



HERMON LABORATORIES

Test Report: Attachment to TR AVR FCC.12768
Date: September, 1998
Total 33 pages

**ATTACHMENT TO TEST REPORT
AVR FCC.12768.DOC**



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3 Radiated Emission Measurements

3.1 Modulation characteristics according to § 2.987 (a) (b)

3.1.1 Definition of the test

This test was performed to demonstrate the EUT relations between the transmitting frequency and modulation.

3.1.2 The test set-up configuration

The test setup is given in Photograph 3.1.

3.1.3 Test results

The test results are given in Table 3.1.1.

Reference numbers of test equipment used

HL 0028	HL 0027	HL 0133	HL 0539	HL 0290
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Full description is given in Appendix A.



Table 3.1.1

TEST SPECIFICATION: FCC Part 2.987 (a) (b)
 COMPANY: AVR Communication Ltd.
 EUT: Transmitter Logicom TX20
 DATE: September 9, 1998
 RELATIVE HUMIDITY: 48%
 AMBIENT TEMPERATURE: 21°C

Modulation Frequency kHz	Modulation Voltage mV rms	Deviation kHz
0.300	0.1	1.26
0.300	0.5	3.26
0.300	2.0	4.5
0.300	5.0	4.91
1.00	0.1	1.25
1.00	0.5	3.26
1.00	2.0	4.23
1.00	5.0	4.67
5.0	0.1	0.68
5.0	0.5	2.84
5.0	2.0	4.14
5.0	5.0	4.45

Test Performed by:
 Mrs. Eleonora Pitt, test engineer

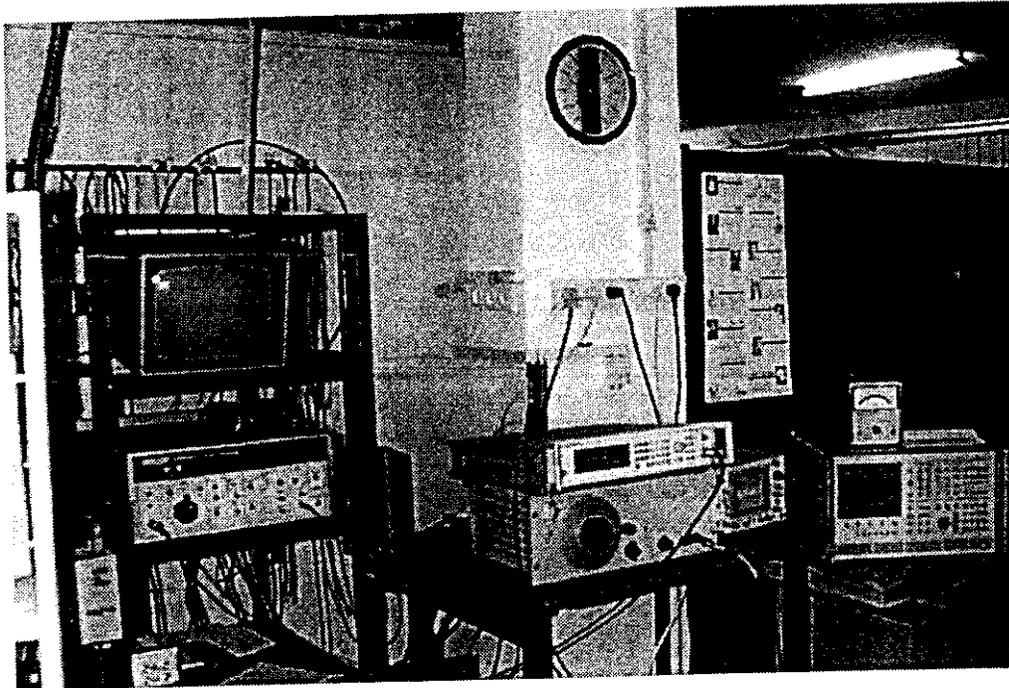
E. Pitt

Hermon Labs



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Photograph 3.1.1
Modulation characteristics test setup



Pat



3.2 Frequency stability test according to § 95.629 (c) (2) and § 2.995

3.2.1 Definition of the test

This test was performed to measure the frequency stability at the temperatures between -30°C to 0°C and at low input voltage deviation.
The maximum instability allowed is ±10.8kHz (50ppm).

3.2.2 The test set-up configuration

The test setup is given in Photographs 3.2.1.

3.3.3 Test results

The EUT have passed the test.
The test results are given in the tables below and in Plots 3.2.1 to 3.2.18.

Table 3.2.1
Frequency stability test results
(in kHz)

Frequency at 25°C, MHz	Frequency shift, kHz			
	At test temperature			
	-30°C	-20°C	-10°C	0°C
216.0255	0.30	1.26	1.90	1.70
216.4753	-0.78	2.42	2.80	2.30
216.9753	-1.26	-0.14	0.70	1.10

Table 3.2.2
Frequency stability test results
(in kHz)

Frequency, MHz At nominal voltage (1.5V)	Frequency shift, kHz at reduced voltage (1.2V)
216.0255	0
216.4753	0
216.9753	0

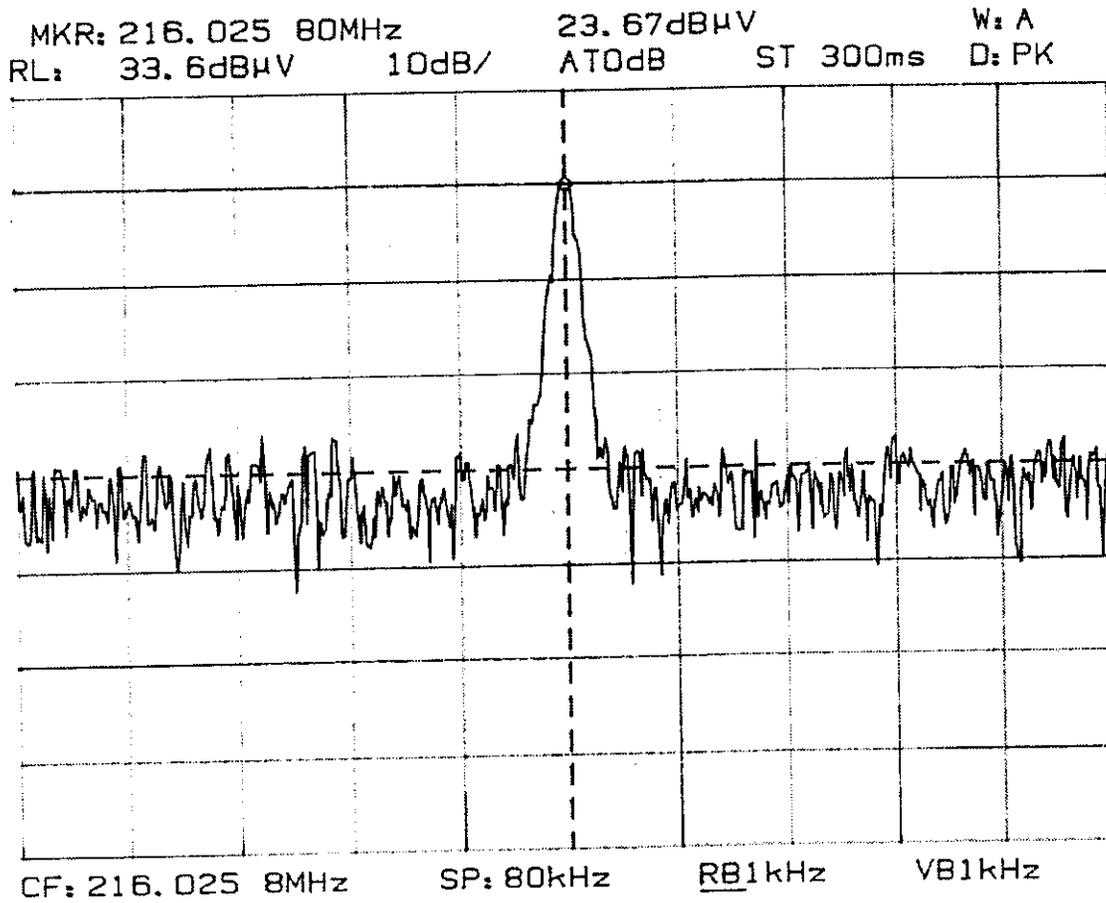
Reference numbers of test equipment used

HL 0500	HL 0507					
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Full description is given in Appendix A.



Plot 3.2.1 Frequency stability test
Frequency: 216.025 MHz
Temperature: -30°C

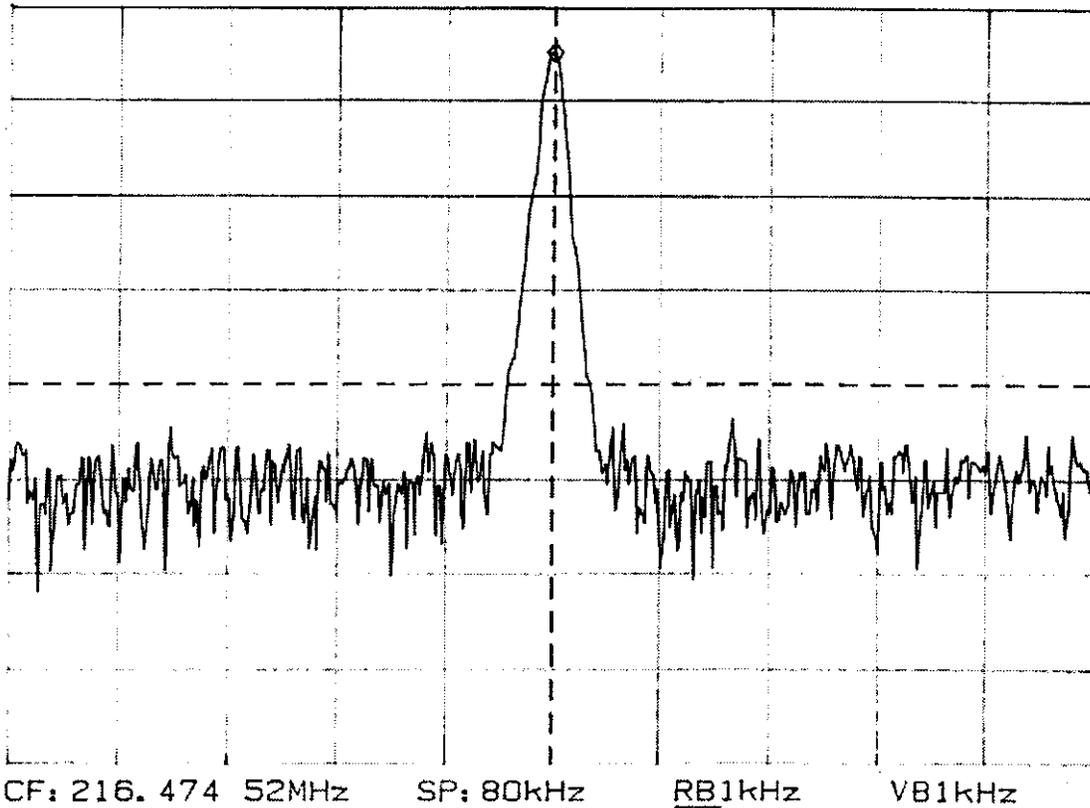




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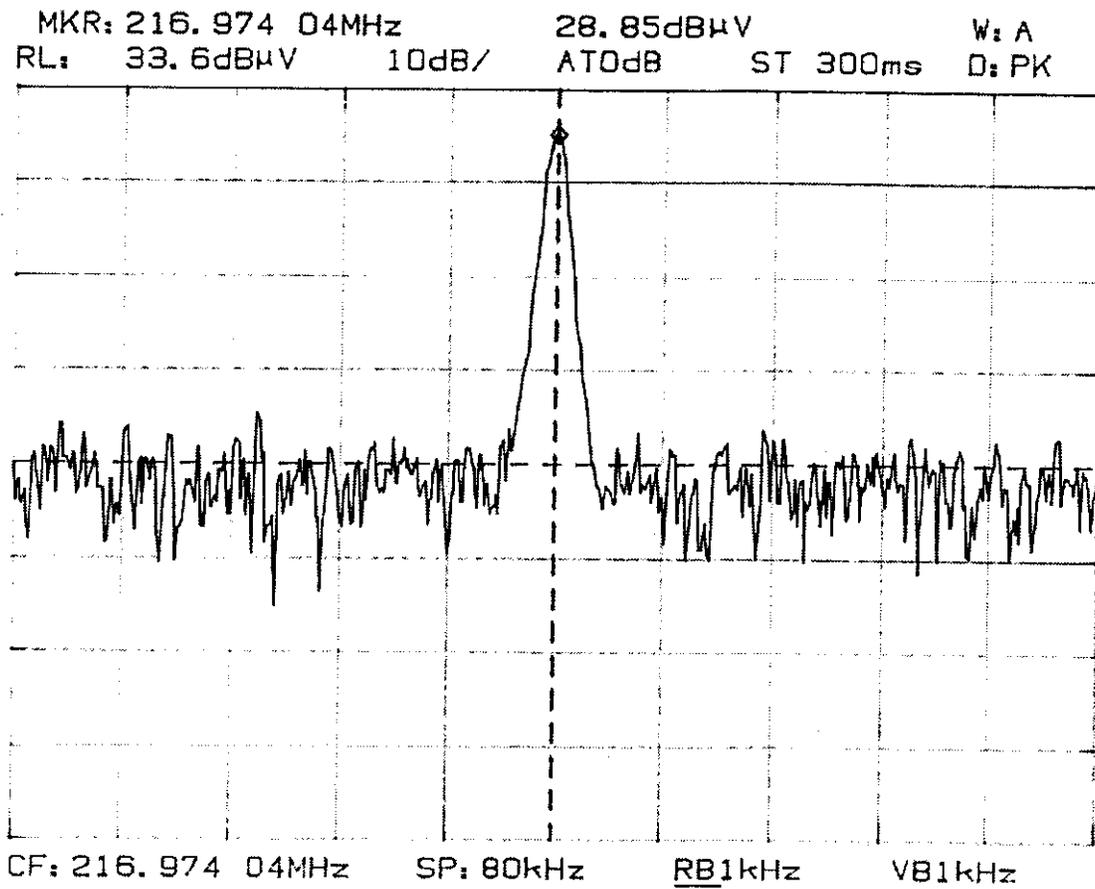
Plot 3.2.2 Frequency stability test
Frequency: 216.475 MHz
Temperature: -30°C

MKR: 216.474 52MHz 38.24dBμV W: A
RL: 43.0dBμV 10dB/ AT0dB ST 300ms D: PK





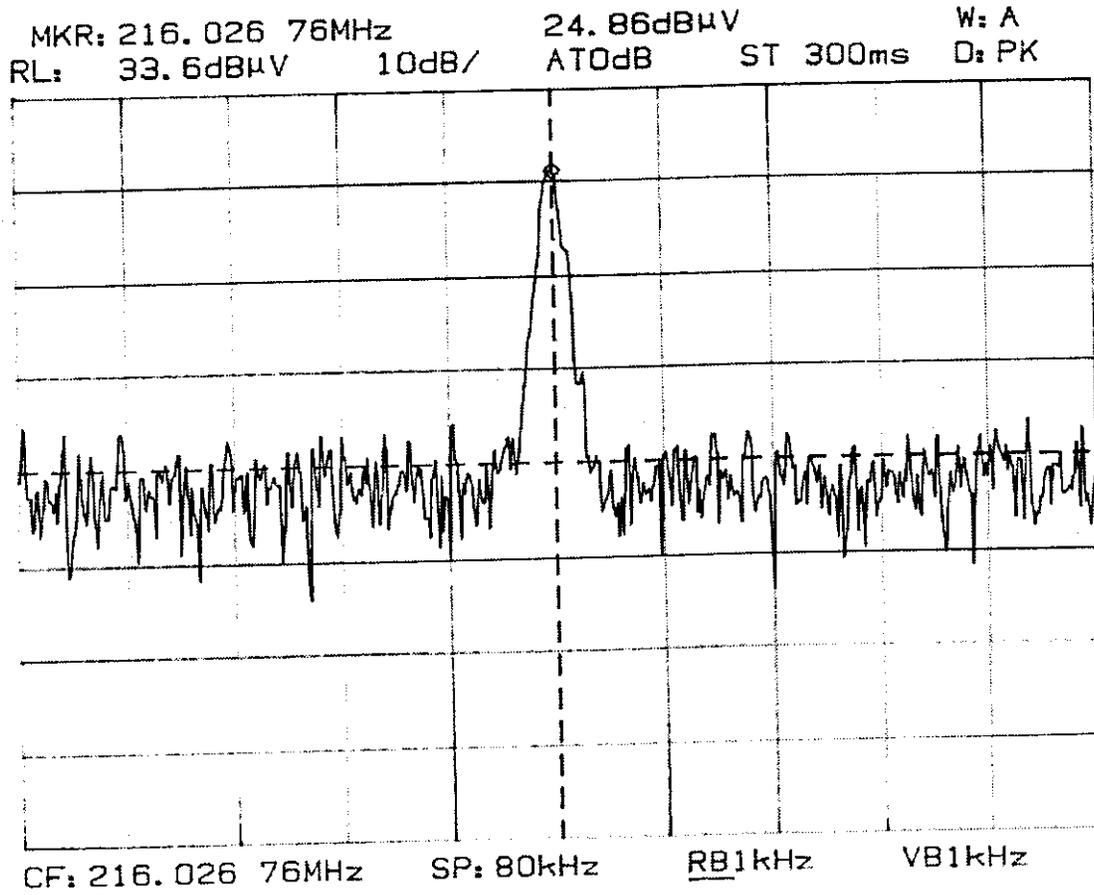
Plot 3.2.3 Frequency stability test
Frequency: 216.975 MHz
Temperature: -30°C





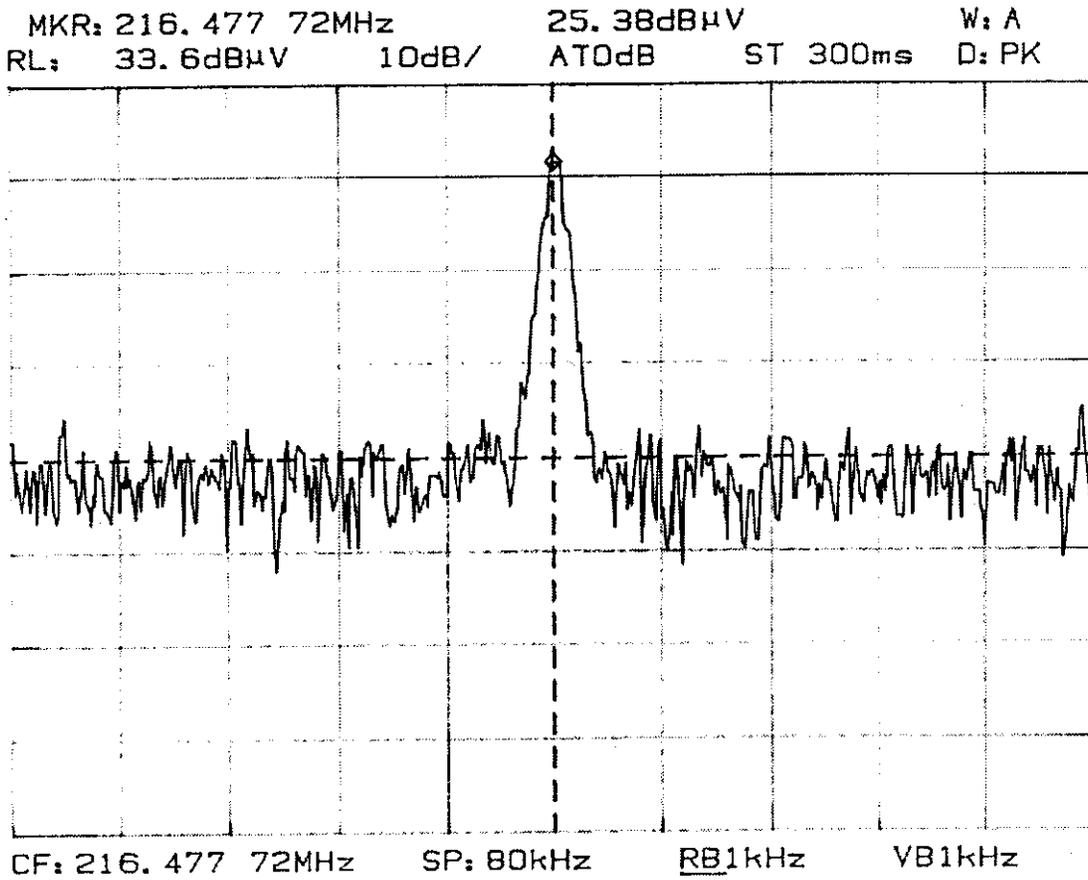
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Plot 3.2.4 Frequency stability test
Frequency: 216.025 MHz
Temperature: -20°C



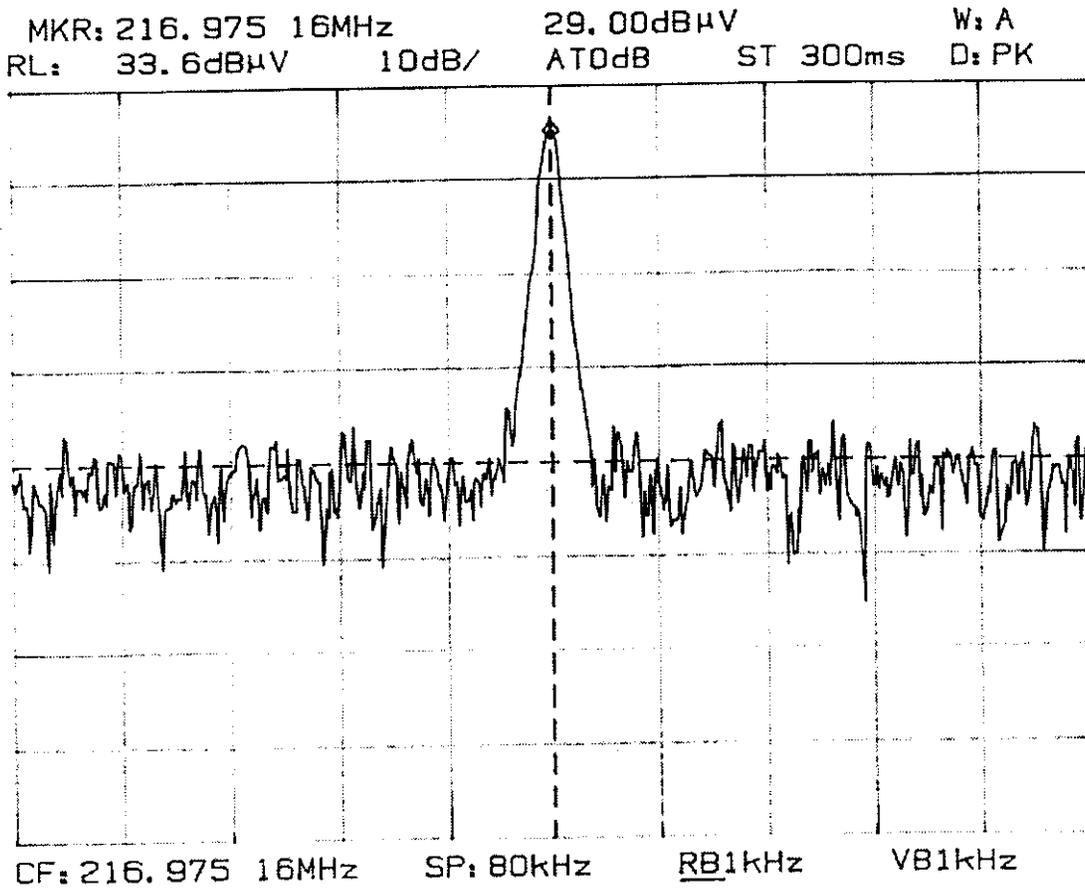


Plot 3.2.5 Frequency stability test
Frequency: 216.475 MHz
Temperature: -20°C



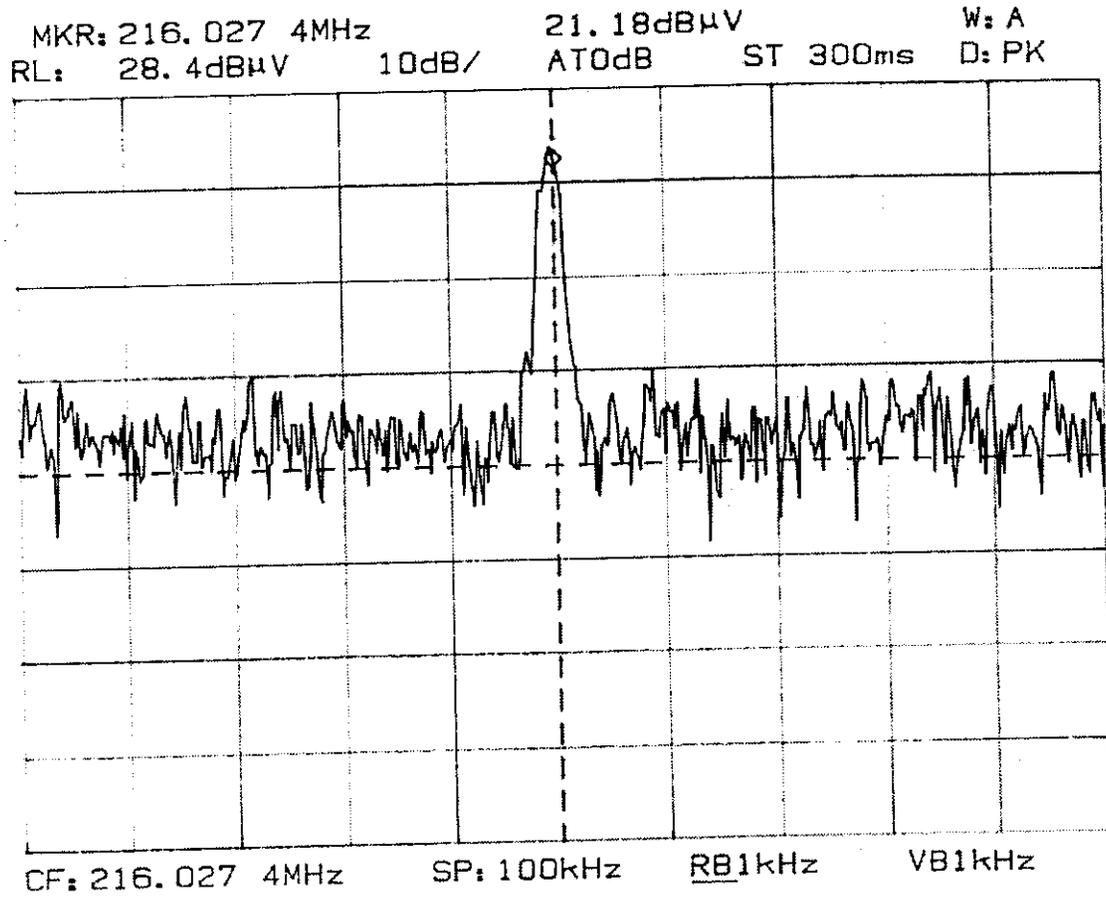


Plot 3.2.6 Frequency stability test
Frequency: 216.975 MHz
Temperature: -20°C



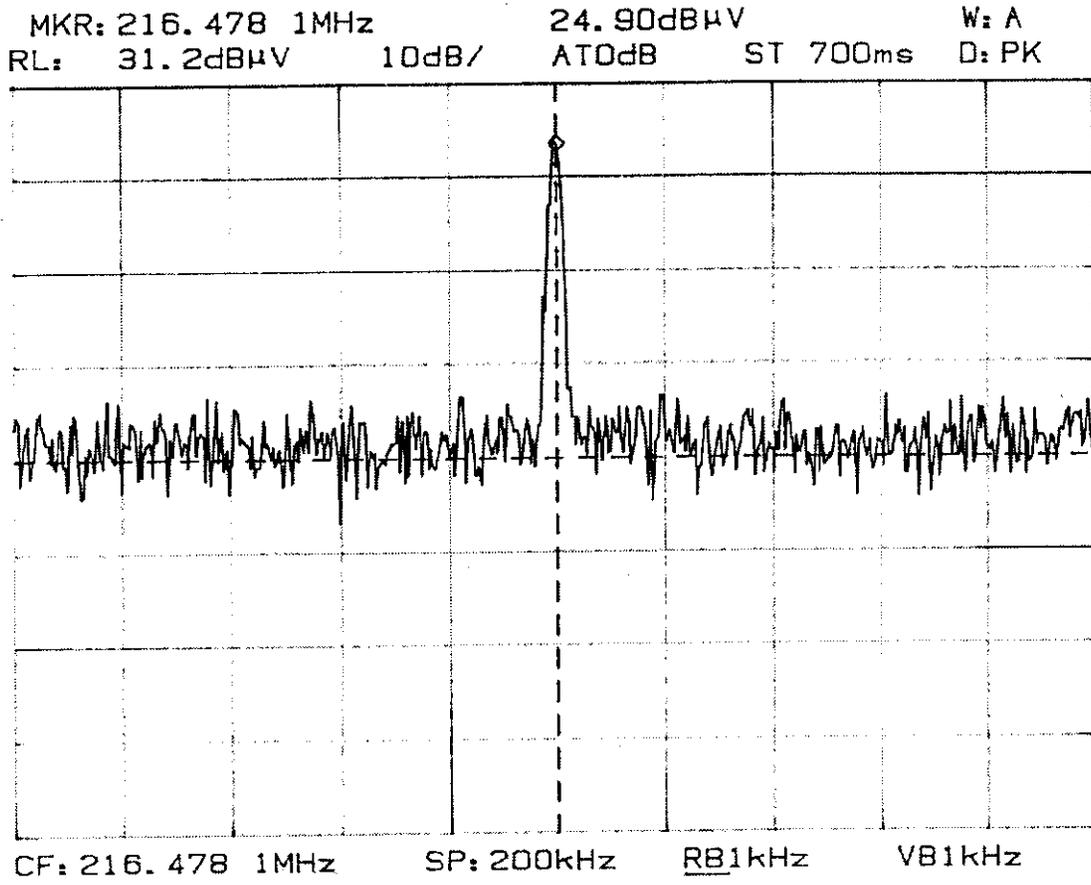


Plot 3.2.7 Frequency stability test
Frequency: 216.075 MHz
Temperature: -10°C





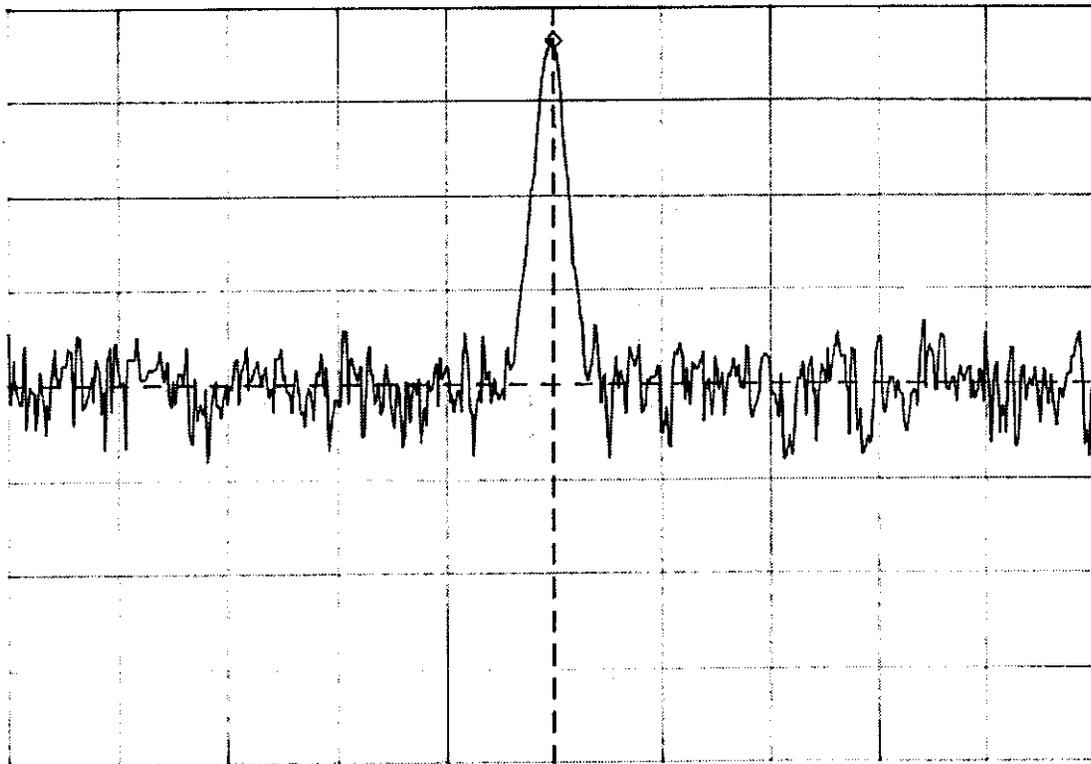
Plot 3.2.8 Frequency stability test
Frequency: 216.475 MHz
Temperature: -10°C





Plot 3.2.9 Frequency stability test
Frequency: 216.975 MHz
Temperature: -10°C

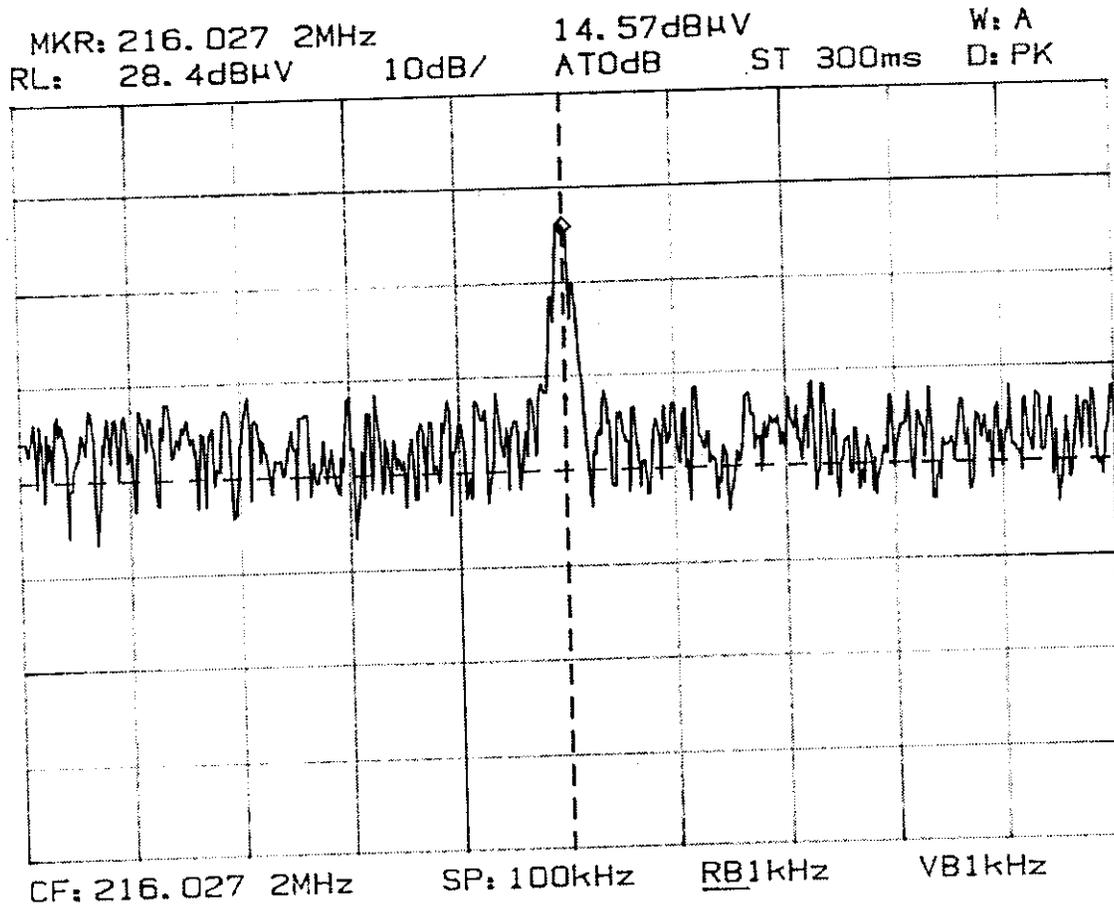
MKR: 216.976 00MHz 27.93dBμV W: A
RL: 31.2dBμV 10dB/ AT0dB ST 300ms D: PK



CF: 216.976MHz SP: 88kHz RB1kHz VB1kHz

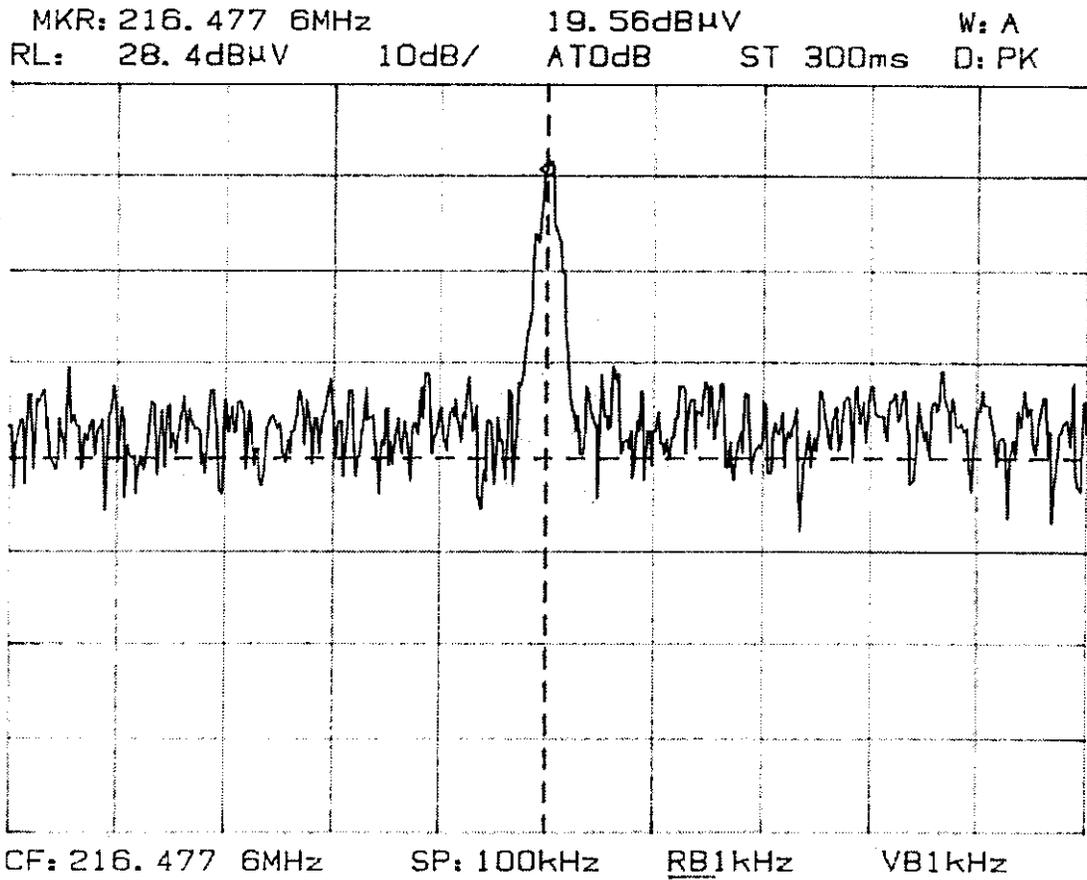


Plot 3.2.10 Frequency stability test
Frequency: 216.025 MHz
Temperature: 0°C





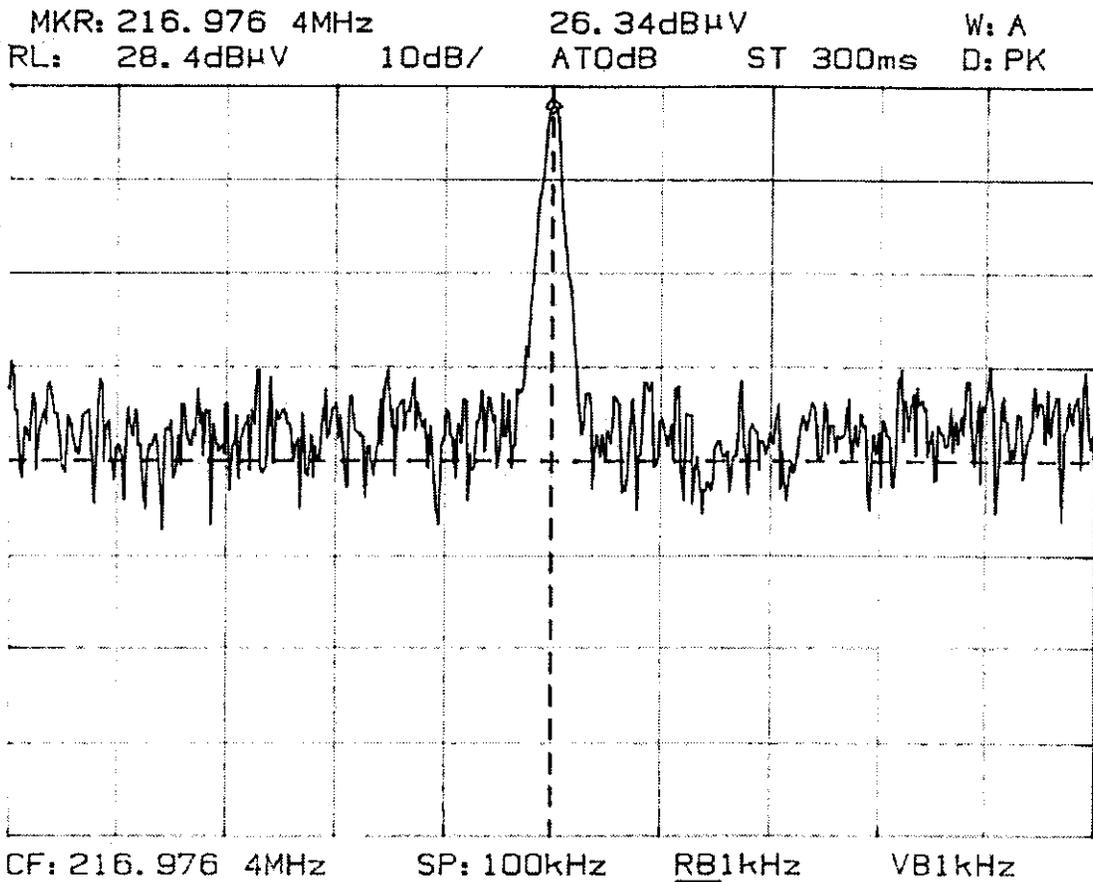
Plot 3.2.11 Frequency stability test
Frequency: 216.475 MHz
Temperature: 0°C





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Plot 3.2.12 Frequency stability test
Frequency: 216.975 MHz
Temperature: 0°C





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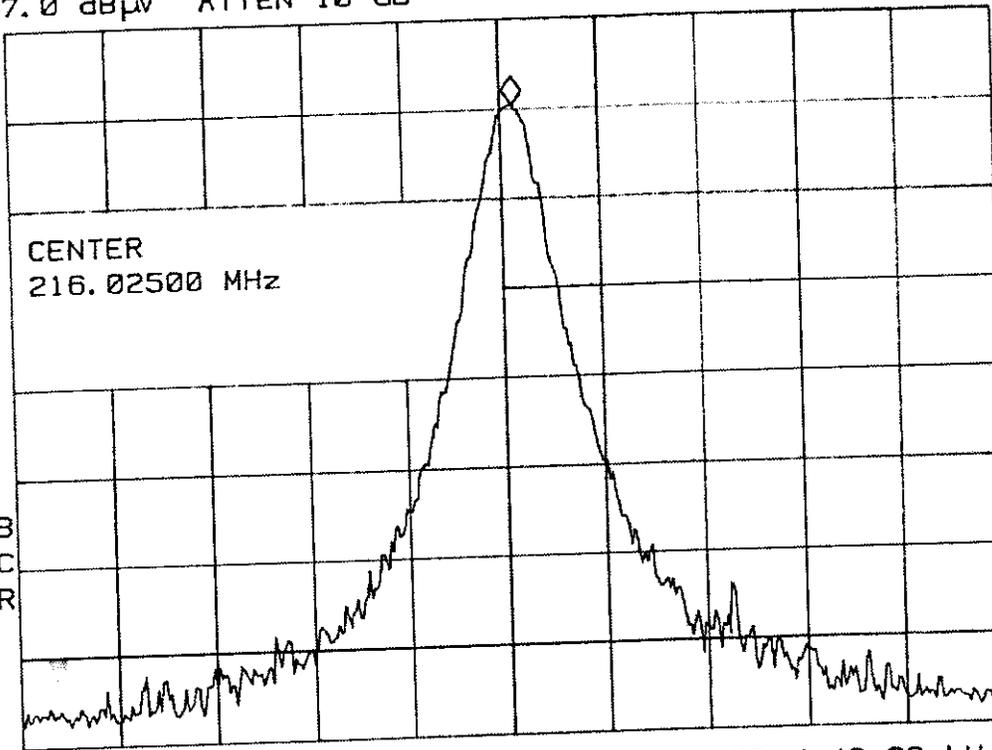
Plot 3.2.13 Frequency stability test
Frequency: 216.025 MHz
Temperature: 24°C
Humidity: 53%
Voltage: 1.2 VDC

18:03:12 SEP 09, 1998

MKR 216.02550 MHz
77.39 dBμV

REF 87.0 dBμV ATTEN 10 dB

PEAK
LOG
10
dB/



MA SB
SC FC
CORR

CENTER 216.02500 MHz
RES BW 1.0 kHz

VBW 1 kHz

SPAN 40.00 kHz
SWP 300 msec

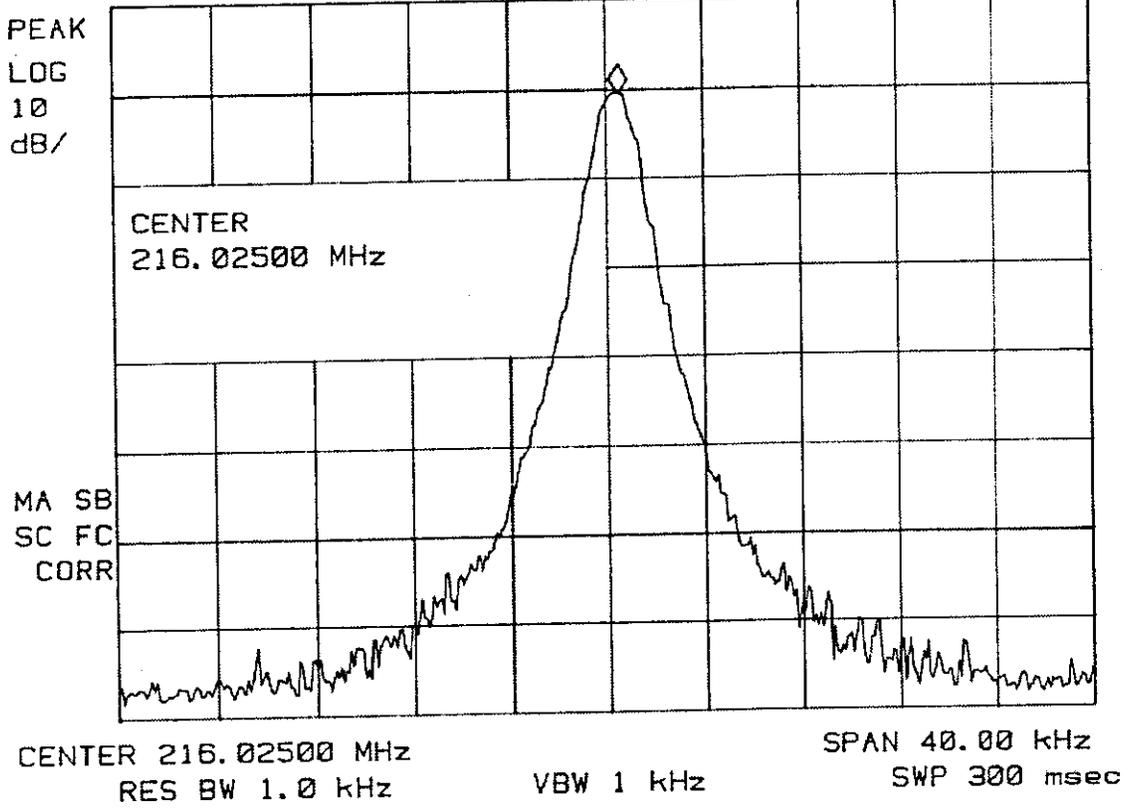


Plot 3.2.14 Frequency stability test
Frequency: 216.025 MHz
Temperature: 24°C
Humidity: 53%
Voltage: 1.5 VDC

18:00:43 SEP 09, 1998
hp

MKR 216.02550 MHz
76.53 dBμV

REF 87.0 dBμV ATTN 10 dB





Plot 3.2.15 Frequency stability test
Frequency: 216.475 MHz
Temperature: 24°C
Humidity: 53%
Voltage: 1.2 VDC

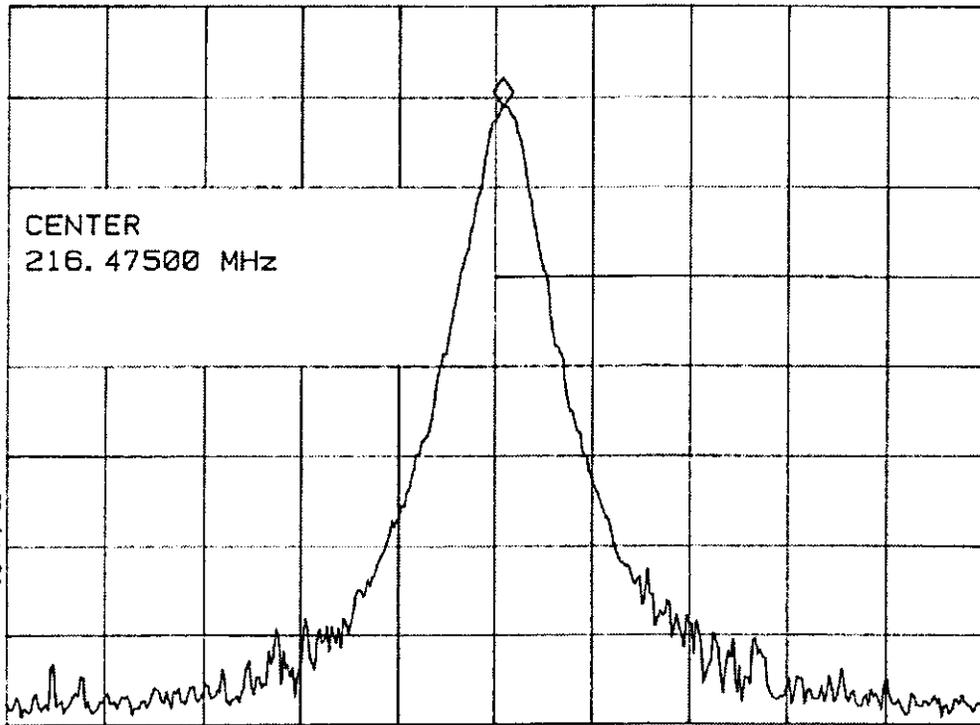
18:05:09 SEP 09, 1998

hp

MKR 216.47530 MHz
75.92 dBμV

REF 87.0 dBμV ATTEN 10 dB

PEAK
LOG
10
dB/



CENTER 216.47500 MHz
RES BW 1.0 kHz

VBW 1 kHz

SPAN 40.00 kHz
SWP 300 msec

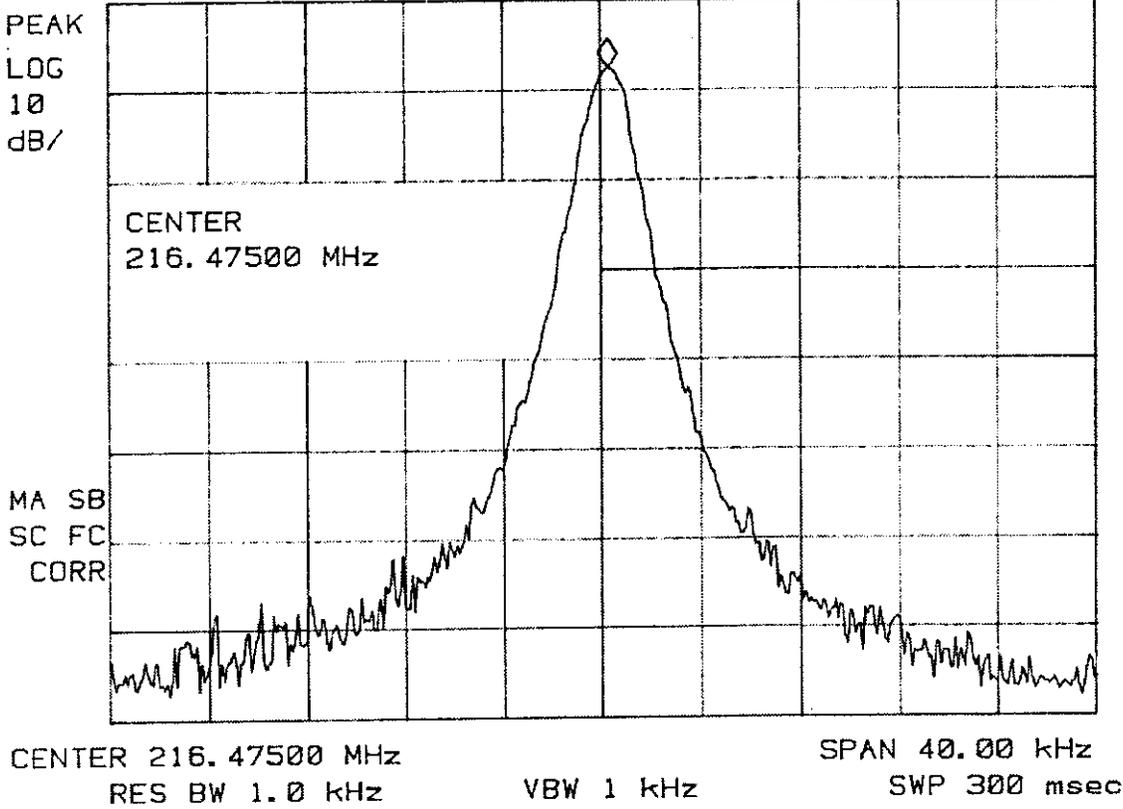


Plot 3.2.16 Frequency stability test
Frequency: 216.475 MHz
Temperature: 24°C
Humidity: 53%
Voltage: 1.5 VDC

18:07:14 SEP 09, 1998

MKR 216.47530 MHz
79.39 dBμV

REF 87.0 dBμV ATTN 10 dB





Plot 3.2.17 Frequency stability test

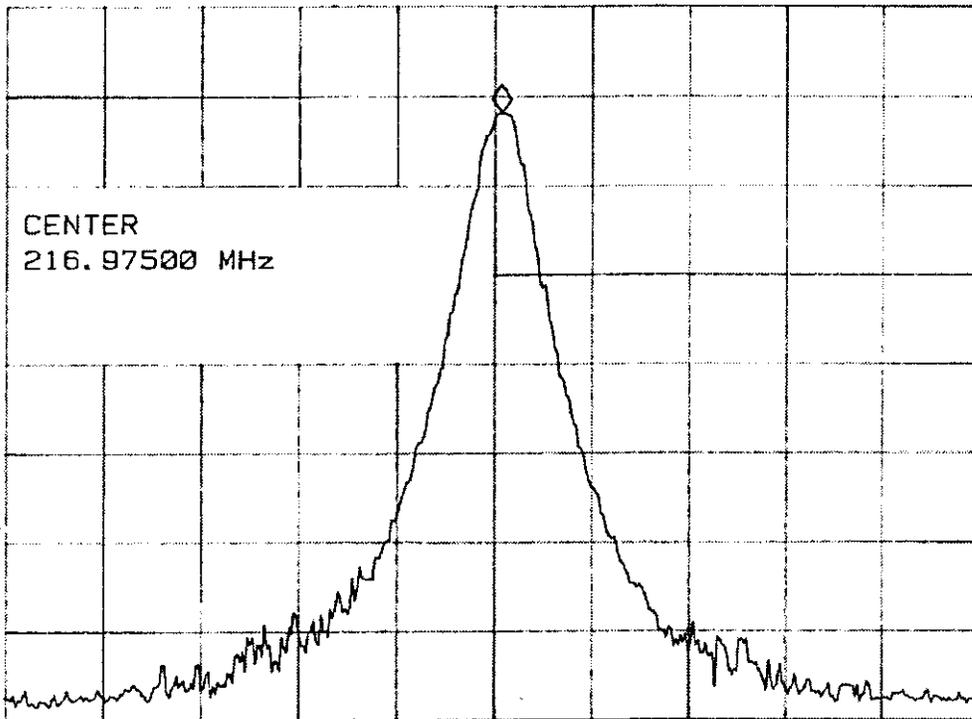
Frequency: 216.975
Temperature: 24°C
Humidity: 53%
Voltage: 1.2 VDC

18:11:07 SEP 09, 1998
hp

MKR 216.97530 MHz
75.09 dBμV

REF 87.0 dBμV ATTN 10 dB

PEAK
LOG
10
dB/



CENTER 216.97500 MHz
RES BW 1.0 kHz

VBW 1 kHz

SPAN 40.00 kHz
SWP 300 msec



Plot 3.2.18 Frequency stability test

Frequency: 216.975
Temperature: 24°C
Humidity: 53%
Voltage: 1.5 VDC

18:09:15 SEP 09, 1998

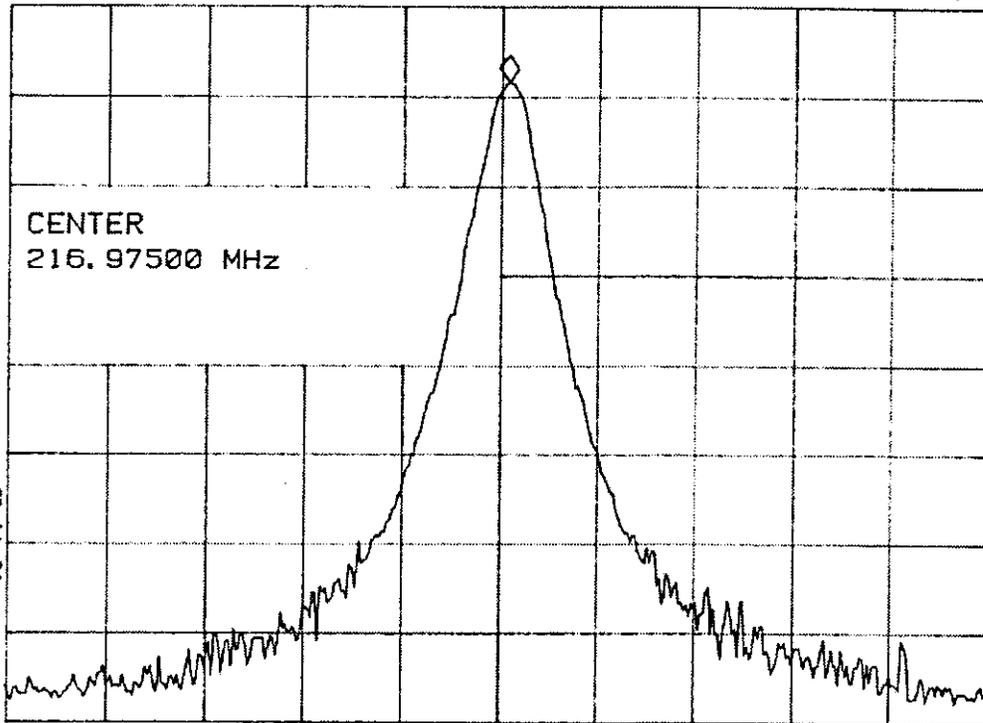
HP

MKR 216.97530 MHz

REF 87.0 dBμV ATTN 10 dB

78.49 dBμV

PEAK
LOG
10
dB/



CENTER 216.97500 MHz
RES BW 1.0 kHz

VBW 1 kHz

SPAN 40.00 kHz
SWP 300 msec



3.3 Occupied Bandwidth test according to § 95.633 (d) (3), § 2.995 and § 2.987 (a)

3.3.1 Definition of the test

This test was performed to determine that the TX occupying bandwidth is less than 50kHz. 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 test setup is given in Photograph 3.3.1.

3.3.3 Test results

The EUT have passed the test.
The test results are given in Plots 3.3.1 to 3.3.3.

Reference numbers of test equipment used

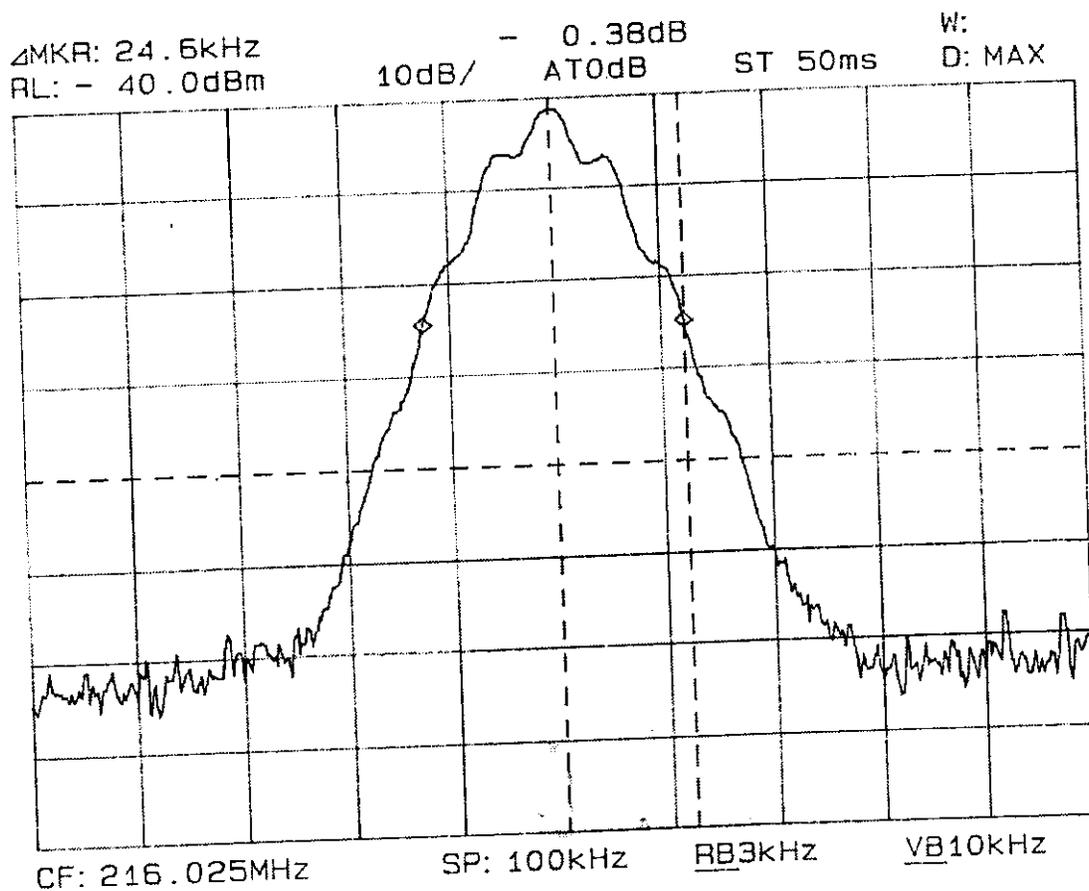
HL 0507						
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Full description is given in Appendix A.



Plot 3.3.1 Occupied Bandwidth test

Frequency: 216.025
Voltage modulation = 5mV RMS
Deviation = 4.45 kHz
Frequency modulation = 5 kHz



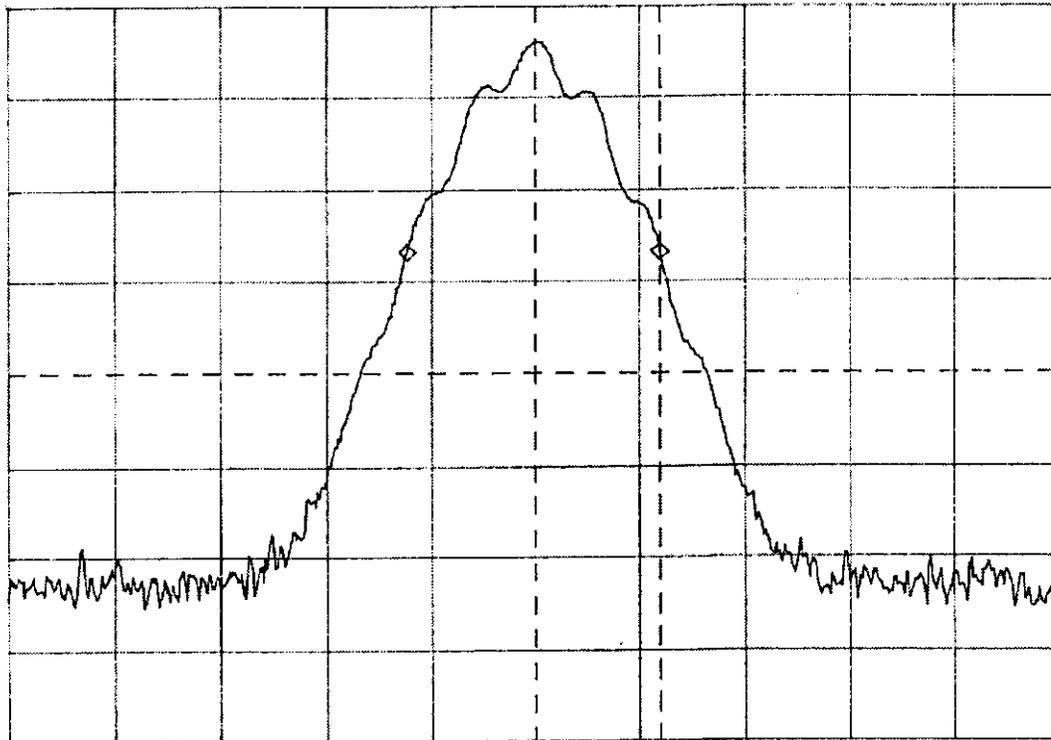
BH



Plot 3.3.2 Occupied Bandwidth test

Frequency: 216.475
Voltage modulation = 5mV RMS
Deviation = 4.45 kHz
Frequency modulation = 5 kHz

Δ MKR: 24.2kHz 0.07dB W:
RL: - 40.0dBm 10dB/ AT0dB ST 50ms D: MAX



CF: 216.475MHz SP: 100kHz RB3kHz VB10kHz

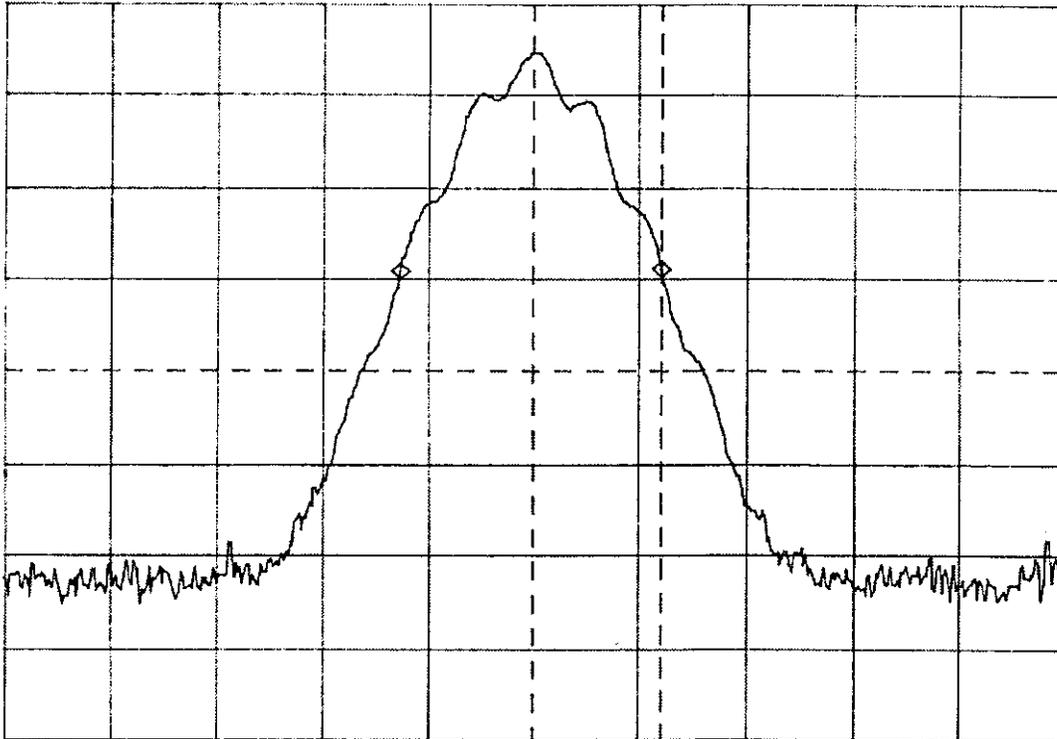
BH



Plot 3.3.3 Occupied Bandwidth test

Frequency: 216.975
Voltage modulation = 5mV RMS
Deviation = 4.45 kHz
Frequency modulation = 5 kHz

Δ MKR: 24.8kHz 0.24dB W:
RL: - 40.0dBm 10dB/ AT0dB ST 50ms D: MAX



CF: 216.975MHz SP: 100kHz RB 3kHz VB 10kHz

Bill



4 Summary and Signatures

The Transmitter Logicom TX20 was found to be in compliance with the requirements of FCC parts § 2.987 (a), § 2.987 (b), § 2.995, § 95.629 (c) (2) and § 95.633 (d) (3).

Test performed by:

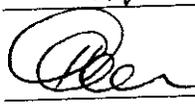
Mrs. Eleonora Pitt, test engineer

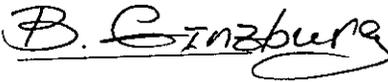
Mr. Yakov Kaplun, test engineer

**Responsible Person from
AVR communications Ltd.**

Mr. Boris Ginzburg, scientific manager









APPENDIX A - Test equipment and ancillaries used for tests

HL Serial No.	Serial No.	Description	Manufacturer	Model No.	Due Calibr.
0027	4838	Spectrum Analyzer, 50 Hz-2 GHz	Anritsu	MS-611A	10/98
0028	4147	Interference Analyzer, 9KHz-1GHz	Electro-Metrics	EMC 30MKIV	7/99
0133	3551	Generator Audio, 5 Hz – 600 kHz	Hewlett Packard	HP, 200CDR	2/99
0290	4644	Voltmeter, RMS, 10 Hz – 10 MHz, Acc. 5%	Hewlett Packard	HP, 3400A	7/99
500	9305	Oven temperature	Thermotron	S-16 Mini-Max	11/98
0539	1041	Generator Signal	Marconi Instruments	52023-001H	10/98
507	2926U 00162	Analyzer, Spectrum 9 kHz - 1.8 GHz	Hewlett Packard	HP 8591A	5/99



TEST MEASUREMENTS REPORT

ACCORDING TO FCC Part 2 and 95

FOR:

AVR Communication Ltd.

EQUIPMENT UNDER TEST:

Transmitter Logicom TX20

Prepared by: *D. Salamah* 313
Mr. D. Salamah, technical writer
Hermon Labs

Approved by: *A. Usoskin*
Mr. A. Usoskin, QA Manager
Hermon Labs

Approved by: *E. Usoskin* 29 March 1998
Dr. E. Usoskin, C.E.O.
Hermon Labs

Approved by: *B. Ginzburg*
Mr. Boris Ginzburg, scientific manager
AVR Communications Ltd.

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HERMON LABORATORIES

Test Report: AVRFCC.12768
Date: March, 1998

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in any form except in full with the approval
of Hermon Laboratories Ltd.***



Description of equipment under test

Test item	Transmitter
Manufacturer	AVR Communications Ltd.
Types (Models)	Logicom TX20
Receipt date	March 3, 1998

Applicant information

Applicant's representative	Mr. Boris Ginzburg, scientific manager
Applicant's responsible person	Mr. Boris Ginzburg, scientific manager
Company	AVR Communication Ltd.
Address	1 Megido Street
P.O. Box	6122
Postal code	31060
City	Haifa
Country	Israel
Telephone number	+972-(0)6-6546233
Telefax number	+972-(0)6-6546242
Order number:	W1107

Test performance

Project Number:	12768
Location	Hermon Laboratories
Test started	March 3, 1998
Test completed	March 5, 1998
Purpose of test	Electromagnetic emissions testing
Test specification(s)	FCC Part 2, § 2.995 and § 2.989 FCC Part 95, §95.639 (e), §95.629 (c) (2) §95.633 (d) (3), §95.635 (c) (2) and §95.629 (c)



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1 General Information

1.1 Abbreviations and Acronyms

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

AGC	Automatic Gain Control
dB	Decibel
dBi	decibel above isotropic
dB(μ V)	decibel referred to one microvolt
dB(μ V/m)	decibel referred to one microvolt per meter
EUT	Equipment Under Test
kHz	kilohertz
m	meter
MHz	megahertz
msec	Millisecond
NA	Not Applicable
ppm	part per million
RBW	resolution bandwidth
QP	Quasi-Peak (Detector)
VBW	video bandwidth
VHF	Very High Frequency
μ	micro

1.2 Specification References

CFR 47 part 2 10/1996	Frequency Allocations and Radio Treaty Matters; General Rules and Regulations
CFR 47 part 95 10/1996	Personal Radio Services (no)
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, Logicom TX20, is the new generation of synthesized transmitter using a low power μ Controller and VHF synthesizer. Logicom TX20 provides operation for 20 extra band channels occupying bandwidth 216.025 MHz - 216.975 MHz.

Transmitter includes four main blocks: power supply unit, microphone AGC amplifier, modulator and output VHF amplifier. Transmitter is equipped by 25cm flexible wire antenna. A single high capacity AA-type battery supplies the transmitter power unit.

Short specification

1. Maximum transmitter output Power (on pad Antenna and load 50Ω) $<10\text{mW}$
2. Transmitter channel Frequencies (extra band channels):

Channel number	Frequency kHz	Channel number	Frequency kHz
1	216.025	11	216.525
2	216.075	12	216.575
3	216.125	13	216.625
4	216.175	14	216.675
5	216.225	15	216.725
6	216.275	16	216.775
7	216.325	17	216.825
8	216.375	18	216.875
9	216.425	19	216.925
10	216.475	20	216.975

3. Modulation bandwidth: $\pm (5\pm 0.5)$ kHz.
4. Carrier frequency stability: $<\pm 5$ ppm
5. Radiation level measured in antenna located at 3m distance from transmitter is 90-100dB($\mu\text{V/m}$)
6. Side band components attenuation $>40\text{dB}$



HERMON LABORATORIES

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Date: March, 1998

1.4 Statement of Manufacturer

I, Boris Ginzburg, scientific manager of AVR Communications Ltd., declare that the Transmitter Logicom TX20 was tested on March 3 to 5, 1998 by Hermon Laboratories and which this test report applies to, is identical of the equipment that will be marketed.

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

Mr. Boris Ginzburg, scientific manager
AVR Communications Ltd.

Signature: Ginzburg

Date: MAY 10, 1998



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)6-628-8001
Fax: +972-(0)6-628-8277

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.

2.3 Laboratory Personnel

The three people of Hermon Laboratories that have participated in measurements and documentation preparation are: Dr. Edward Usoskin - C.E.O., Mrs. Eleonora Pitt - test engineer and Mr. David Salamah - technical writer.

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

The Hermon Laboratories' personnel that participated in this project have more than 60 years combined experience time in EMC measurements and electronic products design.



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Test Report: AVRFCC.12768

Date: March, 1998

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 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: March 25, 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 have learned in the Netherlands for six years and I have a high collective college school diploma and I have learned for two years in a technical college.

I have been with Hermon Laboratories since November 1996.

Name: Mr. David Salamah
Position: technical writer

Signature: 
Date: March 25, 1998

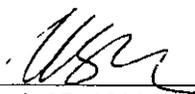
I hereby certify that this test measurement report was prepared under my direction and that to the best of my knowledge and belief, the facts set in the report and accompanying technical data are true and correct.

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: March 25, 1998



3 Radiated Emission Measurements

3.1 Maximum transmitter power test according to § 95.639 (e)

3.1.1 Definition of the test

This test was performed to demonstrate that the EUT maximum peak output power is not more than 100 mW.

3.1.2 The test set-up configuration

The EUT was tested according to the substitution method. ✓
The field strength generated by the EUT was measured and found.
The transmitting antenna was installed in the position where approximately the center of the EUT is to be placed. The transmitting antenna was fed by signal with enough power to give a suitable reading on the measuring set for each test frequency.
The test setup is given in Photographs 3.1.1 and 3.1.2.

3.1.3 Test results

Maximum output power was calculated from: Pout gen. - Cable loss + Gain antenna
The limit is 100mW.
The highest output was more than 90 mW below limit.
The test results are given in the table below.

Table 3.1.1
Maximum transmitter power test results

Frequency MHz	V _{SA} dB (μV/m)	Pout gen. dBm	Cable loss dB	Gain ant. dBi	Pmax Tx.	
					dBm	mW
216.025	98.33	6.3	1.2	2.1	7.2	5.2
216.475	98.96	7.0	1.2	2.1	7.9	6.2
216.975	99.17	8.5	1.2	2.1	9.4	8.7

Reference numbers of test equipment used

HL 0507	HL 0557	HL 0577	HL 0604			
---------	---------	---------	---------	--	--	--

Full description is given in Appendix A.



3.2 Frequency stability test according to § 95.629 (c) (2) and § 2.995

3.2.1 Definition of the test

This test was performed to measure the frequency stability at the temperatures between 0°C to 50°C. The maximum instability allowed is 10.8kHz (50ppm).

3.2.2 The test set-up configuration

The test setup is given in Photographs 3.2.1 and 3.2.2.

3.3.3 Test results

The EUT have passed the test.
The test results are given in the table below and in Plots 3.2.1 to 3.2.18.

Table 3.2.1
Frequency stability test results
(in kHz)

Frequency MHz	Test temperature °C					
	0°C	10°C	20°C	30°C	40°C	50°C
216.025	1.38	1.25	0.88	0	-0.5	-0.75
216.475	3.63	2.75	1.63	0	-1.25	-2.25
216.975	1.0	0.88	0.63	0.38	0	0.38

Reference numbers of test equipment used

HL 0500	HL 0507					
---------	---------	--	--	--	--	--

Full description is given in Appendix A.



HERMON LABORATORIES

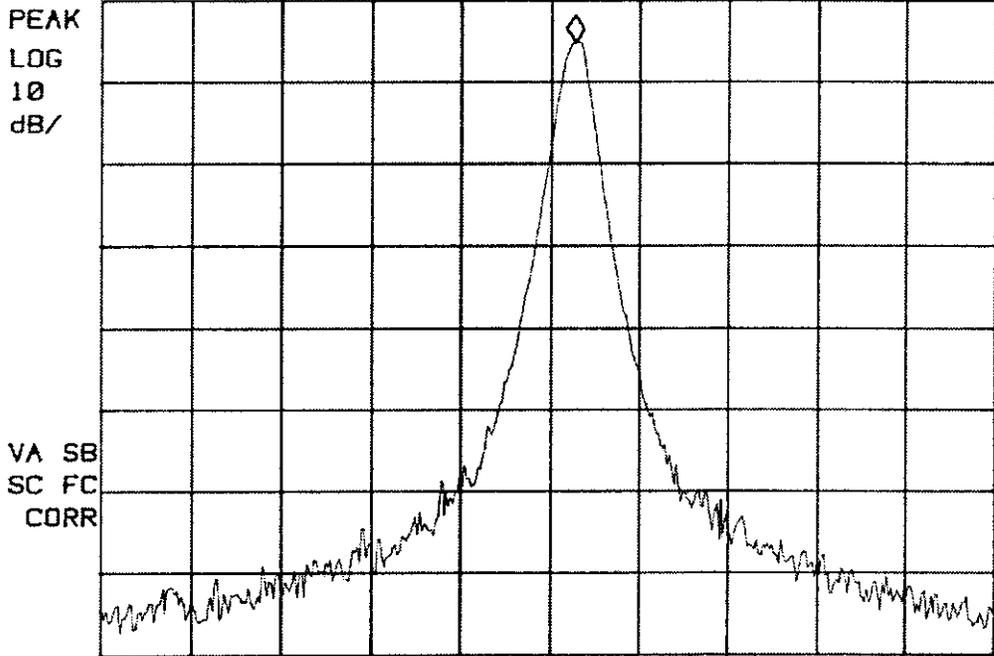
Test Report: AVR FCC.12768
Date: March, 1998

Plot 3.2.1 Frequency stability test
Frequency: 216.025
Temperature: 0°

13:36:16 MAR 05, 1998
fp

MKR 216.02638 MHz
95.84 dB μ V

REF 101.0 dB μ V ATTN 10 dB



CENTER 216.02500 MHz SPAN 50.00 kHz
#RES BW 1.0 kHz VBW 1 kHz SWP 300 msec

PA



HERMON LABORATORIES

Test Report: AVRFCC.12768
Date: March, 1998

Plot 3.2.2 Frequency stability test
Frequency: 216.025
Temperature: 10°

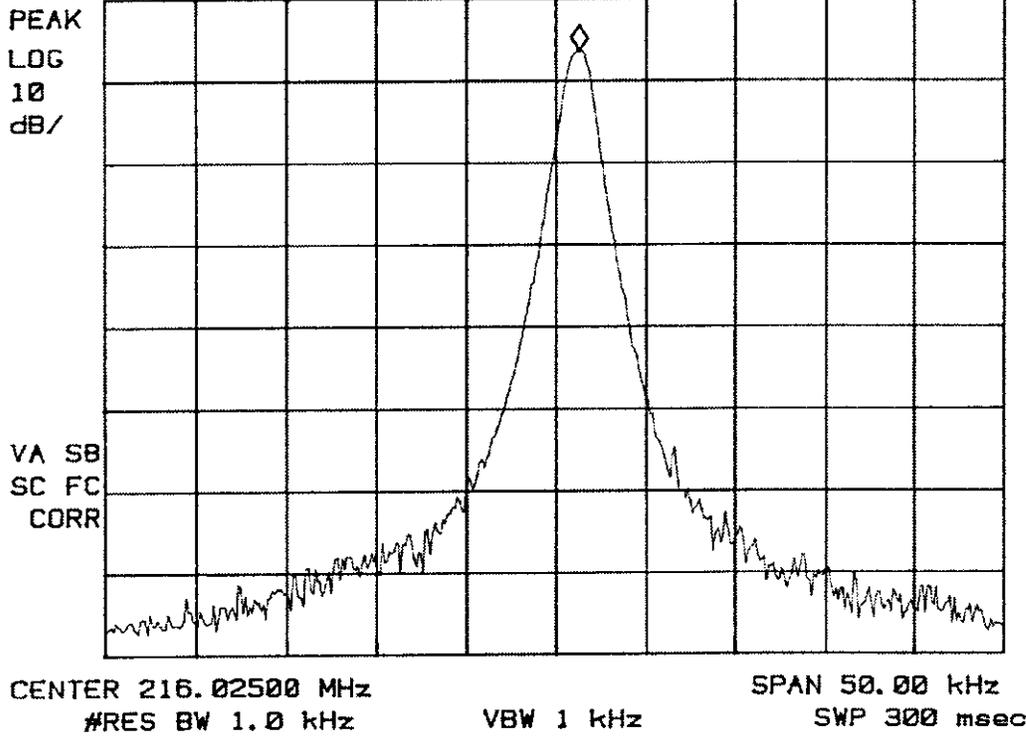
14:01:00 MAR 05, 1998

17

MKR 216.02625 MHz

REF 101.0 dBμV ATTN 10 dB

94.58 dBμV



RH



HERMON LABORATORIES

Test Report: AVRFCC.12768
Date: March, 1998

Plot 3.2.3 Frequency stability test
Frequency: 216.025
Temperature: 20°

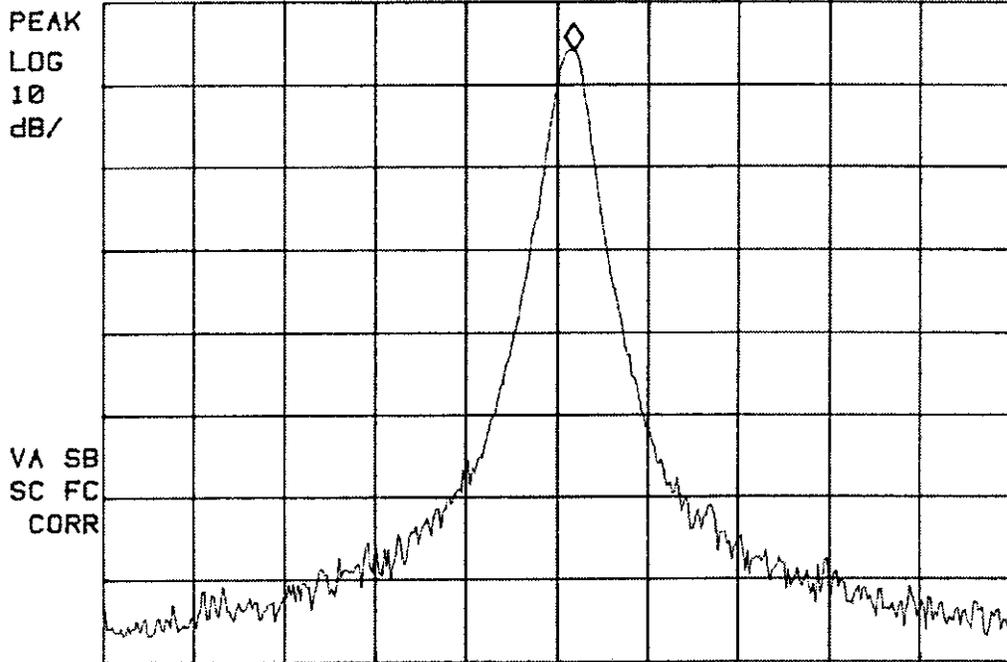
14:21:11 MAR 05, 1998

hp

MKR 216.02588 MHz

REF 99.0 dB μ V ATTN 10 dB

93.06 dB μ V



CENTER 216.02500 MHz
#RES BW 1.0 kHz

VBW 1 kHz

SPAN 50.00 kHz
SWP 300 msec

PH



Plot 3.2.4 Frequency stability test
Frequency: 216.025
Temperature: 30°

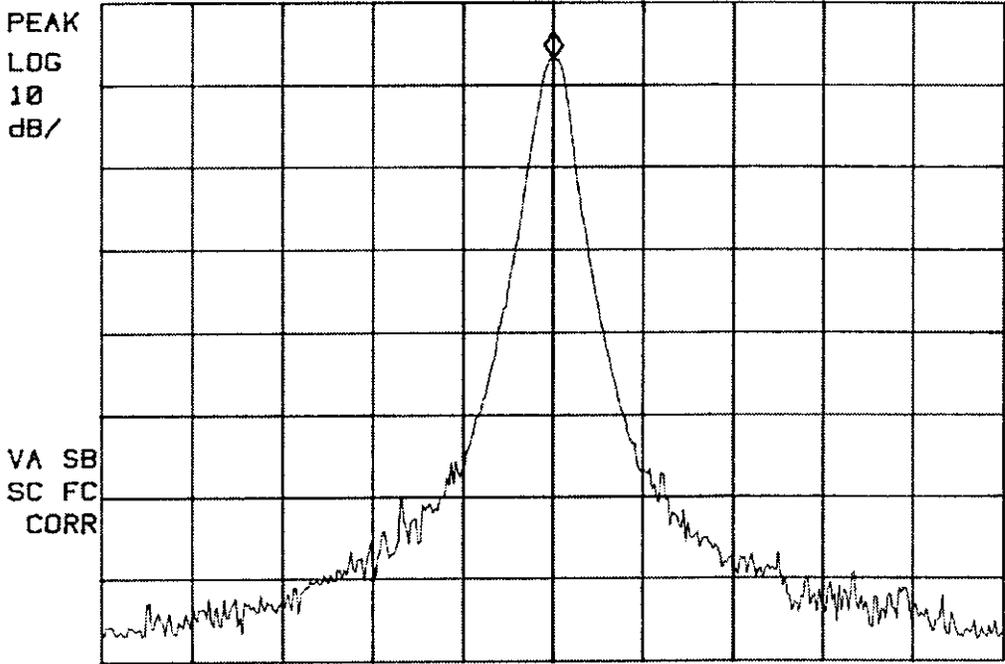
14:48:51 MAR 05, 1998

ip

MKR 216.02500 MHz

REF 99.0 dB μ V ATTEN 10 dB

92.18 dB μ V



CENTER 216.02500 MHz

#RES BW 1.0 kHz

VBW 1 kHz

SPAN 50.00 kHz

SWP 300 msec

BT



HERMON LABORATORIES

Test Report: AVRFCC.12768
Date: March, 1998

Plot 3.2.5 Frequency stability test
Frequency: 216.025
Temperature: 40°

15:10:26 MAR 05, 1998

10

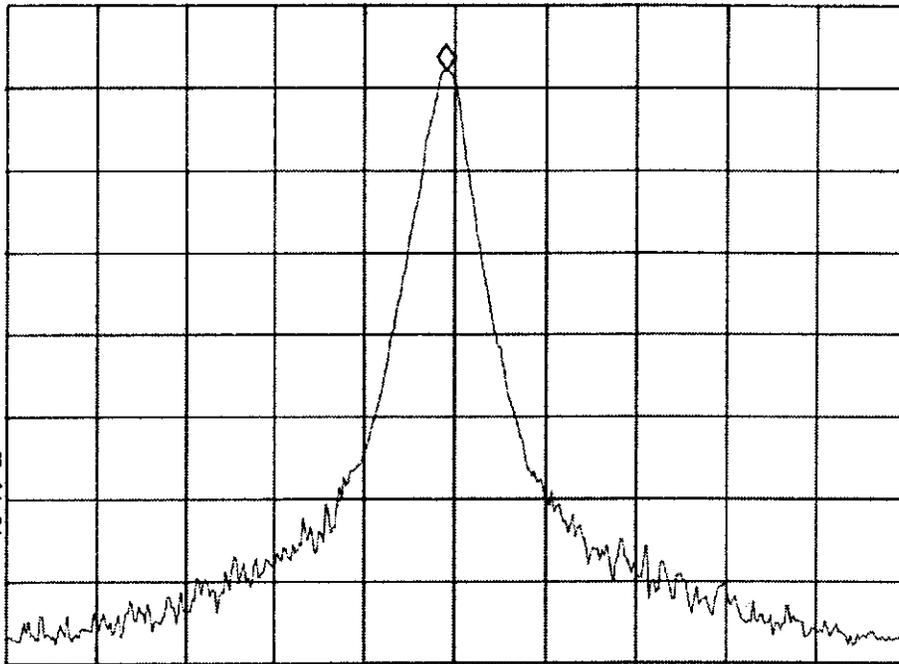
MKR 216.02450 MHz

REF 99.0 dB μ V ATTEN 10 dB

91.06 dB μ V

PEAK
LOG
10
dB/

VA SB
SC FC
CORR



CENTER 216.02500 MHz
#RES BW 1.0 kHz

VBW 1 kHz

SPAN 50.00 kHz
SWP 300 msec

D.L.



HERMON LABORATORIES

Test Report: AVRFCC.12768
Date: March, 1998

Plot 3.2.6 Frequency stability test
Frequency: 216.025
Temperature: 50°

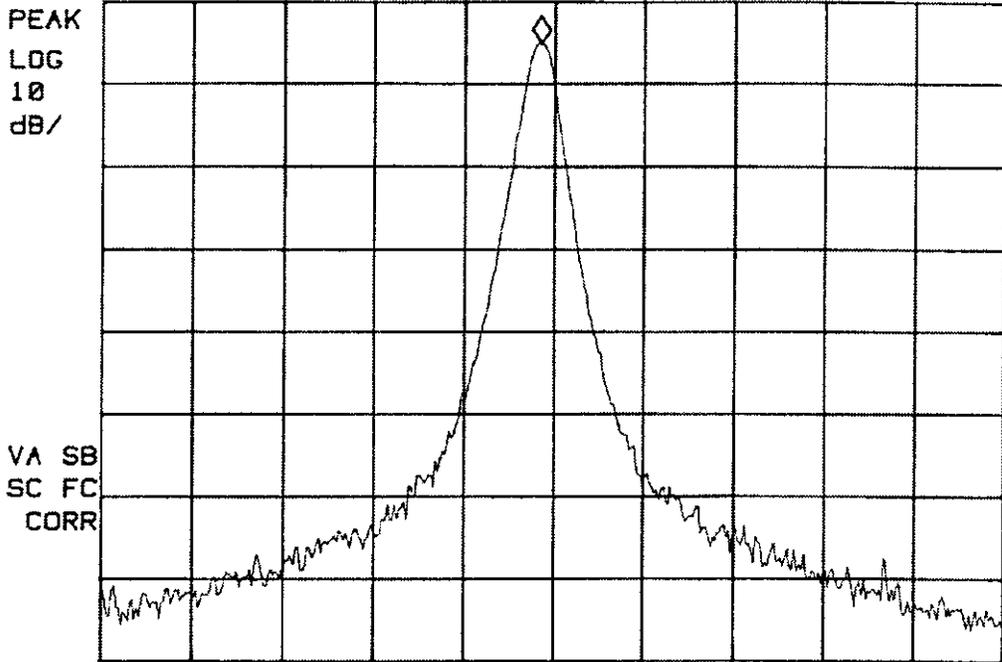
15:46:42 MAR 05, 1998

AP

MKR 216.02425 MHz

REF 95.0 dB μ V ATTN 10 dB

89.95 dB μ V



CENTER 216.02500 MHz

#RES BW 1.0 kHz

VBW 1 kHz

SPAN 50.00 kHz

SWP 300 msec

AP



HERMON LABORATORIES

Test Report: AVRFCC.12768
Date: March, 1998

Plot 3.2.7 Frequency stability test
Frequency: 216.475
Temperature: 0°

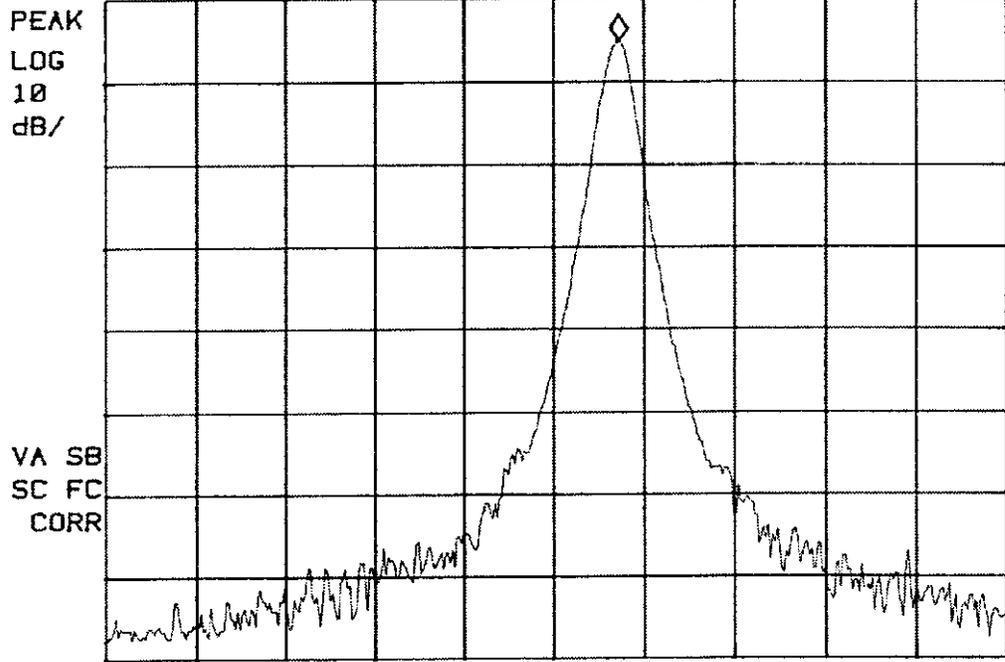
13:34:07 MAR 05, 1998

sp

MKR 216.47863 MHz

REF 109.0 dB μ V ATTN 20 dB

103.89 dB μ V



CENTER 216.47500 MHz
#RES BW 1.0 kHz

VBW 1 kHz

SPAN 50.00 kHz
SWP 300 msec

BT



HERMON LABORATORIES

Test Report: AVRFCC.12768
Date: March, 1998

Plot 3.2.8 Frequency stability test
Frequency: 216.475
Temperature: 10°

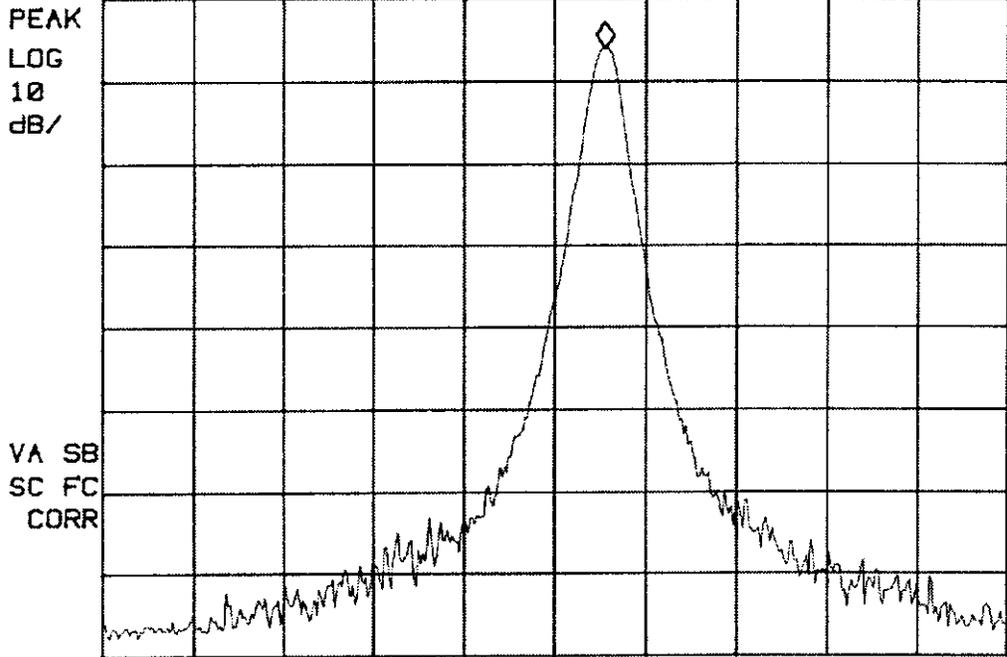
14:05:34 MAR 05, 1998

AP

MKR 216.47775 MHz

REF 109.0 dBμV ATTN 20 dB

102.96 dBμV



CENTER 216.47500 MHz

SPAN 50.00 kHz

#RES BW 1.0 kHz

VBW 1 kHz

SWP 300 msec

AP



HERMON LABORATORIES

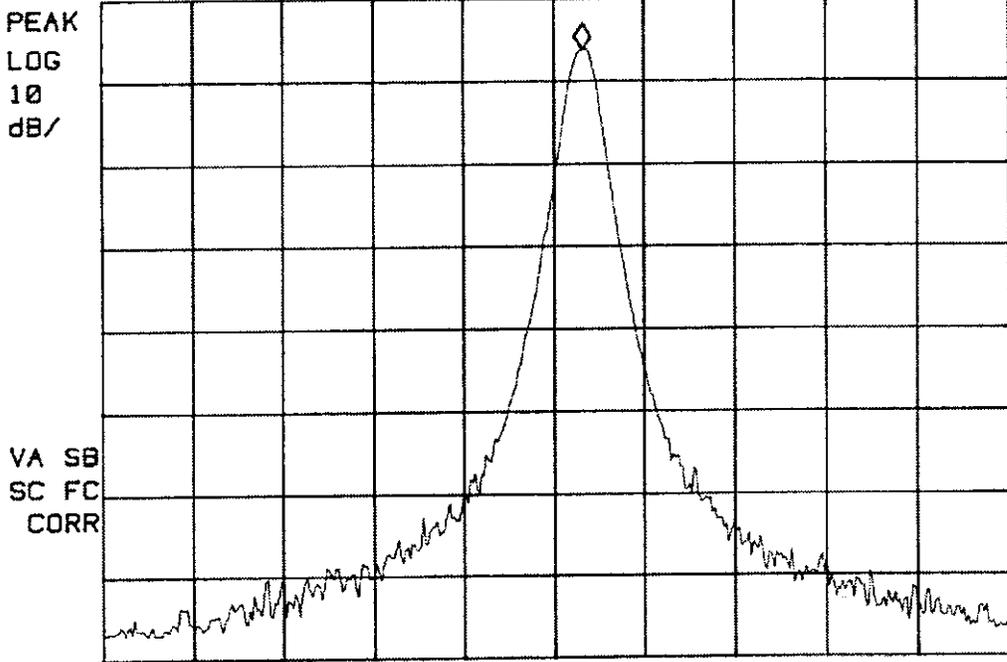
Test Report: AVRFCC.12768
Date: March, 1998

Plot 3.2.9 Frequency stability test
Frequency: 216.475
Temperature: 20°

14:19:06 MAR 05, 1998

REF 109.0 dB μ V ATTN 20 dB

MKR 216.47663 MHz
102.80 dB μ V



CENTER 216.47500 MHz
#RES BW 1.0 kHz

VBW 1 kHz

SPAN 50.00 kHz
SWP 300 msec

[Handwritten signature]



HERMON LABORATORIES

Test Report: AVR FCC.12768

Date: March, 1998

Plot 3.2.10 Frequency stability test
Frequency: 216.475
Temperature: 30°

14:46:51 MAR 05, 1998

AP

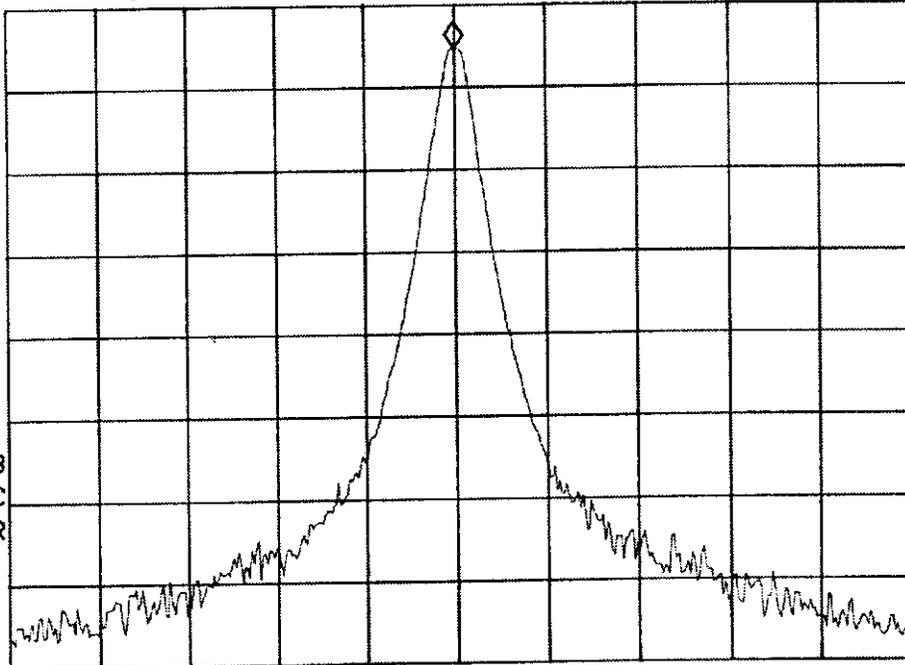
MKR 216.47500 MHz

REF 107.0 dBμV ATTN 10 dB

101.66 dBμV

PEAK
LOG
10
dB/

VA SB
SC FC
CORR



CENTER 216.47500 MHz
#RES BW 1.0 kHz

VBW 1 kHz

SPAN 50.00 kHz
SWP 300 msec

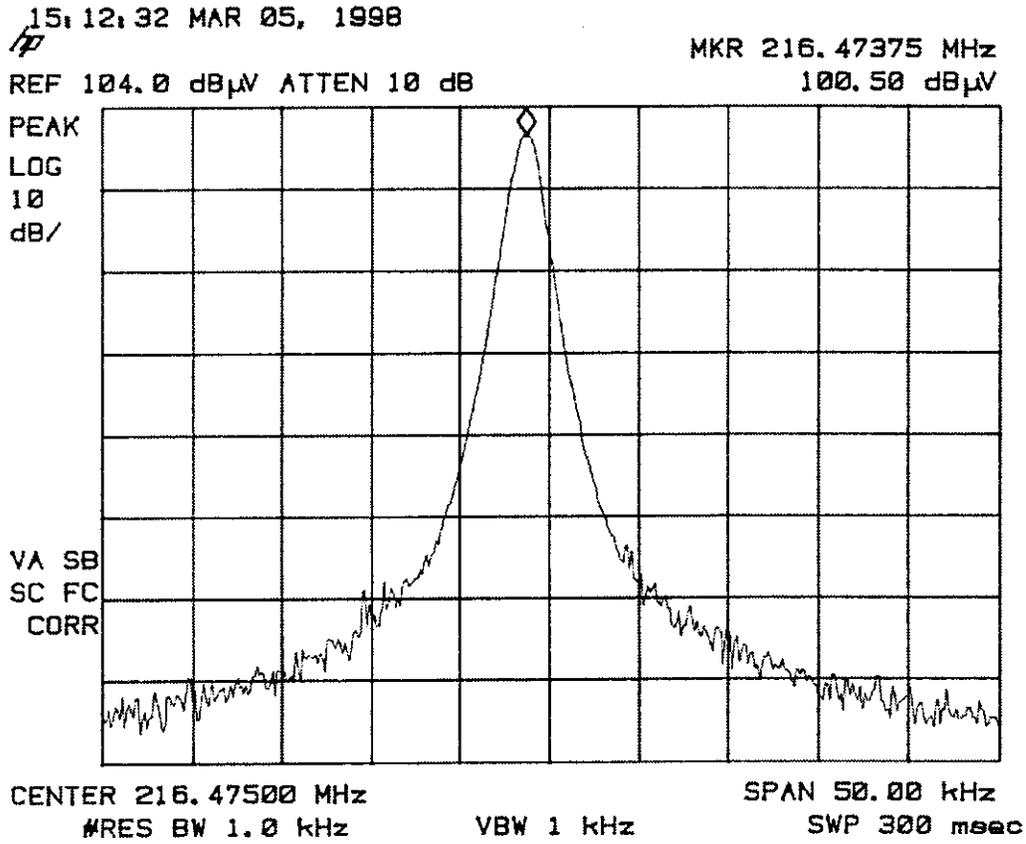
AP



HERMON LABORATORIES

Test Report: AVRFCC.12768
Date: March, 1998

Plot 3.2.11 Frequency stability test
Frequency: 216.475
Temperature: 40°



BE



HERMON LABORATORIES

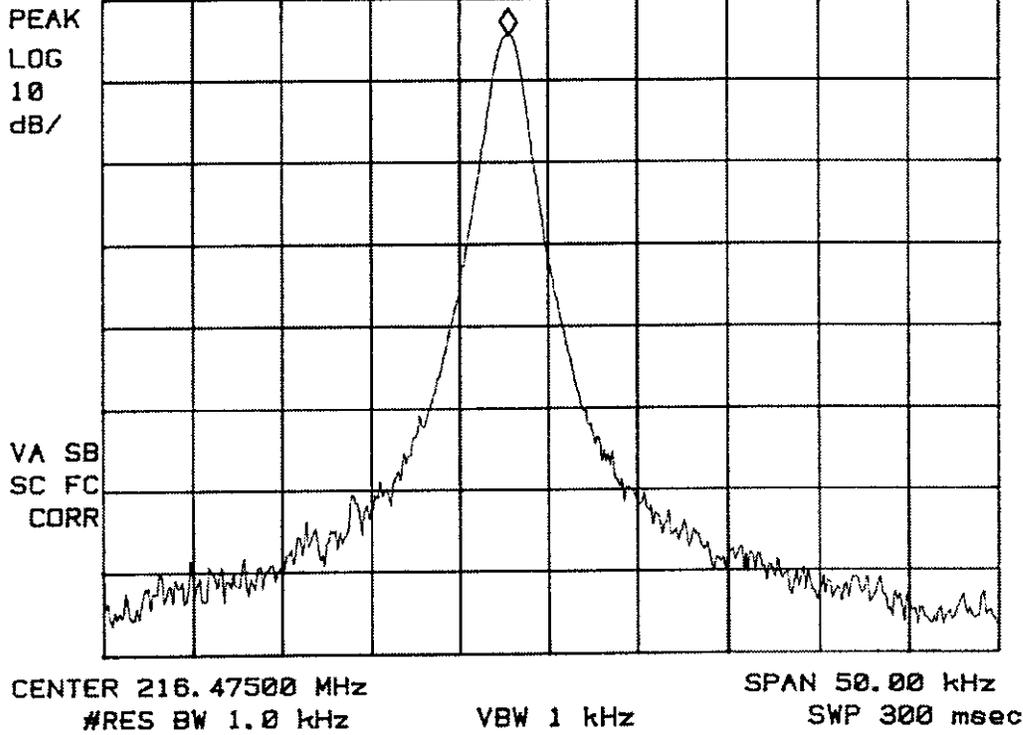
Test Report: AVR FCC.12768
Date: March, 1998

Plot 3.2.12 Frequency stability test
Frequency: 216.475
Temperature: 50°

15:44:22 MAR 05, 1998

REF 104.0 dB μ V ATTN 10 dB

MKR 216.47275 MHz
99.44 dB μ V



Handwritten initials



HERMON LABORATORIES

Test Report: AVR FCC.12768
Date: March, 1998

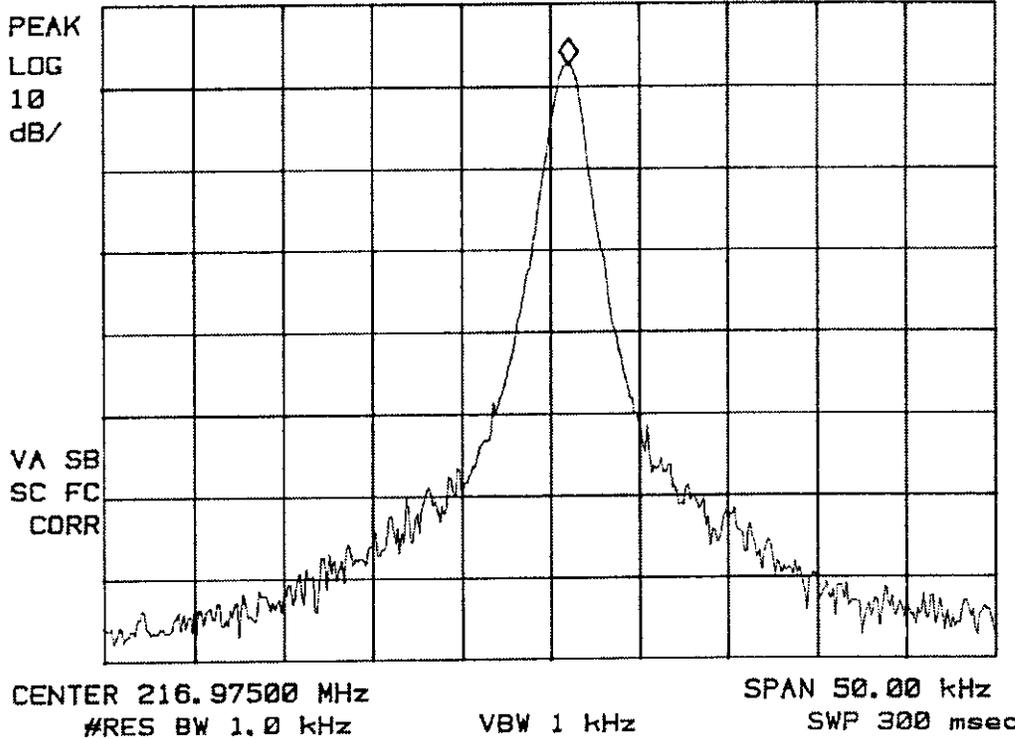
Plot 3.2.13 Frequency stability test
Frequency: 216.975
Temperature: 0°

13:31:23 MAR 05, 1998

FD

MKR 216.97600 MHz
101.63 dB μ V

REF 109.0 dB μ V ATTEN 20 dB



FD



HERMON LABORATORIES

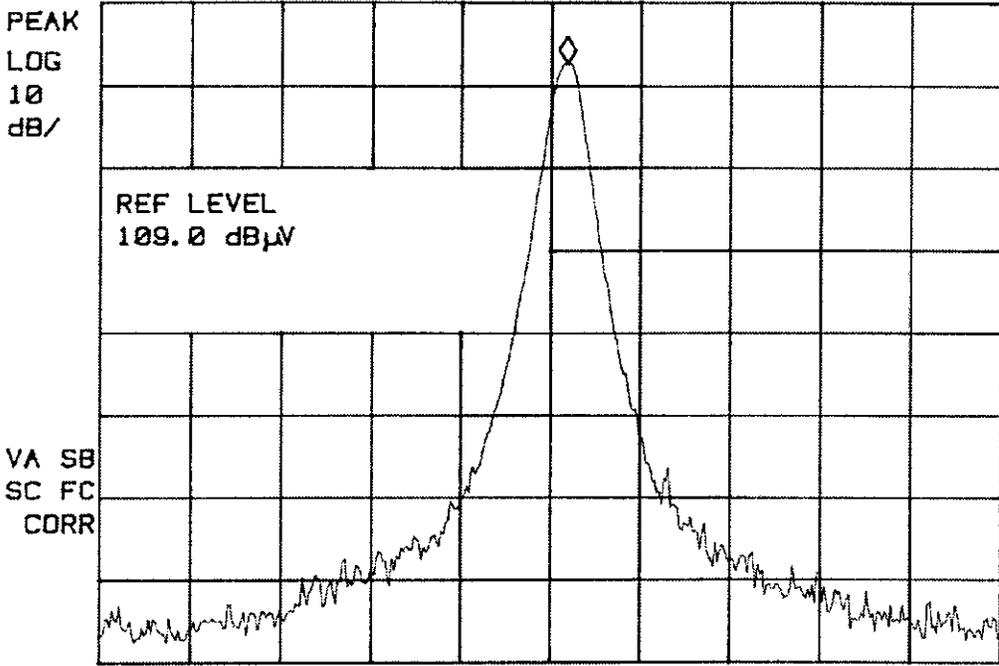
Test Report: AVR FCC.12768
Date: March, 1998

Plot 3.2.14 Frequency stability test
Frequency: 216.975
Temperature: 10°

14:03:20 MAR 05, 1998

REF 109.0 dBμV ATTN 20 dB

MKR 216.97588 MHz
101.65 dBμV



CENTER 216.97500 MHz
#RES BW 1.0 kHz

VBW 1 kHz

SPAN 50.00 kHz
SWP 300 msec

12



HERMON LABORATORIES

Test Report: AVR FCC.12768

Date: March, 1998

Plot 3.2.15 Frequency stability test
Frequency: 216.975
Temperature: 20°

14:23:36 MAR 05, 1998

ip

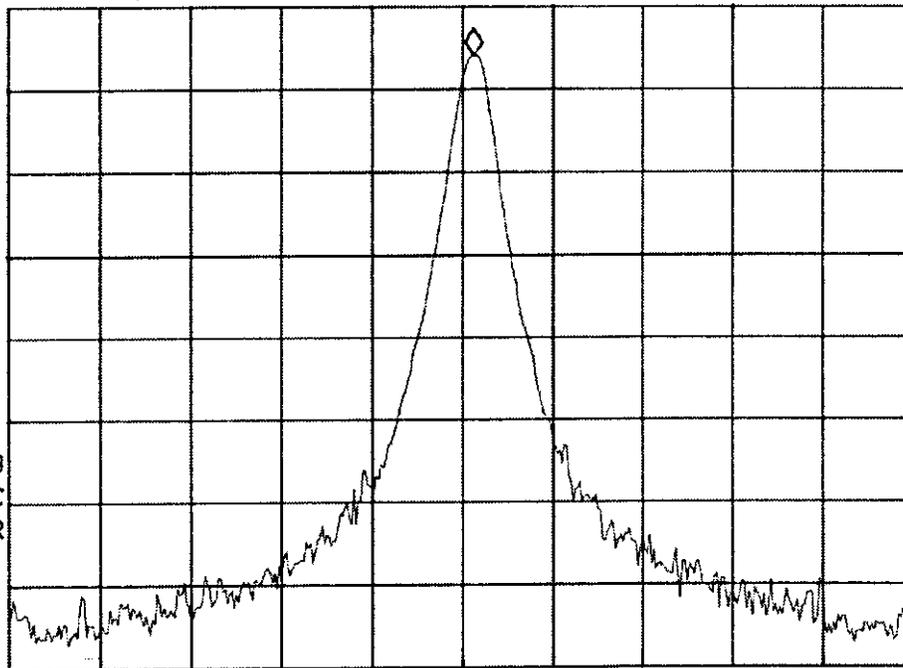
MKR 216.97563 MHz

REF 107.0 dB μ V ATTEN 10 dB

101.14 dB μ V

PEAK
LOG
10
dB/

VA SB
SC FC
CORR



CENTER 216.97500 MHz

#RES BW 1.0 kHz

VBW 1 kHz

SPAN 50.00 kHz

SWP 300 msec

ip



HERMON LABORATORIES

Test Report: AVRFCC.12768
Date: March, 1998

Plot 3.2.16 Frequency stability test
Frequency: 216.975
Temperature: 30°

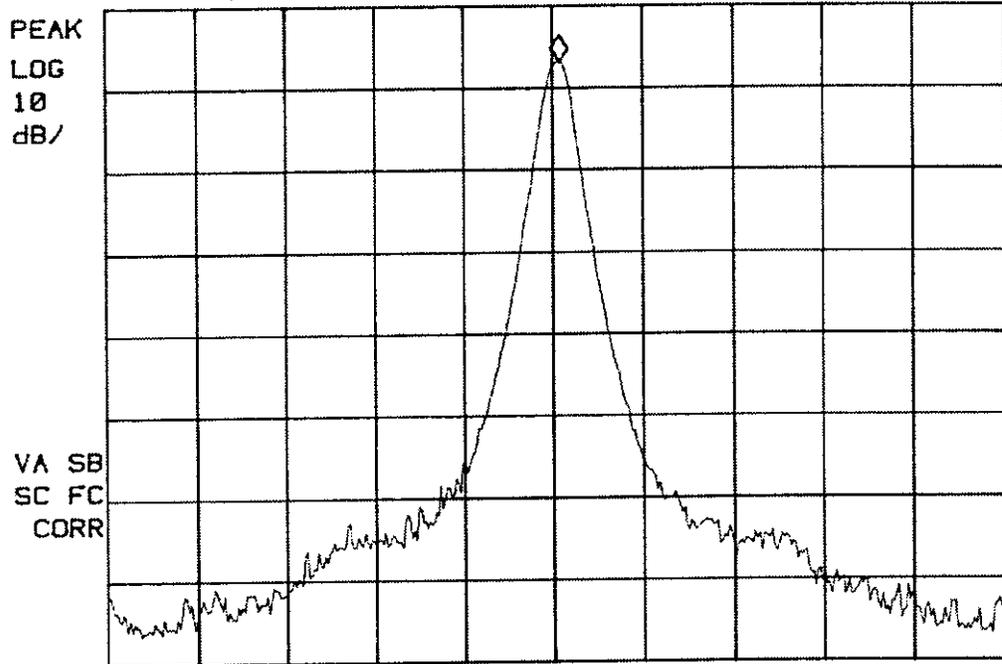
14:44:47 MAR 05, 1998

10

MKR 216.97538 MHz

REF 107.0 dBμV ATTN 10 dB

100.17 dBμV



CENTER 216.97500 MHz

#RES BW 1.0 kHz

VBW 1 kHz

SPAN 50.00 kHz

SWP 300 msec

37



HERMON LABORATORIES

Test Report: AVRFCC.12768
Date: March, 1998

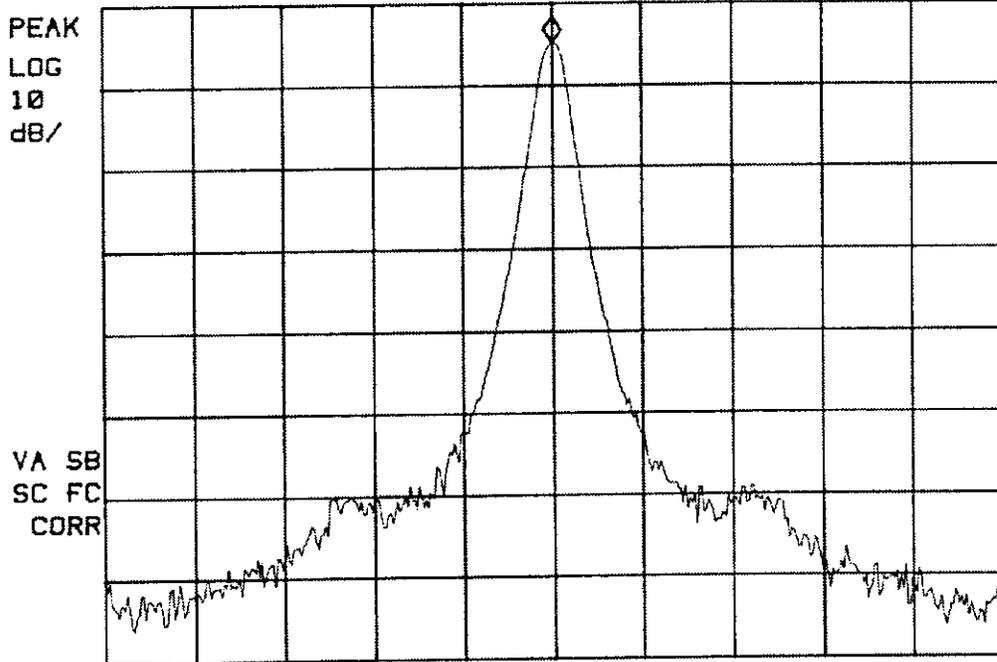
Plot 3.2.17 Frequency stability test
Frequency: 216.975
Temperature: 40°

15, 15, 59 MAR 05, 1998

REF 104.0 dBμV ATTN 10 dB

MKR 216.97500 MHz

99.21 dBμV



CENTER 216.97500 MHz

#RES BW 1.0 kHz

VBW 1 kHz

SPAN 50.00 kHz

SWP 300 msec

P.H.



HERMON LABORATORIES

Test Report: AVRFCC.12768
Date: March, 1998

Plot 3.2.18 Frequency stability test
Frequency: 216.975
Temperature: 50°

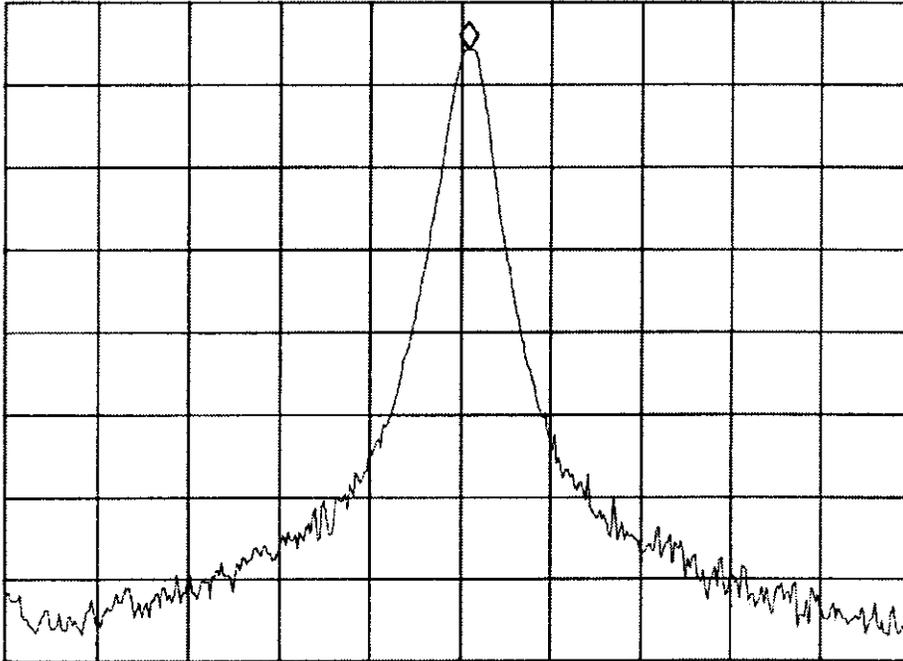
15:40:47 MAR 05, 1998

REF 104.0 dBμV ATTEN 10 dB

MKR 216.97538 MHz
98.32 dBμV

PEAK
LOG
10
dB/

VA SB
SC FC
CORR



CENTER 216.97500 MHz
#RES BW 1.0 kHz

VBW 1 kHz

SPAN 50.00 kHz
SWP 300 msec

Pat



3.3 Occupied Bandwidth test according to § 95.633 (d) (3) and § 2.989

3.3.1 Definition of the test

This test was performed to determine that the TX occupying bandwidth is less than 50kHz. 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 test setup is given in Photograph 3.3.1.

3.3.3 Test results

The EUT have passed the test.
The test results are given in Plots 3.3.1 to 3.3.6.

Reference numbers of test equipment used

HL 0507						
---------	--	--	--	--	--	--

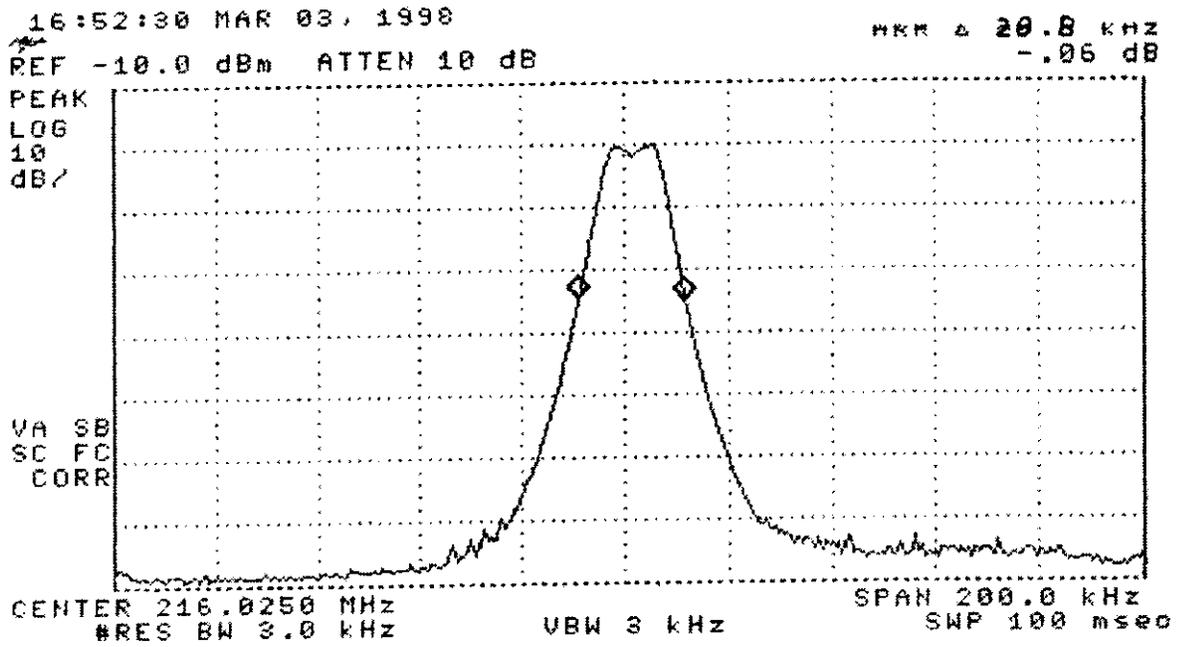
Full description is given in Appendix A.



HERMON LABORATORIES

Test Report: AVRFCC.12768
Date: March, 1998

Plot 3.3.1 Occupied Bandwidth test
Frequency: 216.025



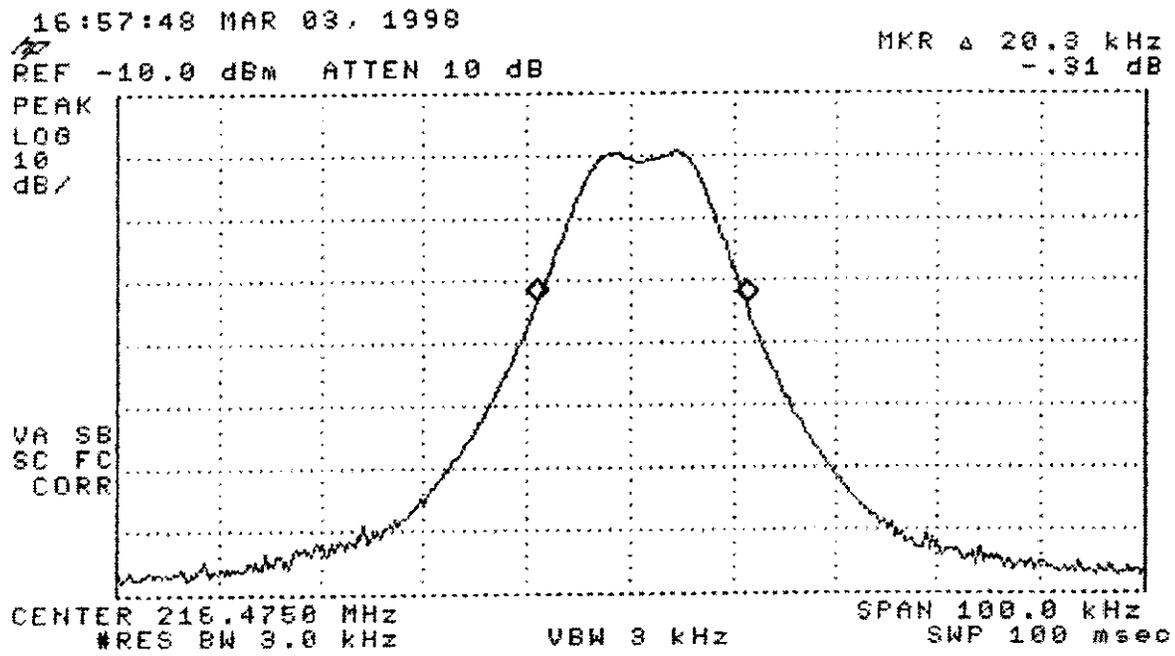
BTH



HERMON LABORATORIES

Test Report: AVR FCC.12768
Date: March, 1998

Plot 3.3.2 Occupied Bandwidth test
Frequency: 216.475



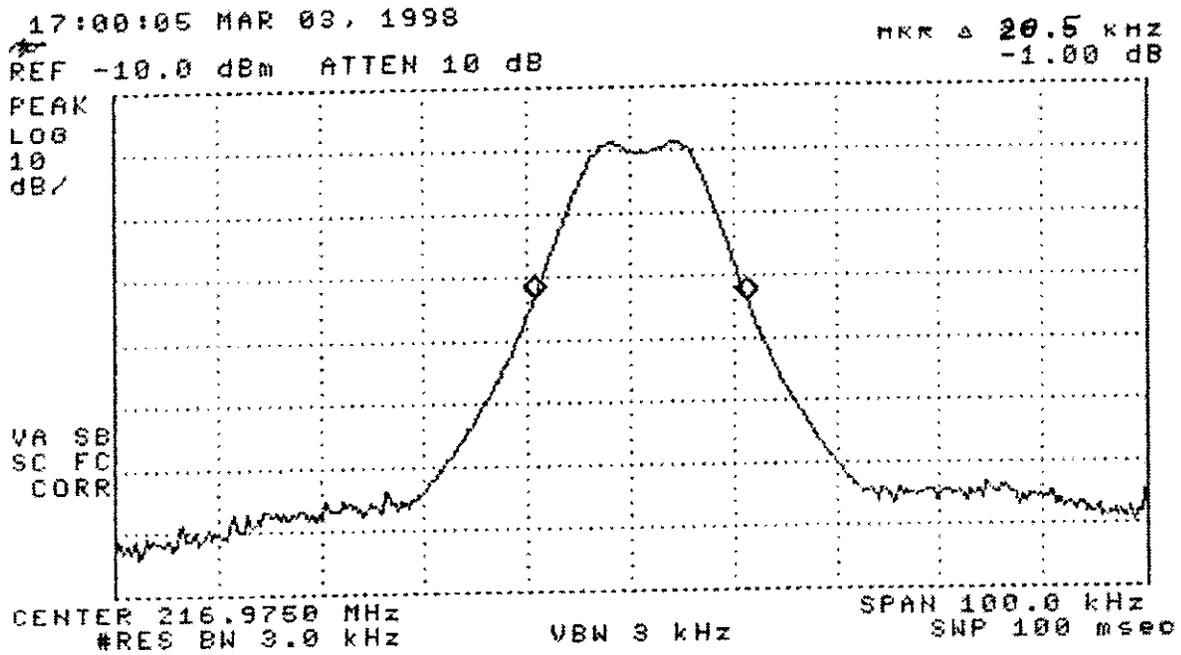
RH



HERMON LABORATORIES

Test Report: AVRFCC.12768
Date: March, 1998

Plot 3.3.3 Occupied Bandwidth test
Frequency: 216.975



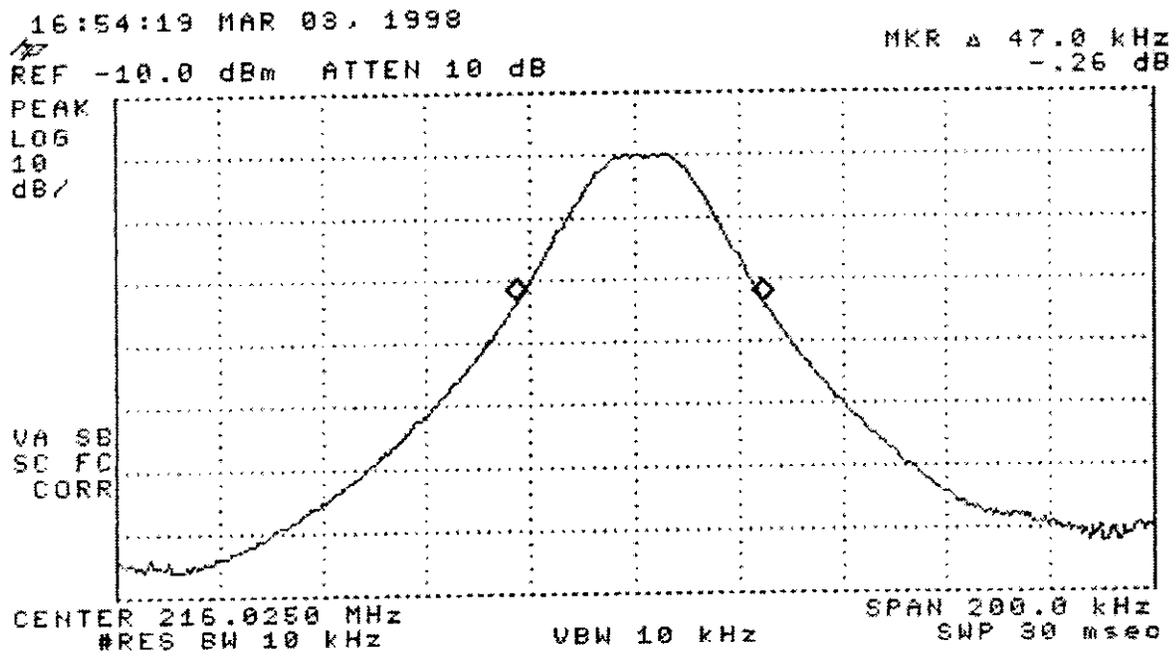
PHE



HERMON LABORATORIES

Test Report: AVRFCC.12768
Date: March, 1998

Plot 3.3.4 Occupied Bandwidth test
Frequency: 216.025



RH

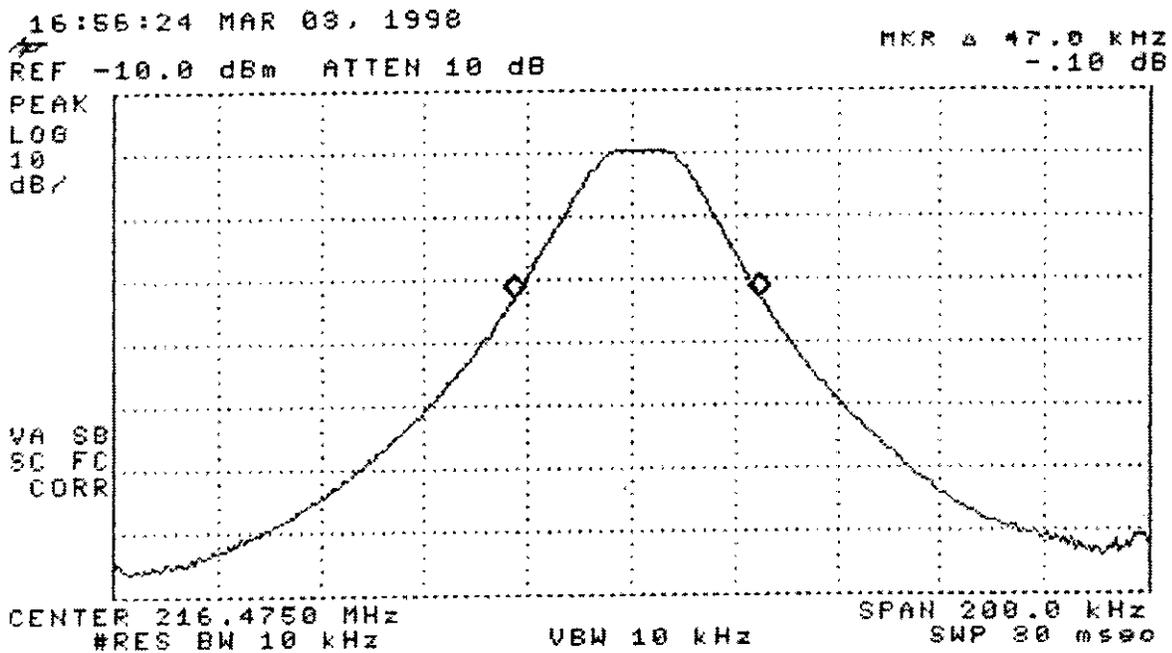


HERMON LABORATORIES

Test Report: AVRFCC.12768

Date: March, 1998

Plot 3.3.5 Occupied Bandwidth test
Frequency: 216.475



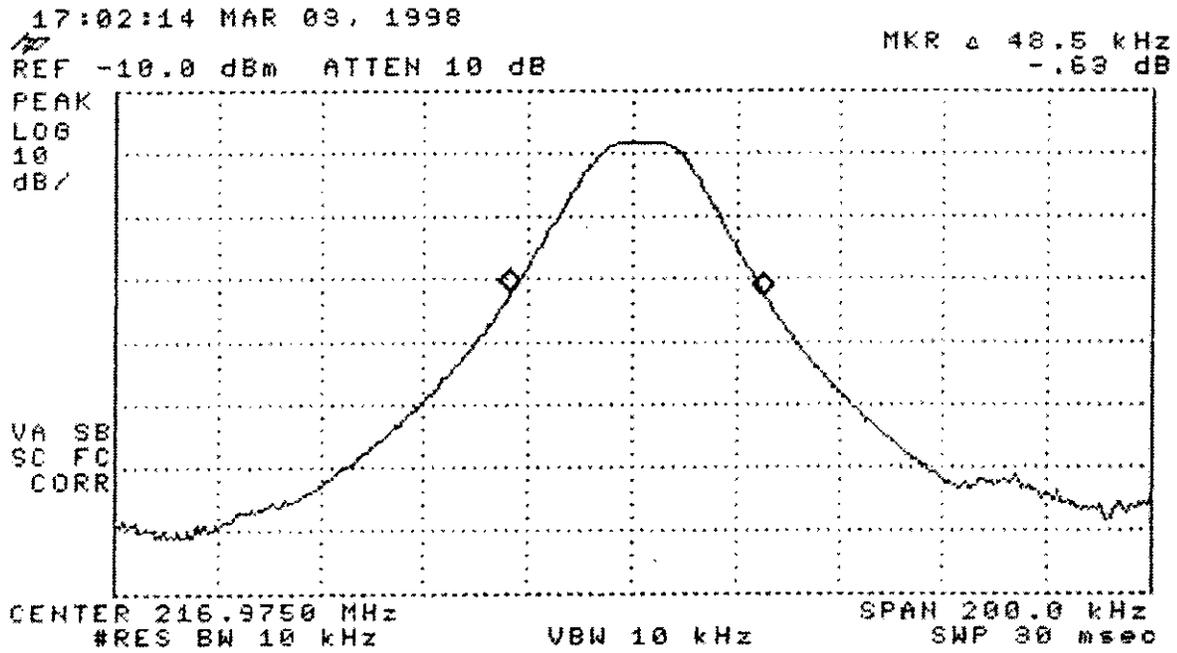
Handwritten signature



HERMON LABORATORIES

Test Report: AVR FCC.12768
Date: March, 1998

Plot 3.3.6 Occupied Bandwidth test
Frequency: 216.975



BH



3.4 Unwanted radiation test according to § 95.635 (c) (2)

3.4.1 Definition of the test

This test was performed to determine that the unwanted radiation at frequencies of the adjacent channel (between 25 to 35 kHz from the carrier). It should be at least 30 dB under the carrier.

The unwanted attenuation of radiations moved more than 35 kHz from the carrier should satisfy the equation $[43 + 10\log (\text{carrier power in watts})]$ dB.

3.4.2 The test set-up configuration

The test setup is given in Photograph 3.4.1.

3.4.3 Test results

The EUT have passed the test.

The test results are given in Plots 3.4.1 to 3.4.30.

F=216.025 MHz			F=216.475 MHz			F=216.975 MHz		
ΔF MHz	Atten. dB	Lim Att dB	ΔF MHz	Atten. dB	Lim Att dB	ΔF MHz	Atten. dB	Lim Att dB
0.0258	64.28	30.00	0.026	63.26	30.0	0.025	62.6	30.0
0.035	31.74	20.16	0.035	36.27	20.9	0.035	39.15	22.4
3.5	66.8	20.16	3.5	67.04	20.9	3.6	67.54	22.4
216.025	45.3	20.16	216.475	46.31	20.9	216.975	46.26	22.4
432.05	41.5	20.16	432.95	41.6	20.9	433.95	41.1	22.4

Reference numbers of test equipment used

HL 0507	HL 0521	HL 0593	HL 0594	HL 0604		
---------	---------	---------	---------	---------	--	--

Full description is given in Appendix A.



HERMON LABORATORIES

Test Report: AVRFCC.12768
Date: March, 1998

Plot 3.4.1
Unwanted radiation test result
Frequency 216.025 MHz

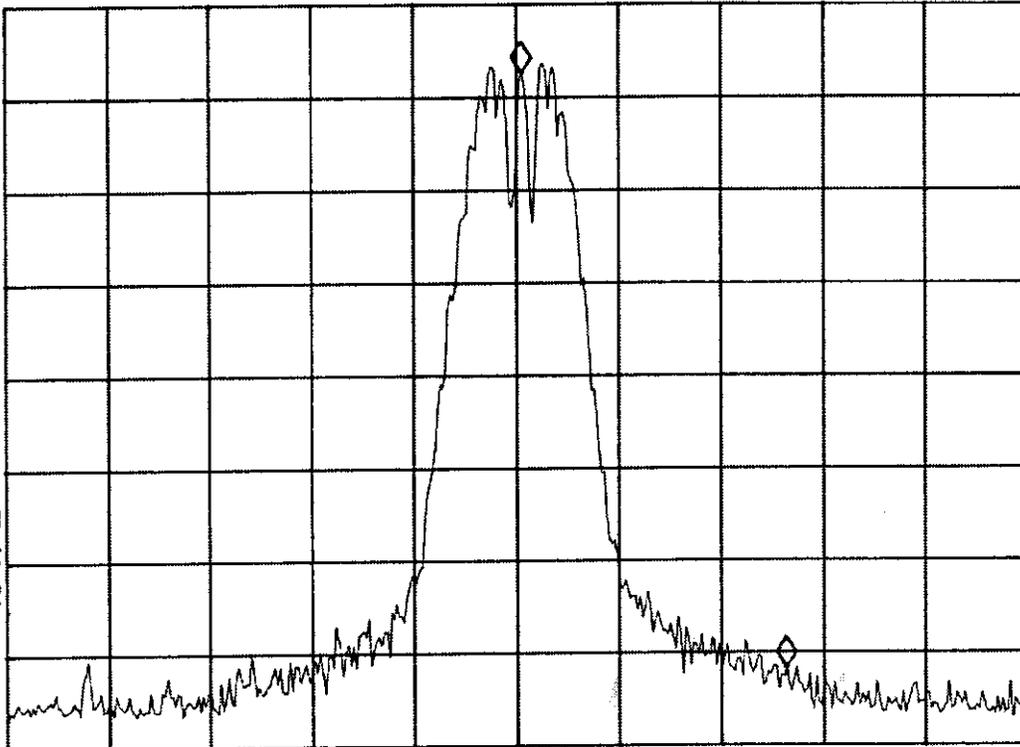
11:37:15 MAR 05, 1998
hp

REF 70.0 dB μ V #ATTEN 0 dB

MKR Δ 25.8 kHz
-64.28 dB

PEAK
LOG
10
dB/

VA SB
SC FC
CORR



CENTER 216.0250 MHz
#RES BW 300 Hz

VBW 300 Hz

SPAN 100.0 kHz
SWP 3.3 sec

RHE



HERMON LABORATORIES

Test Report: AVR FCC.12768
Date: March, 1998

Plot 3.4.2
Unwanted radiation test result
Frequency 216.025 MHz

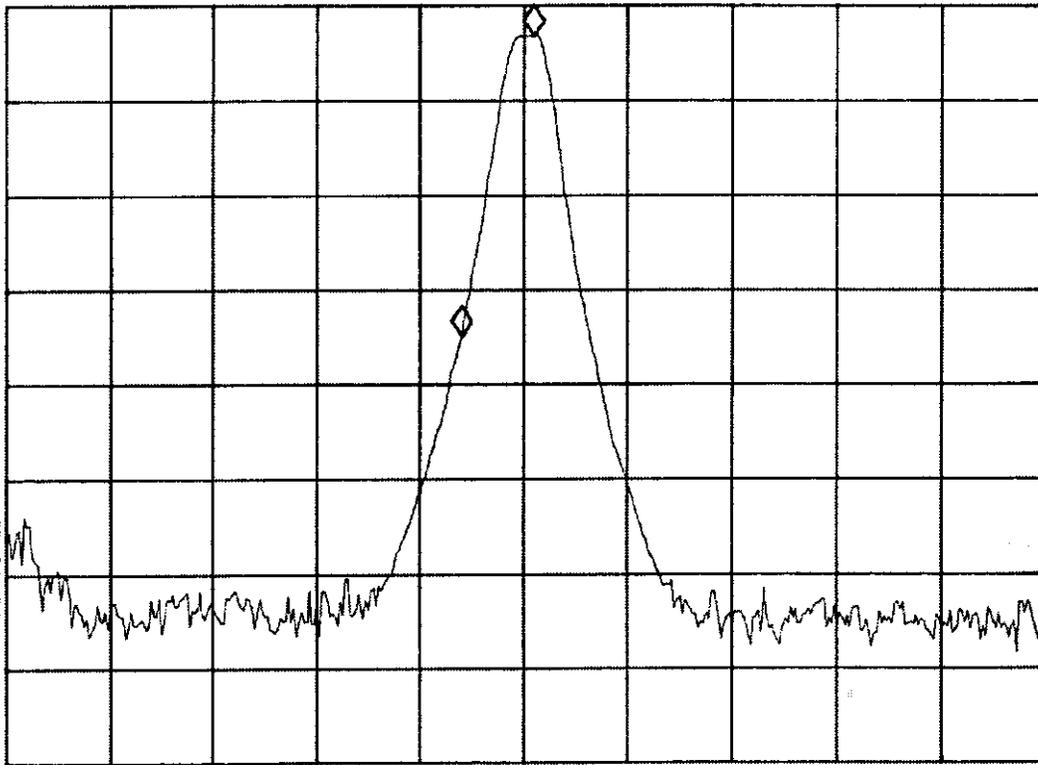
11:33:15 MAR 05, 1998
17

MKR Δ -35.0 kHz
-31.74 dB

REF 70.0 dB μ V #ATTEN 0 dB

PEAK
LOG
10
dB/

VA SB
SC FC
CORR



CENTER 216.0250 MHz
#RES BW 10 kHz

VBW 10 kHz

SPAN 500.0 kHz
SWP 30 msec

RH



HERMON LABORATORIES

Test Report: AVRFCC.12768
Date: March, 1998

Plot 3.4.3
Unwanted radiation test result
Frequency 216.025 MHz

16:00:44 MAR 05, 1998

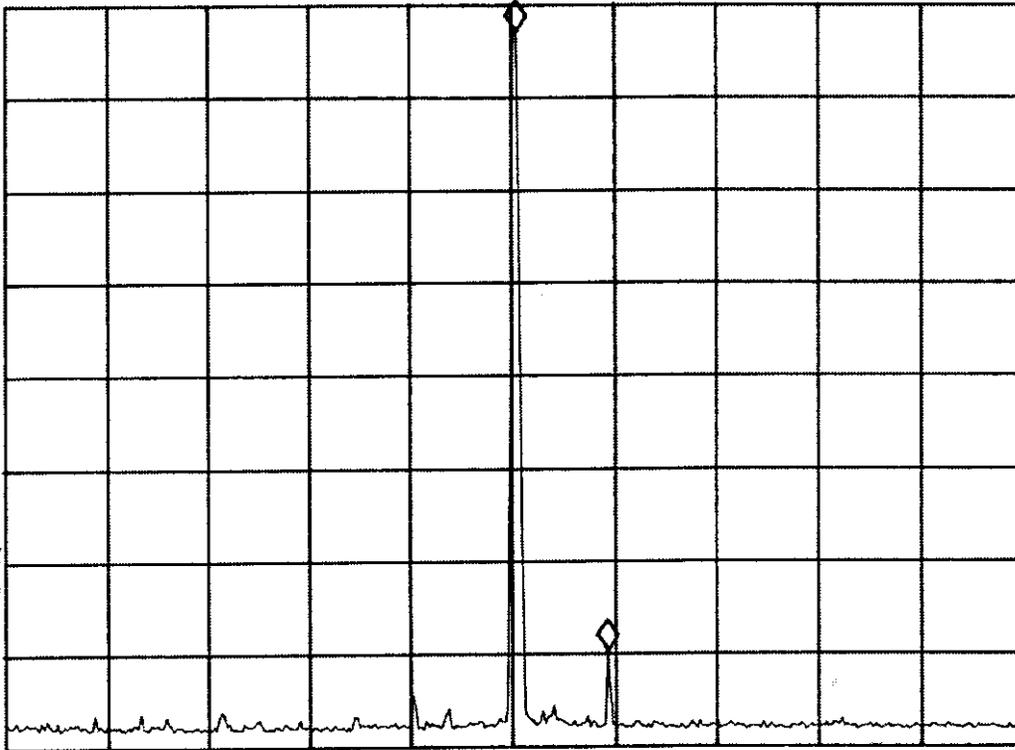
hp

REF 105.0 dBμV ATTN 10 dB

MKR Δ 3.50 MHz
-66.80 dB

PEAK
LOG
10
dB/

VA SB
SC FC
CORR



CENTER 216.48 MHz
#RES BW 30 kHz

VBW 30 kHz

SPAN 40.00 MHz
SWP 130 msec

BAH



HERMON LABORATORIES

Test Report: AVR FCC.12768
Date: March, 1998

Plot 3.4.4
Unwanted radiation test result
Frequency 216.025 MHz

11:08:54 MAR 03, 1998
PR.12768 AVR COM LOGICOM TX20 D=3m

ACTV DET: PEAK
MEAS DET: PEAK QP
MKR 200.6 MHz
29.28 dB μ V/m

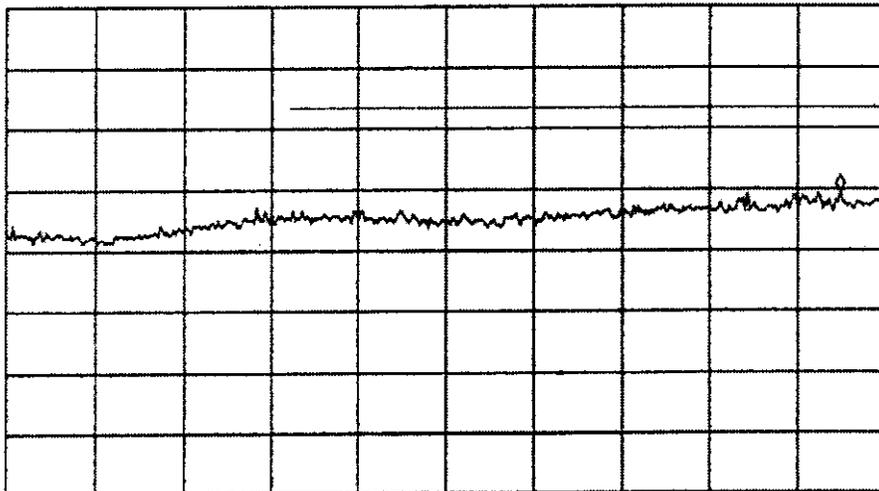
MEASURE
AT MKR

ADD TO
LIST

LOG REF 60.0 dB μ V/m

10
dB/
#ATN
10 dB

VA SB
SC FC
ACORR



START 30.0 MHz IF BW 120 kHz AVG BW 300 kHz SWP 169 msec
STOP 210.0 MHz

COPY
SCREEN

OUTPUT
REPORT

Define
Report

Define
List

EDIT
ANNOTATN

RH



HERMON LABORATORIES

Test Report: AVR FCC.12768
Date: March, 1998

Plot 3.4.5
Unwanted radiation test result
Frequency 216.025 MHz

10:36:44 MAR 03, 1998
PR.12768 AVR COM LOGICOM TX20 D=3m

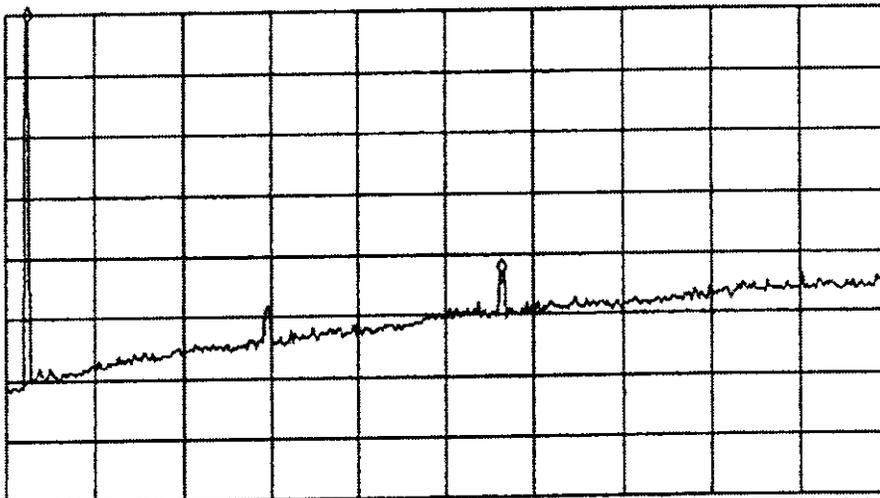
ACTV DET: PEAK
MEAS DET: PEAK QP AVG
MKR Δ 432.0 MHz
-42.16 dB

MEASURE
AT MKR
ADD TO
LIST

LOG REF 100.0 dB μ V/m

10
dB/
#ATN
20 dB

VA SB
SC FC
ACORR



START 200.0 MHz
IF BW 120 kHz
AVG BW 300 kHz
STOP 1.0000 GHz
SWP 750 msec

COPY
SCREEN

OUTPUT
REPORT

Define
Report

Define
List

EDIT
ANNOTATN

PH



HERMON LABORATORIES

Test Report: AVRFCC.12768
Date: March, 1998

Plot 3.4.6
Unwanted radiation test result
Frequency 216.025 MHz

11:00:10 MAR 03, 1998

PR.12768 AVR COM LOGICOM TX20 D=3m

ACTV DET: PEAK
MEAS DET: PEAK QP
MKR 651.6 MHz
54.65 dB μ V/m

MEASURE
AT MKR

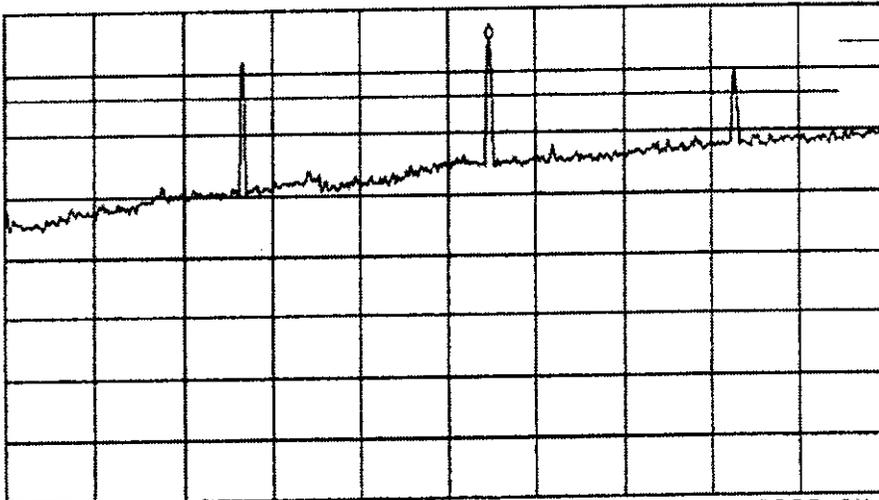
ADD TO
LIST

LOG REF 60.0 dB μ V/m

PREAMP ON

10
dB/
#ATN
10 dB

VA SB
SC FC
ACORR



START 230.0 MHz

IF BW 120 kHz

AVG BW 300 kHz

STOP 1.0000 GHz

SWP 722 msec

COPY
SCREEN

OUTPUT
REPORT

Define
Report

Define
List

EDIT
ANNOTATN

BH



HERMON LABORATORIES

Test Report: AVRFCC.12768
Date: March, 1998

Plot 3.4.7
Unwanted radiation test result
Frequency 216.025 MHz

11:30:40 MAR 03, 1998

PR.12768 AVR COM LOGICOM TX20 D=3m

ACTV DET: PEAK
MEAS DET: PEAK QP
MKR 1.760 GHz
51.94 dB μ V/m

MEASURE
AT MKR
ADD TO
LIST

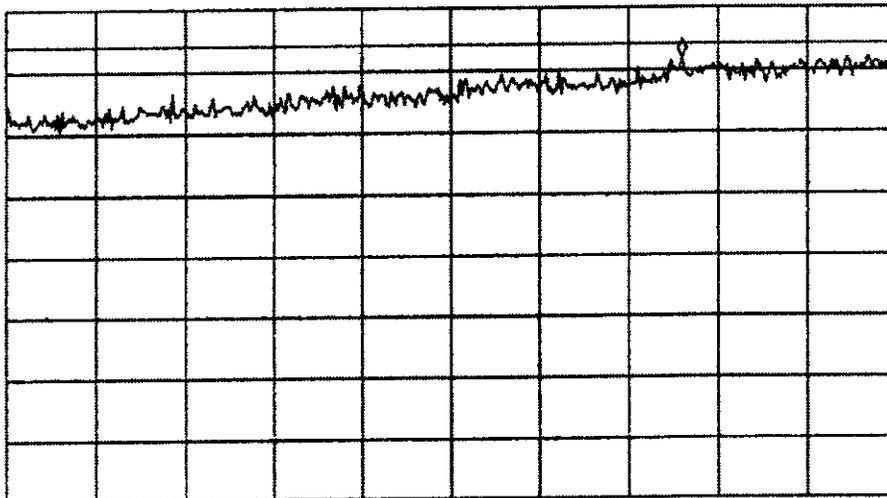
LOG REF 60.0 dB μ V/m

PREAMP ON

COPY
SCREEN

10
dB/
#ATN
10 dB

VA SB
SC FC
ACORR



OUTPUT
REPORT

Define
Report

Define
List

EDIT
ANNOTATN

START 1.000 GHz

#IF BW 1.0 MHz

AVG BW 300 kHz

STOP 2.000 GHz

SWP 20.0 msec

RH



HERMON LABORATORIES

Test Report: AVR FCC.12768
Date: March, 1998

Plot 3.4.8
Unwanted radiation test result
Frequency 216.025 MHz

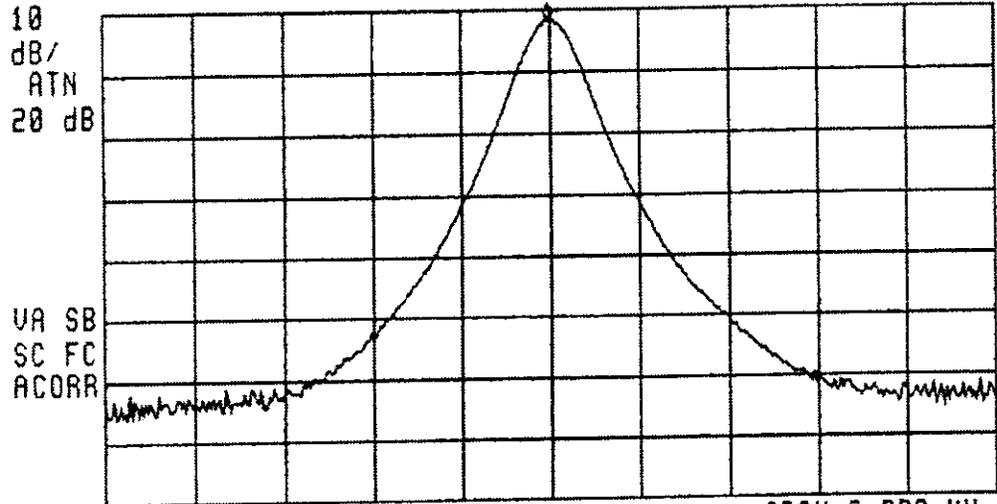
10:07:00 MAR 03, 1998
PR.12768 AVR COM LOGICOM TX20 D=3m

ACTV DET: PEAK
MEAS DET: PEAK QP AVG
MKR 216.023 MHz
98.33 dB μ V/m

MEASURE
AT MKR

ADD TO
LIST

LOG REF 100.0 dB μ V/m



COPY
SCREEN

OUTPUT
REPORT

Def Ine
Report

Define
List

EDIT
ANNOTATN

Handwritten signature



HERMON LABORATORIES

Test Report: AVRFCC.12768
Date: March, 1998

Plot 3.4.9
Unwanted radiation test result
Frequency 216.025 MHz

PR.12768 AVR COM LOGICOM TX20 D=3m

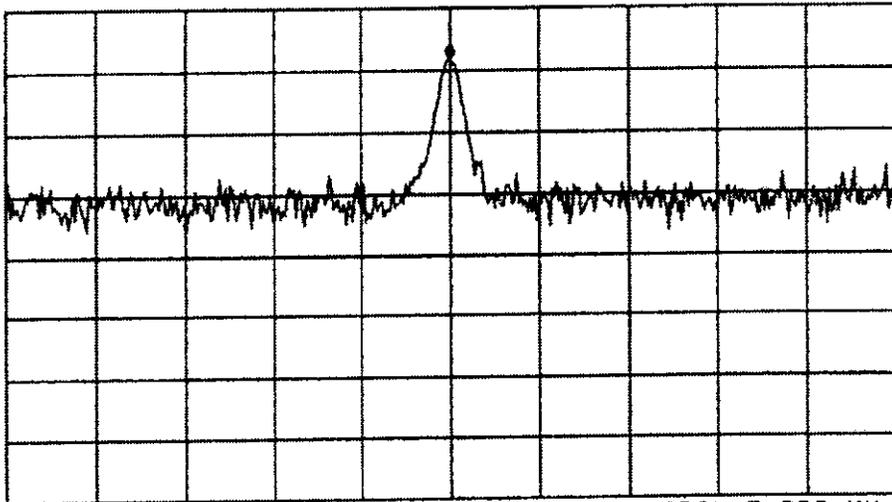
FREQ 432.1 MHz
PEAK 53.0 dB μ V/m
QP 52.2 dB μ V/m
AVG NOT SELECTED

MEASURE
AT MKR

ADD TO
LIST

LOG REF 60.0 dB μ V/m

10
dB/
#ATN
10 dB



VA SB
SC FC
ACORR

CENTER 432.050 MHz

IF BW 120 kHz

AVG BW 300 kHz

SPAN 5.000 MHz

SWP 20.0 msec

COPY
SCREEN

OUTPUT
REPORT

Define
Report

Define
List

EDIT
ANNOTATN

BH



HERMON LABORATORIES

Test Report: AVRFCC.12768
Date: March, 1998

Plot 3.4.10
Unwanted radiation test result
Frequency 216.025 MHz

10:56:45 MAR 03, 1998
PR.12768 AVR COM LOGICOM TX20 D=3m

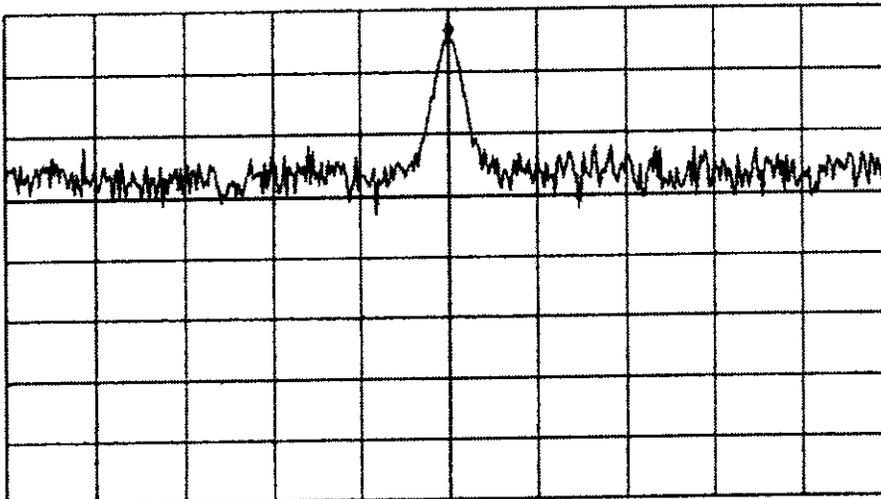
FREQ 648.1 MHz
PEAK 56.8 dB μ V/m
QP 55.9 dB μ V/m
AVG NOT SELECTED

MEASURE
AT MKR

ADD TO
LIST

LOG REF 60.0 dB μ V/m

10
dB/
#ATN
10 dB



CENTER 648.075 MHz SPAN 5.000 MHz
IF BW 120 kHz AVG BW 300 kHz SWP 20.0 msec

COPY
SCREEN

OUTPUT
REPORT

Define
Report

Define
List

EDIT
ANNOTATN

B.H.



HERMON LABORATORIES

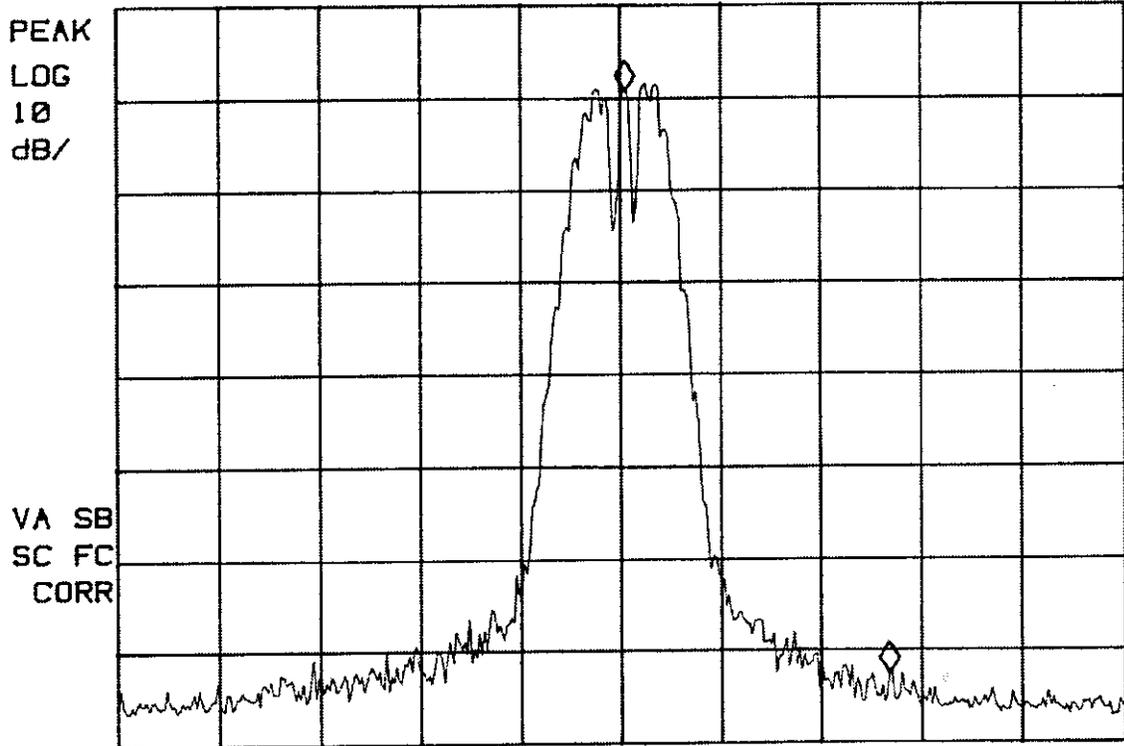
Test Report: AVR FCC.12768
Date: March, 1998

Plot 3.4.11
Unwanted radiation test result
Frequency 216.475 MHz

11:41:07 MAR 05, 1998
hp

REF 70.0 dB μ W #ATTEN 0 dB

MKR Δ 26.3 kHz
-63.26 dB



CENTER 216.4750 MHz
#RES BW 300 Hz

VBW 300 Hz

SPAN 100.0 kHz
SWP 3.3 sec

BH



HERMON LABORATORIES

Test Report: AVR FCC.12768
Date: March, 1998

Plot 3.4.12
Unwanted radiation test result
Frequency 216.475 MHz

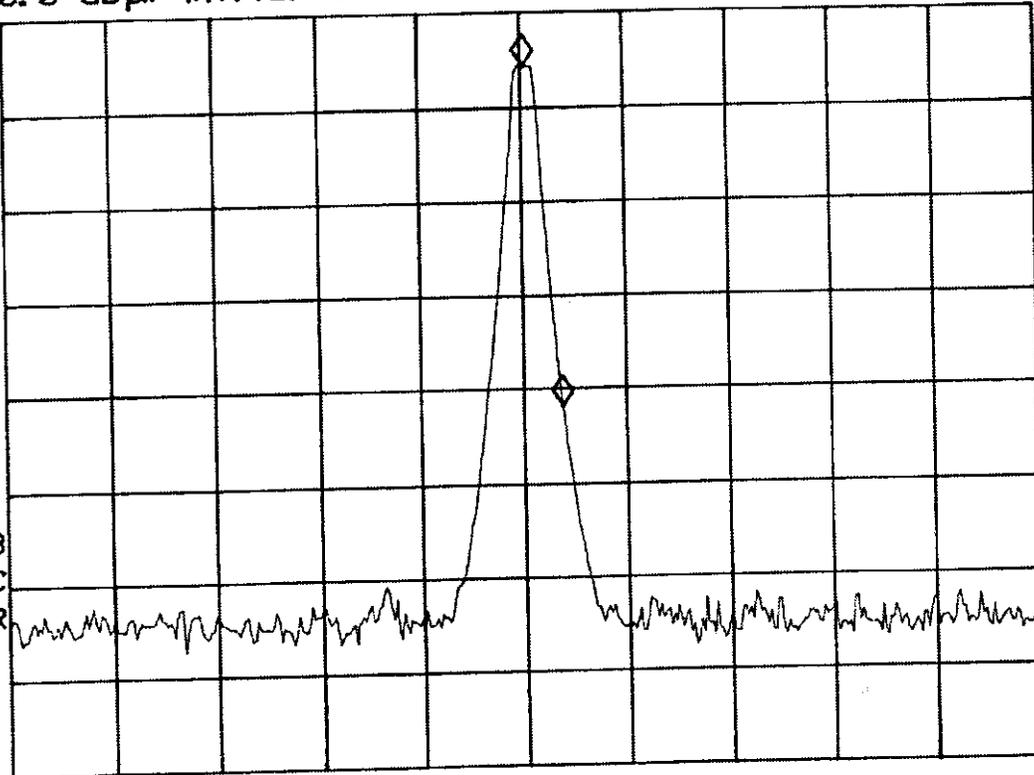
11:46:33 MAR 05, 1998

MKR Δ 35 kHz
-36.27 dB

REF 70.0 dB μ V #ATTEN 0 dB

PEAK
LOG
10
dB/

VA SB
SC FC
CORR



CENTER 216.475 MHz
#RES BW 10 kHz

VBW 10 kHz

SPAN 1.000 MHz
SWP 30 msec

Handwritten signature



HERMON LABORATORIES

Test Report: AVR FCC.12768
Date: March, 1998

Plot 3.4.13
Unwanted radiation test result
Frequency 216.475 MHz

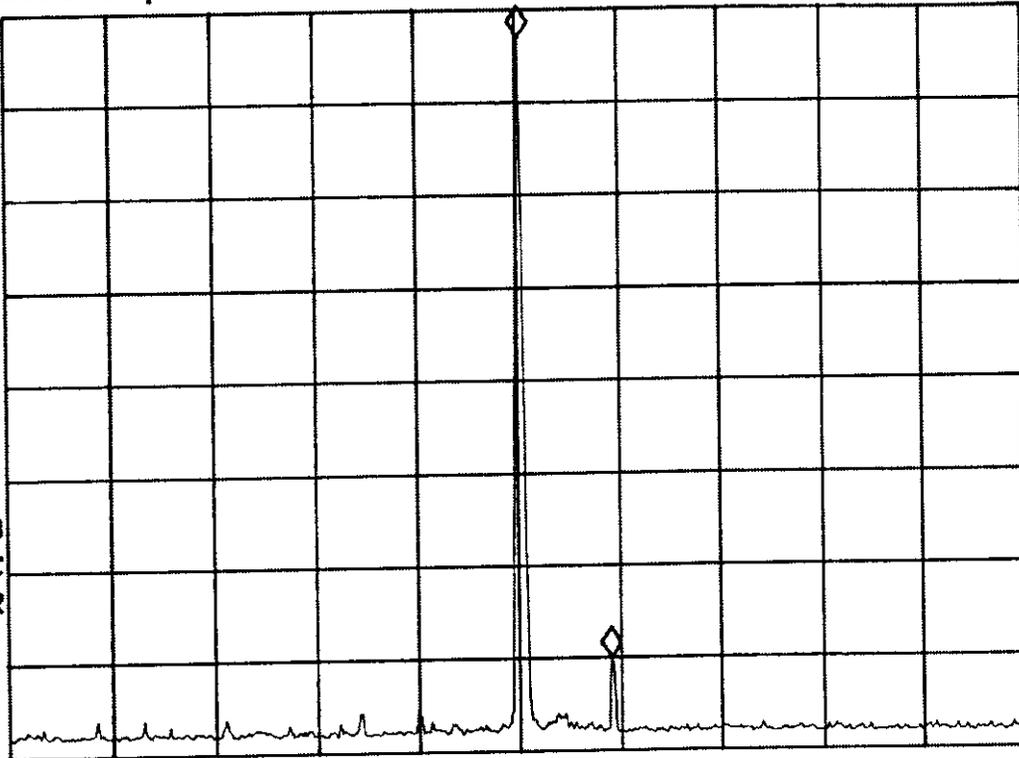
15:58:01 MAR 05, 1998

MKR Δ 3.50 MHz
-67.04 dB

REF 105.0 dB μ V ATTN 10 dB

PEAK
LOG
10
dB/

VA SB
SC FC
CORR



CENTER 216.58 MHz
#RES BW 30 kHz

VBW 30 kHz

SPAN 40.00 MHz
SWP 130 msec

Pat



HERMON LABORATORIES

Test Report: AVR FCC.12768
Date: March, 1998

Plot 3.4.14
Unwanted radiation test result
Frequency 216.475 MHz

14:51:22 MAR 03, 1998
PR.12768 AVR COM LOGICOM TX20 D=3m

ACTV DET: PEAK
MEAS DET: PEAK QP
MKR 193.8 MHz
23.82 dB μ V/m

MEASURE
AT MKR
ADD TO
LIST

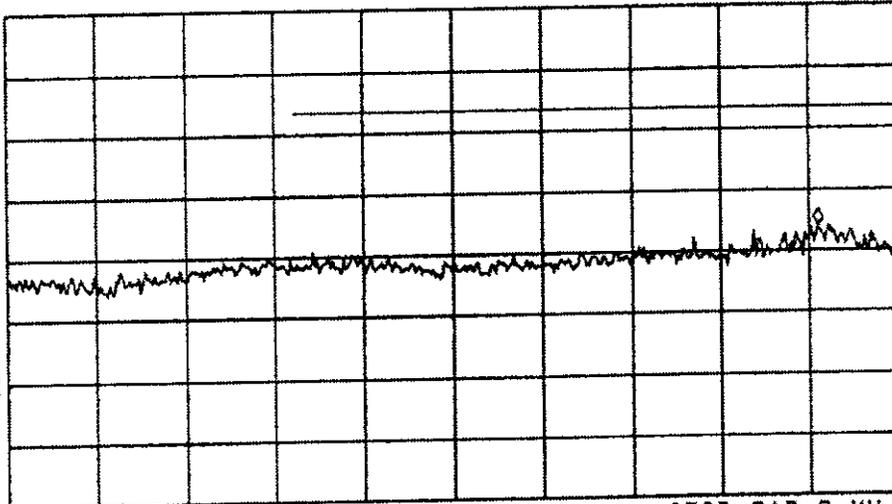
LOG REF 60.0 dB μ V/m

PREAMP ON

COPY
SCREEN

10
dB/
ATN
10 dB

VA SB
SC FC
ACORR



START 30.0 MHz

#IF BW 120 kHz

#AVG BW 300 kHz

STOP 210.0 MHz

SWP 169 msec

OUTPUT
REPORT
Define
Report
Define
List
EDIT
ANNOTATN

BH



HERMON LABORATORIES

Test Report: AVR FCC.12768

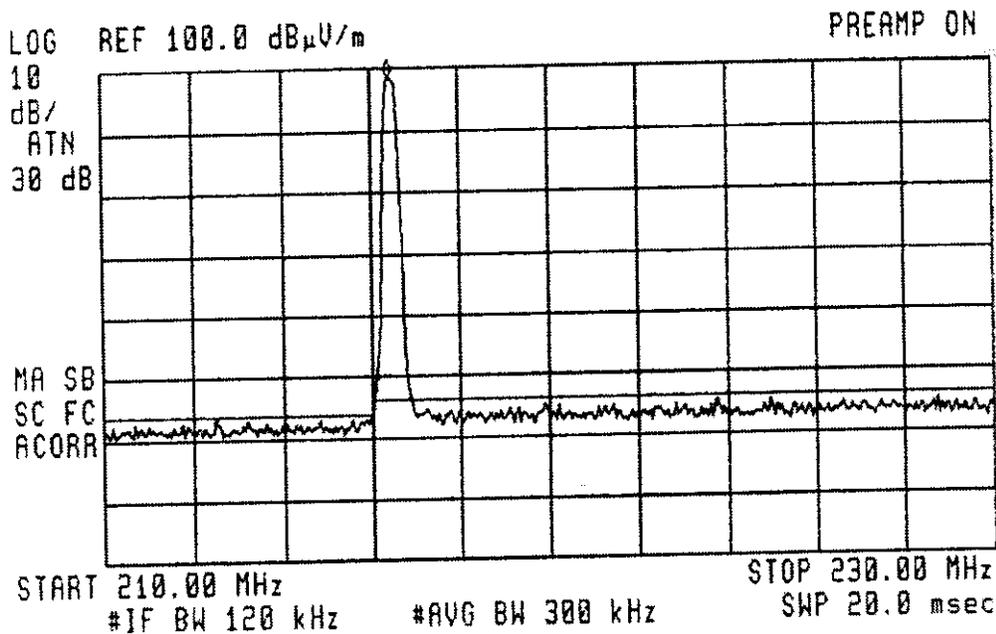
Date: March, 1998

Plot 3.4.15
Unwanted radiation test result
Frequency 216.475 MHz

17:47:44 MAR 03, 1998
PR.12768 AVR COM LOGICOM TX20 D=3m

ACTV DET: PEAK
MEAS DET: PEAK QP
MKR 216.40 MHz
98.76 dB μ V/m

MEASURE
AT MKR
ADD TO
LIST



COPY
SCREEN

OUTPUT
REPORT

Define
Report

Define
List

EDIT
ANNOTATN

Att



HERMON LABORATORIES

Test Report: AVR FCC.12768

Date: March, 1998

Plot 3.4.16
Unwanted radiation test result
Frequency 216.475 MHz

14:57:12 MAR 83, 1998
PR.12768 AVR COM LOGICOM TX20 D=3m

ACTV DET: PEAK
MEAS DET: PEAK QP
MKR 653.5 MHz
57.15 dB μ V/m

MEASURE
AT MKR

ADD TO
LIST

COPY
SCREEN

OUTPUT
REPORT

Define
Report

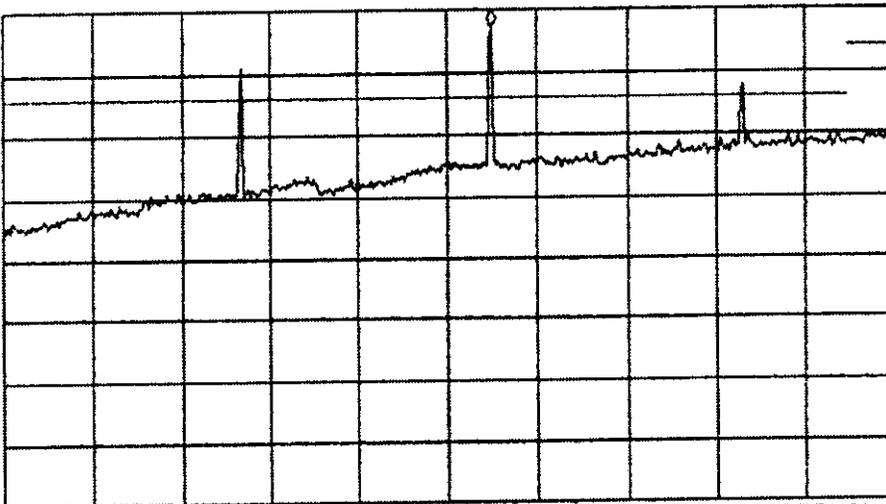
Define
List

EDIT
ANNOTATN

LOG REF 60.0 dB μ V/m

PREAMP ON

10
dB/
ATN
10 dB



START 230.0 MHz

STOP 1.0000 GHz

#IF BW 120 kHz

#AVG BW 300 kHz

SWP 722 msec

VA SB
SC FC
ACORR

RAH



HERMON LABORATORIES

Test Report: AVR FCC.12768
Date: March, 1998

Plot 3.4.17
Unwanted radiation test result
Frequency 216.475 MHz

10:01:07 MAR 03, 1998
PR.12768 AVR COM LOGICOM TX20 D=3m

ACTV DET: PEAK
MEAS DET: PEAK QP
MKR 1.943 GHz
48.00 dB μ V/m

MEASURE
AT MKR
ADD TO
LIST

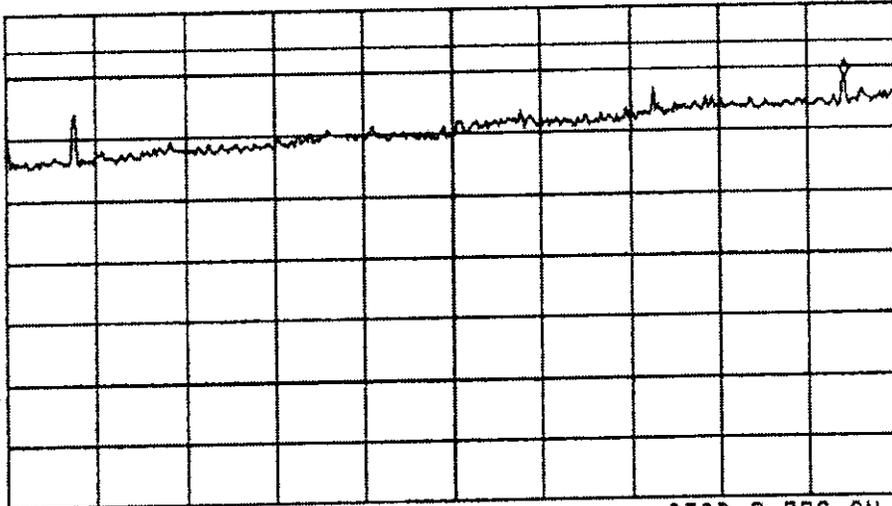
LOG REF 60.0 dB μ V/m

PREAMP ON

COPY
SCREEN

10
dB/
#ATN
0 dB

VA SB
SC FC
ACORR



START 1.000 GHz STOP 2.000 GHz
#IF BW 1.0 MHz #AVG BW 1 MHz SWP 20.0 msec

OUTPUT
REPORT
Define
Report
Define
List
EDIT
ANNOTATN

BH



HERMON LABORATORIES

Test Report: AVR FCC.12768
Date: March, 1998

Plot 3.4.18
Unwanted radiation test result
Frequency 216.475 MHz

13:40:12 MAR 03, 1998
PR.12768 AVR COM LOGICOM TX20 D=3m

ACTV DET: PEAK
MEAS DET: PEAK QP
MKR 216.475 MHz
98.96 dB μ V/m

MEASURE
AT MKR

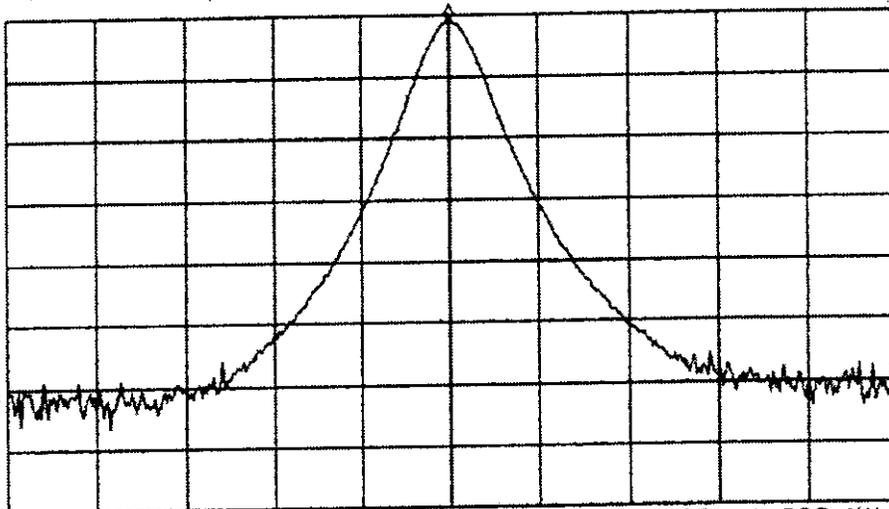
ADD TO
LIST

LOG REF 100.0 dB μ V/m

PREAMP ON

10
dB/
ATN
30 dB

VA SB
SC FC
ACORR



CENTER 216.475 MHz
#IF BW 120 kHz

AVG BW 300 kHz

SPAN 2.000 MHz
SWP 20.0 msec

COPY
SCREEN

OUTPUT
REPORT

Define
Report

Define
List

EDIT
ANNOTATN

Att



HERMON LABORATORIES

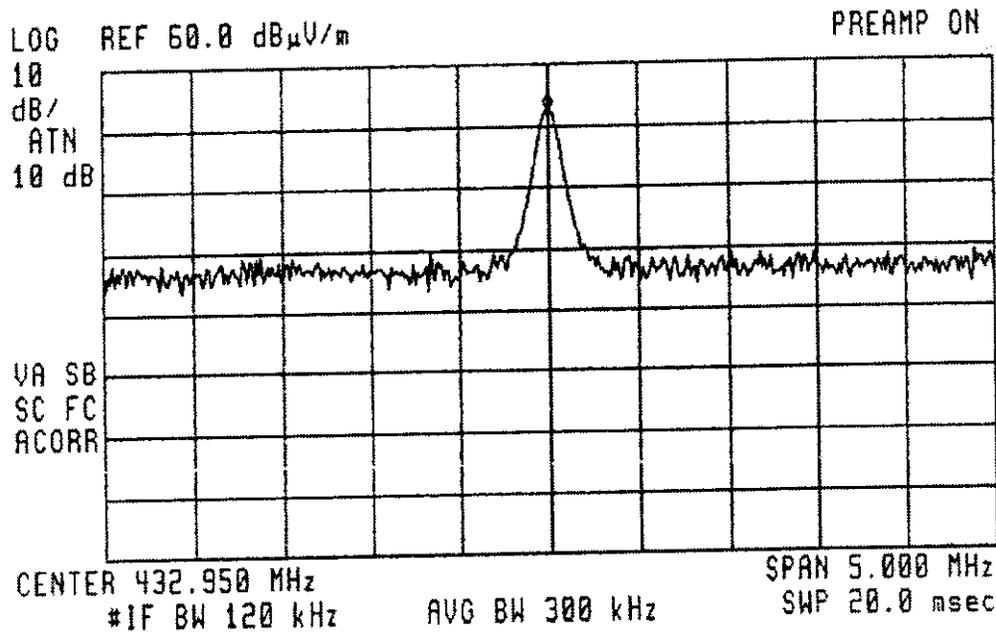
Test Report: AVRFCC.12768
Date: March, 1998

Plot 3.4.19
Unwanted radiation test result
Frequency 216.475 MHz

13:48:35 MAR 03, 1998
PR.12768 AVR COM LOGICOM TX20 D=3m

ACTV DET: PEAK
MEAS DET: PEAK QP
MKR 432.950 MHz
52.65 dB μ V/m

MEASURE
AT MKR
ADD TO
LIST



COPY
SCREEN

OUTPUT
REPORT

Define
Report

Define
List

EDIT
ANNOTATN

BH



HERMON LABORATORIES

Test Report: AVRFCC.12768
Date: March, 1998

Plot 3.4.20
Unwanted radiation test result
Frequency 216.475 MHz

13:54:53 MAR 03, 1998

PR.12768 AVR COM LOGICOM TX20 D=3m

ACTV DET: PEAK
MEAS DET: PEAK QP
MKR 649.425 MHz
57.36 dB μ V/m

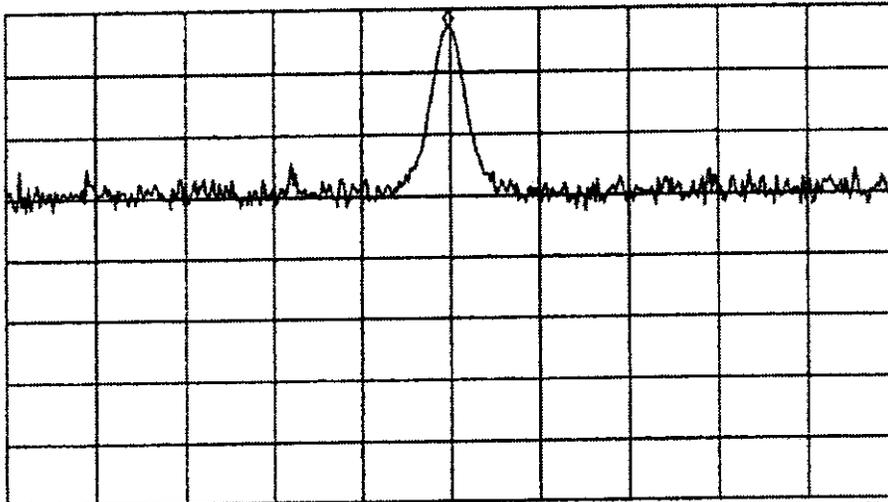
MEASURE
AT MKR
ADD TO
LIST

LOG REF 60.0 dB μ V/m

PREAMP ON

COPY
SCREEN

10
dB/
ATN
10 dB



OUTPUT
REPORT

Define
Report

Define
List

EDIT
ANNOTATN

CENTER 649.439 MHz
#IF BW 120 kHz

AUG BW 300 kHz

SPAN 5.000 MHz
SWP 20.0 msec

PH



HERMON LABORATORIES

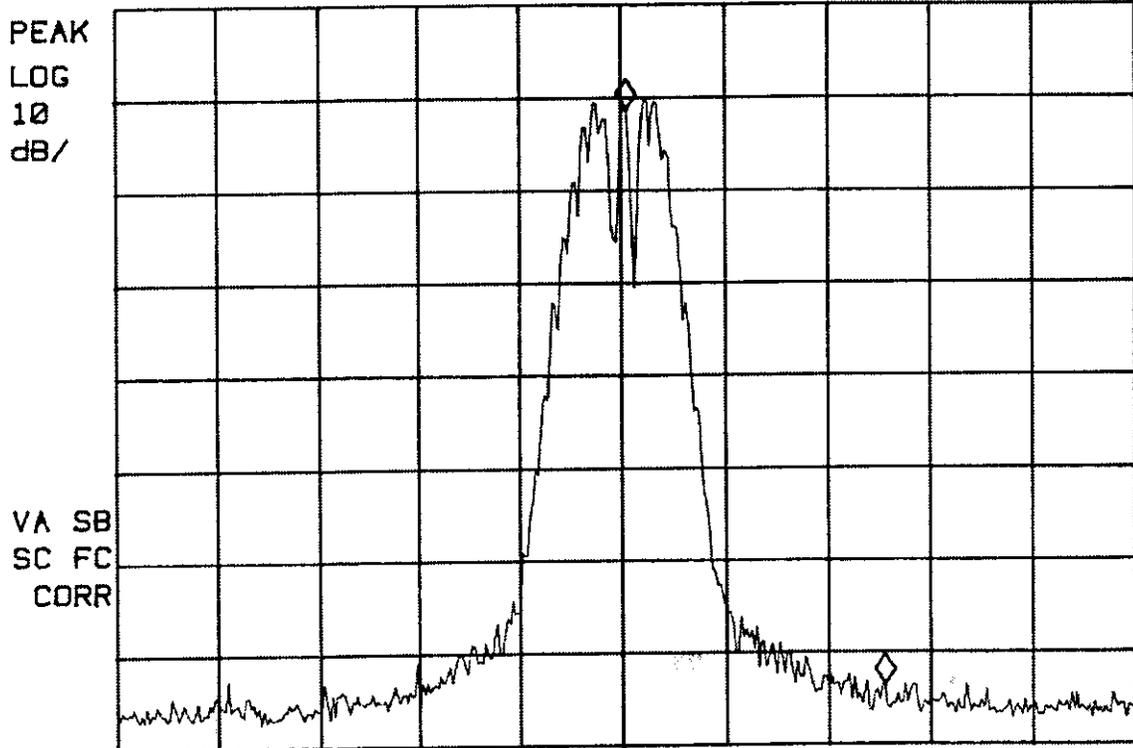
Test Report: AVR FCC.12768
Date: March, 1998

Plot 3.4.21
Unwanted radiation test result
Frequency 216.495 MHz

11:52:51 MAR 05, 1998
hp

MKR Δ 25.0 kHz
-62.20 dB

REF 70.0 dB μ V #ATTEN 0 dB



CENTER 216.9750 MHz
#RES BW 300 Hz

VBW 300 Hz

SPAN 100.0 kHz
SWP 3.3 sec

RTH



HERMON LABORATORIES

Test Report: AVR FCC.12768

Date: March, 1998

Plot 3.4.22
Unwanted radiation test result
Frequency 216.495 MHz

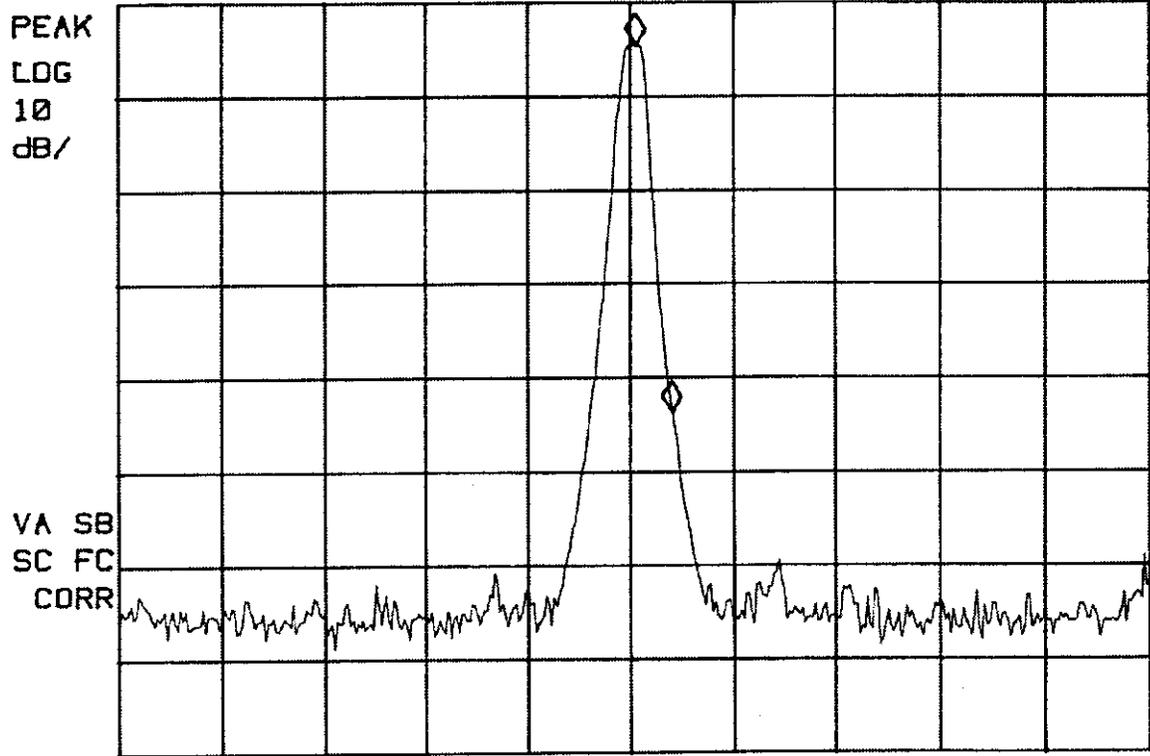
11:49:44 MAR 05, 1998

hp

REF 70.0 dBμV #ATTEN 0 dB

MKR Δ 35 kHz

-39.15 dB



CENTER 216.975 MHz
#RES BW 10 kHz

VBW 10 kHz

SPAN 1.000 MHz
SWP 30 msec

RTH



HERMON LABORATORIES

Test Report: AVR FCC.12768

Date: March, 1998

Plot 3.4.23
Unwanted radiation test result
Frequency 216.495 MHz

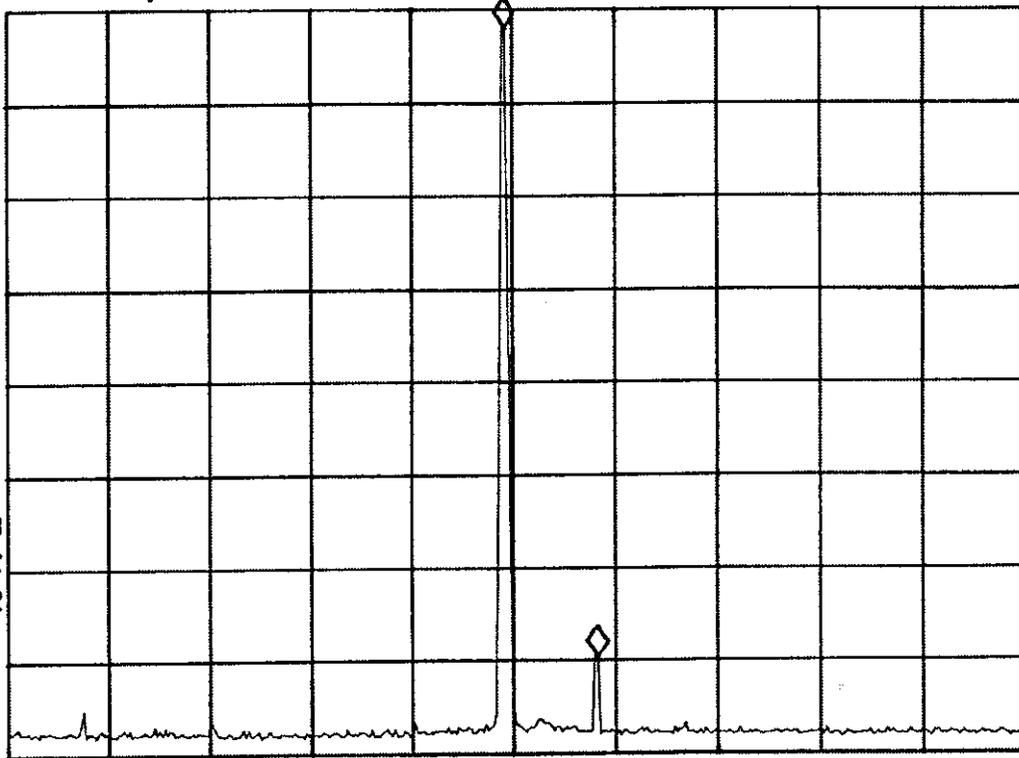
16:02:47 MAR 05, 1998
hp

MKR Δ 3.60 MHz
-67.54 dB

REF 105.0 dB μ V ATTN 10 dB

PEAK
LOG
10
dB/

VA SB
SC FC
CORR



CENTER 216.98 MHz
#RES BW 30 kHz

VBW 30 kHz

SPAN 40.00 MHz
SWP 130 msec

Att



HERMON LABORATORIES

Test Report: AVR FCC.12768
Date: March, 1998

Plot 3.4.24
Unwanted radiation test result
Frequency 216.495 MHz

14:23:19 MAR 03, 1998
PR.12768 AVR COM LOGICOM TX20 D=3m

ACTV DET: PEAK
MEAS DET: PEAK QP
MKR 196.5 MHz
23.86 dB μ V/m

MEASURE
AT MKR

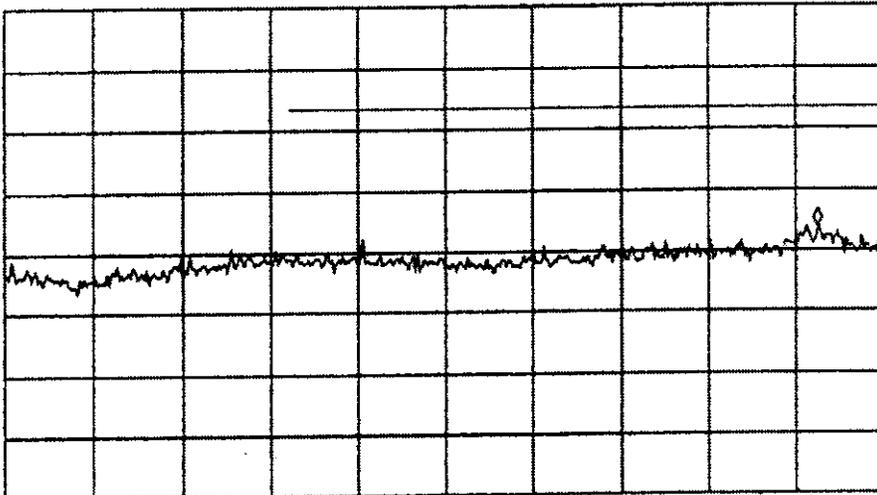
ADD TO
LIST

LOG REF 60.0 dB μ V/m
10
dB/
ATN
10 dB

PREAMP ON

COPY
SCREEN

VA SB
SC FC
ACORR



OUTPUT
REPORT

Define
Report

Define
List

EDIT
ANNOTATN

START 30.0 MHz STOP 210.0 MHz
#IF BW 120 kHz AVG BW 300 kHz SWP 169 msec

PH



HERMON LABORATORIES

Test Report: AVR FCC.12768
Date: March, 1998

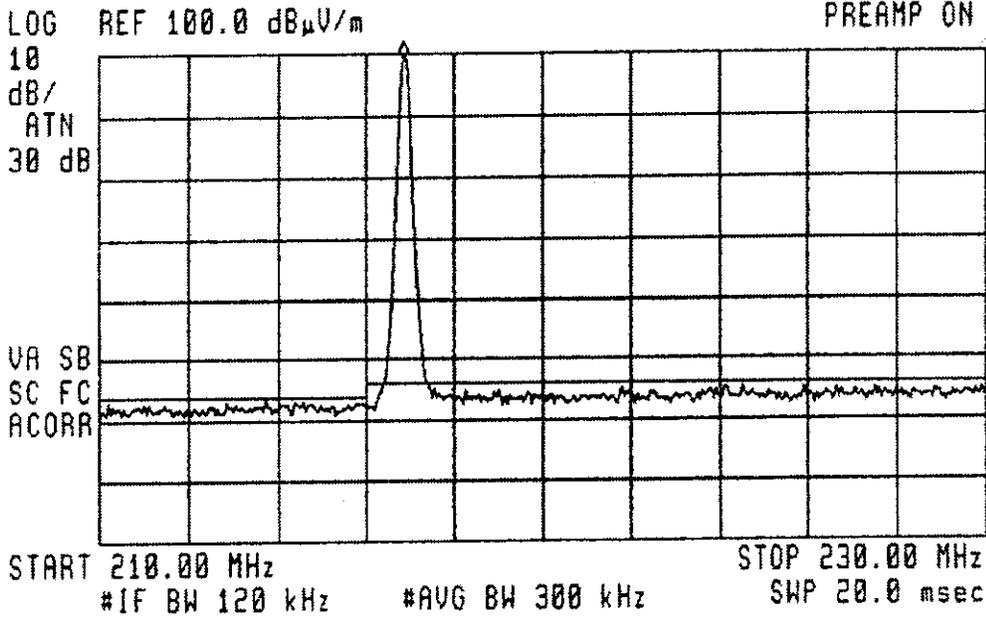
Plot 3.4.25
Unwanted radiation test result
Frequency 216.495 MHz

14:42:38 MAR 03, 1998
PR.12768 AVR COM LOGICOM TX20 D=3m

ACTV DET: PEAK
MEAS DET: PEAK QP
MKR 216.85 MHz
99.19 dB μ V/m

MEASURE
AT MKR

ADD TO
LIST



COPY
SCREEN

OUTPUT
REPORT

Define
Report

Define
List

EDIT
ANNOTATN

Rth



HERMON LABORATORIES

Test Report: AVR FCC.12768

Date: March, 1998

Plot 3.4.26
Unwanted radiation test result
Frequency 216.495 MHz

14:29:21 MAR 03, 1998
PR.12768 AVR COM LOGICOM TX20 D=3m

ACTV DET: PEAK
MEAS DET: PEAK QP
MKR 655.4 MHz
57.87 dB μ V/m

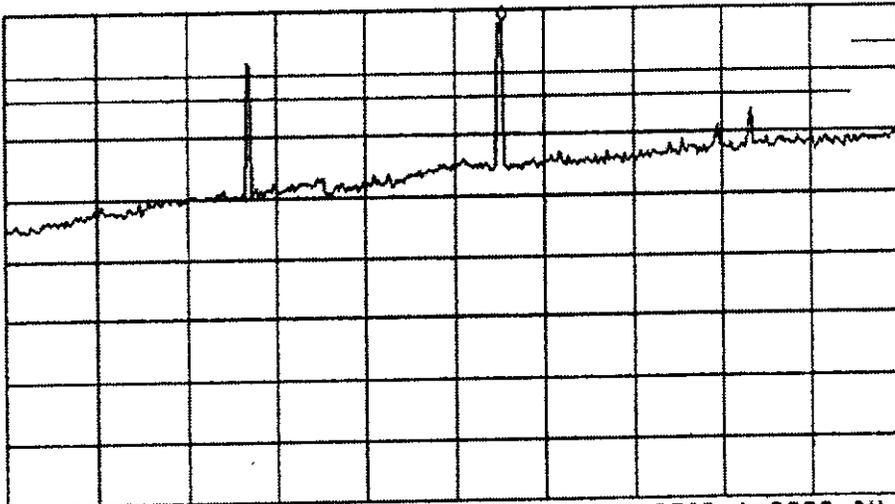
MEASURE
AT MKR

ADD TO
LIST

LOG REF 60.0 dB μ V/m

PREAMP ON

10
dB/
ATN
10 dB



START 230.0 MHz

#IF BW 120 kHz

AVG BW 300 kHz

STOP 1.0000 GHz

SWP 722 msec

VA SB
SC FC
ACORR

COPY
SCREEN

OUTPUT
REPORT

Define
Report

Define
List

EDIT
ANNOTATN

PH



HERMON LABORATORIES

Test Report: AVR FCC.12768
Date: March, 1998

Plot 3.4.27
Unwanted radiation test result
Frequency 216.495 MHz

14:36:38 MAR 03, 1998
PR.12768 AVR COM LOGICOM TX20 D=3m

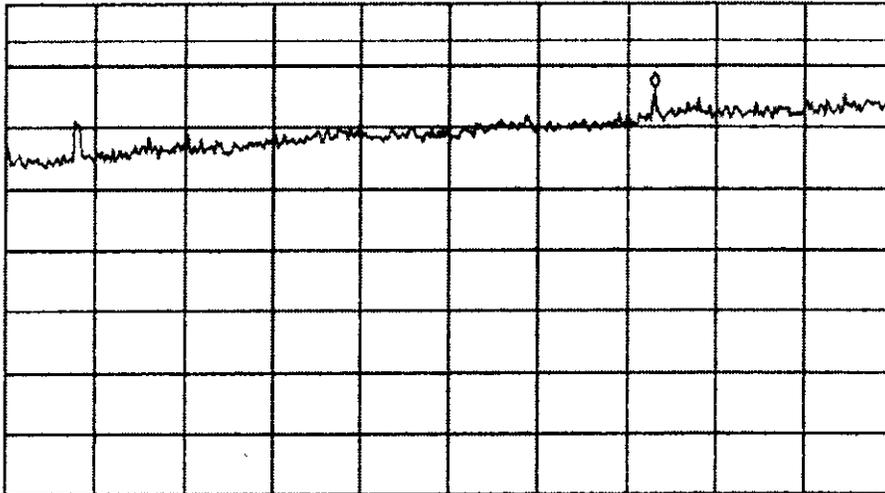
ACTV DET: PEAK
MEAS DET: PEAK QP
MKR 1.730 GHz
45.81 dB μ V/m

MEASURE
AT MKR
ADD TO
LIST

LOG REF 50.0 dB μ V/m

PREAMP ON

10
dB/
#ATTN
0 dB



START 1.000 GHz STOP 2.000 GHz
#IF BW 1.0 MHz #AVG BW 1 MHz SWP 20.0 msec

COPY
SCREEN

OUTPUT
REPORT

Define
Report

Define
List

EDIT
ANNOTATN

PH



HERMON LABORATORIES

Test Report: AVRFCC.12768

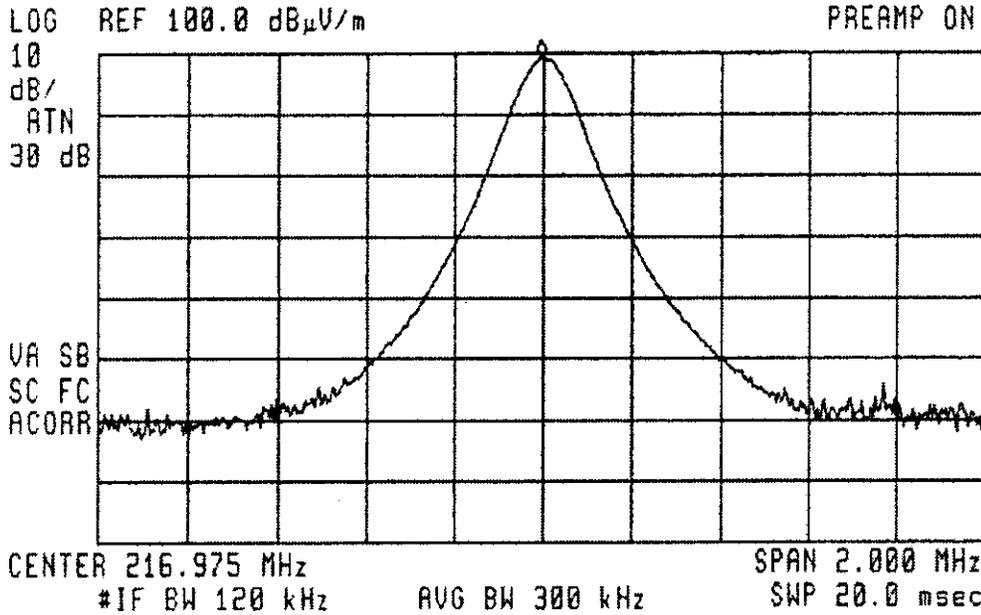
Date: March, 1998

Plot 3.4.28
Unwanted radiation test result
Frequency 216.495 MHz

14:07:19 MAR 03, 1998
PR.12768 AVR COM LOGICOM TX20 D=3m

ACTV DET: PEAK
MEAS DET: PEAK QP
MKR 216.970 MHz
99.17 dB μ V/m

MEASURE
AT MKR
ADD TO
LIST



COPY
SCREEN

OUTPUT
REPORT

Define
Report

Define
List

EDIT
ANNOTATN

RH



HERMON LABORATORIES

Test Report: AVR FCC.12768
Date: March, 1998

Plot 3.4.29
Unwanted radiation test result
Frequency 216.495 MHz

14:13:18 MAR 03, 1998
PR.12768 AVR COM LOGICOM TX20 D=3m

ACTV DET: PEAK
MEAS DET: PEAK QP
MKR 433.950 MHz
52.91 dB μ V/m

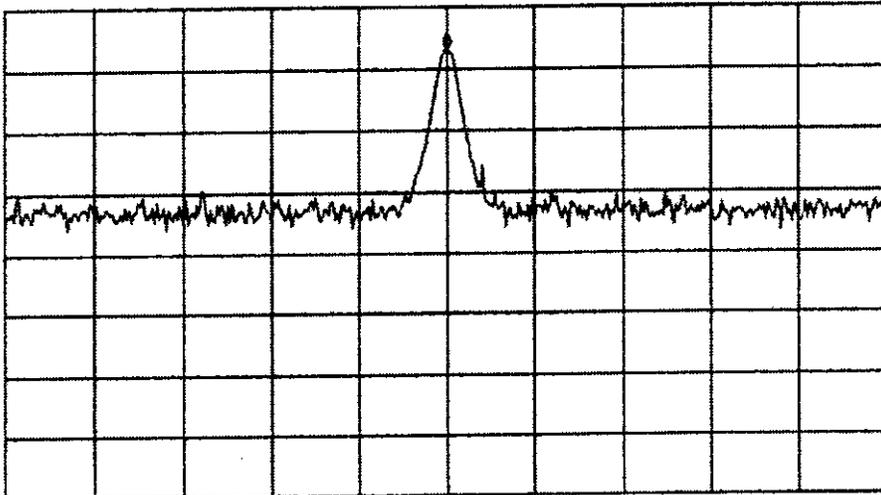
MEASURE
AT MKR

ADD TO
LIST

LOG REF 60.0 dB μ V/m

PREAMP ON

10
dB/
ATN
10 dB



CENTER 433.950 MHz
#IF BW 120 kHz

AVG BW 300 kHz

SPAN 5.000 MHz
SWP 20.0 msec

COPY
SCREEN

OUTPUT
REPORT

Define
Report

Define
List

EDIT
ANNOTATN

RTH



HERMON LABORATORIES

Test Report: AVR FCC.12768

Date: March, 1998

Plot 3.4.30
Unwanted radiation test result
Frequency 216.495 MHz

14:18:26 MAR 03, 1998
PR.12768 AVR COM LOGICOM TX20 D=3m

ACTV DET: PEAK
MEAS DET: PEAK QP
MKR 650.925 MHz
58.04 dB μ V/m

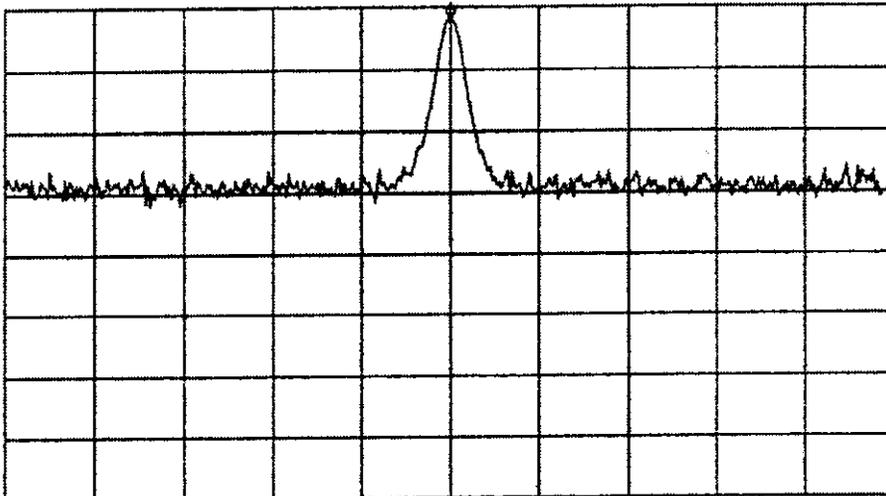
MEASURE
AT MKR

ADD TO
LIST

LOG REF 60.0 dB μ V/m

PREAMP ON

10
dB/
ATTN
10 dB



CENTER 650.925 MHz
*IF BW 120 kHz

AVG BW 300 kHz

SPAN 5.000 MHz
SWP 20.0 msec

COPY
SCREEN

OUTPUT
REPORT

Define
Report

Define
List

EDIT
ANNOTATN

PH



4 Summary and Signatures

The Transmitter Logicom TX20 was found to be in compliance with the requirements of FCC part 2 § 2.995, § 2.989 and FCC part 95 § 95.639 (e), § 95.629 © (2), § 95.633 (d) (3), § 95.635 © (2), § 95.629 ©.

Test performed by:

Mrs. Eleonora Pitt, test engineer



Approved by:

Dr. Edward Usoskin, Gen. Manager



**Responsible Person from
AVR communications Ltd.**

Mr. Boris Ginzburg, scientific manager



**APPENDIX A - Test equipment and ancillaries used for tests**

HL Serial No.	Serial No.	Description	Manufacturer	Model No.	Due Calibr.
500	25-2893-05	Oven temperature	Thermotron	S-16 Mini-Max	11/98
507	2926U00162	Analyzer, Spectrum 9 kHz - 1.8 GHz	Hewlett Packard	HP 8591A	5/98
521	3617A00319	Analyzer, Spectrum with RF filter section - HP EMI Receiver 9 kHz - 8 GHz	Hewlett Packard	HP 8546A	7/98
557	112225/080	Generator Signal	Marconi Instruments	52023-002E	11/98
577	1716A12314/8	Multimeter Digital	Hewlett Packard	HP 3466A	12/98
593	593	Antenna Mast, 1-4/1-6 m Pneumatic	Hermon Laboratories	HL AM-F1	4/98
594	594	Turn Table for Anechoic Chamber	Hermon Laboratories	HL TT-EDC1	11/98
604	1011	Antenna Log-Periodic/T Bow-Tie 26-2000 MHz	Emco	3141 BICONILOG ANTENNA	7/98



APPENDIX B-Test Equipment Correction Factors

Antenna Factor at 10m 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).