9
720	22.2	1820	30.7
740	22.1	1840	30.6
760	22.3	1860	30.6
780	22.6	1880	30.6
800	22.7	1900	30.6
820	22.9	1920	30.7
840	23.1	1940	30.9
860	23.4	1960	31.2
880	23.8	1980	31.6
900	24.1	2000	32.0
920	24.1		

Antenna factor is to be added to receiver meter reading in dB(μ V) to convert to field intensity in dB(μ V/meter).



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Test Report: TLR FCC.12663

Date: April, 1998

FCC ID:ARACET-10

Antenna Factor
Double Ridged Guide Antenna
Electro-Metrics, Model RGA-50/60
Ser.No.2811

Frequency, MHz	Antenna Factor, dB(1/m)
1000	24.3
1500	25.4
2000	28.4
2500	29.2
3000	30.5
3500	31.6
4000	33.7
4500	32.2
5000	34.5
5500	34.5
6000	34.6
6500	35.3
7000	35.5
7500	35.9
8000	36.6
8500	37.3
9000	37.7
9500	37.7
10,000	38.2
10,500	38.5
11,000	39.0
11,500	40.1
12,000	40.2
12,500	39.3
13,000	39.9
13,500	40.6
14,000	41.1
14,500	40.5
15,000	39.9
15,500	37.8
16,000	39.1
16,500	41.1
17,000	41.7
17,500	45.1
18,000	44.3

Antenna factor dB(1/m) is to be added to receiver meter reading in dB(μ V) to convert it into field intensity in dB(μ V/meter)