

TEST RESULT SUMMARY

FCC PART 15 SUBPART C

Section 15.247

FCC PART 15 SUBPART C

Section 15.207 Conducted Emission Requirements

MANUFACTURER'S NAME	SoniqCast, LLC
NAME OF EQUIPMENT	802.11b Transmitter
MODEL NUMBER	SQ-1000-NA
MANUFACTURER'S ADDRESS	4400 Baker Road Minnetonka MN 55343
TEST REPORT NUMBER	NC305614.2
TEST DATE	16 & 18 December 2003

According to testing performed at TÜV Product Service Inc, the above-mentioned unit is in compliance with the electromagnetic compatibility requirements defined in FCC Part 15 Subpart C Sections 15.207 and 15.247.

It is the manufacturer's responsibility to assure that additional production units of this model are manufactured with identical electrical and mechanical characteristics. Any modifications necessary for compliance made during testing on the above mentioned date(s) must be implemented in all production units for compliance to be maintained.

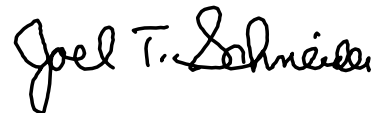
TÜV Product Service Inc, as an independent testing laboratory, declares that the equipment tested as specified above conforms to the requirements of FCC Part 15 Subpart C Sections 15.207 and 15.247.

Date: 15 January 2004

Location: Taylors Falls MN
USA



G. S. Jakubowski
Tested By



J. T. Schneider
Reviewed By

Not Transferable

EMC EMISSION - TEST REPORT

Test Report File No. : **NC305614.2** Date of issue: 15 January 2004

Model No. : **SQ-1000-NA**

Product Name : **802.11b Transmitter**

Applicant : **SoniqCast, LLC**

Manufacturer : **SoniqCast, LLC**

License holder : **SoniqCast, LLC**

Address : **4400 Baker Road**

: **Minnetonka MN 55343**

Test Result : ☒ **Positive** ☐ **Negative**

Test Project Number :
Reference(s) : **NC305614.2**

Total pages including
Appendices : **42**

TÜV Product Service Inc is a subcontractor to TÜV Product Service, GmbH according to the principles outlined in ISO/IEC Guide 25 and EN 45001.

TÜV Product Service Inc reports apply only to the specific samples tested under stated test conditions. It is the manufacturer's responsibility to assure that additional production units of this model are manufactured with identical electrical and mechanical components. TÜV Product Service Inc shall have no liability for any deductions, inferences or generalizations drawn by the client or others from TÜV Product Service Inc issued reports.

This report is the confidential property of the client. As a mutual protection to our clients, the public and ourselves, extracts from the test report shall not be reproduced except in full without our written approval. This report shall not be used by the client to claim product endorsement by NVLAP or any agency of the US government.

TÜV Product Service Inc and its professional staff hold government and professional organization certifications and are members of AAMI, ACIL, AEA, ANSI, IEEE, NVLAP, and VCCI

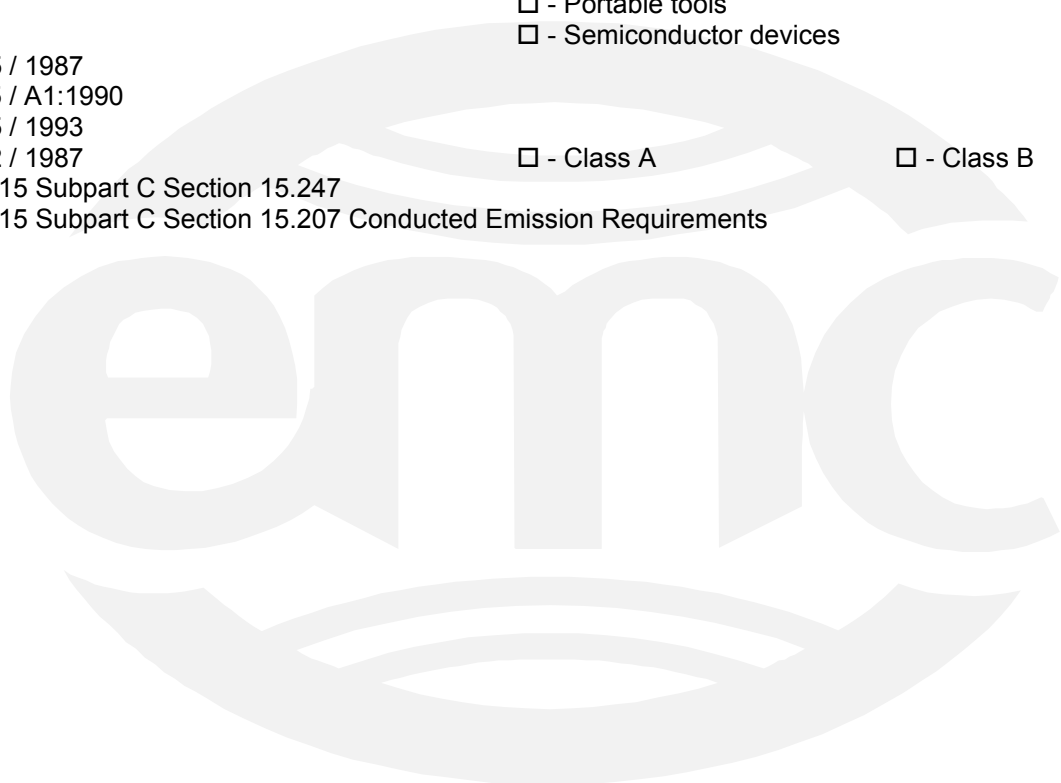
D I R E C T O R Y - E M I S S I O N S

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EMISSIONS TEST REGULATIONS :

The emissions tests were performed according to following regulations:

- ☐ - EN 50081-1 / 1991
☐ - EN 55011 / 1998
 w/Amendment A1:1999
☐ - EN 55013 / 1990
☐ - EN 55014 / 1987
- ☐ - EN 55014 / A2:1990
☐ - EN 55014 / 1993
- ☐ - EN 55015 / 1987
☐ - EN 55015 / A1:1990
☐ - EN 55015 / 1993
☐ - EN 55022 / 1987
■ - FCC Part 15 Subpart C Section 15.247
■ - FCC Part 15 Subpart C Section 15.207 Conducted Emission Requirements
- ☐ - Group 1
☐ - Class A
- ☐ - Group 2
☐ - Class B
- ☐ - Household appliances and similar
☐ - Portable tools
☐ - Semiconductor devices
- ☐ - Household appliances and similar
☐ - Portable tools
☐ - Semiconductor devices
- ☐ - Class A
☐ - Class B



Environmental conditions in the lab:

	<u>Actual</u>
Temperature	: 21 - 23 °C
Relative Humidity	: 25 - 30 %
Atmospheric pressure	: 98.0 kPa
Power supply system	: 60 Hz – 115 VAC – 1 Phase

Sign Explanations:

- ☐ - not applicable
☒ - applicable



Emissions Test Conditions: CONDUCTED EMISSIONS (Interference Voltage)

The *CONDUCTED EMISSIONS (INTERFERENCE VOLTAGE)* measurements were performed at the following test location:

☐ - Test not applicable

- ☒ - Wild River Lab Large Test Site (Open Area Test Site)
- ☐ - Wild River Lab Small Test Site (Open Area Test Site)
- ☐ - Oakwood Lab (Open Area Test Site)
- ☐ - Wild River Lab Screen Room
- ☐ - New Brighton Lab Shielded Room

Test equipment used:

	TUV ID	Model Number	Manufacturer	Description	Serial Number	Cal Due
■ -	2417	3825/2	Electro-Mechanics (EMCO)	50 Ω LISN	8812-1439	1-15-04
■ -	2420	ESH-3	Rhode & Schwarz	EMI Receiver	892473/004	2-25-04

All measurement instrumentation is traceable to the National Institute of Standards and Technology (NIST) and is calibrated annually.

Emissions Test Conditions: RADIATED EMISSIONS (Magnetic Field)

The *RADIATED EMISSIONS (MAGNETIC FIELD)* measurements were performed at the following test location:

☒ - Test not applicable

- ☐ - Wild River Lab Large Test Site (Open Area Test Site)
- ☐ - Wild River Lab Small Test Site (Open Area Test Site)
- ☐ - Oakwood Lab (Open Area Test Site)

at a test distance of :

- ☐ - 3 meters
- ☐ - 30 meters

Emissions Test Conditions: RADIATED EMISSIONS (Electric Field)

The *RADIATED EMISSIONS (ELECTRIC FIELD)* measurements, in the frequency range of 30 MHz-1000 MHz, were tested in a horizontal and vertical polarization at the following test location:

☐ - Test not applicable

- - Wild River Lab Large Test Site (Open Area Test Site) – NSA measurements made 2-03, due 2-04.
- ☐ - Wild River Lab Small Test Site (Open Area Test Site)
- ☐ - Oakwood Lab (Open Area Test Site)

at a test distance of :

- - 3 meters
- ☐ - 10 meters
- ☐ - 30 meters

Test equipment used:

	TUV ID	Model Number	Manufacturer	Description	Serial Number	Cal Due
■ -	2668	8447D	Hewlett-Packard	Preamplifier	1937A02209	2-28-04
■ -	8052	8566B	Hewlett-Packard	Spectrum Analyzer	2115a00853	10-17-04
■ -	8051	85662A	Hewlett-Packard	Analyzer Display	2112A02220	10-17-04
■	2680	85650A	Hewlett-Packard	Quasi-Peak Adapter (Unit B)	2043A00343	2-08-04
■ -	3204	EM-6917B	Electro-Metrics	Biconicalog Periodic	102	10-24-04

All measurement instrumentation is traceable to the National Institute of Standards and Technology (NIST) and is calibrated annually.

Emissions Test Conditions: INTERFERENCE POWER

The *INTERFERENCE POWER* measurements were performed by using the absorbing clamp on the mains and interface cables in the frequency range 30 MHz - 300 MHz at the following test location :

■ - Test not applicable

- ☐ - Wild River Lab Large Test Site (Open Area Test Site)
- ☐ - Wild River Lab Small Test Site (Open Area Test Site)
- ☐ - Oakwood Lab (Open Area Test Site)
- ☐ - Wild River Lab Screen Room
- ☐ - New Brighton Lab Shielded Room

Emissions Test Conditions: RADIATED EMISSIONS (Electric Field)

The *EQUIVALENT RADIATED EMISSIONS* measurements in the frequency range 1 GHz – 25 GHz were performed in a horizontal and vertical polarization at the following test location:

☐ - Test not applicable

- - Wild River Lab Large Test Site (Open Area Test Site)
- ☐ - Wild River Lab Small Test Site (Open Area Test Site)
- ☐ - Oakwood Lab (Open Area Test Site)
- ☐ - Wild River Lab Screen Room

at a test distance of:

- ☐ - 1 meters
- - 3 meters
- ☐ - 10 meters

Test equipment used:

	TUV ID	Model Number	Manufacturer	Description	Serial Number	Cal Due
■ -	8052	8566B	Hewlett-Packard	Spectrum Analyzer	2115a00853	10-17-04
■ -	8051	85662A	Hewlett-Packard	Analyzer Display	2112A02220	10-17-04
■ -	2680	85650A	Hewlett-Packard	Quasi-Peak Adapter (Unit B)	2043A00343	2-08-04
■ -	3204	EM-6917B	Electro-Metrics	Biconicalog Periodic	102	10-24-04
■ -	2075	3115	Electro-Mechanics (EMCO)	Ridge Guide Ant. 1-18 GHz	9001-3275	11-19-04
■ -	3957	SL18B4020	Phase One Microwave	Preamplifier 1 – 18 GHz	0001	9-23-04
■ -	2662	11970K	Hewlett-Packard	Harm Mixer – 18-26.5 GHz	2332A01170	7-11-04
■ -	2788	3116	Electro-Mechanics (EMCO)	Ridge Guide Ant 18-40 GHz	2005	7-11-04
■ -	2127	11975A	Hewlett Packard	Amplifier 2- 8 GHz	2738A01200	3-04-04

All measurement instrumentation is traceable to the National Institute of Standards and Technology (NIST) and is calibrated annually.

Equipment Under Test (EUT) Test Operation Mode - Emission tests :

The device under test was operated under the following conditions during emissions testing:

- ☐ - Standby
- ☐ - Test program (H - Pattern)
- ☐ - Test program (color bar)
- ☐ - Test program (customer specific)
- ☐ - Practice operation
- ☐ - Normal Operating Mode
- - Transmitting channels 1, 6, and 11.

Configuration of the device under test:

- ☐ - See Constructional Data Form in Appendix B - Page B2
- - See Product Information Form in Appendix B - beginning on Page B2

The following peripheral devices and interface cables were connected during the measurement:

- | | |
|---|----------------|
| ☐ - _____ | Type : _____ |
| ☐ - _____ | Type : _____ |
| ☐ - _____ | Type : _____ |
| ☐ - _____ | Type : _____ |
| ☐ - _____ | Type : _____ |
| ☐ - _____ | Type : _____ |
| ☐ - _____ | Type : _____ |
| ☐ - _____ | Type : _____ |
| ■ - unshielded power cable | |
| ☐ - unshielded cables | |
| ■ - shielded cables | MPS.No.: _____ |
| ☐ - customer specific cables | |
| ☐ - _____ | |

Emission Test Results:**6 dB Bandwidth [15.247 (a)(2)]**

The requirements are

☒ - MET☐ - NOT MET

The minimum 6 dB bandwidth shall be at least 500 kHz.

Remarks: See plots on pages A3 – A5. Bandwidths are shown to be 11.8 to 15.8 MHz.

Peak Power Out [15.247 (b)]

The requirements are

☒ - MET☐ - NOT MET

Maximum peak power output shall be 1 watt.

Remarks: See plots on pages A6 – A8. Max peak output power is shown to be 23.9 mW (13.8 dBm).

Antenna Directional Gain [15.247 (b)(3)(i)]

The requirements are

☒ - MET☐ - NOT MET

The antenna directional gain is less than 6 dBi. For antennas with directional gain greater than 6 dBi the maximum peak output power is reduced by 1 dB for every 3 dB that the directional gain is over 6 dBi.

Remarks: The antenna directional gain is 0 dB.

Peak Power Spectral Density – [15.247 (d)]

The requirements are

☒ - MET☐ - NOT MET

Peak power spectral density shall not be greater than 8 dBm in any 3 kHz band.

Remarks: See plots on pages A9 - A11.

Emission Test Results Continued:

FCC 15.207 - Conducted emissions 150 kHz - 30 MHz

The requirements are ☒ - MET ☐ - NOT MET

Minimum margin of compliance 0.1 dB at 954.75 kHz

Maximum margin of non-compliance dB at MHz

Remarks: See data on pages A15 – A18.

Spurious radiated emissions (electric field) 30 MHz - 1000 MHz (restricted bands)

The requirements are ☒ - MET ☐ - NOT MET

Minimum margin of compliance 7 dB at 252 MHz

Maximum margin of non-compliance dB at MHz

Remarks: See data on pages A19 – A22.

Spurious conducted emissions 30 MHz – 25 GHz

The requirements are ☒ - MET ☐ - NOT MET

Minimum margin of compliance >10 dB at MHz

Maximum margin of non-compliance dB at MHz

The limit is –20 dBc in any 100 kHz band outside the operating band.

Remarks: No emissions detected. See page A12.

Special attention is paid to ensure band edge compliance. See pages A13 and A14.

Equivalent Radiated emissions 1 GHz – 25 GHz (restricted bands)

The requirements are ☒ - MET ☐ - NOT MET

Minimum margin of compliance >10 dB at MHz

Maximum margin of non-compliance dB at MHz

Remarks: No emissions detected. See page A23.

DEVIATIONS FROM STANDARD:

None

GENERAL REMARKS:**SUMMARY:**

The requirements according to the technical regulations are

☒ - met

☐ - **not** met.

The device under test does

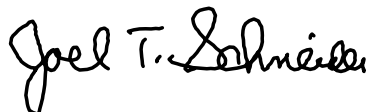
☒ - fulfill the general approval requirements mentioned on page 3.

☐ - **not** fulfill the general approval requirements mentioned on page 3.

Testing Start Date: 16 December 2003

Testing End Date: 18 December 2003

- TÜV PRODUCT SERVICE INC -



J. T. Schneider
Chief Engineer

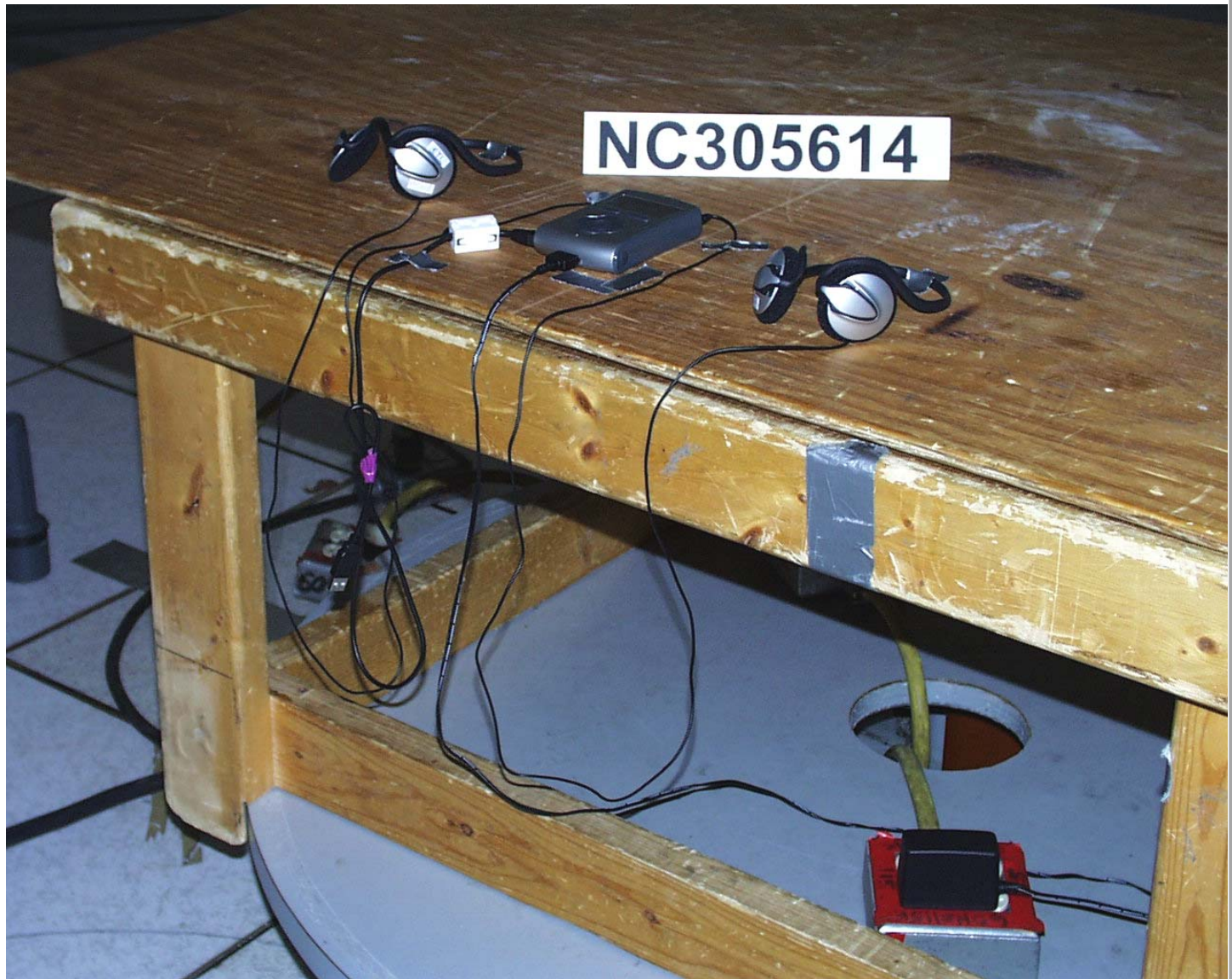


Tested By:
G. S. Jakubowski

Test-setup photo(s):
Conducted emission 10/150 kHz - 30 MHz

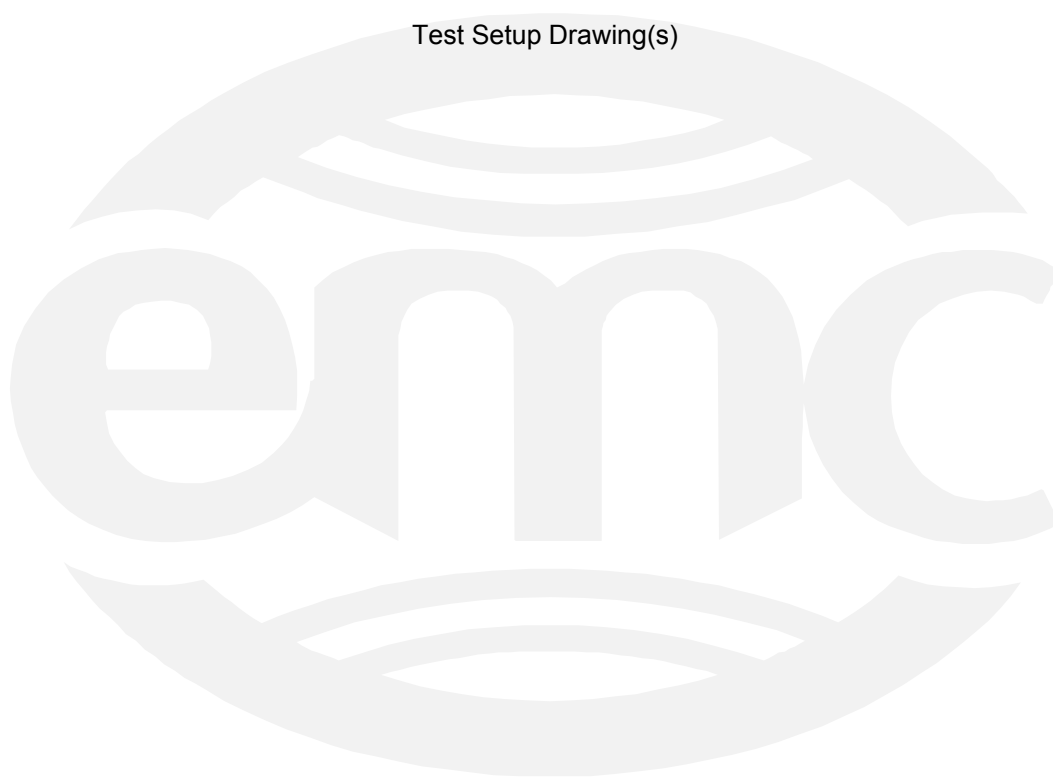


Test-setup photo(s):
Radiated emission 30 MHz - 25000 MHz



Appendix A

Test Data Sheets
and
Test Setup Drawing(s)

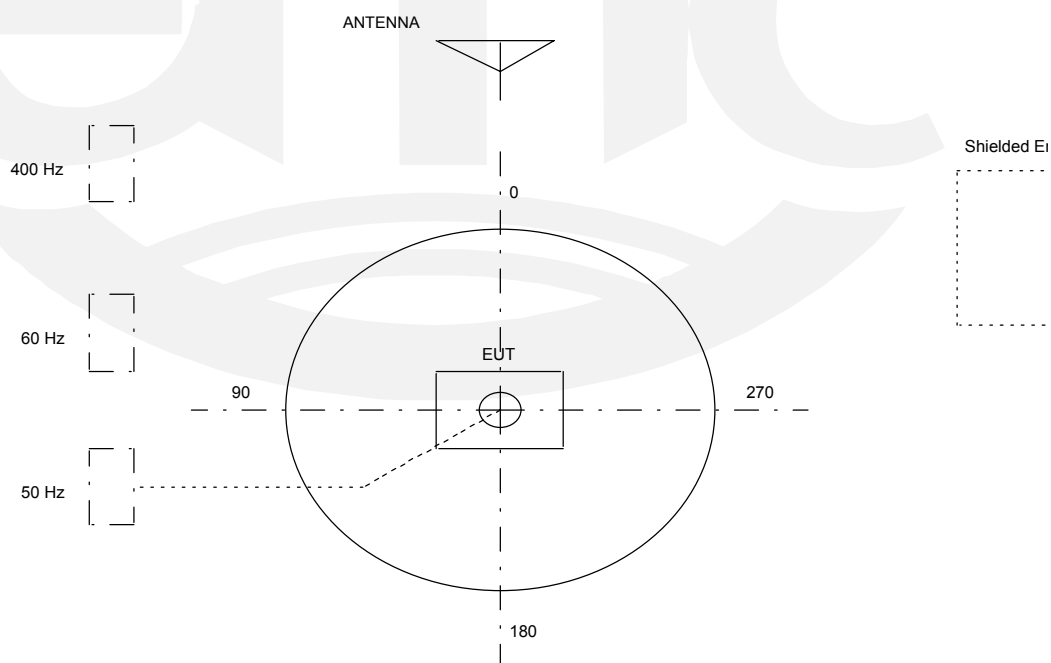


TEST SETUP FOR EMISSIONS TESTING

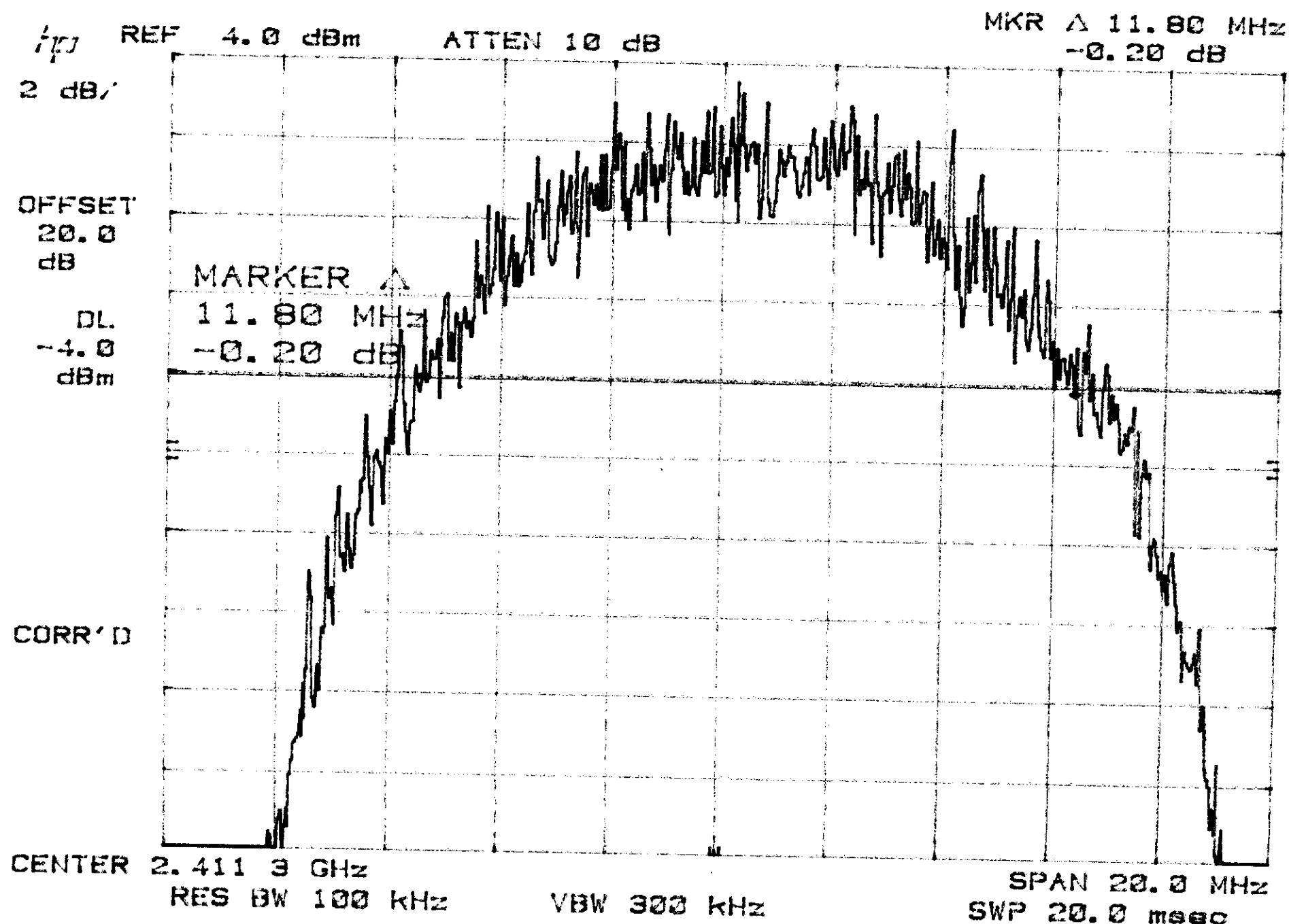
WILD RIVER LAB Large Test Site

Notes:

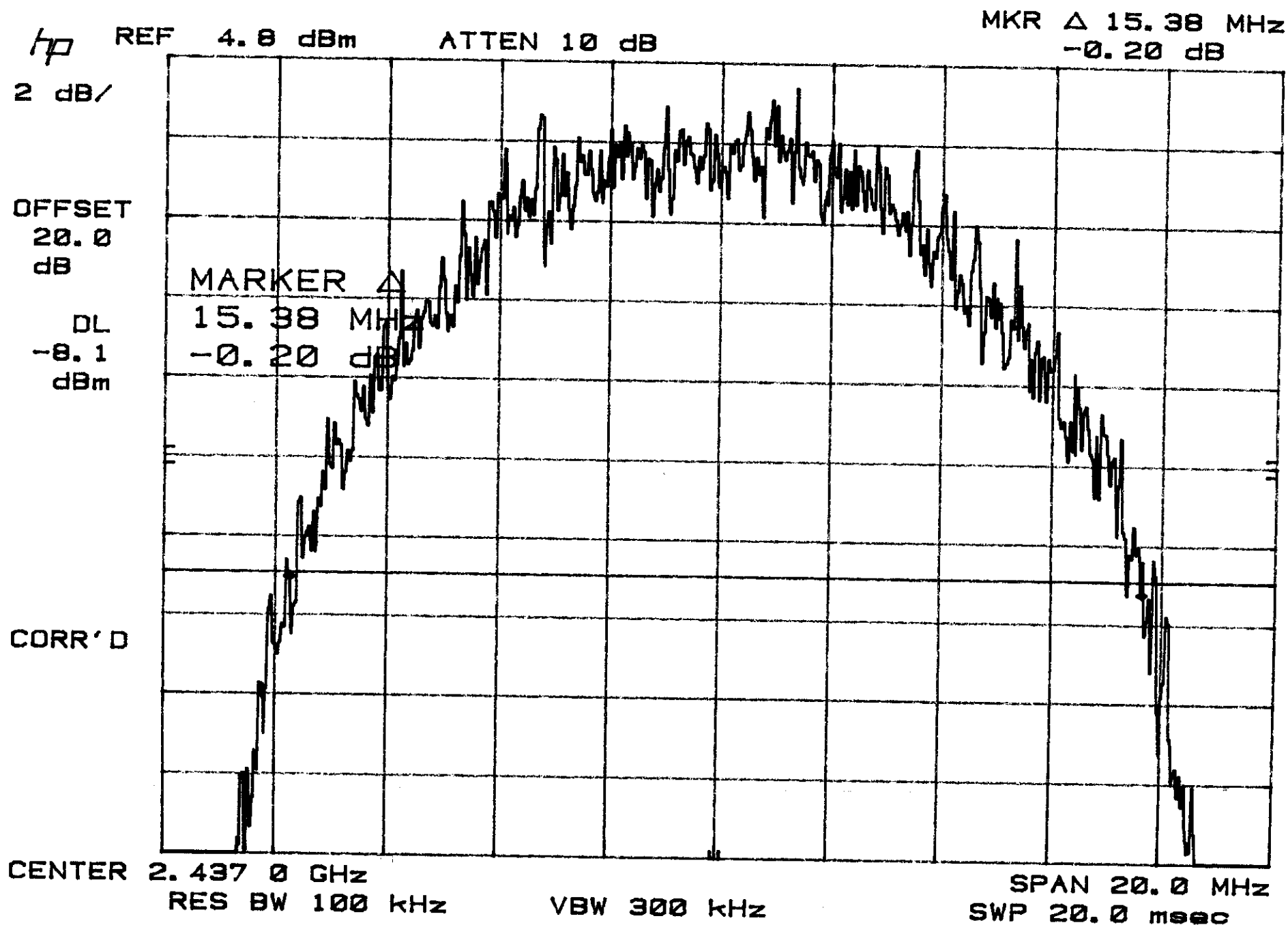
1. Items shown in dotted lines are located on the floor below the test area. It is 5 meters vertically from the ground floor to the test area.
2. 50 Hz, 60 Hz, and 400 Hz are power panels for alternating current.
3. The antenna may be positioned horizontally 3, 10 or 30 meters from the center of the turntable.
4. The circle is a 6.7 meter diameter turntable.
5. A ground plane is in the plane of this sheet.
6. The test sample is shown in the azimuthal position representing zero degrees.



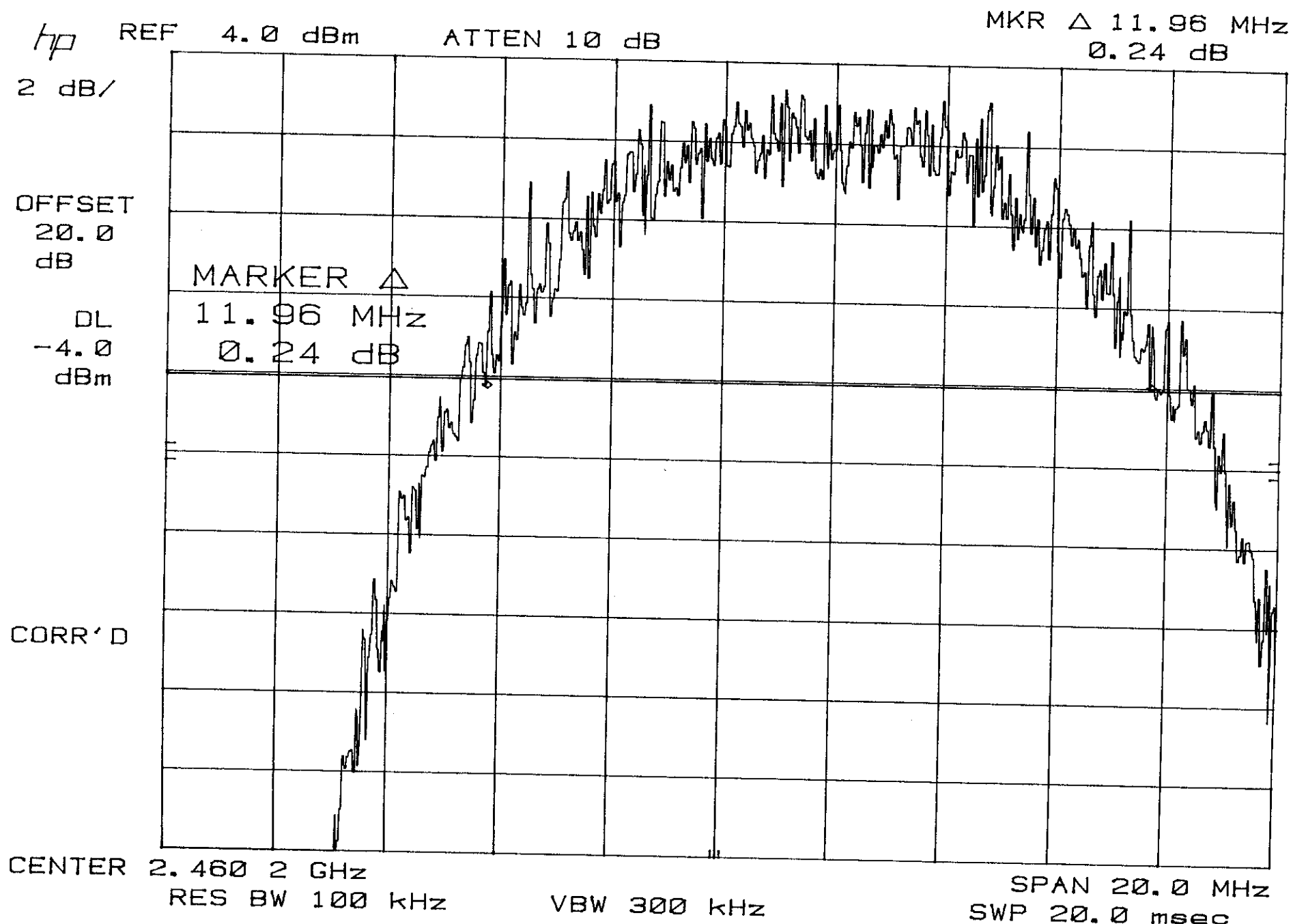
NC305614 12/18/03 6dB BW Ch. 1 (low)



NC305614 12/18/03 6dB BW Ch. 6 (mid)



NC305614 12/18/03 6dB BW Ch. 11 (high)



NC305614

12/18/03 Maximum Peak Output Power

Channel 6 (mid)

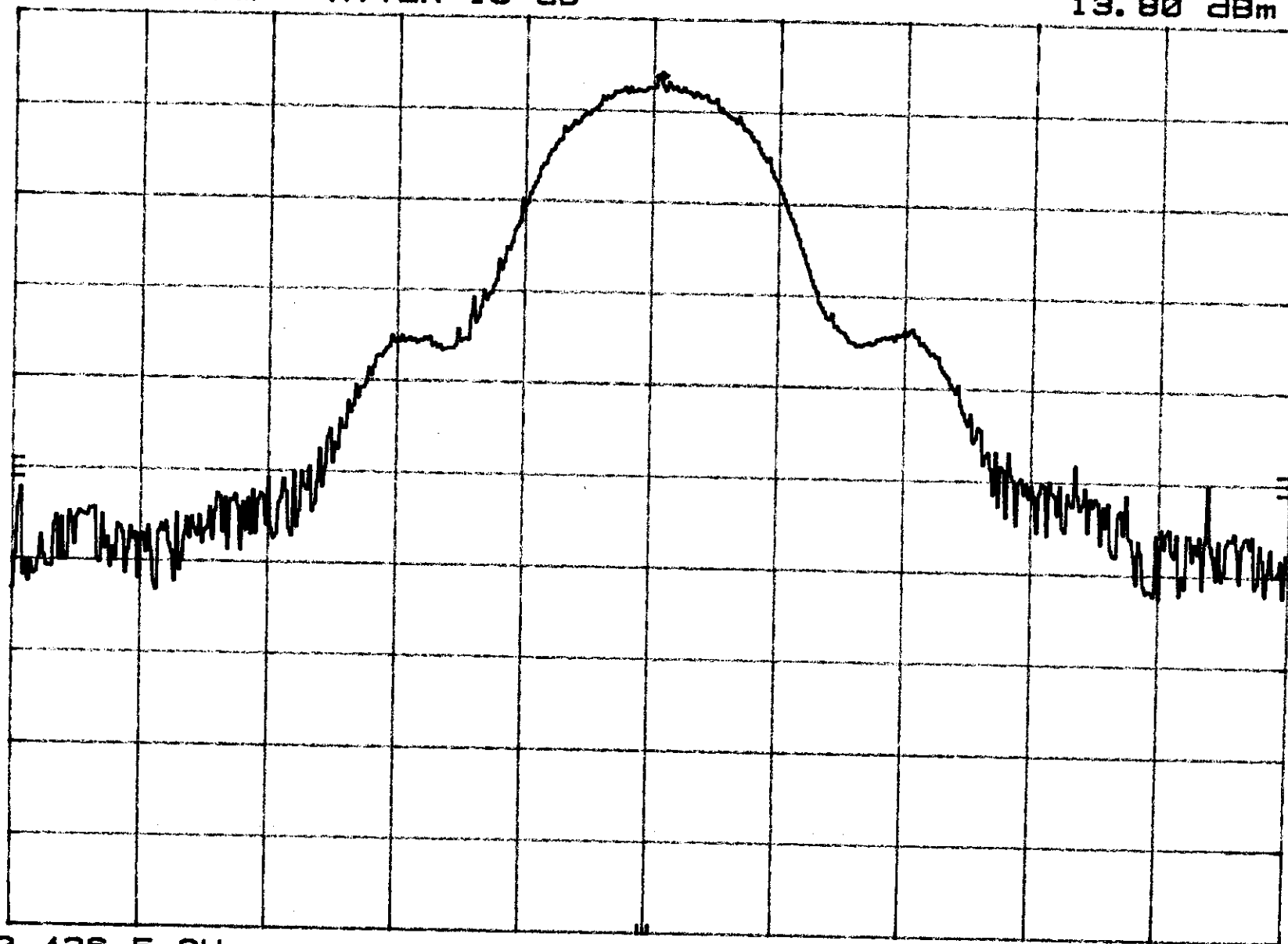
MKR 2.437 02 GHz
13.80 dBm

REF 20.0 dBm ATTEN 10 dB

hp
10 dB/

OFFSET
20.0
dB

CORR'D

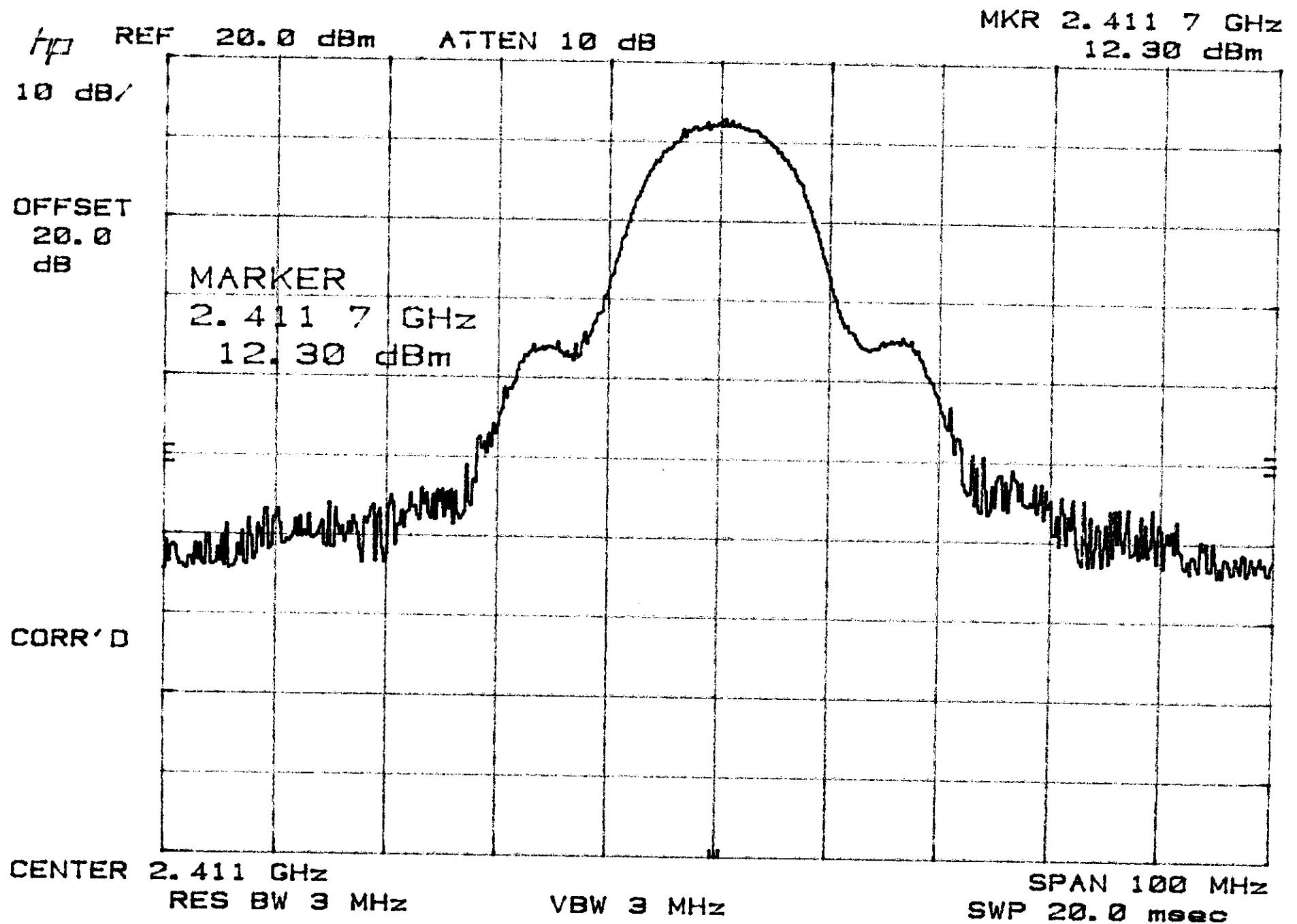


CENTER 2.436 5 GHz
RES BW 3 MHz

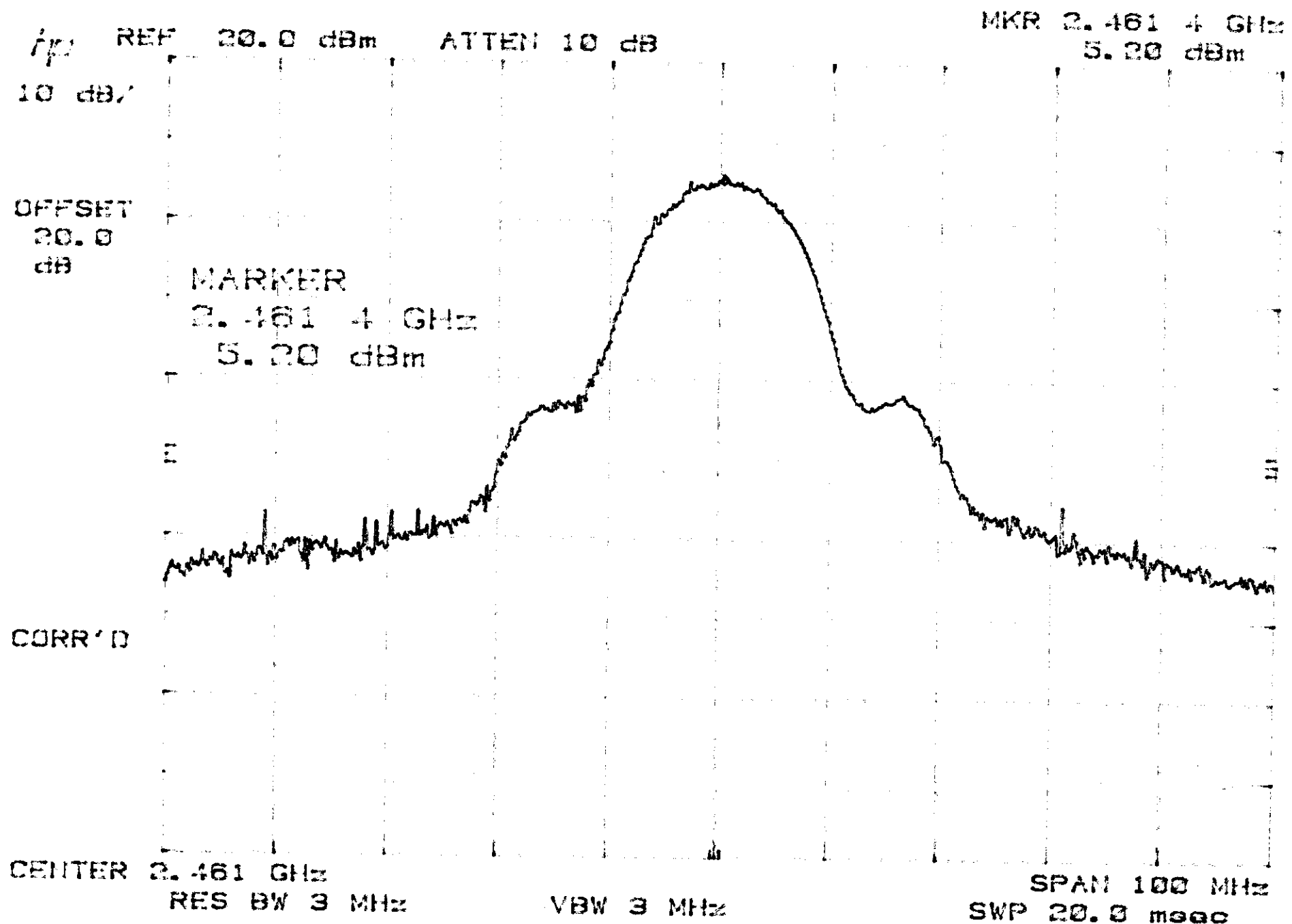
VBW 3 MHz

SPAN 83.0 MHz
SWP 20.0 msec

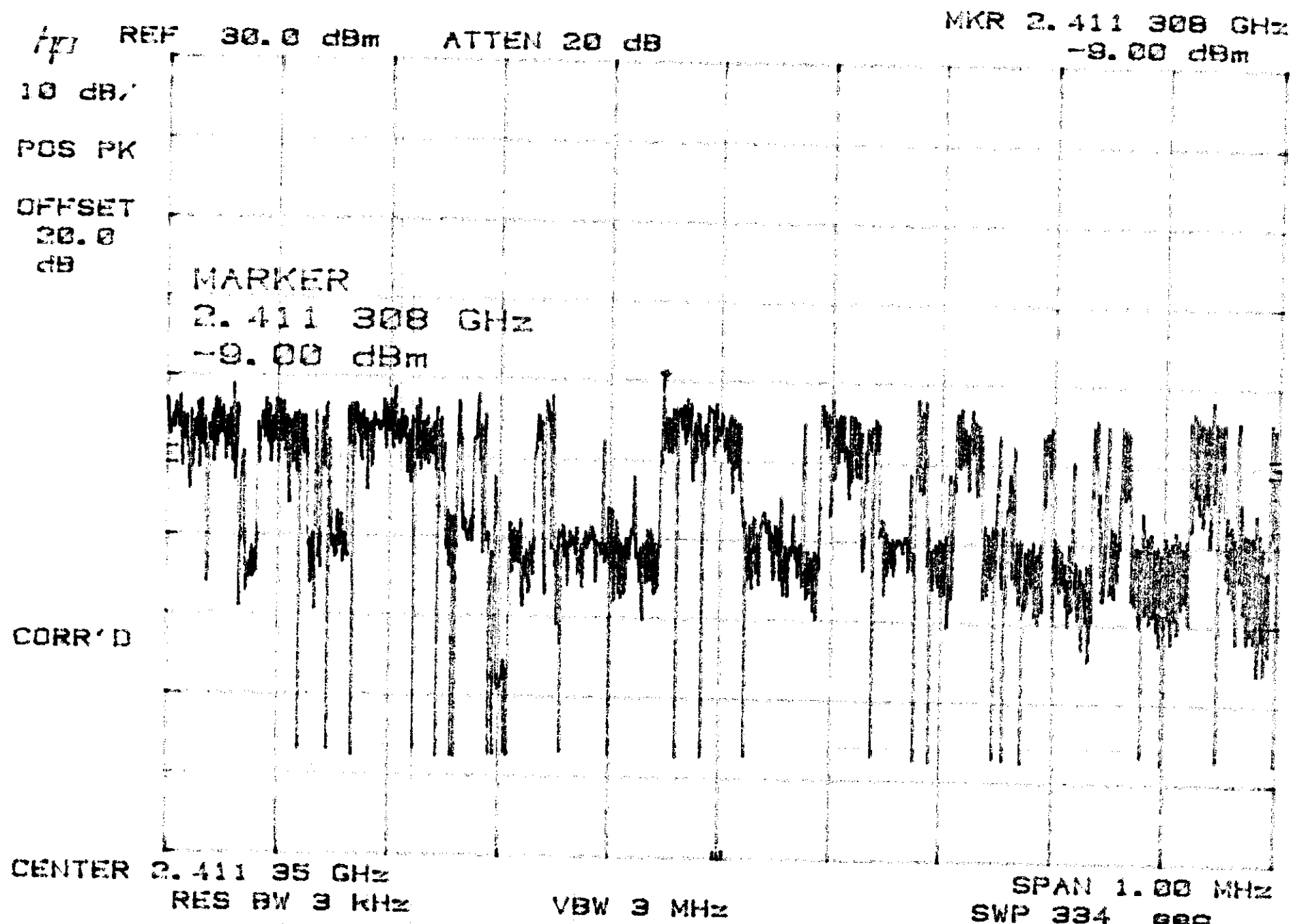
NC305614 12/18/03 Maximum Peak Output Power Ch. 1 (low)



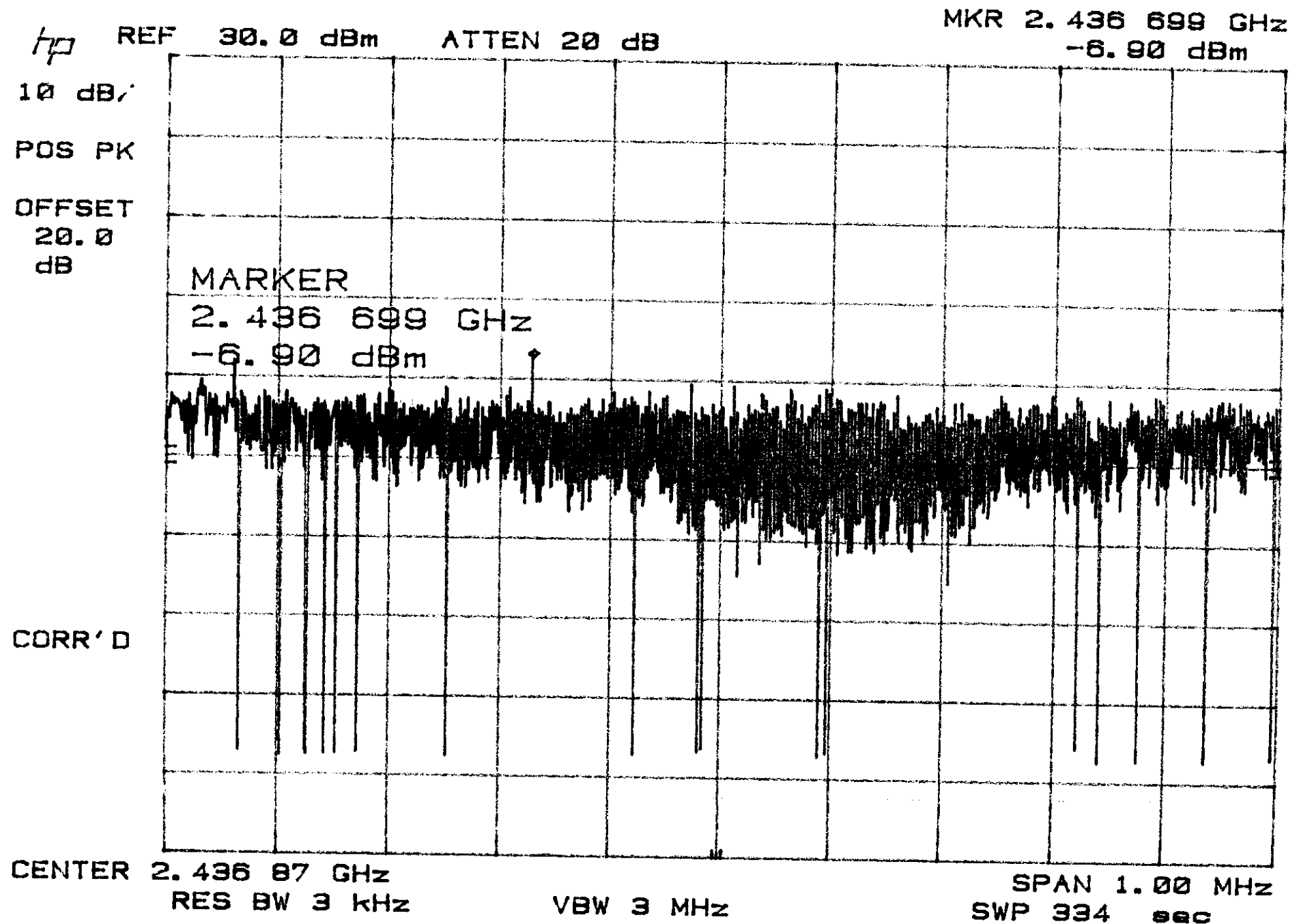
NC305614 12/18/03 Maximum Peak Output Power Ch. 11 (high)



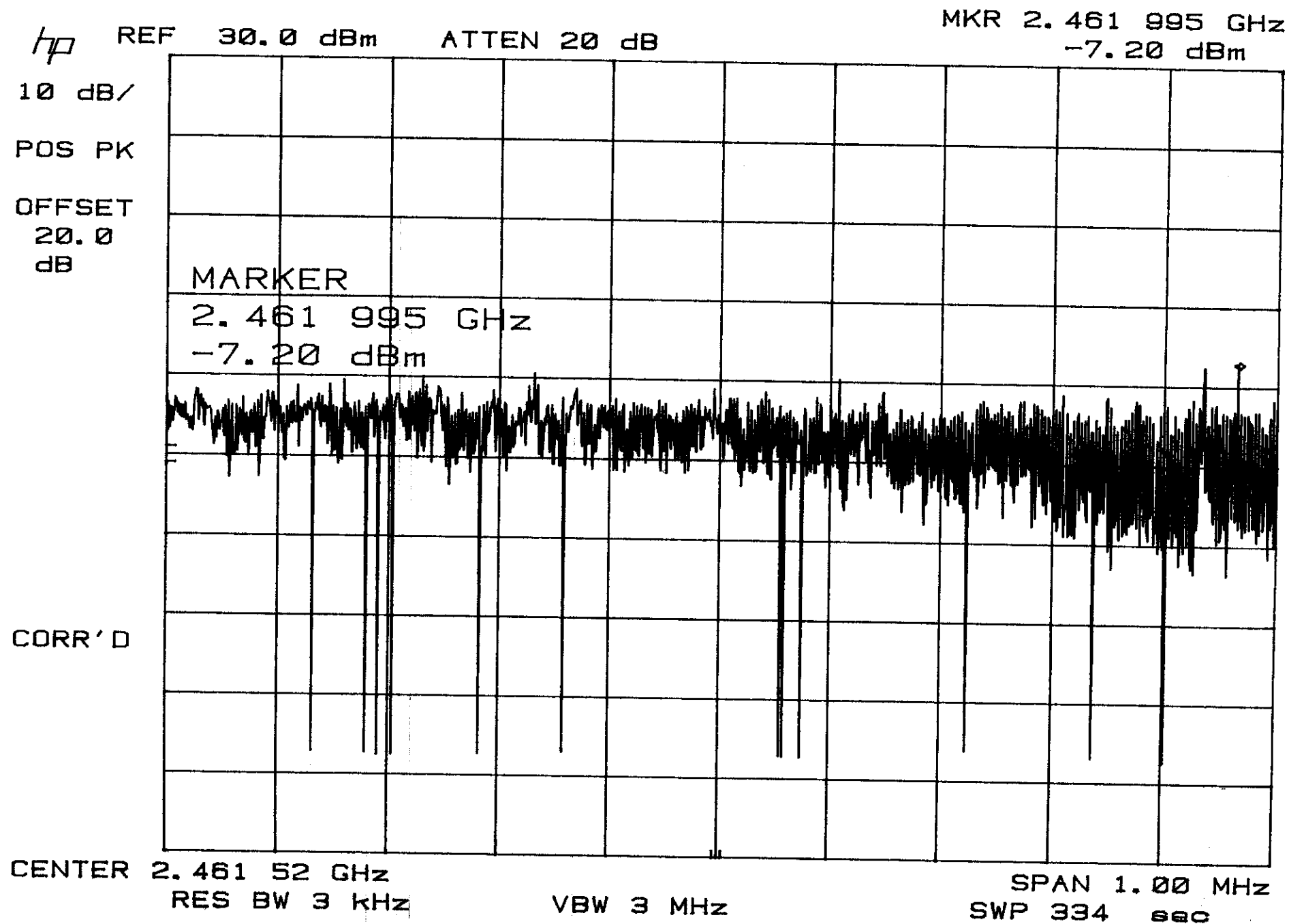
NC305614 12/18/03 Peak Power Spectral Density Ch. 1 (low)



NC305614 12/18/03 Peak Power Spectral Density Ch. 6 (mid)



NC305614 12/18/03 Peak Power Spectral Density Ch. 11 (high)



CONDUCTED EMISSIONS



Test Report #: NC305614 Run 5 Test Area: LTS
EUT Model #: SQ1000-NA Date: 12/18/03
EUT Serial #: 12 EUT Power: Internal DC Temperature: 21.0 °C
Test Method: FCC 15.247 Air Pressure: 98.0 kPa
Customer: SonicCast Rel. Humidity: 30.0 %
EUT Description: Aireo MP3 Player

Notes: _____

Data File Name: 5614-2.dat

Page: 1 of 1

List of measurements for run #: 5

FREQ	LEVEL (dBuV)	CABLE / ANT / PREAMP / ATTEN (dB)	FINAL (dBuV / m)	EUT Lead	DELTA1	DELTA2
Conducted Emissions of spread spectrum RF output						
Channel 6						
No significant emissions, other than the fundamental, detected from 30MHz to 24.5GHz						
Channel 1						
No significant emissions, other than the fundamental, detected from 30MHz to 24.5GHz						
Channel 11						
No significant emissions, other than the fundamental, detected from 30MHz to 24.5GHz						

Tested by: G Jakubowski

Printed

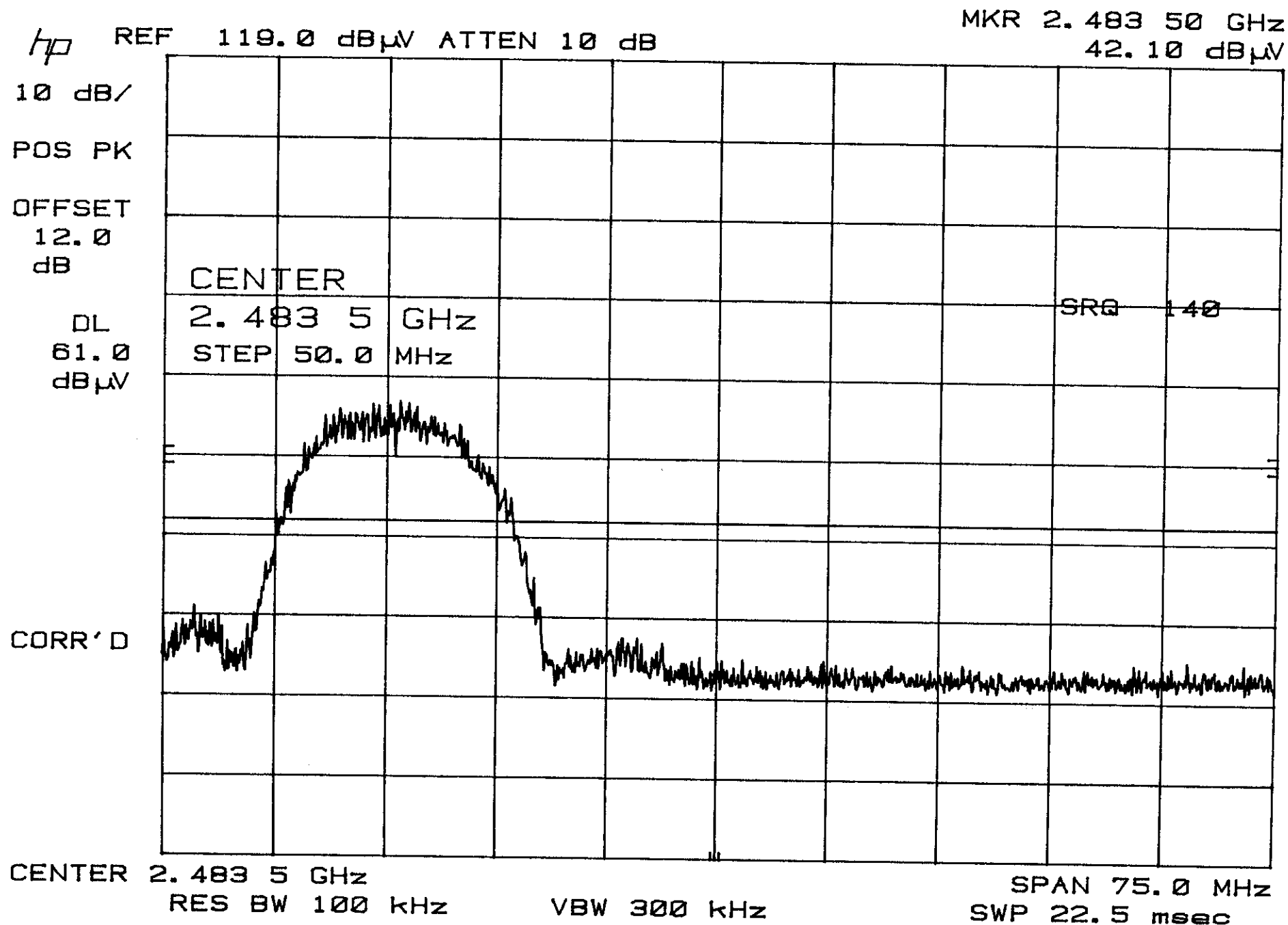
Signature

Reviewed by: TKS

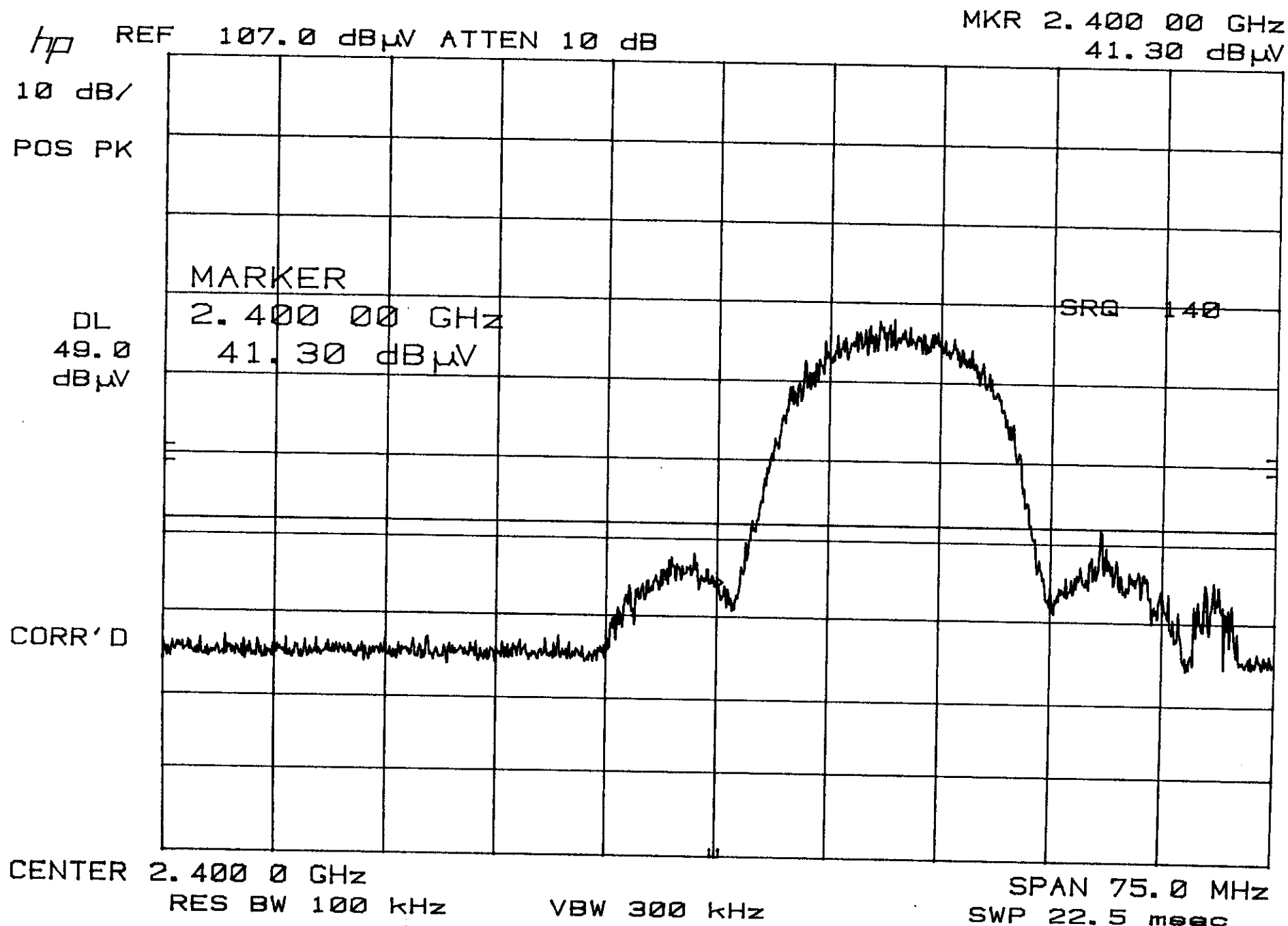
Printed

Signature

CHANNEL 11 BANDEDGE



CHANNEL 1 BANDEDGE



CONDUCTED EMISSIONS



Test Report #: NC305614 Run 2 Test Area: LTS
EUT Model #: SQ1000-NA Date: 12/16/03
EUT Serial #: 12 EUT Power: 110VAC / 60Hz Temperature: 23.0 °C
Test Method: EN55022 B Air Pressure: 98.0 kPa
Customer: SonicCast Rel. Humidity: 25.0 %

EUT Description: Aireo MP3 Player

Notes: FM Receiver On, MP3 player On

Data File Name: 5614.dat

Page: 1 of 4

List of measurements for run #: 2

FREQ	LEVEL (dBuV)	CABLE / ANT / PREAMP / ATTEN (dB)	FINAL (dBuV / m)	EUT Lead	DELTA1 EN55022 B Qp	DELTA2 EN55022 B Avg
189.36 kHz	51.11 Qp	0.0 / 2.21 / 0.0 / 0.0	53.32	L1	-10.74	n/a
189.36 kHz	46.16 Av	0.0 / 2.21 / 0.0 / 0.0	48.37	L1	n/a	-5.69
317.16 kHz	45.37 Qp	0.0 / 1.41 / 0.0 / 0.0	46.78	L1	-13.0	n/a
317.16 kHz	43.79 Av	0.0 / 1.41 / 0.0 / 0.0	45.2	L1	n/a	-4.58
572.62 kHz	46.44 Qp	0.0 / 0.21 / 0.0 / 0.0	46.65	L1	-9.35	n/a
572.62 kHz	44.94 Av	0.0 / 0.21 / 0.0 / 0.0	45.15	L1	n/a	-0.85
954.75 kHz	47.36 Qp	0.1 / 0.05 / 0.0 / 0.0	47.51	L1	-8.49	n/a
954.75 kHz	45.73 Av	0.1 / 0.05 / 0.0 / 0.0	45.88	L1	n/a	-0.12
1.338 MHz	48.03 Qp	0.06 / 0.05 / 0.0 / 0.0	48.14	L1	-7.86	n/a
1.337 MHz	45.5 Av	0.06 / 0.05 / 0.0 / 0.0	45.61	L1	n/a	-0.39
1.721 MHz	47.65 Qp	0.1 / 0.05 / 0.0 / 0.0	47.8	L1	-8.2	n/a
1.721 MHz	45.0 Av	0.1 / 0.05 / 0.0 / 0.0	45.15	L1	n/a	-0.85
189.36 kHz	50.98 Qp	0.0 / 2.21 / 0.0 / 0.0	53.19	N	-10.87	n/a
189.36 kHz	45.87 Av	0.0 / 2.21 / 0.0 / 0.0	48.08	N	n/a	-5.98
317.16 kHz	45.74 Qp	0.0 / 1.41 / 0.0 / 0.0	47.15	N	-12.63	n/a
317.16 kHz	44.51 Av	0.0 / 1.41 / 0.0 / 0.0	45.92	N	n/a	-3.86
572.62 kHz	46.89 Qp	0.0 / 0.21 / 0.0 / 0.0	47.1	N	-8.9	n/a
572.62 kHz	45.51 Av	0.0 / 0.21 / 0.0 / 0.0	45.72	N	n/a	-0.28
954.75 kHz	46.83 Qp	0.1 / 0.05 / 0.0 / 0.0	46.98	N	-9.02	n/a
954.75 kHz	45.36 Av	0.1 / 0.05 / 0.0 / 0.0	45.51	N	n/a	-0.49
1.337 MHz	46.54 Qp	0.06 / 0.05 / 0.0 / 0.0	46.65	N	-9.35	n/a
1.337 MHz	44.94 Av	0.06 / 0.05 / 0.0 / 0.0	45.05	N	n/a	-0.95
1.721 MHz	45.2 Qp	0.1 / 0.05 / 0.0 / 0.0	45.35	N	-10.65	n/a
1.721 MHz	43.38 Av	0.1 / 0.05 / 0.0 / 0.0	43.53	N	n/a	-2.47

Tested by: G Jakubowski

Printed

Signature

Reviewed by: TKS

Printed

Signature

TÜV
PRODUCT SERVICE

CONDUCTED EMISSIONS



Test Report #: NC305614 Run 2 Test Area: LTS

EUT Model #: SQ1000-NA Date: 12/16/03

EUT Serial #: 12 EUT Power: 110VAC / 60Hz Temperature: 23.0 °C

Test Method: EN55022 B Air Pressure: 98.0 kPa

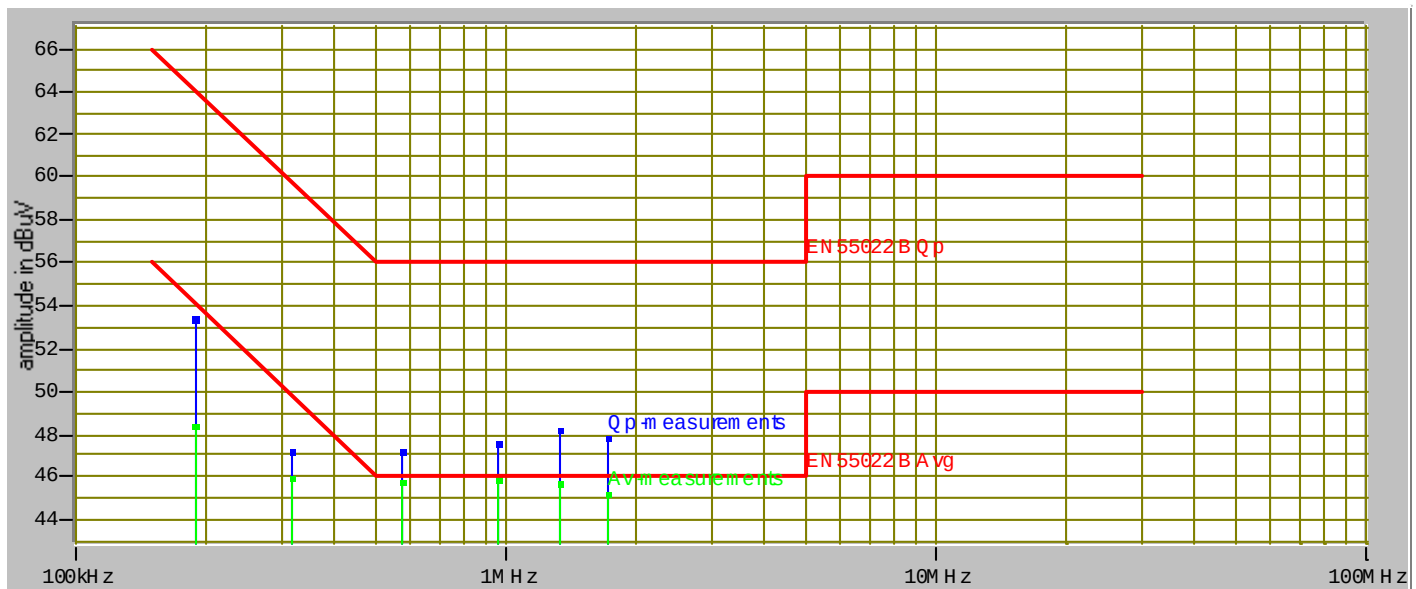
Customer: SonicCast Rel. Humidity: 25.0 %

EUT Description: Aireo MP3 Player

Notes: FM Receiver On, MP3 player On

Data File Name: 5614.dat Page: 3 of 4

Graph:



Tested by: G Jakubowski

Printed

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Reviewed by: TKS

Printed

Signature

CONDUCTED EMISSIONS



Test Report #: NC305614 Run 2 Test Area: LTS
EUT Model #: SQ1000-NA Date: 12/16/03
EUT Serial #: 12 EUT Power: 110VAC / 60Hz Temperature: 23.0 °C
Test Method: EN55022 B Air Pressure: 98.0 kPa
Customer: SonicCast Rel. Humidity: 25.0 %

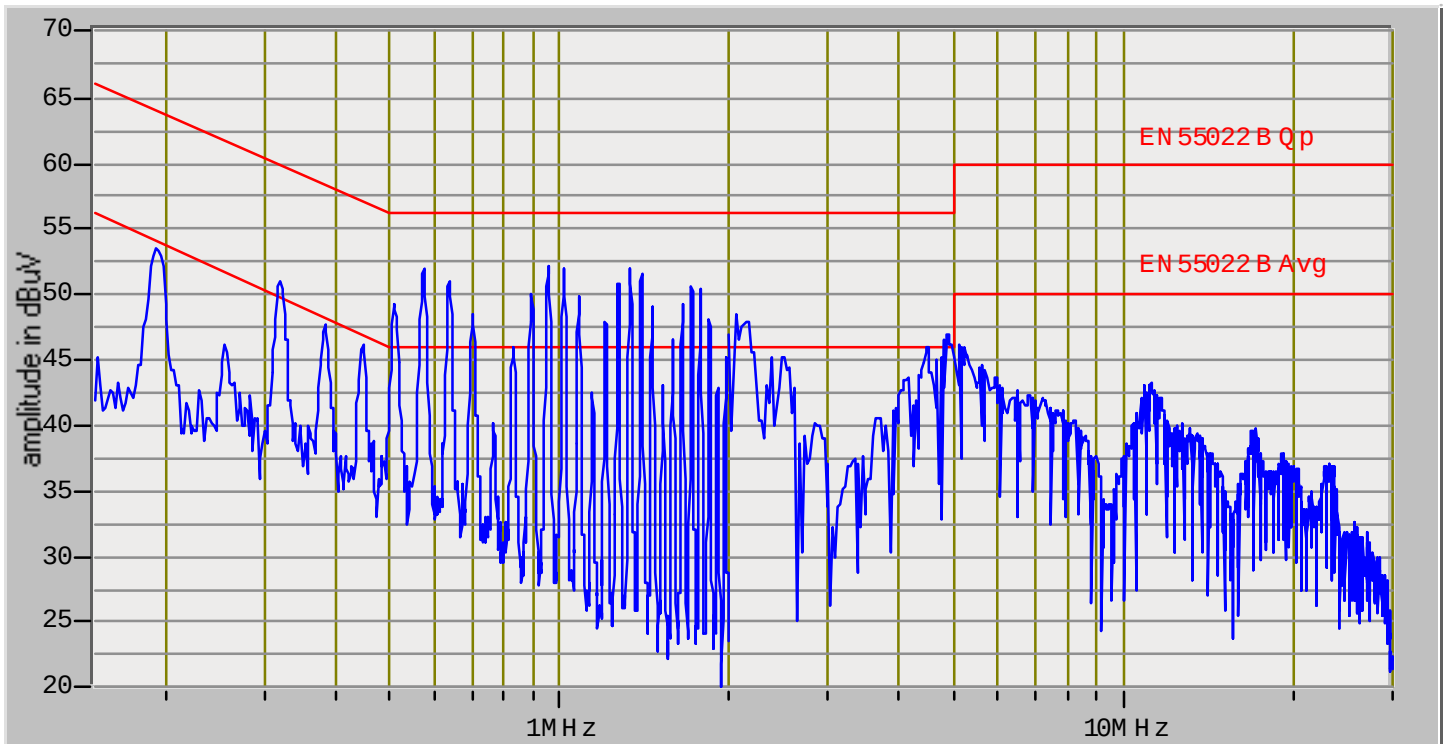
EUT Description: Aireo MP3 Player

Notes: FM Receiver On, MP3 player On

Data File Name: 5614.dat

Page: 4 of 4

Prescan Trace:



Tested by: G Jakubowski

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Signature

Reviewed by: TKS

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RADIATED EMISSIONS



Test Report #: NC305614 Run 6 Test Area: LTS

EUT Model #: SQ1000-NA Date: 12/18/03

EUT Serial #: 12 EUT Power: Internal DC Temperature: 21.0 °C

Test Method: FCC 15.247 Air Pressure: 98.0 kPa

Customer: SonicCast Rel. Humidity: 30.0 %

EUT Description: Aireo MP3 Player

Notes: 2.4GHz On

Data File Name: 5614-2.dat

Page: 1 of 4

List of measurements for run #: 6

FREQ	LEVEL (dBuV)	CABLE / ANT / PREAMP / ATTEN (dB)	FINAL (dBuV / m)	POL / HGT / AZ (m)(DEG)	DELTA1 FCC-B <1GHz 3m	DELTA2 FCC B >1GHz 3m
2.4GHz On						
32.64 MHz	43.85 Qp	0.5 / 19.71 / 29.6 / 0.0	34.46	V / 1.00 / 0	-5.54	n/a
44.88 MHz	46.9 Qp	0.57 / 15.5 / 29.6 / 0.0	33.37	V / 1.00 / 0	-6.63	n/a
50.88 MHz	44.95 Qp	0.6 / 14.0 / 29.6 / 0.0	29.95	V / 1.00 / 0	-10.05	n/a
57.78 MHz	45.8 Qp	0.63 / 12.3 / 29.51 / 0.0	29.22	V / 1.00 / 0	-10.78	n/a
63.84 MHz	44.1 Qp	0.7 / 10.9 / 29.55 / 0.0	26.15	V / 1.00 / 0	-13.85	n/a
75.72 MHz	43.65 Qp	0.72 / 8.28 / 29.4 / 0.0	23.25	V / 1.00 / 0	-16.75	n/a
149.296 MHz	56.35 Qp	1.0 / 10.06 / 29.58 / 0.0	37.83	V / 1.00 / 0	-5.67	n/a
156.0 MHz	54.35 Qp	1.06 / 9.19 / 29.64 / 0.0	34.97	V / 1.00 / 0	-8.53	n/a
156.396 MHz	52.1 Qp	1.07 / 9.16 / 29.64 / 0.0	32.68	V / 1.00 / 0	-10.82	n/a
166.0 MHz	42.55 Qp	1.1 / 9.04 / 29.7 / 0.0	22.99	V / 1.00 / 0	-20.51	n/a
177.73 MHz	48.65 Qp	1.1 / 9.4 / 29.67 / 0.0	29.48	V / 1.00 / 0	-14.02	n/a
180.009 MHz	49.95 Qp	1.1 / 9.48 / 29.65 / 0.0	30.88	V / 1.00 / 0	-12.62	n/a
220.03 MHz	43.0 Qp	1.26 / 11.0 / 29.6 / 0.0	25.66	V / 1.00 / 0	-20.34	n/a
248.822 MHz	45.05 Qp	1.34 / 11.83 / 29.61 / 0.0	28.6	V / 1.00 / 0	-17.4	n/a
252.0 MHz	46.6 Qp	1.35 / 12.16 / 29.63 / 0.0	30.48	V / 1.00 / 0	-15.52	n/a
276.0 MHz	42.9 Qp	1.49 / 12.49 / 29.76 / 0.0	27.11	V / 1.00 / 0	-18.89	n/a
298.576 MHz	50.65 Qp	1.5 / 13.67 / 29.8 / 0.0	36.02	V / 1.00 / 0	-9.98	n/a
497.358 MHz	44.88 Qp	1.97 / 17.8 / 30.21 / 0.0	34.44	V / 1.00 / 0	-11.56	n/a
44.88 MHz	47.3 Qp	0.57 / 15.5 / 29.6 / 0.0	33.77	V / 1.00 / 90	-6.23	n/a
63.84 MHz	44.95 Qp	0.7 / 10.9 / 29.55 / 0.0	27.0	V / 1.00 / 90	-13.0	n/a
177.73 MHz	49.05 Qp	1.1 / 9.4 / 29.67 / 0.0	29.88	V / 1.00 / 90	-13.62	n/a

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RADIATED EMISSIONS



Test Report #: NC305614 Run 6 Test Area: LTS

EUT Model #: SQ1000-NA Date: 12/18/03

EUT Serial #: 12 EUT Power: Internal DC Temperature: 21.0 °C

Test Method: FCC 15.247 Air Pressure: 98.0 kPa

Customer: SonicCast Rel. Humidity: 30.0 %

EUT Description: Aireo MP3 Player

Notes: 2.4GHz On

Data File Name: 5614-2.dat

Page: 2 of 4

List of measurements for run #: 6

FREQ	LEVEL (dBuV)	CABLE / ANT / PREAMP / ATTEN (dB)	FINAL (dBuV / m)	POL / HGT / AZ (m)(DEG)	DELTA1 FCC-B <1GHz 3m	DELTA2 FCC B >1GHz 3m
252.0 MHz	47.1 Qp	1.35 / 12.16 / 29.63 / 0.0	30.98	V / 1.00 / 90	-15.02	n/a
44.88 MHz	48.3 Qp	0.57 / 15.5 / 29.6 / 0.0	34.77	V / 1.00 / 180	-5.23	n/a
63.84 MHz	46.1 Qp	0.7 / 10.9 / 29.55 / 0.0	28.15	V / 1.00 / 180	-11.85	n/a
75.72 MHz	44.9 Qp	0.72 / 8.28 / 29.4 / 0.0	24.5	V / 1.00 / 180	-15.5	n/a
166.0 MHz	43.2 Qp	1.1 / 9.04 / 29.7 / 0.0	23.64	V / 1.00 / 180	-19.86	n/a
220.03 MHz	43.45 Qp	1.26 / 11.0 / 29.6 / 0.0	26.11	V / 1.00 / 180	-19.89	n/a
248.822 MHz	46.7 Qp	1.34 / 11.83 / 29.61 / 0.0	30.25	V / 1.00 / 180	-15.75	n/a
252.0 MHz	49.8 Qp	1.35 / 12.16 / 29.63 / 0.0	33.68	V / 1.00 / 180	-12.32	n/a
248.822 MHz	49.3 Qp	1.34 / 11.83 / 29.61 / 0.0	32.85	H / 1.00 / 270	-13.15	n/a
252.0 MHz	54.35 Qp	1.35 / 12.16 / 29.63 / 0.0	38.23	H / 1.00 / 270	-7.77	n/a
Maximized						
32.64 MHz	45.89 Qp	0.5 / 19.71 / 29.6 / 0.0	36.5	/ 1.00 / 0	-3.5	n/a
32.62 MHz	48.65 Pk	0.5 / 19.72 / 29.6 / 0.0	39.27	/ 1.00 / 0	-0.73*	n/a
149.296 MHz	57.4 Pk	1.0 / 10.06 / 29.58 / 0.0	38.88	V / 1.00 / 10	-4.62*	n/a
End scan 30 MHz to 2000MHz						

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RADIATED EMISSIONS

Test Report #: NC305614 Run 6 Test Area: LTS

EUT Model #: SQ1000-NA Date: 12/18/03

EUT Serial #: 12 EUT Power: Internal DC Temperature: 21.0 °C

Test Method: FCC 15.247 Air Pressure: 98.0 kPa

Customer: SonicCast Rel. Humidity: 30.0 %

EUT Description: Aireo MP3 Player

Notes: 2.4GHz On

Data File Name: 5614-2.dat

Page: 3 of 4

Measurement summary for limit1: FCC-B <1GHz 3m (Qp)

FREQ	LEVEL (dBuV)	CABLE / ANT / PREAMP / ATTEN (dB)	FINAL (dBuV / m)	POL / HGT / AZ (m)(DEG)	DELTA1 FCC-B <1GHz 3m
32.64 MHz	45.89 Qp	0.5 / 19.71 / 29.6 / 0.0	36.5	/ 1.00 / 0	-3.5
44.88 MHz	48.3 Qp	0.57 / 15.5 / 29.6 / 0.0	34.77	V / 1.00 / 180	-5.23
149.296 MHz	56.35 Qp	1.0 / 10.06 / 29.58 / 0.0	37.83	V / 1.00 / 0	-5.67
252.0 MHz	54.35 Qp	1.35 / 12.16 / 29.63 / 0.0	38.23	H / 1.00 / 270	-7.77
156.0 MHz	54.35 Qp	1.06 / 9.19 / 29.64 / 0.0	34.97	V / 1.00 / 0	-8.53
298.576 MHz	50.65 Qp	1.5 / 13.67 / 29.8 / 0.0	36.02	V / 1.00 / 0	-9.98
50.88 MHz	44.95 Qp	0.6 / 14.0 / 29.6 / 0.0	29.95	V / 1.00 / 0	-10.05
57.78 MHz	45.8 Qp	0.63 / 12.3 / 29.51 / 0.0	29.22	V / 1.00 / 0	-10.78
156.396 MHz	52.1 Qp	1.07 / 9.16 / 29.64 / 0.0	32.68	V / 1.00 / 0	-10.82
497.358 MHz	44.88 Qp	1.97 / 17.8 / 30.21 / 0.0	34.44	V / 1.00 / 0	-11.56
63.84 MHz	46.1 Qp	0.7 / 10.9 / 29.55 / 0.0	28.15	V / 1.00 / 180	-11.85
180.009 MHz	49.95 Qp	1.1 / 9.48 / 29.65 / 0.0	30.88	V / 1.00 / 0	-12.62
248.822 MHz	49.3 Qp	1.34 / 11.83 / 29.61 / 0.0	32.85	H / 1.00 / 270	-13.15
177.73 MHz	49.05 Qp	1.1 / 9.4 / 29.67 / 0.0	29.88	V / 1.00 / 90	-13.62
32.62 MHz	48.65 Pk	0.5 / 19.72 / 29.6 / 0.0	39.27	/ 1.00 / 0	-0.73*
149.296 MHz	57.4 Pk	1.0 / 10.06 / 29.58 / 0.0	38.88	V / 1.00 / 10	-4.62*

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RADIATED EMISSIONS



Test Report #: NC305614 Run 6 Test Area: LTS

EUT Model #: SQ1000-NA Date: 12/18/03

EUT Serial #: 12 EUT Power: Internal DC Temperature: 21.0 °C

Test Method: FCC 15.247 Air Pressure: 98.0 kPa

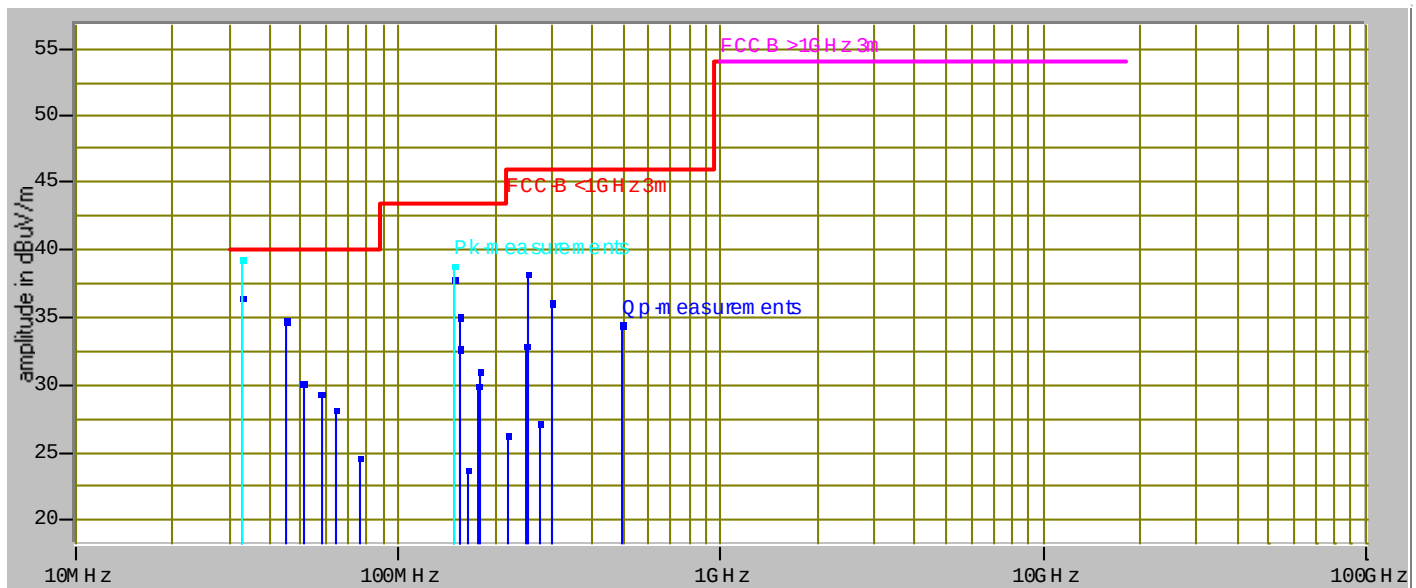
Customer: SonicCast Rel. Humidity: 30.0 %

EUT Description: Aireo MP3 Player

Notes: 2.4GHz On

Data File Name: 5614-2.dat Page: 4 of 4

Graph:



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RADIATED EMISSIONS



Test Report #: NC305614 Run 7 Test Area: LTS
EUT Model #: SQ1000-NA Date: 12/18/03
EUT Serial #: 12 EUT Power: Internal DC Temperature: 21.0 °C
Test Method: FCC 15.247 Air Pressure: 98.0 kPa
Customer: SonicCast Rel. Humidity: 30.0 %

EUT Description: Aireo MP3 Player

Notes: 2.4GHz On (2 - 25GHz SCAN)

Data File Name: 5614-2.dat

Page: 1 of 1

List of measurements for run #: 7

FREQ	LEVEL (dBuV)	CABLE / ANT / PREAMP / ATTEN (dB)	FINAL (dBuV / m)	POL / HGT / AZ (m)(DEG)	DELTA1 FCC B >1GHz 3m	DELTA2
NO EMISSIONS FOUND WITH V OR H POLARIZATION AT ALL AZIMUTHS 2 - 25GHz						

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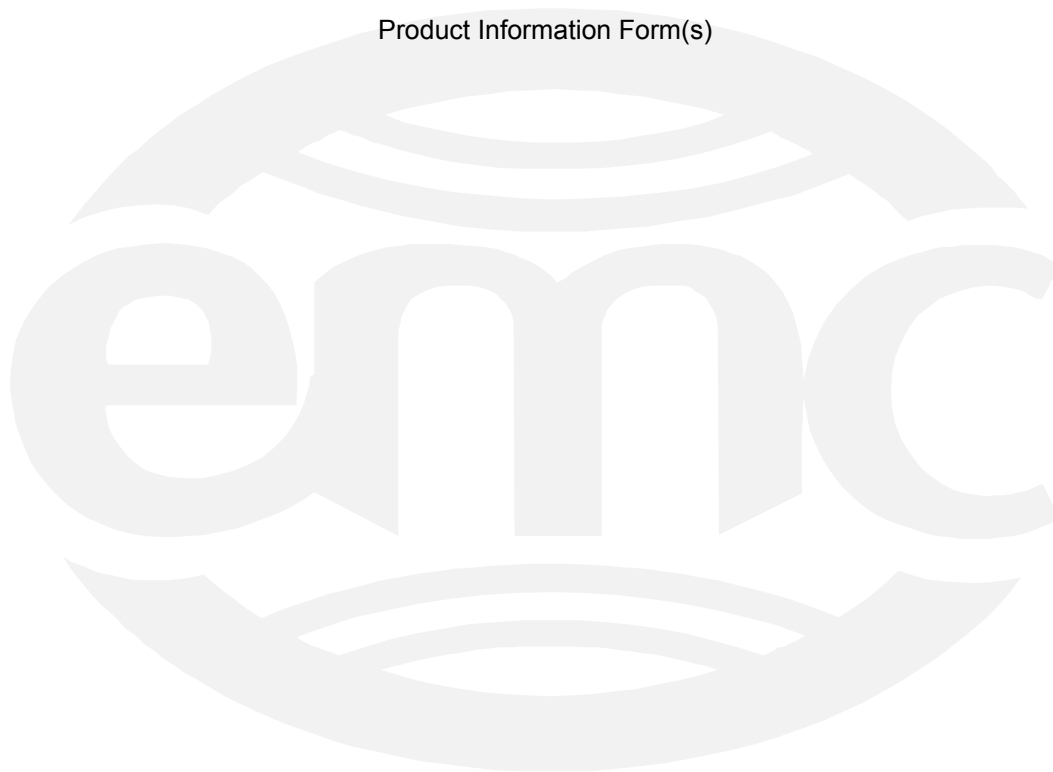
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Appendix B

Constructional Data Form(s)

and/or

Product Information Form(s)



The SoniqCast Aireo is a portable wireless audio player for the consumer electronics market. It plays audio content, including music and voice, in MP3, WMA and .wav digital formats. Content is stored on an internal hard disk and an optional removable SD format memory card. Content is loaded via a USB interface and/or an 802.11b wireless LAN connection. Audio output is via external headphones or is modulated onto a carrier in the 88-108 MHz band for receipt on a conventional FM radio receiver.

The user interface consists of a power button, keypad and LCD screen. A single IC, the Rohm BH1415, provides a FM stereo transmit function with the audio supplied from the device. A PLL controlled VCO is implemented with a varactor controlled LC tank circuit, tuning over the 88-108 MHz band. Digital tuning of the PLL is by the unit microprocessor. 75us pre-emphasis is implemented for compatibility with the US market. The transmitter is automatically disabled when any headphone jack is populated. A pcb trace is used for the FM transmit antenna. The trace forms a simple, short monopole. The transmitter is disabled if any headphone jack is populated.

Aireo! Technical Specifications

Platform Specifications:

File Support

Playback Formats

- MP3 (at 8,16,22.05,24,32,44.1 and 48 kHz)
- MP3 VBA
- WMA (at 16, 22.05, 24, 32, 44.1, and 48 kHz)

Software

Operating System

- WinCe.Net 4.0

Application Software

- SoniqSync Music Manager
- SoniqSync Music Scheduler

Hardware Specification:

Hardware Specification

Size

- 2.68 in (W) x 4.58 in (H) x 0.87 in (D) or 68.1 mm x 116.3 mm x 22.1 mm

Weight

- 8,0 oz or 226 gms

Memory

- 32 MB SDRAM buffer

Capacity

- 1.5 GB hard drive

Memory Slot type

- SD/MMC Card

Flash Storage

- SD/MMC – 32 MB to 1GB Card Capacities Accepted

WiFi Interface	Automatic rate scaling: 1, 2, 5.5, 11 Mbps
Communication Interfaces	- USB 1.1 802.11B
Battery type	Lithium-ion battery (non-removable)

Hardware Specification (continued)

Battery Life	Up to 5 hours of continuous playback from a fully charged battery. Based on continuous playback of tracks encoded at 128 kbps. Playback time may be reduced by: - playing tracks encoded at bitrates greater than 128Kbps - playing WMA music files - transmitting music - long LCD backlight timeout setting - wireless sync or transfer process
Battery Charging	About 4 hours

Audio Specifications:

Audio Inputs

Microphone Input	- Omni Directional - Frequency Response: 50 – 16,000 Hz
-------------------------	--

FM Receiver	- Frequency Band: 87.9 – 107.9 MHz, digital tuned - Modulation: FM Stereo - Distortion: 0.5% - Frequency Response: 50 – 15,000 Hz (+/- 3 dB) - Stereo Separation: 30 dB - Scan, Seek
--------------------	---

Audio Specifications (continued):

Audio Outputs

Speaker Output

- Power Output: 25 mW
- Frequency Response: 400 – 5,000 Hz

Headphone Output

- Rated Impedance: 32 ohms
- Power Output: 60 mW
- Frequency Response: 20 – 20,000 Hz (+/- 3 dB)
- THD: -75 dB

Analog Line Output

- Rated Impedance: 60 mW
- Frequency Response: 20 – 20,000 Hz (+/- 3 dB)
- THD: -75 dB

Digital Output

- SPDIF
- Coax interface in docking station accessory

FM Transmitter

- Frequency Band: 88.1 – 107.9 MHz, digital tuned
- Modulation: FM Stereo
- Transmit Power: FCC Part 15 limited
- Range: Up to 30 ft
- Frequency Response: 30 – 15,000 Hz (+/- 3 dB)
- Stereo Separation: > 40 dB
- Signal Distortion: 0.3 %
- Automatic Free Band Scan

Appendix C

MEASUREMENT PROTOCOL

GENERAL INFORMATION

Test Methodology

Conducted and radiated emission testing is performed according to the procedures in International Special Committee on Radio Interference (CISPR) Publication 22 (1993), European Standard EN 55022 and Australian Standard AS 3548 (which are based on CISPR 22).

The Japanese standard, "Voluntary Control Council for Interference (VCCI) by Data Processing Equipment and Electronic Office Machines, Technical Requirements" is technically equivalent to CISPR 22 (1993). For official compliance, a conformance report must be sent to and accepted by the VCCI.

In compliance with FCC Docket 92-152, "Harmonization of Rules for Digital Devices Incorporate International Standards", testing for FCC compliance may be done following the ANSI C63.4-1992 procedures and using the CISPR 22 Limits.

Measurement Uncertainty

The test system for conducted emissions is defined as the LISN, tuned receiver or spectrum analyzer, and coaxial cable. The test system for radiated emissions is defined as the antenna, the pre-amplifier, the spectrum analyzer and the coaxial cable. These test systems have a measurement uncertainty of ± 4.5 dB. The equipment comprising the test systems are calibrated on an annual basis.

Justification

The Equipment Under Test (EUT) is configured in a typical user arrangement in accordance with the manufacturer's instructions. A cable is connected to each available port and either terminated with a peripheral into its characteristic impedance or left unterminated. When appropriate, the cables are manually manipulated with respect to each other to obtain maximum emissions from the unit.

CONDUCTED EMISSIONS

The final level, expressed in dB μ V, is arrived at by taking the reading directly from the EMI receiver. This level is compared directly to the CISPR limit.

To convert between dB μ V and μ V, the following conversions apply:

$$\text{dB}\mu\text{V} = 20(\log \mu\text{V})$$

$$\mu\text{V} = \text{Inverse log}(\text{dB}\mu\text{V}/20)$$

RADIATED EMISSIONS

The final level, expressed in dB μ V/m, is arrived at by taking the reading from the spectrum analyzer (Level dB μ V), adding the antenna correction factor and cable loss factor (Factor dB) to it, then subtracting the preamp gain. This result then has the CISPR limit subtracted from it to provide the Delta which gives the tabular data as shown in the data sheets in Attachment A.

Example:

FREQ (MHz)	LEVEL (dB μ V)	CABLE/ANT/PREAMP (dB)	FINAL (dB μ V/m)	POL/HGT/AZ (m) (deg)	DELTA1 EN 55022 A
60.80	42.5Qp	+ 1.2 + 10.9 - 25.5 =	29.1	V 1.0 0.0	-10.9

DETAILS OF TEST PROCEDURES

General Standard Information

The test methods used comply with ANSI C63.4-1992 - "Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz."

Conducted Emissions

Conducted emissions on the 50 Hz and/or 60 Hz power interface of the EUT are measured in the frequency range of 150 kHz to 30 MHz. The measurements are performed using a receiver, which has CISPR characteristic bandwidth and quasi-peak detection, and a Line Impedance Stabilization Network (LISN), with 50 Ω /50 μ H (CISPR 16) characteristics. Table top equipment is placed on a non-conducting table 80 centimeters above the floor and is positioned 40 centimeters from the vertical ground plane (wall) of the screen room. In some cases, a pre-scan using a spectrum analyzer is initially performed on the units comprising the system under test to locate the highest emissions. If the minimum passing margin appears to be less than 20 dB with a peak mode measurement, the emissions are re-measured using a tuned receiver or spectrum analyzer with quasi-peak and average detection and recorded on the data sheets.

Radiated Emissions

Radiated emissions from the EUT are measured in the frequency range of 30 to 25000 MHz using a spectrum analyzer and appropriate broadband linearly polarized antennas. Measurements between 30 MHz and 1000 MHz are made with 120 kHz/6 dB bandwidth and quasi-peak detection and measurements above 1000 MHz are made with a 1 MHz/6 dB bandwidth and peak detection. Table top equipment is placed on a 1.0 X 1.5 meter non-conducting table 80 centimeters above the ground plane. Floor standing equipment is placed directly on the turntable/ground plane. Interface cables that are closer than 40 centimeters to the ground plane are bundled in the center in a serpentine fashion so they are at least 40 centimeters from the ground plane. Cables to simulators/testers (if used in this test) are routed through the center of the table and to a screen room located outside the test area. The antenna is positioned 3, 10 or 30 meters horizontally from the EUT. To locate maximum emissions from the test sample the antenna is varied in height from 1 to 4 meters, measurement scans are made with both horizontal and vertical antenna polarizations and the EUT are rotated 360 degrees. The transmitter is rotated through 3 orthogonal axes in order to determine the maximum emission levels.