FCC PART 15, SUBPART B and C
TEST REPORT

for

VERSA REMOTE TRANSMITTER MODULE

MODEL: VRTS
FCC ID: P4U-VRTS

Prepared for

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DELAFIELD, WISCONSIN 53018

Prepared by:_____

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DATE: AUGUST 19, 2003

	REPORT BODY	APPENDICES					TOTAL
		A	***B***	***C***	***D***	***E***	
PAGES	20	2	2	2	10	54	**90**

TABLE OF CONTENTS

Section / Title	PAGE
GENERAL REPORT SUMMARY	***4***
SUMMARY OF TEST RESULTS	***5***
1. PURPOSE	**6**
2. ADMINISTRATIVE DATA	**7**
2.1 Location of Testing	7
2.2 Traceability Statement	7
2.3 Cognizant Personnel	7
2.4 Date Test Sample was Received	7
2.5 Disposition of the Test Sample	7
2.6 Abbreviations and Acronyms	7
3. APPLICABLE DOCUMENTS	**8**
4. DESCRIPTION OF TEST CONFIGURATION	**9**
4.1 Description of Test Configuration - EMI	9
4.1.1 Photograph of Test Configuration - EMI	9
4.1.2 Cable Construction and Termination	10
5. LISTS OF EUT, ACCESSORIES AND TEST EQUIPMENT	**11**
5.1 EUT and Accessory List	11
5.2 EMI Test Equipment	12
6. TEST SITE DESCRIPTION	**13**
6.1 Test Facility Description	13
6.2 EUT Mounting, Bonding and Grounding	13
7. CHARACTERISTICS OF THE TRANSMITTER	**14**
7.1 Transmitter Power	14
7.2 Channel Number and Frequencies	14
8. TEST PROCEDURES	**15**
8.1 RF Emissions	15
8.1.1 Radiated Emissions (Spurious and Harmonics) Test	15
8.2 20 dB Bandwidth	17
8.3 Peak Output Power	17
8.4 RF Antenna Conducted Test	17
8.5 RF Band Edges	18
8.6 Carrier Frequency Separation	18
8.7 Number of Hopping Frequencies	18
8.8 Average Time of Occupancy Test	19
9. CONCLUSIONS	**20**

LIST OF APPENDICES

APPENDIX	TITLE
A	Laboratory Recognitions
B	Modifications to the EUT
C	Additional Models Covered Under This Report
D	Diagrams, Charts, and Photos • Test Setup Diagrams • Radiated Emissions Photos • Antenna and Effective Gain Factors
E	Data Sheets

LIST OF FIGURES

FIGURE	TITLE
1	Plot Map And Layout of Test Site

GENERAL REPORT SUMMARY

This electromagnetic emission test report is generated by Compatible Electronics Inc., which is an independent testing and consulting firm. The test report is based on testing performed by Compatible Electronics personnel according to the measurement procedures described in the test specifications given below and in the "Test Procedures" section of this report.

The measurement data and conclusions appearing herein relate only to the sample tested and this report may not be reproduced without the written permission of Compatible Electronics, unless done so in full.

This report must not be used to claim product endorsement by NVLAP or any other agency of the U.S. Government.

Device Tested:	Versa Remote Transmitter Module Model: VRTS S/N: N/A
Product Description:	See Expository Statement.
Modifications:	The EUT was not modified during the testing.
Manufacturer:	Kar-Tech Inc. 111 Enterprise Road Delafield, Wisconsin 53018
Test Dates:	July 29, 30, 31, August 13, 15, and 18 2003
Test Specifications:	EMI requirements CFR Title 47, Part 15, Subpart B; and Subpart C, sections 15.205, 15.209, and 15.247
Test Procedure:	ANSI C63.4: 2001 FCC Public Notice (Document Number: DA 00-705)
Test Deviations:	The test procedure was not deviated from during the testing.

SUMMARY OF TEST RESULTS

TEST	DESCRIPTION	RESULTS
1	Spurious Radiated RF Emissions, 30 MHz – 1000 MHz	Complies with the **Class B** limits of CFR Title 47, Part 15, Subpart B; and the limits of CFR Title 47, Part 15, Subpart C, section 15.209
2	Spurious Radiated RF Emissions, 10 kHz – 30 MHz and 1000 MHz – 10000 MHz	Complies with the relevant requirements of CFR Title 47, Part 15, Subpart C, section 15.247(c)
3	Fundamental and Emissions produced by the intentional radiator in non-restricted bands, 10 kHz – 10 GHz	Complies with the relevant requirements of CFR Title 47, Part 15, Subpart C, section 15.247(c)
4	Emissions produced by the intentional radiator in restricted bands, 10 kHz – 10 GHz	Complies with the relevant requirements of CFR Title 47, Part 15, Subpart C, section 15.205, 15.209(a), and section 15.247 (c)
5	20 dB Bandwidth	Complies with the relevant requirements of FCC Title 47, Part 15, Subpart C, section 15.247 (a)(1)(i)
6	Peak Power Output	Complies with the relevant requirements of FCC Title 47, Part 15, Subpart C, section 15.247 (b)(1)
7	RF Conducted Antenna Test	Complies with the relevant requirements of FCC Title 47, Part 15, Subpart C, section 15.247 (c)
8	Channel Hopping Separation	Complies with the relevant requirements of CFR Title 47, Part 15, Subpart C, section 15.247 (a)(1) and 15.247 (a)(1)(i)
9	Average Time of Occupancy	Complies with the relevant requirements of CFR Title 47, Part 15, Subpart C, section 15.247 (a)(1)(i)

1. PURPOSE

This document is a qualification test report based on the Electromagnetic Interference (EMI) tests performed on the Versa Remote Transmitter Module, Model: VRTS. The EMI measurements were performed according to the measurement procedure described in ANSI C63.4: 2001. The tests were performed in order to determine whether the electromagnetic emissions from the equipment under test, referred to as EUT hereafter, are within the Class B specification limits defined by CFR Title 47, Part 15, Subpart B; and Subpart C, sections 15.205, 15.209, and 15.247.

Note: For the unintentional radiator portion of the test, the EUT was within the **Class B** specification limits defined by CFR Title 47, Part 15, Subpart B.

2. ADMINISTRATIVE DATA

2.1 Location of Testing

The EMI tests described herein were performed at the test facility of Compatible Electronics, 19121 El Toro Road, Lake Forest (Silverado), California 92676.

2.2 Traceability Statement

The calibration certificates of all test equipment used during the test are on file at the location of the test. The calibration is traceable to the National Institute of Standards and Technology (NIST).

2.3 Cognizant Personnel

Kar-Tech Inc.

Aaron Oestreich	Engineer

Compatible Electronics, Inc.

Carlos Sandoval	Sr. Test Technician
Brian Voegele	Lab Manager – Lake Forest (Silverado) Division

2.4 Date Test Sample was Received

The test sample was received on July 25, 2003

2.5 Disposition of the Test Sample

The sample has not been returned to Kar-Tech Inc. as of the date of this report.

2.6 Abbreviations and Acronyms

The following abbreviations and acronyms may be used in this document.

RF	Radio Frequency
EMI	Electromagnetic Interference
EUT	Equipment Under Test
P/N	Part Number
S/N	Serial Number
HP	Hewlett Packard
ITE	Information Technology Equipment
CML	Corrected Meter Limit
LISN	Line Impedance Stabilization Network

3. APPLICABLE DOCUMENTS

The following documents are referenced or used in the preparation of this EMI Test Report.

SPEC	TITLE
FCC Title 47, Part 15 Subpart C	FCC Rules - Radio frequency devices (including digital devices) – Intentional Radiators
ANSI C63.4 2001	Methods of measurement of radio-noise emissions from low-voltage electrical and electronic equipment in the range of 9 kHz to 40 GHz
FCC Title 47, Part 15 Subpart B	FCC Rules - Radio frequency devices (including digital devices) – Unintentional Radiators
FCC Public Notice – DA 00-705	Filing and Measurement Guidelines for Frequency Hopping Spread Spectrum Systems

4. DESCRIPTION OF TEST CONFIGURATION

4.1 Description of Test Configuration - EMI

The Versa Remote Transmitter Module, Model: VRTS (EUT) was connected to the test PCB board via an 18-pin header cable. The test PCB board was also connected to four momentary switches and a toggle switch. Three of the momentary switches respectively enabled a CW of the high, medium, or low channels. The fourth momentary switch was utilized for channel hopping mode. The toggle switch was utilized to change from either transmit or receive mode. A 12 V_{DC} battery powered the EUT.

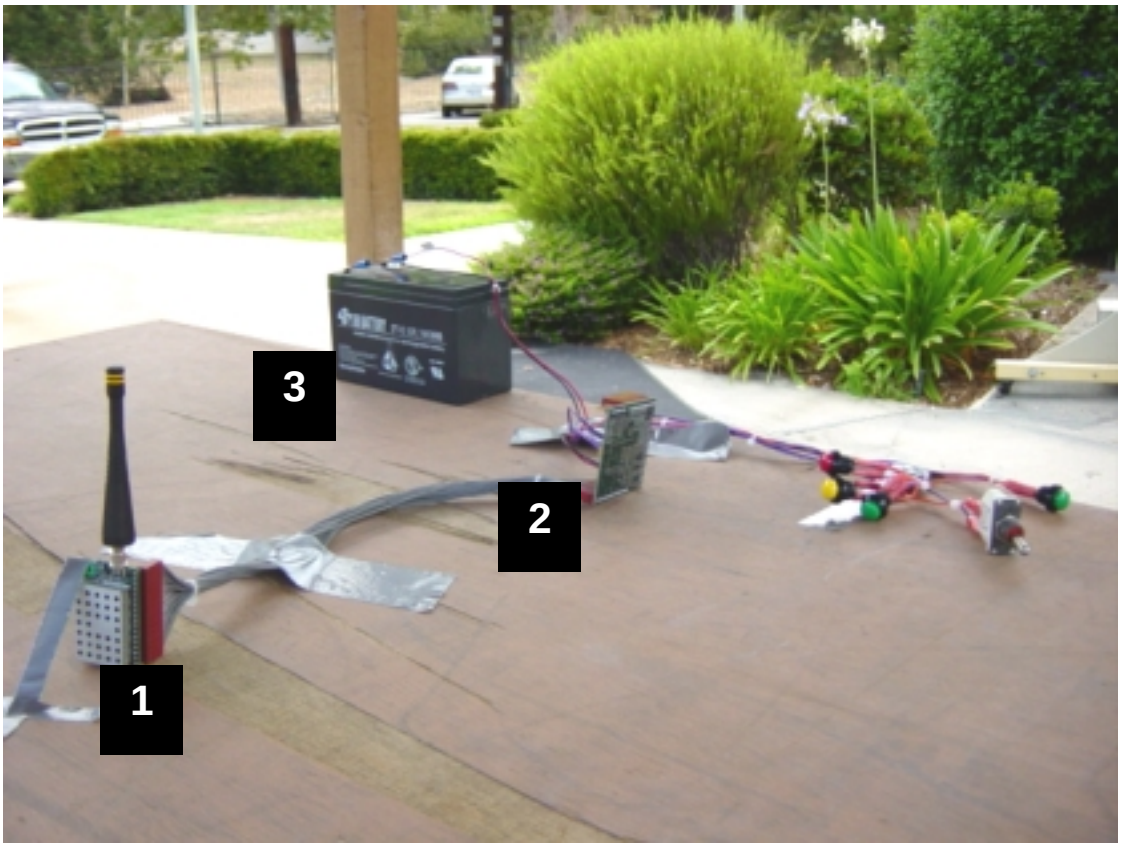
For the intentional radiator portion of the test – The EUT was directly connected to the spectrum analyzer and was in transmitting mode. The switches were used to control the channel of the transmitter or to commit the unit to channel hopping mode, depending on the nature of the specific test.

For the unintentional radiator and conducted emission portion of the test – The EUT was placed on the OATS table and was operating in receive mode.

For the restricted band emission portion of the test – The EUT was placed on the OATS table and was operating in transmitting mode

The final radiated as well as the conducted data was taken in the mode above. Please see Appendix E for the data sheets.

4.1.1 Photograph of Test Configuration - EMI



4.1.2 Cable Construction and Termination

Cable 1

This is a 15-inch unshielded cable connecting the EUT to the test PCB board. It has an 18-pin header connector at each end.

Cable 2

This is an 18-inch unshielded cable connecting the test PCB board to the five switches. It has an 18-pin header connector at the test PCB board end and was hard wired to each of the switches.

5. LISTS OF EUT, ACCESSORIES AND TEST EQUIPMENT

5.1 EUT and Accessory List

#	EQUIPMENT TYPE	MANUFACTURER	MODEL	SERIAL NUMBER	FCC ID
1	VERSA REMOTE TRANSMITTER MODULE. (EUT)	KAR-TECH INC.	VRTS	N/A	P4U-VRTS
2	TEST PCB BOARD	KAR-TECH INC.	UNLABELED	N/A	N/A
3	DC BATTERY	BB BATTERY	BP7-12	N/A	N/A

5.2 EMI Test Equipment

EQUIPMENT TYPE	MANUFACTURER	MODEL NUMBER	SERIAL NUMBER	CAL. DATE	CAL. DUE DATE
Analyzer Spectrum – RF Section	Hewlett Packard	8566B	2637A03816	1/8/03	1/8/04
Analyzer Spectrum – Display Section	Hewlett Packard	85662A	2648A13730	1/8/03	1/8/04
Analyzer Spectrum - Quasi-Peak Adapter	Hewlett Packard	85650A	2430A00530	1/8/03	1/8/04
Antenna Horn	Com-Power	AH-118	1319	4/8/02	4/8/04
Antenna Biconical	Com Power	AB-900	14022	3/21/03	3/21/04
Antenna Log Periodic	Com Power	AL-100	16016	11/16/02	11/16/03
High Pass Filter	Microwave Circuits, Inc.	H1G63G01	061703-01R	8/14/03	8/14/04
Transient Limiter	Com Power	Hz-560	N/A	3/19/03	3/19/04
Computer Test Station	Hewlett Packard	Pavilion 4530	US91925466	N.C.R.	N/A
Generator Comb - Radiated	Com Power	CG-520	25164	N.C.R.	N/A
Hygrometer	Abbeon	HTAB169B	N/A	N.C.R.	N/A
Keyboard Test Station	Hewlett Packard	5183-7399	B91617825	N.C.R.	N/A
LISN EUT Side	Com Power	LI-215	12072	1/30/03	1/30/04
LISN Accessory Side	Com Power	LI-215	12073	1/30/03	1/30/04
Mast Antenna	Com Power	AM-400	N/A	N.C.R.	N/A
Monitor Test Station	Sony	CPD-100ES	7862A008	N.C.R.	N/A
Mouse Test Station	Hewlett Packard	M-S34	LZC911S8069	N.C.R.	N/A
Preamplifier	Com Power	PA-103	1541	1/13/03	1/13/04
Preamplifier	Com Power	PA-122	2120	4/22/03	4/22/04
Printer Test Station	Hewlett Packard	DeskJet 697C	US9341D07G	N.C.R.	N/A
AC Power Supply/Analyser	Agilent Technologies	6813B	US38390530	5/19/03	5/19/04

6. TEST SITE DESCRIPTION

6.1 Test Facility Description

Please refer to section 2.1 and 7.1 of this report for EMI test location.

6.2 EUT Mounting, Bonding and Grounding

The EUT was mounted on a 1.0 by 1.5 meter non-conductive table 0.8 meters above the ground plane.

The EUT was not grounded.

7. CHARACTERISTICS OF THE TRANSMITTER

7.1 Transmitter Power

Transmit power is herein defined as the power delivered to a 50 Ohm load at the RF output of the EUT. The test sample had a total of four output power levels per channel. They are the following:

CHANNEL	OUTPUT	POWER	ACCURACY
Low	1	-3.2	+2/-2 dB
Low	2	0.9	+2/-2 dB
Low	3	6.0	+2/-2 dB
Low	4	12.2	+2/-2 dB
Medium	1	-3.0	+2/-2 dB
Medium	2	1.2	+2/-2 dB
Medium	3	6.2	+2/-2 dB
Medium	4	12.3	+2/-2 dB
High	1	-3.2	+2/-2 dB
High	2	0.8	+2/-2 dB
High	3	5.7	+2/-2 dB
High	4	11.7	+2/-2 dB

7.2 Channel Number and Frequencies

There are a total of 50 channels. The low channel is at 903 MHz and the high channel is at 926.5 MHz. There is a 500 kHz separation between channels.

8. TEST PROCEDURES

The following sections describe the test methods and the specifications for the tests. Test results are also included in this section.

8.1 RF Emissions

8.1.1 Radiated Emissions (Spurious and Harmonics) Test

The spectrum analyzer was used as a measuring meter along with the quasi-peak adapter. Amplifiers were used to increase the sensitivity of the instrument. The Com Power Preamplifier Model: PA-102 was used for frequencies from 30 MHz to 1 GHz, and the Com-Power Microwave Preamplifier Model: PA-122 was used for frequencies above 1 GHz. The spectrum analyzer was used in the peak detect mode with the "Max Hold" feature activated. In this mode, the spectrum analyzer records the highest measured reading over all the sweeps.

The quasi-peak adapter was used only for those readings which are marked accordingly on the data sheets.

The frequencies above 1 GHz were averaged manually by narrowing the video filter down to 10 Hz and putting the sweep time on AUTO on the spectrum analyzer to keep the amplitude reading calibrated.

The measurement bandwidths and transducers used for the radiated emissions test were:

FREQUENCY RANGE	EFFECTIVE MEASUREMENT BANDWIDTH	TRANSDUCER
10 kHz to 150 kHz	200 Hz	Active Loop Antenna
150 kHz to 30 MHz	9 kHz	Active Loop Antenna
30 MHz to 300 MHz	120 kHz	Biconical Antenna
300 MHz to 1 GHz	120 kHz	Log Periodic Antenna
1 GHz to 10 GHz	1 MHz	Horn Antenna

The open field test site of Compatible Electronics, Inc. was used for radiated emission testing. This test site is set up according to ANSI C63.4: 2001. Please see section 6.2 of this report for mounting, bonding and grounding of the EUT. The turntable supporting the EUT is remote controlled using a motor. The turntable permits EUT rotation of 360 degrees in order to maximize emissions. Also, the antenna mast allows height variation of the antenna from 1 meter to 4 meters. Data was collected in the worst case (highest emission) configuration of the EUT by the Radiated Emission Manual Test software. At each reading, the EUT was rotated 360 degrees and the antenna height was varied from 1 to 4 meters (for E field radiated field strength). The gunsight method was used when measuring with the horn antenna in order to ensure accurate results. The loop antenna was also rotated in the horizontal and vertical axis in order to ensure accurate results.

Radiated Emissions (Spurious and Harmonics) Test (con't)

The presence of ambient signals was verified by turning the EUT off. In case an ambient signal was detected, the measurement bandwidth was reduced temporarily and verification was made that an additional adjacent peak did not exist. This ensures that the ambient signal does not hide any emissions from the EUT. The EUT was tested at a 3 meter test distance from 10 kHz to 10 GHz to obtain final test data.

The harmonics of the transmitter frequency in the applicable restricted band were also measured utilizing the method mentioned above. See appendix E for datasheets.

8.2 20 dB Bandwidth

The 20 dB Bandwidth was measured using the spectrum analyzer. The bandwidth was measured using a direct connection from the RF out on the EUT. The resolution and video bandwidths were >= 1% of the 20 dB bandwidth.

Test Results:

The EUT complies with the relevant requirements of FCC Title 47, Part 15, Subpart C section 15.247 (a)(1)(i). The bandwidth is less than 500 kHz. Please see the data sheets located in Appendix E.

8.3 Peak Output Power

The Peak Output Power was taken using the spectrum analyzer. The bandwidth was measured using a direct connection from the RF out on the EUT. The resolution bandwidth was 3 MHz, and the video bandwidth was 3 MHz.

Test Results:

The EUT complies with the relevant requirements of FCC Title 47, Part 15, Subpart C section 15.247 (b)(1). The maximum peak output power is less than 1 watt. Please see the data sheets located in Appendix E.

8.4 RF Antenna Conducted Test

The RF antenna conducted test was taken using the spectrum analyzer. The RF antenna conducted test was measured using a direct connection from the RF out on the EUT into the input of the analyzer. The resolution bandwidth was 100 kHz, and the video bandwidth 300 kHz. The spans were wide enough to include all the harmonics and emissions that were produced by the intentional radiator.

Test Results:

The EUT complies with the relevant requirements of FCC Title 47, Part 15, Subpart C section 15.247 (c). The RF power that is produced by the intentional radiator is at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of desired power. Please see the data sheets located in Appendix E.

8.5 RF Band Edges

The RF band edges were taken at the edges of the spectrum (902 MHz when the EUT was on the low channel and 928 MHz when the EUT was on the high channel) using the spectrum analyzer. The 100 kHz bandwidth outside the frequency band was at least 20 dB below from the spectrum analyzer to the spec limit. The EUT was tested in DH5 mode, which is the 100 kHz bandwidth of the highest level. A data sheet is also included, which compares the reading worst case.

Test Results:

The EUT complies with the relevant requirements of FCC Title 47, Part 15, Subpart C section 15.247 (c). The RF power at the band edges at 902 MHz and 928 MHz meet the limits of section 15.209. Please see the data sheets located in Appendix E.

8.6 Carrier Frequency Separation

The Channel Hopping Separation Test was measured using the spectrum analyzer. The EUT was operating in its normal operating mode. The resolution bandwidth was 100 kHz, and the video bandwidth 100 kHz. The frequency span was wide enough to include the peaks of two adjacent channels.

Test Results:

The EUT complies with the relevant requirements of FCC Title 47, Part 15, Subpart C section 15.247 (a)(1) and 15.247 (a)(1)(i). The Channel Hopping Separation is greater than the 20 dB bandwidth. Please see the data sheets located in Appendix D.

8.7 Number of Hopping Frequencies

The Channel Hopping Separation Test was measured using the spectrum analyzer. The EUT was operating in its normal operating mode. The resolution bandwidth was 1 MHz, and the video bandwidth 1 MHz. The frequency span was wide enough to include all of the peaks in the frequency band of operation.

Test Results:

The EUT complies with the relevant requirements of FCC Title 47, Part 15, Subpart C section 15.247 (a)(1) and 15.247 (a)(1)(i). The number of hopping frequencies is 50. Please see the data sheets located in Appendix E.

8.8 Average Time of Occupancy Test

The Average Time of Occupancy Test was measured using the spectrum analyzer. The EUT was operating in normal operating mode. The frequency span was taken to 0 Hz with a sweep time of 500 msec to determine the time for each transmission. The EUT was tested in channel hopping mode.

The dwell time for one frequency was 64 msec. In a 10 second period, the number of frequency transmissions that appear are 4. Therefore, if you multiply the dwell time for one frequency transmission with the number of transmissions in a 10 second period, you should have the time of occupancy in a 10 second period.

0.064 seconds x 4 = 0.256 seconds

Test Results:

The EUT complies with the relevant requirements of FCC Title 47, Part 15, Subpart C section 15.247 (a)(1)(i). The EUT does not transmit for more than 400 msec during a 10 second period on any frequency. Please see the data sheets located in Appendix E.

9. CONCLUSIONS

The Versa Remote Transmitter Module, Model: VRTS meets all of the specification limits defined in FCC Title 47, Part 15, Subpart C, sections 15.205, 15.209, and 15.247.

Note: For the unintentional radiator portion of the test, the EUT was within the **Class B** specification limits defined in CFR Title 47, Part 15, Subpart B.

APPENDIX A

LABORATORY RECOGNITIONS

LABORATORY ACCREDITATIONS AND RECOGNITIONS

NVLAP CODES 200063-0, 200528-0, 200527-0

For US, Canada, Australia/New Zealand, Taiwan and the European Union, Compatible Electronics is currently accredited by NVLAP to ISO/IEC 17025 an ISO 9002 equivilent. Please follow the link to the NIST site for each of our facilities NVLAP certificate and scope of accreditation.

Silverado/Lake Forest Division: http://ts.nist.gov/ts/htdocs/210/214/scopes/2005270.htm
Brea Division: http://ts.nist.gov/ts/htdocs/210/214/scopes/2005280.htm
Agoura Division: http://ts.nist.gov/ts/htdocs/210/214/scopes/2000630.htm

Compatible Electronics has been accredited by ANSI and appointed by the FCC to serve as a Telecommunications Certification Body (TCB). Compatible Electronics ANSI TCB listing can be found at: http://www.ansi.org/public/ca/ansi_cp.html

Compatible Electronics has been nominated as a Conformity Assessment Body (CAB) for EMC under the US/EU Mutual Recognition Agreement (MRA). Compatible Electronics NIST US/EU CAB listing can be found at: http://ts.nist.gov/ts/htdocs/210/gsig/emc-cabs-mar02.pdf

Compatible Electronics has been nominated as a Conformity Assessment Body (CAB) for Taiwan/BSMI under the US/APEC (Asia-Pacific Economic Cooperation) Mutual Recognition Agreement (MRA). Compatible Electronics NIST US/APEC CAB listing can be found at: http://ts.nist.gov/ts/htdocs/210/gsig/apec/bsmi-cabs-may02.pdf

World Wide Market Access with Nemko

Compatible Electronics has been validated by NEMKO against ISO/IEC 17025 under the NEMKO EMC Laboratory Authorization (ELA) program to all EN standards required by the European Union (EU) EMC Directive 89/336/EEC. Please follow the link to the Compatible Electronics' web site for each of our facilities NEMKO ELA certificate and scope of accreditation. http://www.celectronics.com/certs.htm

We are also certified/listed for IT products by the following country/agency:

Compatible Electronics VCCI listing can be found at:
http://www.vcci.or.jp/vcci_e/member/tekigo/setsubi_index_id.html

Just type "Compatible Electronics" into the Keyword search box.

Compatible Electronics FCC listing can be found at:
https://gullfoss2.fcc.gov/prod/oet/index_ie.html

Just type "Compatible Electronics" into the Test Firms search box.

Industry Canada / Industrie Canada

Compatible Electronics IC listing can be found at:
http://spectrum.ic.gc.ca/~cert/labs/oats_lab_c_e.html

APPENDIX B

MODIFICATIONS TO THE EUT

MODIFICATIONS TO THE EUT

The modifications listed below were made to the EUT to pass CFR Title 47, Part 15, Subpart B; and Subpart C, sections 15.205, 15.209, and 15.247specifications.

All the rework described below was implemented during the test in a method that could be reproduced in all the units by the manufacturer.

No modifications were made to the EUT during testing.

APPENDIX C

ADDITIONAL MODELS COVERED UNDER THIS REPORT

ADDITIONAL MODELS COVERED UNDER THIS REPORT

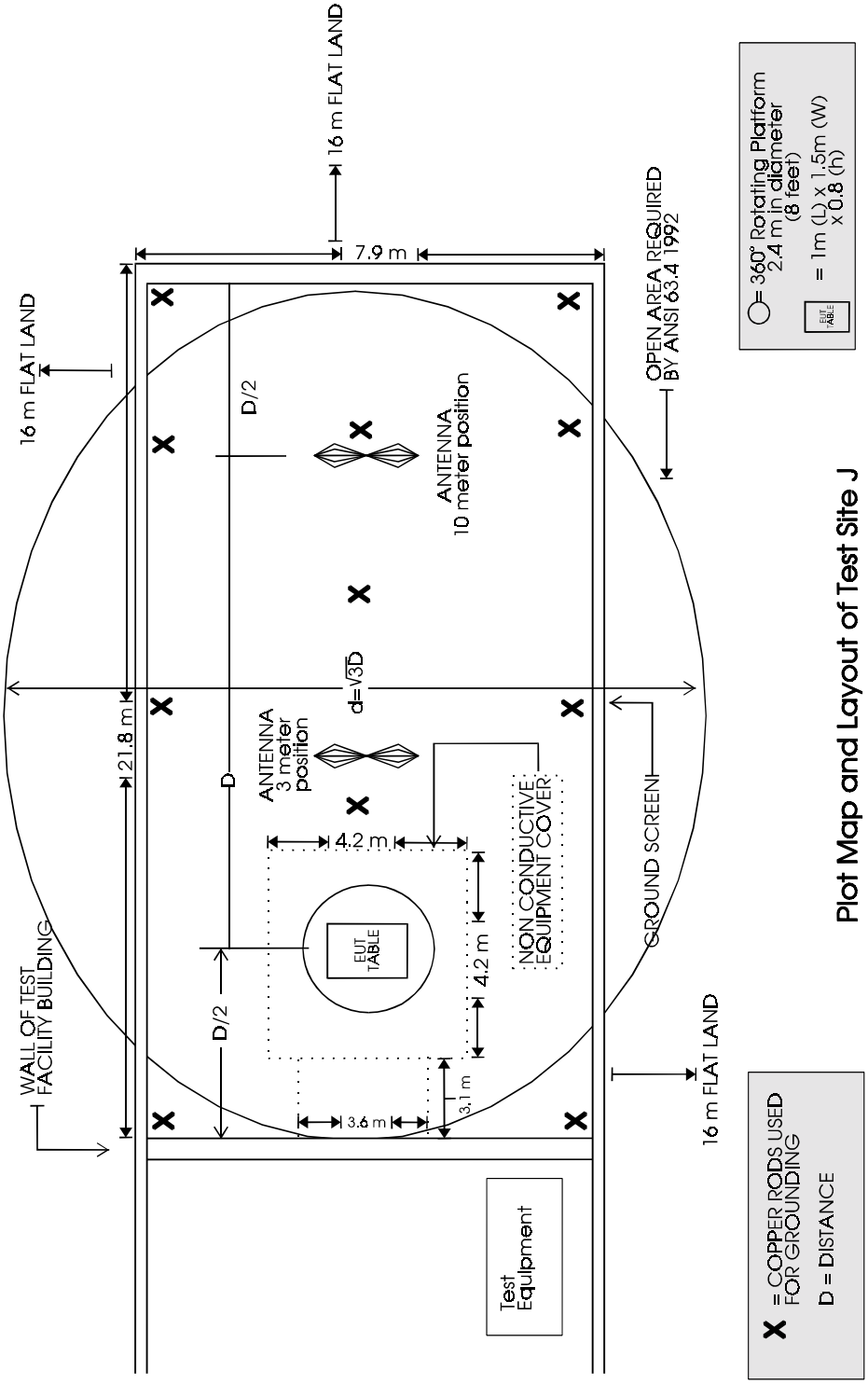
USED FOR THE PRIMARY TEST	VERSA REMOTE TRANSMITTER MODULE Model: VRTS S/N: N/A

There were no additional models covered under this report.

APPENDIX D

DIAGRAMS, CHARTS, AND PHOTOS

FIGURE 1: PLOT MAP AND LAYOUT OF RADIATED SITE



COM-POWER AL-130

LAB H – LOOP ANTENNA (E-FIELD)

S/N: 25310

CALIBRATION DATE: JUNE 4, 2003

FREQUENCY (MHz)	FACTOR (dB)	FREQUENCY (MHz)	FACTOR (dB)
0.009	10.3	1.0	10.0
0.01	10.2	2.0	10.5
0.02	9.2	3.0	10.2
0.03	11.0	4.0	10.2
0.04	10.5	5.0	10.6
0.05	9.0	6.0	10.5
0.06	9.4	7.0	10.4
0.07	9.2	8.0	10.1
0.08	8.9	9.0	10.4
0.09	8.8	10.0	9.9
0.1	9.0	12.0	9.6
0.2	6.9	14.0	9.5
0.3	9.4	15.0	9.4
0.4	9.1	16.0	9.1
0.5	9.1	18.0	9.3
0.6	9.3	20.0	9.3
0.7	9.4	25.0	8.8
0.8	9.3	30.0	7.2
0.9	9.2	-	-

COM-POWER AB-900

LAB J - BICONICAL ANTENNA

S/N: 14022

CALIBRATION DATE: MARCH 21, 2003

FREQUENCY (MHz)	FACTOR (dB)	FREQUENCY (MHz)	FACTOR (dB)
30.0	14.80	120.0	10.90
35.0	13.80	125.0	11.50
40.0	11.00	140.0	12.00
45.0	11.40	150.0	12.40
50.0	10.60	160.0	12.40
60.0	10.70	175.0	13.30
70.0	9.60	180.0	11.80
80.0	8.30	200.0	15.70
90.0	9.00	250.0	17.10
100.0	9.30	300.0	19.30

COM-POWER AL-100

LAB J - LOG PERIODIC ANTENNA

S/N: 16016

CALIBRATION DATE: NOVEMBER 16, 2002

FREQUENCY (MHz)	FACTOR (dB)	FREQUENCY (MHz)	FACTOR (dB)
300	14.20	350	15.30
400	15.20	450	16.00
500	17.60	550	17.40
600	18.60	650	19.10
700	19.40	750	19.70
800	21.10	850	22.60
900	22.30	950	23.20
1000	24.80	-	-

COM-POWER AL-118

LAB J - HORN ANTENNA

S/N: 01319

CALIBRATION DATE: APRIL 8, 2002

FREQUENCY (MHz)	FACTOR (dB)	FREQUENCY (MHz)	FACTOR (dB)
1000	25.3	10000	40.3
1500	26.7	10500	42.9
2000	28.4	11000	41.3
2500	28.9	11500	44.1
3000	31.7	12000	43.7
3500	32.1	12500	42.8
4000	31.9	13000	39.7
4500	32.2	13500	41.7
5000	32.8	14000	39.6
6000	34.9	14500	45.6
6500	34.6	15000	43.3
7000	39.1	15500	43.9
7500	38.9	16000	43.5
8000	38.6	16500	44.6
8500	39.1	17000	46.4
9000	37.9	17500	47.9
9500	39.6	18000	44.2

COM-POWER PA-103

LAB J - PREAMPLIFIER

S/N: 1541

CALIBRATION DATE: JANUARY 13, 2003

FREQUENCY (MHz)	FACTOR (dB)	FREQUENCY (MHz)	FACTOR (dB)
30	**33.4**	300	**32.9**
40	**33.4**	350	**32.9**
50	**33.4**	400	**33.0**
60	**33.3**	450	**32.7**
70	**33.3**	500	**32.4**
80	**33.3**	550	**32.8**
90	**33.3**	600	**32.3**
100	**33.3**	650	**31.9**
125	**33.3**	700	**32.2**
150	**33.3**	750	**32.5**
175	**33.3**	800	**31.6**
200	**33.3**	850	**32.0**
225	**33.2**	900	**31.7**
250	**33.1**	950	**31.8**
275	**33.0**	1000	**31.6**

COM-POWER PA-122

LAB J – HI-FREQUENCY PREAMPLIFIER

S/N: 01321

CALIBRATION DATE: APRIL 22, 2003

FREQUENCY (MHz)	FACTOR (dB)	FREQUENCY (MHz)	FACTOR (dB)
1000	28.5	6000	26.8
1100	28.8	6500	26.8
1200	28.9	7000	27.3
1300	28.8	7500	28.6
1400	28.8	8000	29.2
1500	29.0	8500	28.9
1600	28.6	9000	28.9
1700	28.6	9500	28.5
1800	28.8	10000	29.5
1900	28.9	11000	30.6
2000	28.6	12000	29.8
2500	28.3	13000	28.9
3000	28.3	14000	29.4
3500	28.1	15000	29.8
4000	27.8	16000	31.5
4500	27.1	17000	29.3
5000	26.8	18000	28.0
5500	27.0	-	-

FRONT VIEW

KAR-TECH INC.
VERSA REMOTE TRANSMITTER MODULE.
MODEL: VRTS
FCC SUBPART B AND C - RADIATED EMISSIONS – JULY 28 – 31, 2003

PHOTOGRAPH SHOWING THE EUT CONFIGURATION FOR MAXIMUM EMISSIONS

REAR VIEW

KAR-TECH INC.
VERSA REMOTE TRANSMITTER MODULE.
MODEL: VRTS
FCC SUBPART B AND C - RADIATED EMISSIONS – JULY 28 – 31, 2003

PHOTOGRAPH SHOWING THE EUT CONFIGURATION FOR MAXIMUM EMISSIONS

APPENDIX E

DATA SHEETS

Test Location : Compatible Electronics **Page** : 1/1
Customer : Kar Tech, Inc. **Date** : 07/31/2003
Manufacturer : Kar Tech, Inc. **Time** : 03:25:54 PM
Eut name : Versa Remote Transmitter Module **Lab** : J
Model : VRTS **Test Distance** : 3.00 Meters
Serial # : N/A
Specification : FCC Section 15.209 (40log)
Distance correction factor (20 * log(test/spec)) : 0.00
Test Mode : -
Qualification Scan
Test Range: 10 KHz - 30 MHz
Tested by Carlos Sandoval

Pol	Freq	Reading	Cable loss	Antenna factor	Amplifier gain	Corr'd rdg = R	Limit = L	Delta R-L
	MHz	dBuV	dB	dB	dB	dBuV/m	dBuV/m	dB

No emissions were found in the range of 10 kHz - 30 MHz
on the Vertical or Horizontal Axis of the Loop Antenna

Test Location : Compatible Electronics **Page** : 1/1
Customer : Kar Tech, Inc. **Date** : 07/30/2003
Manufacturer : Kar Tech, Inc. **Time** : 02:09:17 PM
Eut name : Versa Remote Transmitter Module **Lab** : J
Model : VRTS **Test Distance** : 3.00 Meters
Serial # : N/A
Specification : FCC Pt. 15 - Class B
Distance correction factor (20 * log(test/spec)) : 0.00
Test Mode : -
Qualification Scan
Test Range: 30 - 300 MHz
Tested by Carlos Sandoval

Pol	Freq	Reading	Cable loss	Antenna factor	Amplifier gain	Corr'd rdg = R	Limit = L	Delta R-L
	MHz	dBuV	dB	dB	dB	dBuV/m	dBuV/m	dB
V	40.060	51.80	0.60	11.01	33.30	30.11	40.00	-9.89
V	60.070	46.60	0.80	10.69	33.30	24.79	40.00	-15.21
V	64.859	46.60	0.85	10.14	33.30	24.29	40.00	-15.71
V	80.053	53.00	0.90	8.30	33.30	28.90	40.00	-11.10
V	90.082	49.60	1.00	9.00	33.30	26.30	43.50	-17.20
V	100.059	62.70	1.00	9.31	33.30	39.71	43.50	-3.79
V	100.063Qp	60.93	1.00	9.31	33.30	37.94	43.50	-5.56
V	110.074	47.40	1.09	10.14	33.30	25.33	43.50	-18.17
V	120.067	49.30	1.16	10.91	33.30	28.07	43.50	-15.43
V	125.091	44.20	1.20	11.50	33.30	23.60	43.50	-19.90
V	130.103	43.00	1.24	11.68	33.30	22.62	43.50	-20.88
V	140.089	45.40	1.33	12.00	33.30	25.43	43.50	-18.07
V	150.069	43.10	1.40	12.40	33.30	23.60	43.50	-19.90
V	200.083	41.60	1.60	15.70	33.30	25.60	43.50	-17.90
V	220.077	45.40	1.68	16.30	33.22	30.16	46.00	-15.84
V	250.093	42.00	1.90	17.10	33.10	27.91	46.00	-18.09

Test Location : Compatible Electronics **Page** : 1/1
Customer : Kar Tech, Inc. **Date** : 07/30/2003
Manufacturer : Kar Tech, Inc. **Time** : 03:19:33 PM
Eut name : Versa Remote Transmitter Module **Lab** : J
Model : VRTS **Test Distance** : 3.00 Meters
Serial # : N/A
Specification : FCC Pt. 15 - Class B
Distance correction factor (20 * log(test/spec)) : 0.00
Test Mode : -
Qualification Scan
Test Range: 30 - 300 MHz
Tested by Carlos Sandoval

Pol	Freq	Reading	Cable loss	Antenna factor	Amplifier gain	Corr'd rdg = R	Limit = L	Delta R-L
	MHz	dBuV	dB	dB	dB	dBuV/m	dBuV/m	dB
H	40.093	51.60	0.60	11.01	33.30	29.91	40.00	-10.09
H	60.091	43.80	0.80	10.69	33.30	21.99	40.00	-18.01
H	64.860	43.10	0.85	10.14	33.30	20.79	40.00	-19.21
H	70.070	42.90	0.90	9.59	33.30	20.09	40.00	-19.91
H	80.098	59.40	0.90	8.31	33.30	35.31	40.00	-4.69
H	90.047	56.50	1.00	9.00	33.30	33.20	43.50	-10.30
H	110.087	48.80	1.09	10.14	33.30	26.73	43.50	-16.77
H	120.041	63.20	1.16	10.91	33.30	41.97	43.50	-1.53
H	120.045Qp	63.03	1.16	10.91	33.30	41.80	43.50	-1.70
H	125.087	47.30	1.20	11.50	33.30	26.70	43.50	-16.80
H	130.103	46.90	1.24	11.68	33.30	26.52	43.50	-16.98
H	140.050	57.20	1.32	12.00	33.30	37.23	43.50	-6.27
H	150.083	42.40	1.40	12.40	33.30	22.90	43.50	-20.60
H	160.062	39.80	1.44	12.40	33.30	20.35	43.50	-23.15
H	180.070	45.70	1.52	13.71	33.30	27.63	43.50	-15.87
H	200.072	43.60	1.60	15.70	33.30	27.60	43.50	-15.90
H	220.064	44.00	1.68	16.30	33.22	28.76	46.00	-17.24
H	240.081	45.60	1.82	16.85	33.14	31.13	46.00	-14.87
H	260.030	45.90	1.98	17.57	33.06	32.40	46.00	-13.60
H	280.081	40.90	2.10	18.47	32.98	28.49	46.00	-17.51

Test Location : Compatible Electronics **Page** : 1/1
Customer : Kar Tech, Inc. **Date** : 07/31/2003
Manufacturer : Kar Tech, Inc. **Time** : 08:47:30 AM
Eut name : Versa Remote Transmitter Module **Lab** : J
Model : VRTS **Test Distance** : 3.00 Meters
Serial # : N/A
Specification : FCC Pt. 15 - Class B
Distance correction factor (20 * log(test/spec)) : 0.00
Test Mode : -
Qualification Scan
Test Range: 300 - 1000 MHz
Tested by Carlos Sandoval

Pol	Freq	Reading	Cable loss	Antenna factor	Amplifier gain	Corr'd rdg = R	Limit = L	Delta R-L
	MHz	dBuV	dB	dB	dB	dBuV/m	dBuV/m	dB
V	300.062	49.80	2.10	14.20	32.90	33.20	46.00	-12.80
V	320.049	41.20	2.14	14.66	32.90	25.10	46.00	-20.90
V	360.099	43.70	2.26	15.28	32.99	28.26	46.00	-17.74
V	400.074	40.70	2.50	15.20	33.30	25.10	46.00	-20.90
V	440.048	40.20	2.66	15.85	32.81	25.90	46.00	-20.10
H	300.084	44.00	2.10	14.20	32.90	27.40	46.00	-18.60
H	320.045	47.40	2.14	14.66	32.90	31.30	46.00	-14.70
H	321.070	47.10	2.14	14.68	32.90	31.03	46.00	-14.97
H	340.124	38.80	2.18	15.10	32.90	23.18	46.00	-22.82
H	360.090	49.20	2.26	15.28	32.99	33.76	46.00	-12.24
H	380.062	42.30	2.39	15.24	33.15	26.78	46.00	-19.22
H	400.064	45.40	2.50	15.20	33.30	29.80	46.00	-16.20
H	438.063	47.40	2.65	15.82	32.84	33.03	46.00	-12.97
H	450.320	50.70	2.70	16.01	32.70	36.71	46.00	-9.29

Test Location : Compatible Electronics **Page** : 1/1
Customer : Kar Tech, Inc. **Date** : 07/31/2003
Manufacturer : Kar Tech, Inc. **Time** : 09:45:34 AM
Eut name : Versa Remote Transmitter Module **Lab** : J
Model : VRTS **Test Distance** : 3.00 Meters
Serial # : N/A
Specification : FCC Pt. 15 - Class B
Distance correction factor (20 * log(test/spec)) : 0.00
Test Mode : -
Qualification Scan
Test Range: 1 GHz - 10 GHz
Tested by Carlos Sandoval

Pol	Freq	Reading	Cable loss	Antenna factor	Amplifier gain	Corr'd rdg = R	Limit = L	Delta R-L
	MHz	dBuV	dB	dB	dB	dBuV/m	dBuV/m	dB

No spurious emissions from were found from the range or 1 GHz - 10 GHz on the Vertical or Horizontal Polarization

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(949) 587-0400

RADIATED EMISSIONS (FCC SECTION 15.205 AND 15.247)

COMPANY	**Kar Tech**	**DATE**	**8/18/03**
EUT	**Versa Remote Transmitter Module**	**DUTY CYCLE**	**N/A**
MODEL	**VRTS**	**PEAK TO AVG**	**N/A**
S/N	**NONE**	**TEST DIST.**	**3 METERS**
TEST ENGINEER	**Carlos Sandoval**	**LAB**	**J**

Frequency MHz	Peak Reading (dBuV)	Average (A) or Quasi-Peak (QP)	Antenna Polar. (V or H)	Antenna Height (meters)	EUT Azimuth (degrees)	EUT Axis (X,Y,Z)	EUT Tx Channel	Antenna Factor (dB)	Cable Loss (dB)	Amplifier Gain (dB)	*Corrected Reading (dBuV/m)	Delta ** (dB)	Spec Limit (dBuV/m)	Comments
2709.0000	44.0	35.7 A	H			X	LOW	30.1	2.2	28.3	**39.7**	**-14.3**	**54.0**	
2709.0000	48.6	45.1 A	H			Y	LOW	30.1	2.2	28.3	**49.1**	**-4.9**	**54.0**	
2709.0000	48.0	44.8 A	H			Z	LOW	30.1	2.2	28.3	**48.8**	**-5.2**	**54.0**	
2709.0000	46.1	39.0 A	V			X	LOW	30.1	2.2	28.3	**43.0**	**-11.0**	**54.0**	
2709.0000	49.6	46.5 A	V			Y	LOW	30.1	2.2	28.3	**50.5**	**-3.5**	**54.0**	
2709.0000	48.0	44.3 A	V			Z	LOW	30.1	2.2	28.3	**48.3**	**-5.7**	**54.0**	
2745.0000	45.3	37.9 A	H			X	MED.	30.3	2.2	28.3	**42.1**	**-11.9**	**54.0**	
2745.0000	50.5	46.5 A	H			Y	MED.	30.3	2.2	28.3	**50.7**	**-3.3**	**54.0**	
2745.0000	51.1	46.0 A	H			Z	MED.	30.3	2.2	28.3	**50.2**	**-3.8**	**54.0**	
2745.0000	47.2	42.1 A	V			X	MED.	30.3	2.2	28.3	**46.3**	**-7.7**	**54.0**	
2745.0000	49.7	46.8 A	V			Y	MED.	30.3	2.2	28.3	**51.0**	**-3.0**	**54.0**	
2745.0000	46.3	42.4 A	V			Z	MED.	30.3	2.2	28.3	**46.6**	**-7.4**	**54.0**	
2779.5000	45.3	36.9 A	H			X	HIGH	30.5	2.2	28.3	**41.3**	**-12.7**	**54.0**	
2779.5000	48.5	45.2 A	H			Y	HIGH	30.5	2.2	28.3	**49.6**	**-4.4**	**54.0**	
2779.5000	49.3	46.2 A	H			Z	HIGH	30.5	2.2	28.3	**50.6**	**-3.4**	**54.0**	
2779.5000	48.1	44.5 A	V			X	HIGH	30.5	2.2	28.3	**48.9**	**-5.1**	**54.0**	
2779.5000	48.9	45.6 A	V			Y	HIGH	30.5	2.2	28.3	**50.0**	**-4.0**	**54.0**	
2779.5000	48.9	46.3 A	V			Z	HIGH	30.5	2.2	28.3	**50.7**	**-3.3**	**54.0**	

* CORRECTED READING = METER READING + ANTENNA FACTOR + CABLE LOSS - AMPLIFIER GAIN
** DELTA = SPEC LIMIT - CORRECTED READING

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RADIATED EMISSIONS (FCC SECTION 15.205 AND 15.247)

COMPANY	**Kar Tech**	**DATE**	**8/18/03**
EUT	**Versa Remote Transmitter Module**	**DUTY CYCLE**	**N/A**
MODEL	**VRTS**	**PEAK TO AVG**	**N/A**
S/N	**NONE**	**TEST DIST.**	**3 METERS**
TEST ENGINEER	**Carlos Sandoval**	**LAB**	**J**

Frequency MHz	Peak Reading (dBuV)	Average (A) or Quasi-Peak (QP)	Antenna Polar. (V or H)	Antenna Height (meters)	EUT Azimuth (degrees)	EUT Axis (X,Y,Z)	EUT Tx Channel	Antenna Factor (dB)	Cable Loss (dB)	Amplifier Gain (dB)	*Corrected Reading (dBuV/m)	Delta ** (dB)	Spec Limit (dBuV/m)	Comments
3612.0000	44.4	36.7 A	H			X	LOW	32.1	2.3	28.0	**43.0**	**-11.0**	**54.0**	
3612.0000	43.4	33.1 A	H			Y	LOW	32.1	2.3	28.0	**39.4**	**-14.6**	**54.0**	
3612.0000	44.8	34.6 A	H			Z	LOW	32.1	2.3	28.0	**40.9**	**-13.1**	**54.0**	
3612.0000	43.8	36.6 A	V			X	LOW	32.1	2.3	28.0	**42.9**	**-11.1**	**54.0**	
3612.0000	43.5	35.6 A	V			Y	LOW	32.1	2.3	28.0	**41.9**	**-12.1**	**54.0**	
3612.0000	45.1	38.8 A	V			Z	LOW	32.1	2.3	28.0	**45.1**	**-8.9**	**54.0**	
3660.0000	43.6	34.5 A	H			X	MED.	32.0	2.3	28.0	**40.8**	**-13.2**	**54.0**	
3660.0000	41.2	30.7 A	H			Y	MED.	32.0	2.3	28.0	**37.0**	**-17.0**	**54.0**	
3660.0000	42.5	35.6 A	H			Z	MED.	32.0	2.3	28.0	**41.9**	**-12.1**	**54.0**	
3660.0000	43.6	34.7 A	V			X	MED.	32.0	2.3	28.0	**41.0**	**-13.0**	**54.0**	
3660.0000	42.3	33.1 A	V			Y	MED.	32.0	2.3	28.0	**39.4**	**-14.6**	**54.0**	
3660.0000	44.7	37.6 A	V			Z	MED.	32.0	2.3	28.0	**43.9**	**-10.1**	**54.0**	
3706.0000	41.6	31.8 A	H			X	HIGH	32.0	2.3	28.0	**38.1**	**-15.9**	**54.0**	
3706.0000	43.6	37.6 A	H			Y	HIGH	32.0	2.3	28.0	**43.9**	**-10.1**	**54.0**	
3706.0000	44.5	37.8 A	H			Z	HIGH	32.0	2.3	28.0	**44.1**	**-9.9**	**54.0**	
3706.0000	43.7	36.2 A	V			X	HIGH	32.0	2.3	28.0	**42.5**	**-11.5**	**54.0**	
3706.0000	43.6	35.4 A	V			Y	HIGH	32.0	2.3	28.0	**41.7**	**-12.3**	**54.0**	
3706.0000	40.8	31.1 A	V			Z	HIGH	32.0	2.3	28.0	**37.4**	**-16.6**	**54.0**	

* CORRECTED READING = METER READING + ANTENNA FACTOR + CABLE LOSS - AMPLIFIER GAIN
** DELTA = SPEC LIMIT - CORRECTED READING

RADIATED EMISSIONS (FCC SECTION 15.205 AND 15.247)

COMPANY	Kar Tech	DATE	8/18/03
EUT	Versa Remote Transmitter Module	DUTY CYCLE	N/A
MODEL	VRTS	PEAK TO AVG	N/A
S/N	NONE	TEST DIST.	3 METERS
TEST ENGINEER	Carlos Sandoval	LAB	J

Frequency MHz	Peak Reading (dBuV)	Average (A) or Quasi-Peak (QP)	Antenna Polar. (V or H)	Antenna Height (meters)	EUT Azimuth (degrees)	EUT Axis (X,Y,Z)	EUT Tx Channel	Antenna Factor (dB)	Cable Loss (dB)	Amplifier Gain (dB)	*Corrected Reading (dBuV/m)	Delta ** (dB)	Spec Limit (dBuV/m)	Comments
4515.0000	40.4	30.9 A	H			X	LOW	32.2	3.4	27.1	**39.4**	**-14.6**	**54.0**	
4515.0000	41.7	31.3 A	H			Y	LOW	32.2	3.4	27.1	**39.8**	**-14.2**	**54.0**	
4515.0000	42.2	31.3 A	H			Z	LOW	32.2	3.4	27.1	**39.8**	**-14.2**	**54.0**	
4515.0000	40.7	31.2 A	V			X	LOW	32.2	3.4	27.1	**39.7**	**-14.3**	**54.0**	
4515.0000	39.9	30.1 A	V			Y	LOW	32.2	3.4	27.1	**38.6**	**-15.4**	**54.0**	
4515.0000	40.7	30.0 A	V			Z	LOW	32.2	3.4	27.1	**38.5**	**-15.5**	**54.0**	
4575.0000	41.4	30.0 A	H			X	MED.	32.3	3.3	27.1	**38.6**	**-15.4**	**54.0**	
4575.0000	41.8	30.5 A	H			Y	MED.	32.3	3.3	27.1	**39.1**	**-14.9**	**54.0**	
4575.0000	42.8	30.2 A	H			Z	MED.	32.3	3.3	27.1	**38.8**	**-15.2**	**54.0**	
4575.0000	41.7	30.9 A	V			X	MED.	32.3	3.3	27.1	**39.5**	**-14.5**	**54.0**	
4575.0000	41.4	31.2 A	V			Y	MED.	32.3	3.3	27.1	**39.8**	**-14.2**	**54.0**	
4575.0000	42.4	30.9 A	V			Z	MED.	32.3	3.3	27.1	**39.5**	**-14.5**	**54.0**	
4632.5000	41.0	30.8 A	H			X	HIGH	32.4	3.3	27.0	**39.5**	**-14.5**	**54.0**	
4632.5000	41.7	31.0 A	H			Y	HIGH	32.4	3.3	27.0	**39.7**	**-14.3**	**54.0**	
4632.5000	40.9	31.8 A	H			Z	HIGH	32.4	3.3	27.0	**40.5**	**-13.5**	**54.0**	
4632.5000	42.8	31.3 A	V			X	HIGH	32.4	3.3	27.0	**40.0**	**-14.0**	**54.0**	
4632.5000	42.6	31.1 A	V			Y	HIGH	32.4	3.3	27.0	**39.8**	**-14.2**	**54.0**	
4632.5000	42.4	31.2 A	V			Z	HIGH	32.4	3.3	27.0	**39.9**	**-14.1**	**54.0**	

* CORRECTED READING = METER READING + ANTENNA FACTOR + CABLE LOSS - AMPLIFIER GAIN
** DELTA = SPEC LIMIT - CORRECTED READING

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RADIATED EMISSIONS (FCC SECTION 15.205 AND 15.247)

COMPANY	Kar Tech	DATE	8/18/03
EUT	Versa Remote Transmitter Module	DUTY CYCLE	N/A
MODEL	VRTS	PEAK TO AVG	N/A
S/N	NONE	TEST DIST.	3 METERS
TEST ENGINEER	Carlos Sandoval	LAB	J

Frequency MHz	Peak Reading (dBuV)	Average (A) or Quasi-Peak (QP)	Antenna Polar. (V or H)	Antenna Height (meters)	EUT Azimuth (degrees)	EUT Axis (X,Y,Z)	EUT Tx Channel	Antenna Factor (dB)	Cable Loss (dB)	Amplifier Gain (dB)	*Corrected Reading (dBuV/m)	Delta ** (dB)	Spec Limit (dBuV/m)	Comments
5418.0000	39.7	29.8 A	H			X	LOW	33.0	3.2	27.0	**39.0**	**-15.0**	**54.0**	**Noise Floor**
5418.0000	42.9	32.7 A	H			Y	LOW	33.0	3.2	27.0	**41.9**	**-12.1**	**54.0**	**Noise Floor**
5418.0000	41.0	33.5 A	H			Z	LOW	33.0	3.2	27.0	**42.7**	**-11.3**	**54.0**	**Noise Floor**
5418.0000	39.6	29.6 A	V			X	LOW	33.0	3.2	27.0	**38.8**	**-15.2**	**54.0**	**Noise Floor**
5418.0000	41.1	30.3 A	V			Y	LOW	33.0	3.2	27.0	**39.5**	**-14.5**	**54.0**	**Noise Floor**
5418.0000	40.6	29.6 A	V			Z	LOW	33.0	3.2	27.0	**38.8**	**-15.2**	**54.0**	**Noise Floor**
5490.0000		A	H			X	MED.	33.0	3.3	27.0			**54.0**	
5490.0000		A	H			Y	MED.	33.0	3.3	27.0			**54.0**	
5490.0000		A	H			Z	MED.	33.0	3.3	27.0			**54.0**	
5490.0000		A	V			X	MED.	33.0	3.3	27.0			**54.0**	
5490.0000		A	V			Y	MED.	33.0	3.3	27.0			**54.0**	
5490.0000		A	V			Z	MED.	33.0	3.3	27.0			**54.0**	
5559.0000		A	H			X	HIGH	33.2	3.3	27.0			**54.0**	
5559.0000		A	H			Y	HIGH	33.2	3.3	27.0			**54.0**	
5559.0000		A	H			Z	HIGH	33.2	3.3	27.0			**54.0**	
5559.0000		A	V			X	HIGH	33.2	3.3	27.0			**54.0**	
5559.0000		A	V			Y	HIGH	33.2	3.3	27.0			**54.0**	
5559.0000		A	V			Z	HIGH	33.2	3.3	27.0			**54.0**	

* CORRECTED READING = METER READING + ANTENNA FACTOR + CABLE LOSS - AMPLIFIER GAIN
** DELTA = SPEC LIMIT - CORRECTED READING

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RADIATED EMISSIONS (FCC SECTION 15.205 AND 15.247)

COMPANY	Kar Tech	DATE	8/18/03
EUT	Versa Remote Transmitter Module	DUTY CYCLE	N/A
MODEL	VRTS	PEAK TO AVG	N/A
S/N	NONE	TEST DIST.	3 METERS
TEST ENGINEER	Carlos Sandoval	LAB	J

Frequency MHz	Peak Reading (dBuV)	Average (A) or Quasi-Peak (QP)	Antenna Polar. (V or H)	Antenna Height (meters)	EUT Azimuth (degrees)	EUT Axis (X,Y,Z)	EUT Tx Channel	Antenna Factor (dB)	Cable Loss (dB)	Amplifier Gain (dB)	*Corrected Reading (dBuV/m)	Delta ** (dB)	Spec Limit (dBuV/m)	Comments
7224.0000		A	H			X	LOW	39.0	6.7	27.9			60.0	
7224.0000		A	H			Y	LOW	39.0	6.7	27.9			60.0	
7224.0000		A	H			Z	LOW	39.0	6.7	27.9			60.0	
7224.0000		A	V			X	LOW	39.0	6.7	27.9			60.0	
7224.0000		A	V			Y	LOW	39.0	6.7	27.9			60.0	
7224.0000		A	V			Z	LOW	39.0	6.7	27.9			60.0	
7320.0000	44.3	33.6 A	H			X	MED.	39.0	6.2	28.1	50.7	-3.3	54.0	Noise Floor
7320.0000	43.3	33.7 A	H			Y	MED.	39.0	6.2	28.1	50.8	-3.2	54.0	Noise Floor
7320.0000	44.2	33.6 A	H			Z	MED.	39.0	6.2	28.1	50.7	-3.3	54.0	Noise Floor
7320.0000	44.2	33.4 A	V			X	MED.	39.0	6.2	28.1	50.5	-3.5	54.0	Noise Floor
7320.0000	43.5	33.1 A	V			Y	MED.	39.0	6.2	28.1	50.2	-3.8	54.0	Noise Floor
7320.0000	44.2	33.7 A	V			Z	MED.	39.0	6.2	28.1	50.8	-3.2	54.0	Noise Floor
7412.0000	44.2	33.9 A	H			X	HIGH	38.9	5.5	28.4	49.9	-4.1	54.0	Noise Floor
7412.0000	44.4	33.8 A	H			Y	HIGH	38.9	5.5	28.4	49.8	-4.2	54.0	Noise Floor
7412.0000	44.5	33.7 A	H			Z	HIGH	38.9	5.5	28.4	49.7	-4.3	54.0	Noise Floor
7412.0000	44.2	33.9 A	V			X	HIGH	38.9	5.5	28.4	49.9	-4.1	54.0	Noise Floor
7412.0000	43.8	33.3 A	V			Y	HIGH	38.9	5.5	28.4	49.3	-4.7	54.0	Noise Floor
7412.0000	43.9	33.6 A	V			Z	HIGH	38.9	5.5	28.4	49.6	-4.4	54.0	Noise Floor

* CORRECTED READING = METER READING + ANTENNA FACTOR + CABLE LOSS - AMPLIFIER GAIN
** DELTA = SPEC LIMIT - CORRECTED READING

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RADIATED EMISSIONS (FCC SECTION 15.205 AND 15.247)

COMPANY	Kar Tech	DATE	8/18/03
EUT	Versa Remote Transmitter Module	DUTY CYCLE	N/A
MODEL	VRTS	PEAK TO AVG	N/A
S/N	NONE	TEST DIST.	3 METERS
TEST ENGINEER	Carlos Sandoval	LAB	J

Frequency MHz	Peak Reading (dBuV)	Average (A) or Quasi-Peak (QP)		Antenna Polar. (V or H)	Antenna Height (meters)	EUT Azimuth (degrees)	EUT Axis (X,Y,Z)	EUT Tx Channel	Antenna Factor (dB)	Cable Loss (dB)	Amplifier Gain (dB)	*Corrected Reading (dBuV/m)	Delta ** (dB)	Spec Limit (dBuV/m)	Comments
8127.0000	44.4	33.6	A	H			X	LOW	38.7	3.8	29.1	**47.0**	**-7.0**	**54.0**	**Noise Floor**
8127.0000	44.3	33.6	A	H			Y	LOW	38.7	3.8	29.1	**47.0**	**-7.0**	**54.0**	**Noise Floor**
8127.0000	44.0	33.6	A	H			Z	LOW	38.7	3.8	29.1	**47.0**	**-7.0**	**54.0**	**Noise Floor**
8127.0000	43.8	33.5	A	V			X	LOW	38.7	3.8	29.1	**46.9**	**-7.1**	**54.0**	**Noise Floor**
8127.0000	42.9	32.9	A	V			Y	LOW	38.7	3.8	29.1	**46.3**	**-7.7**	**54.0**	**Noise Floor**
8127.0000	43.6	32.9	A	V			Z	LOW	38.7	3.8	29.1	**46.3**	**-7.7**	**54.0**	**Noise Floor**
8235.0000	44.8	33.4	A	H			X	MED.	38.8	3.7	29.1	**46.9**	**-7.1**	**54.0**	**Noise Floor**
8235.0000	43.4	33.5	A	H			Y	MED.	38.8	3.7	29.1	**47.0**	**-7.0**	**54.0**	**Noise Floor**
8235.0000	44.2	33.0	A	H			Z	MED.	38.8	3.7	29.1	**46.5**	**-7.5**	**54.0**	**Noise Floor**
8235.0000	45.2	33.4	A	V			X	MED.	38.8	3.7	29.1	**46.9**	**-7.1**	**54.0**	**Noise Floor**
8235.0000	44.3	32.7	A	V			Y	MED.	38.8	3.7	29.1	**46.2**	**-7.8**	**54.0**	**Noise Floor**
8235.0000	44.3	33.0	A	V			Z	MED.	38.8	3.7	29.1	**46.5**	**-7.5**	**54.0**	**Noise Floor**
8338.5000	42.9	33.5	A	H			X	HIGH	38.9	3.7	29.0	**47.1**	**-6.9**	**54.0**	**Noise Floor**
8338.5000	44.8	33.6	A	H			Y	HIGH	38.9	3.7	29.0	**47.2**	**-6.8**	**54.0**	**Noise Floor**
8338.5000	44.8	33.5	A	H			Z	HIGH	38.9	3.7	29.0	**47.1**	**-6.9**	**54.0**	**Noise Floor**
8338.5000	43.3	33.5	A	V			X	HIGH	38.9	3.7	29.0	**47.1**	**-6.9**	**54.0**	**Noise Floor**
8338.5000	43.6	32.8	A	V			Y	HIGH	38.9	3.7	29.0	**46.4**	**-7.6**	**54.0**	**Noise Floor**
8338.5000	43.3	33.5	A	V			Z	HIGH	38.9	3.7	29.0	**47.1**	**-6.9**	**54.0**	**Noise Floor**

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** DELTA = SPEC LIMIT - CORRECTED READING

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RADIATED EMISSIONS (FCC SECTION 15.205 AND 15.247)

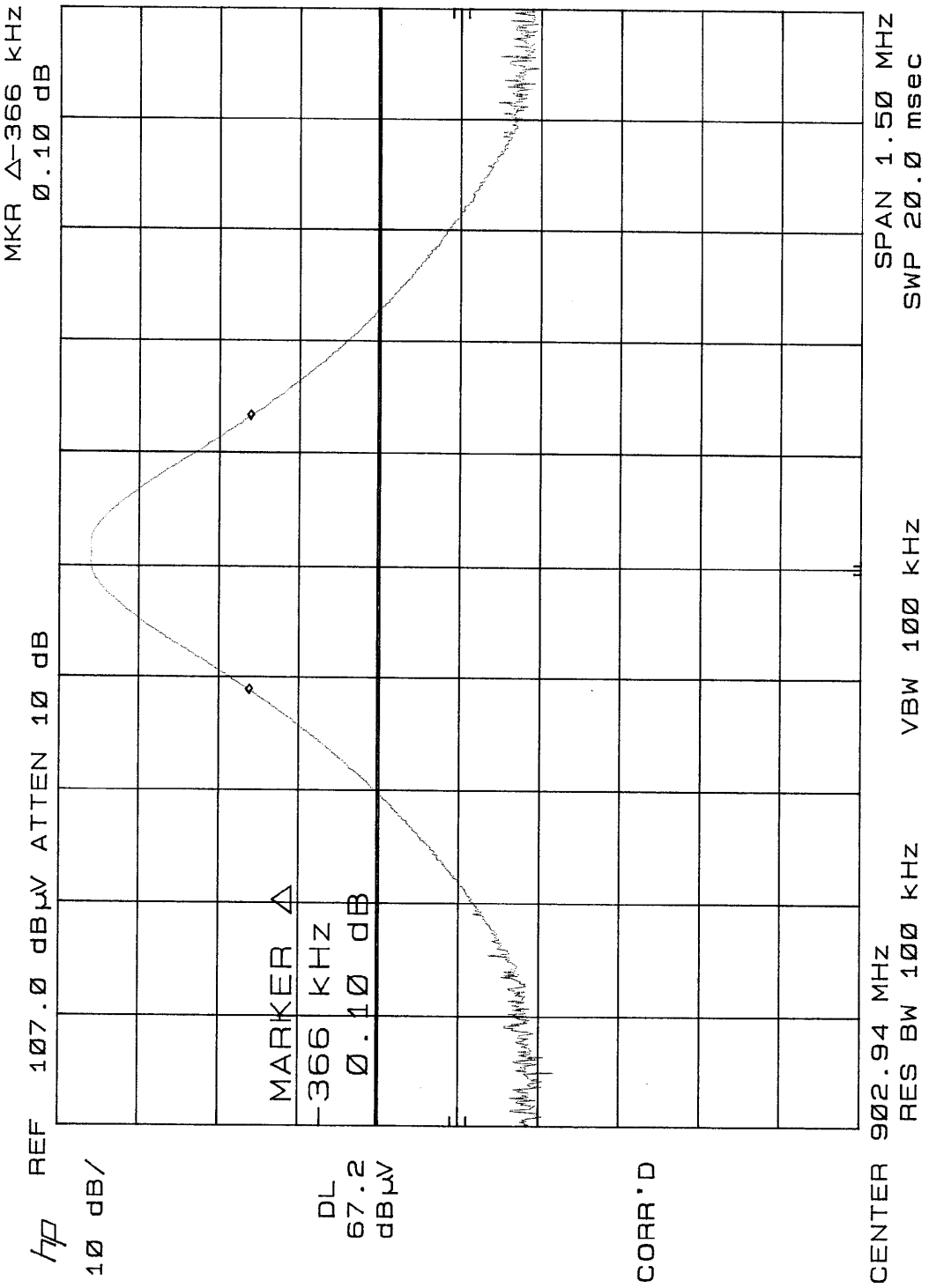
COMPANY	Kar Tech	DATE	8/18/03
EUT	Versa Remote Transmitter Module	DUTY CYCLE	N/A
MODEL	VRTS	PEAK TO AVG	N/A
S/N	NONE	TEST DIST.	3 METERS
TEST ENGINEER	Carlos Sandoval	LAB	J

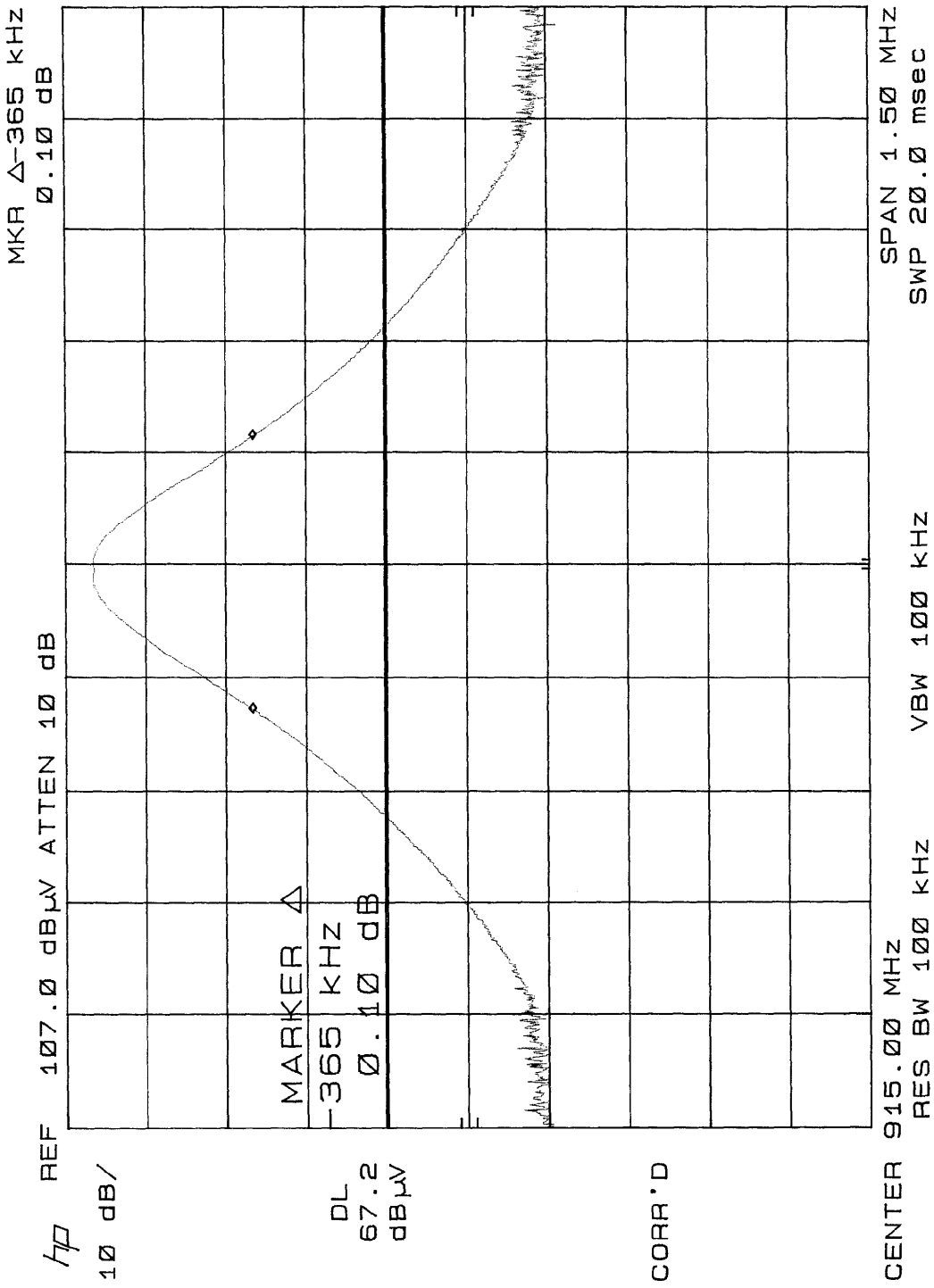
Frequency MHz	Peak Reading (dBuV)	Average (A) or Quasi-Peak (QP)		Antenna Polar. (V or H)	Antenna Height (meters)	EUT Azimuth (degrees)	EUT Axis (X,Y,Z)	EUT Tx Channel	Antenna Factor (dB)	Cable Loss (dB)	Amplifier Gain (dB)	*Corrected Reading (dBuV/m)	Delta ** (dB)	Spec Limit (dBuV/m)	Comments
9030.0000	43.7	33.0	A	H			X	LOW	38.0	3.7	28.9	**45.9**	**-8.1**	**54.0**	**Noise Floor**
9030.0000	43.1	33.1	A	H			Y	LOW	38.0	3.7	28.9	**46.0**	**-8.0**	**54.0**	**Noise Floor**
9030.0000	43.5	33.3	A	H			Z	LOW	38.0	3.7	28.9	**46.2**	**-7.8**	**54.0**	**Noise Floor**
9030.0000	43.6	33.0	A	V			X	LOW	38.0	3.7	28.9	**45.9**	**-8.1**	**54.0**	**Noise Floor**
9030.0000	43.6	32.6	A	V			Y	LOW	38.0	3.7	28.9	**45.5**	**-8.5**	**54.0**	**Noise Floor**
9030.0000	43.5	32.5	A	V			Z	LOW	38.0	3.7	28.9	**45.4**	**-8.6**	**54.0**	**Noise Floor**
9150.0000	43.0	33.2	A	H			X	MED.	38.4	3.9	28.8	**46.7**	**-7.3**	**54.0**	**Noise Floor**
9150.0000	43.6	33.3	A	H			Y	MED.	38.4	3.9	28.8	**46.8**	**-7.2**	**54.0**	**Noise Floor**
9150.0000	43.9	33.3	A	H			Z	MED.	38.4	3.9	28.8	**46.8**	**-7.2**	**54.0**	**Noise Floor**
9150.0000	42.2	33.2	A	V			X	MED.	38.4	3.9	28.8	**46.7**	**-7.3**	**54.0**	**Noise Floor**
9150.0000	43.8	32.7	A	V			Y	MED.	38.4	3.9	28.8	**46.2**	**-7.8**	**54.0**	**Noise Floor**
9150.0000			A	V			Z	MED.	38.4	3.9	28.8			**54.0**	
9265.0000			A	H			X	HIGH	38.8	4.0	28.7			**54.0**	
9265.0000			A	H			Y	HIGH	38.8	4.0	28.7			**54.0**	
9265.0000			A	H			Z	HIGH	38.8	4.0	28.7			**54.0**	
9265.0000			A	V			X	HIGH	38.8	4.0	28.7			**54.0**	
9265.0000			A	V			Y	HIGH	38.8	4.0	28.7			**54.0**	
9265.0000			A	V			Z	HIGH	38.8	4.0	28.7			**54.0**	

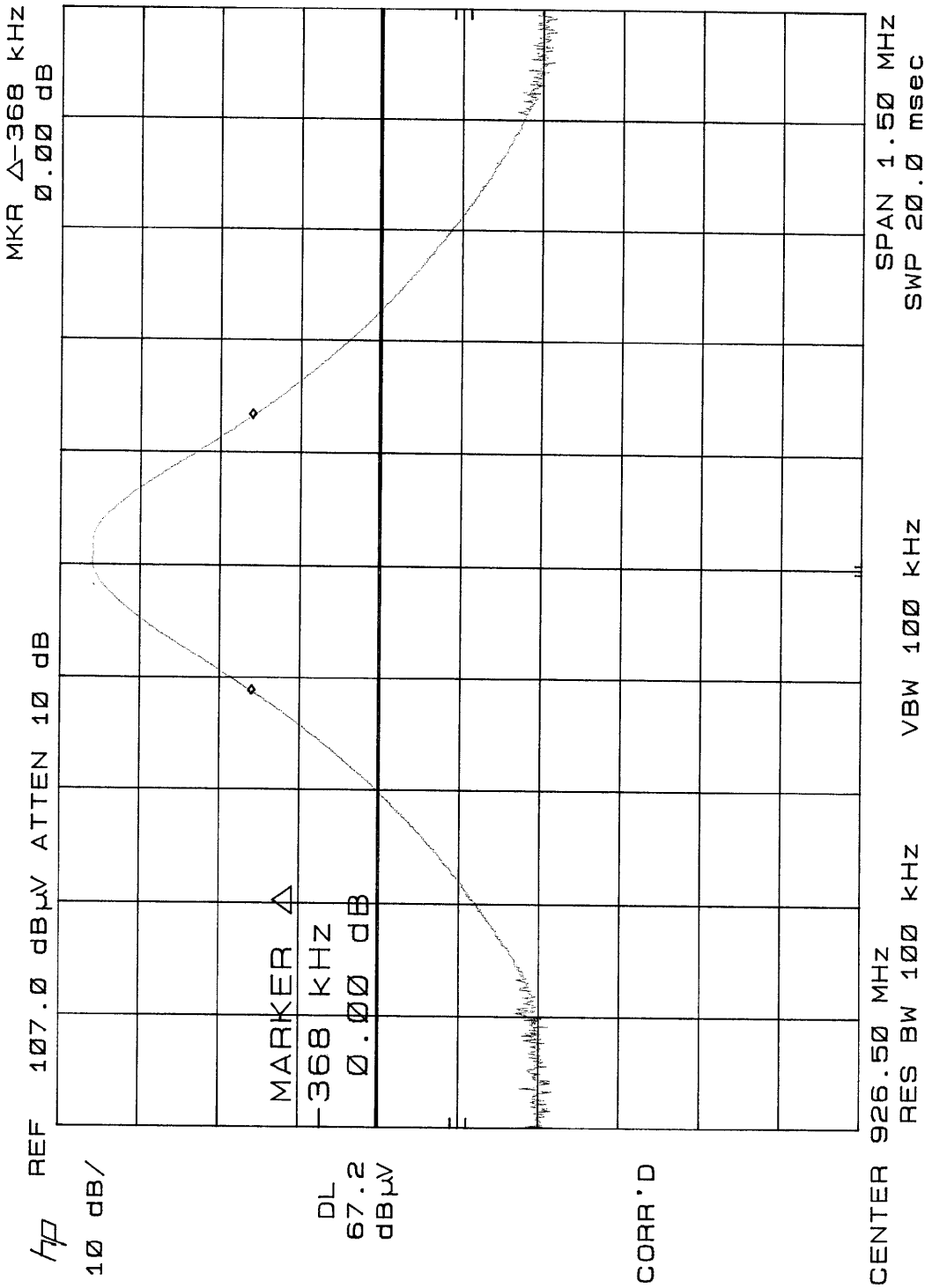
* CORRECTED READING = METER READING + ANTENNA FACTOR + CABLE LOSS - AMPLIFIER GAIN
** DELTA = SPEC LIMIT - CORRECTED READING

-20 dB BANDWIDTH

DATA SHEETS

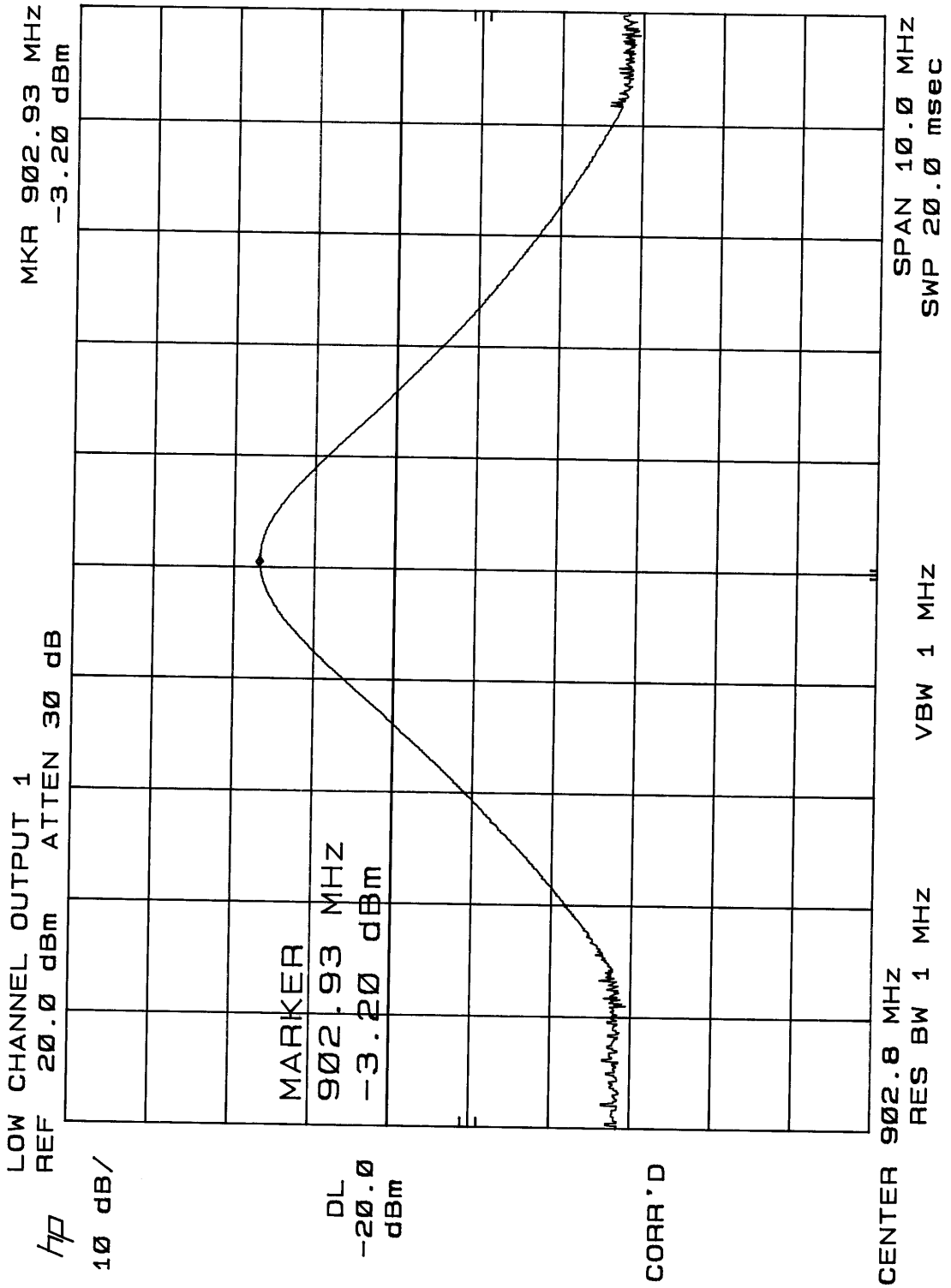

MKR Δ-366 kHz
Ø.1Ø dB
SPAN 1.5Ø MHz
SWP 2Ø.Ø msec
REF 1Ø7.Ø dBμV ATTEN 1Ø dB
VBW 1ØØ kHz
MARKER Δ
-366 kHz
Ø.1Ø dB
hp
1Ø dB/
DL
67.2
dBμV
CORR'D
CENTER 9Ø2.94 MHz
RES BW 1ØØ kHz

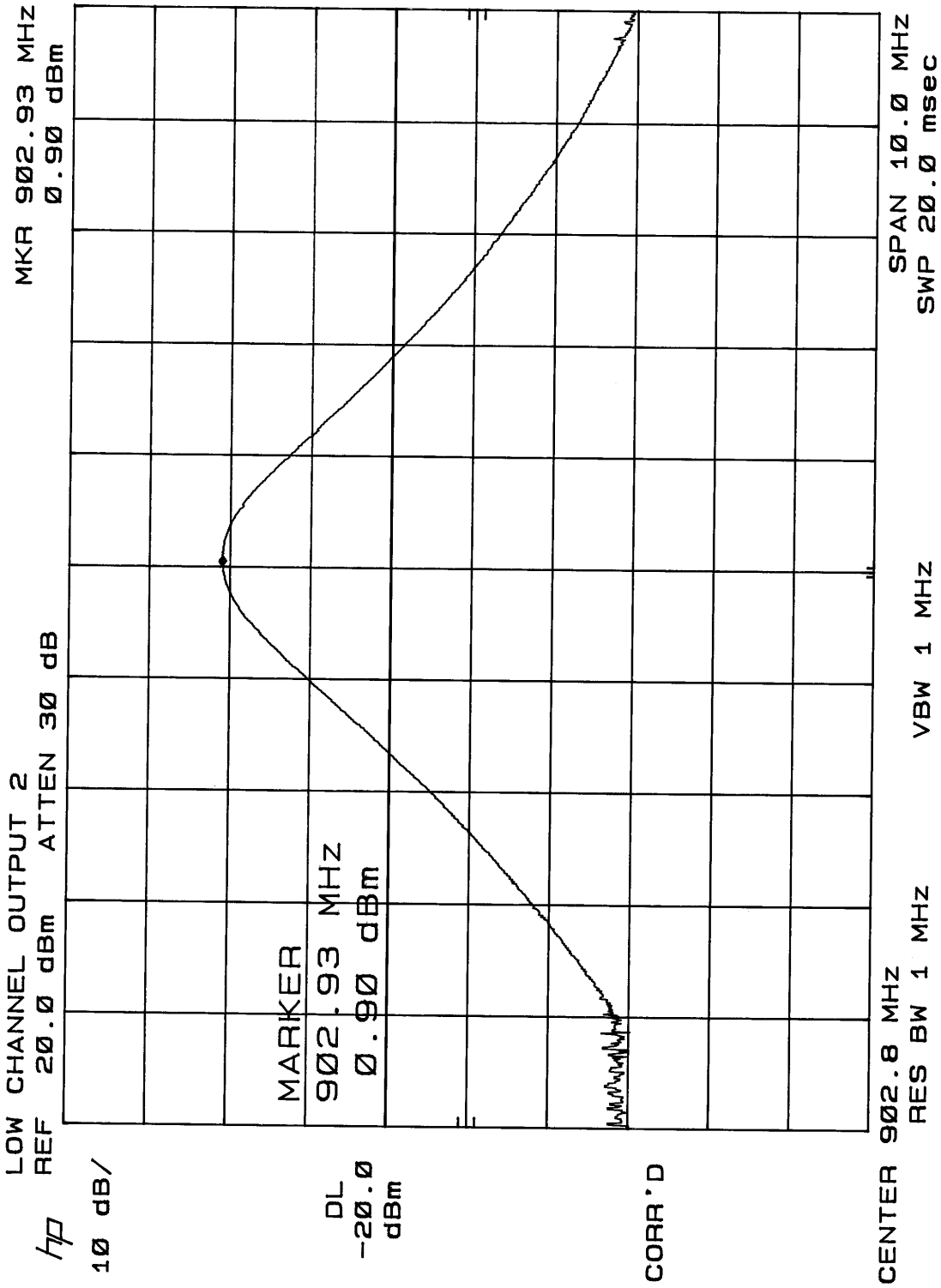

MKR Δ-365 kHz
Ø.1Ø dB
SPAN 1.5Ø MHz
SWP 2Ø.Ø msec
REF 1Ø7.Ø dBµV ATTEN 1Ø dB
VBW 1ØØ kHz
MARKER Δ
-365 kHz
Ø.1Ø dB
1Ø dB/
DL
67.2
dBµV
CORR'D
CENTER 915.ØØ MHz
RES BW 1ØØ kHz

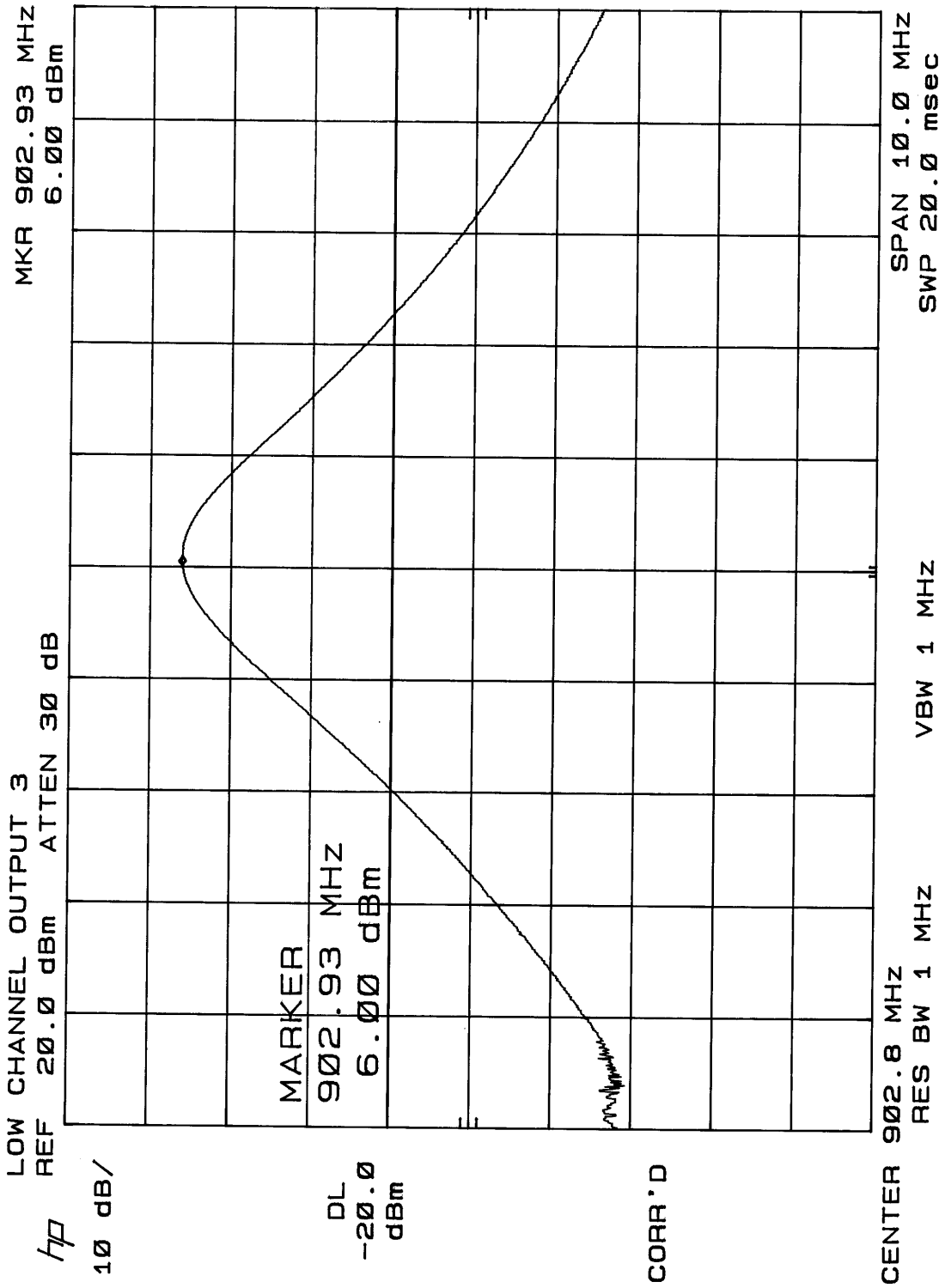

MKR Δ-368 kHz
0.00 dB
SPAN 1.50 MHz
SWP 20.0 msec
REF 107.0 dBµV ATTEN 10 dB
VBW 100 kHz
MARKER Δ
-368 kHz
0.00 dB
10 dB/
DL
67.2
dBµV
CORR'D
CENTER 926.50 MHz
RES BW 100 kHz

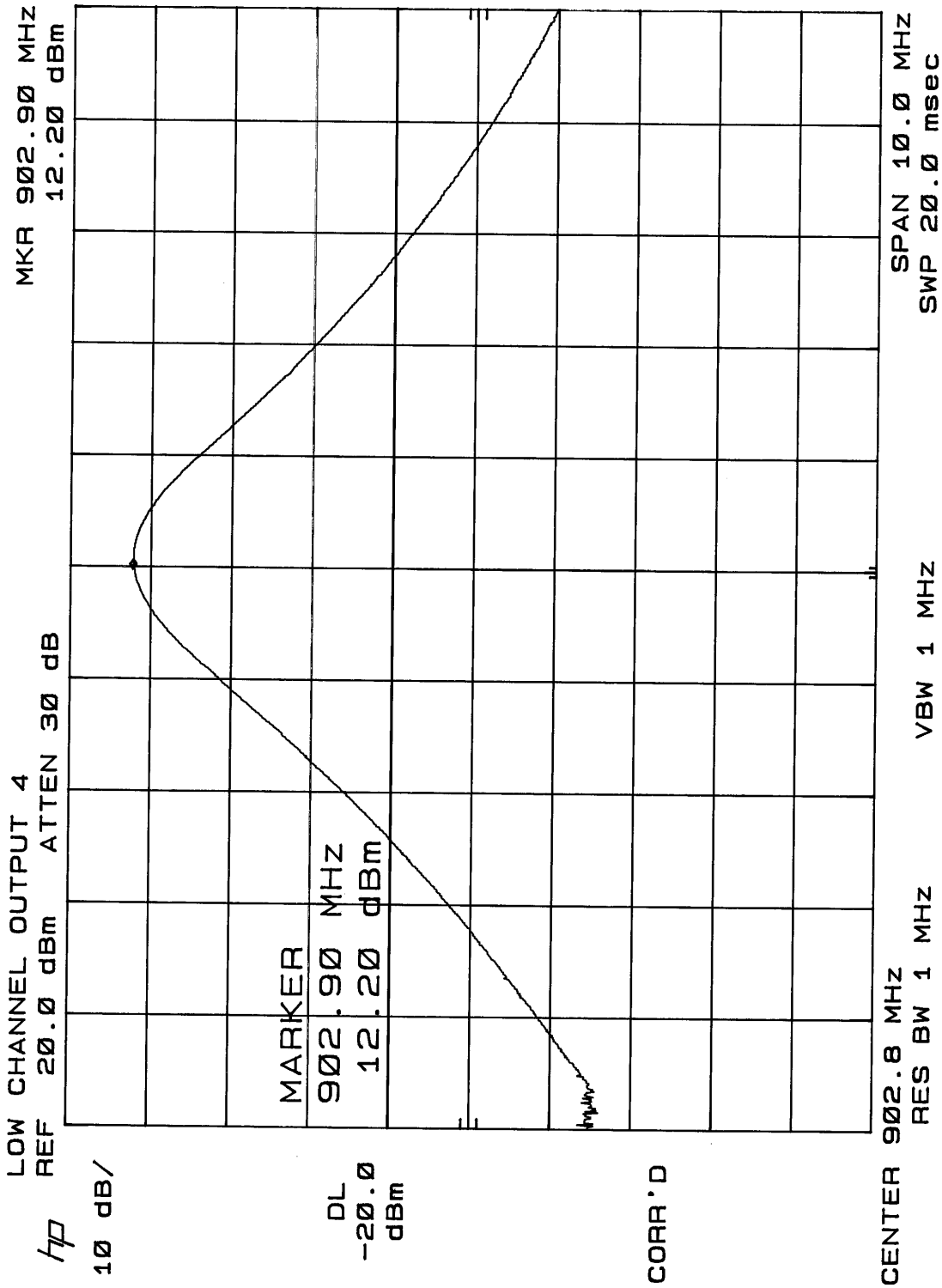
PEAK POWER OUTPUT

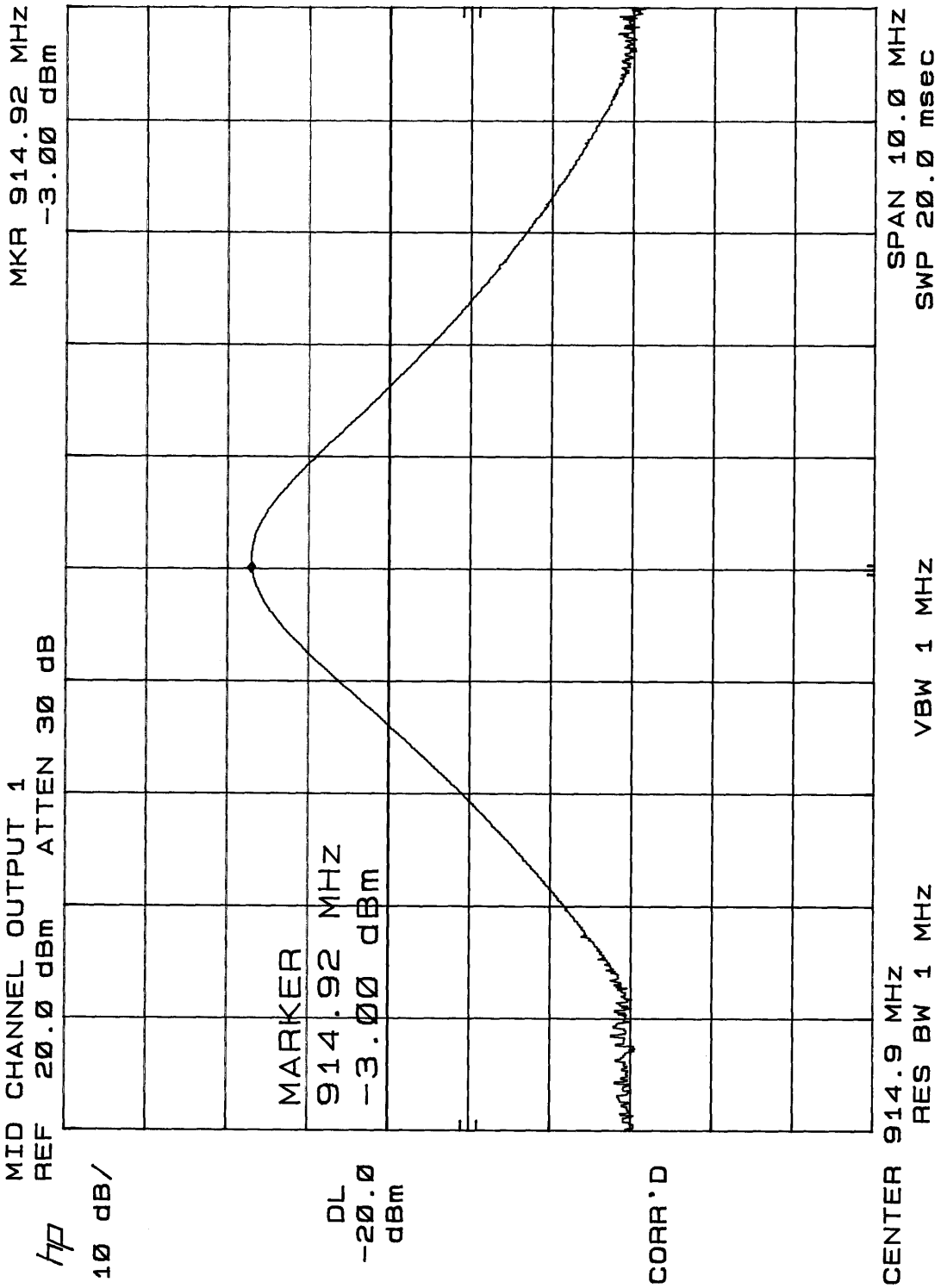
DATA SHEETS

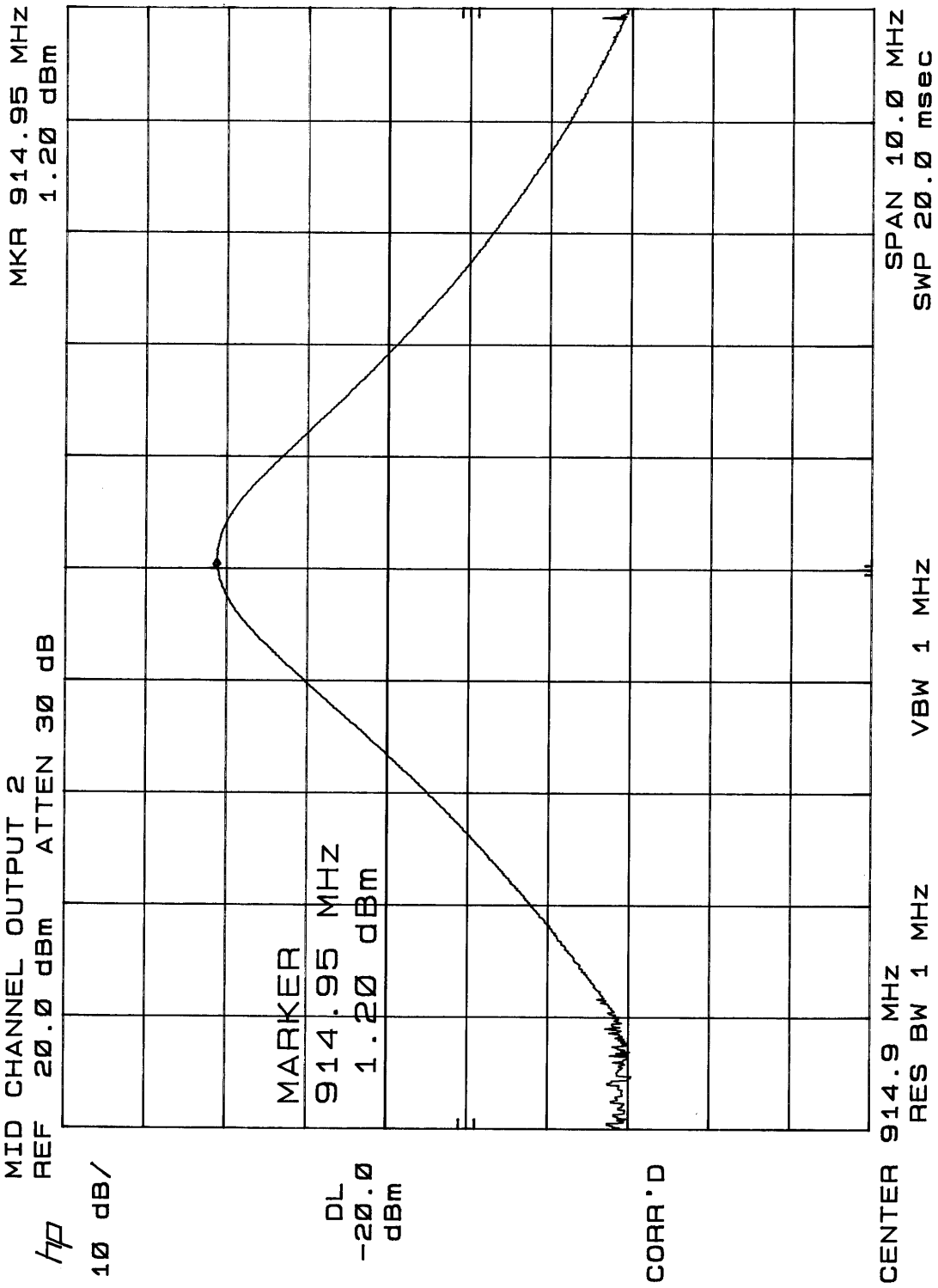

MKR 902.93 MHz
-3.20 dBm
SPAN 10.0 MHz
SWP 20.0 msec
LOW CHANNEL OUTPUT 1
REF 20.0 dBm
ATTEN 30 dB
VBW 1 MHz
MARKER
902.93 MHz
-3.20 dBm
10 dB/
DL
-20.0
dBm
CORR'D
CENTER 902.8 MHz
RES BW 1 MHz

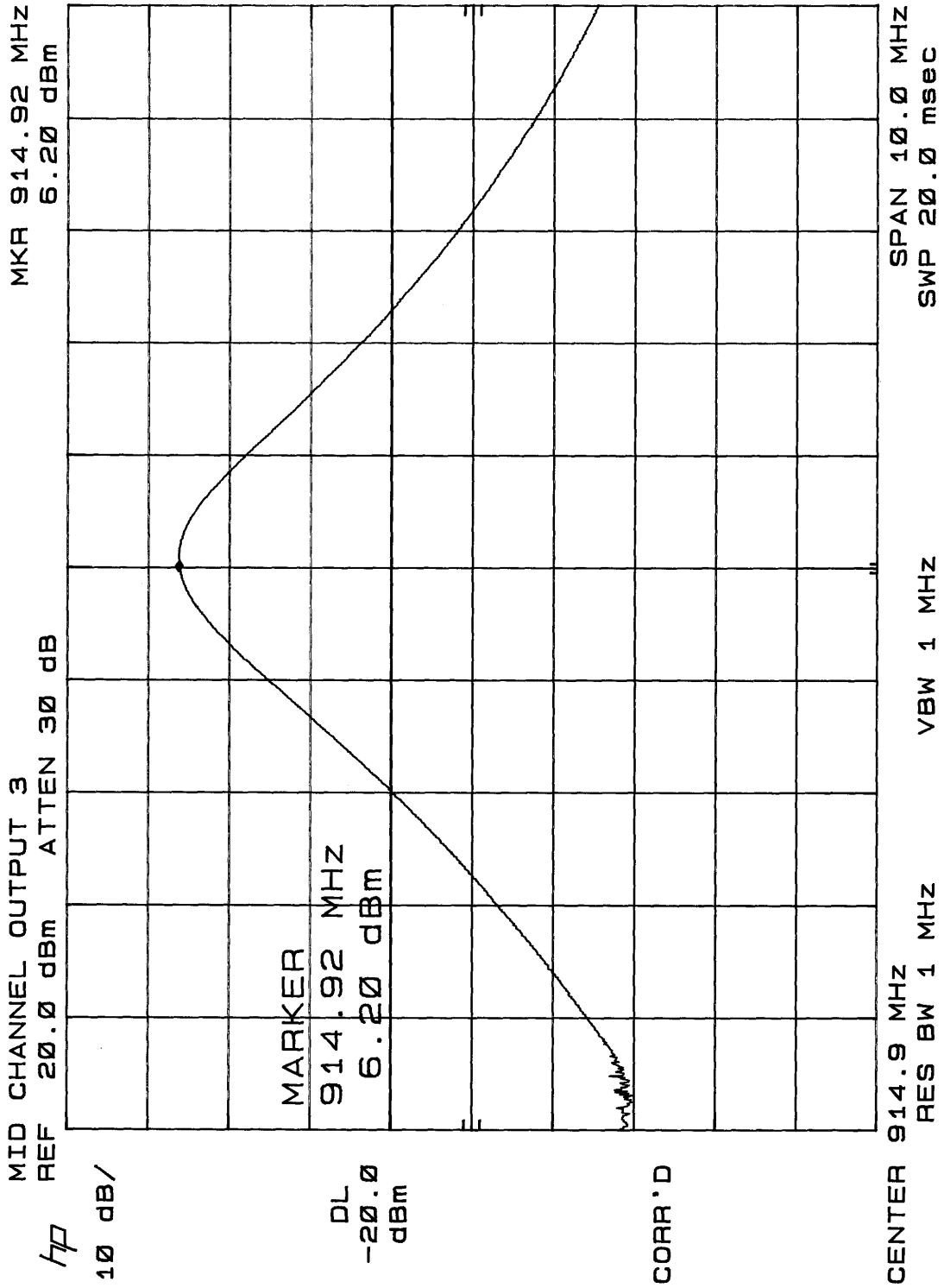

MKR 902.93 MHz
0.90 dBm
SPAN 10.0 MHz
SWP 20.0 msec
LOW CHANNEL OUTPUT 2
REF 20.0 dBm
ATTEN 30 dB
VBW 1 MHz
MARKER
902.93 MHz
0.90 dBm
10 dB/
DL
-20.0
dBm
CORR'D
CENTER 902.8 MHz
RES BW 1 MHz

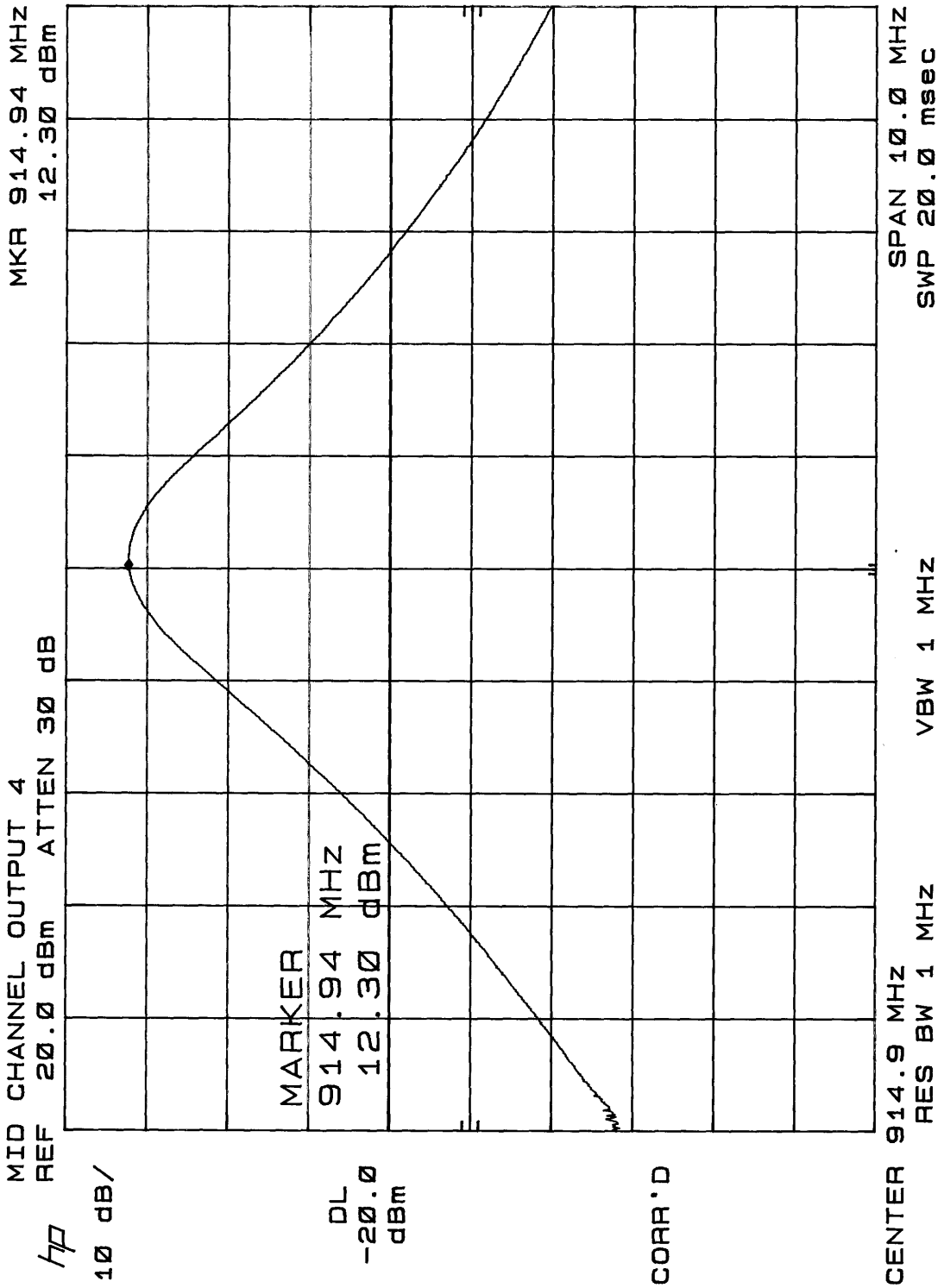

MKR 902.93 MHz
6.00 dBm
SPAN 10.0 MHz
SWP 20.0 msec
LOW CHANNEL OUTPUT 3
REF 20.0 dBm
ATTEN 30 dB
VBW 1 MHz
MARKER
902.93 MHz
6.00 dBm
10 dB/
DL
-20.0
dBm
CORR'D
CENTER 902.8 MHz
RES BW 1 MHz

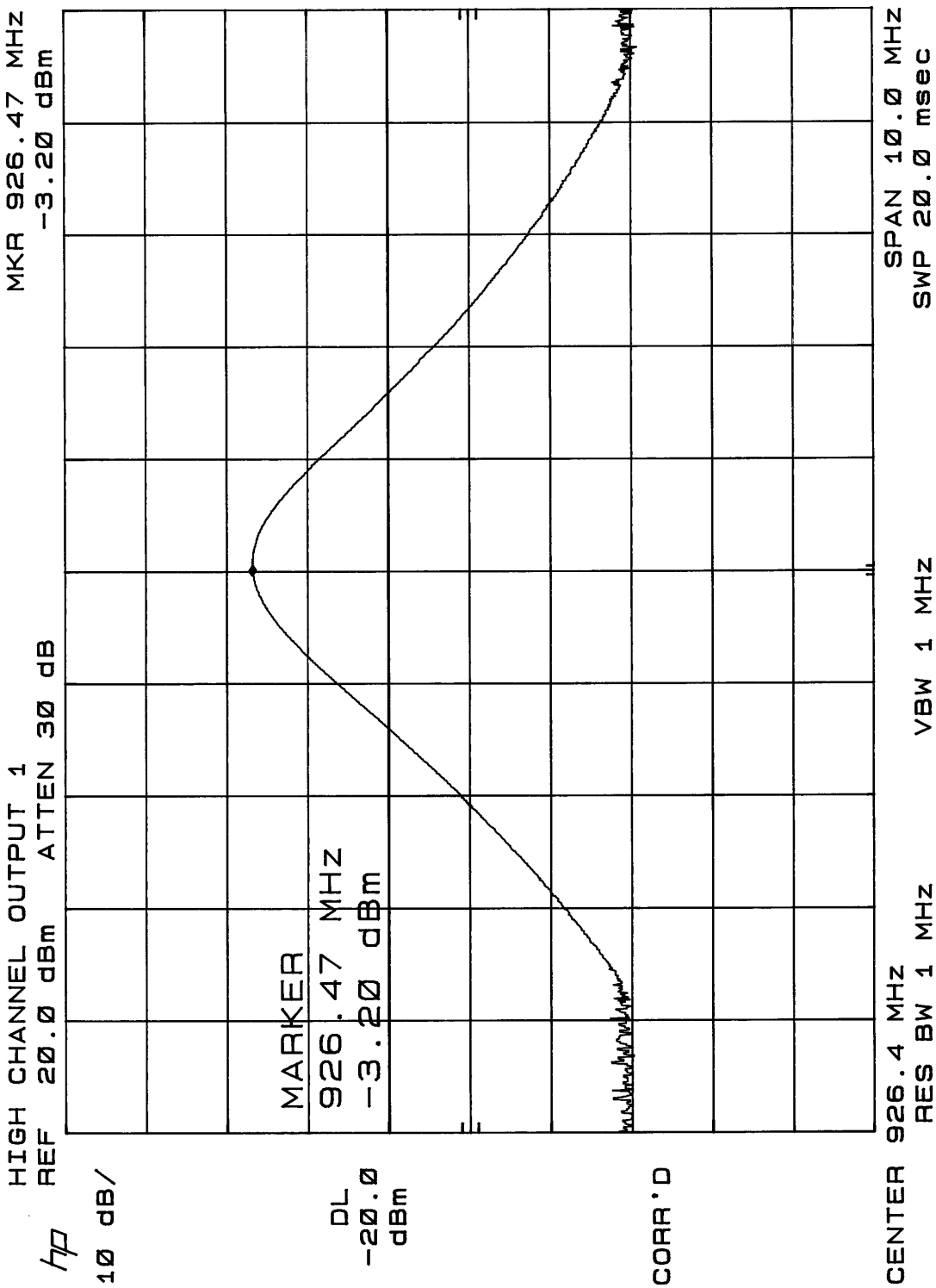

LOW CHANNEL OUTPUT 4
REF 20.0 dBm
ATTEN 30 dB
10 dB/
MKR 902.90 MHz
12.20 dBm
MARKER
902.90 MHz
12.20 dBm
DL
-20.0
dBm
CORR'D
CENTER 902.8 MHz
RES BW 1 MHz
VBW 1 MHz
SPAN 10.0 MHz
SWP 20.0 msec

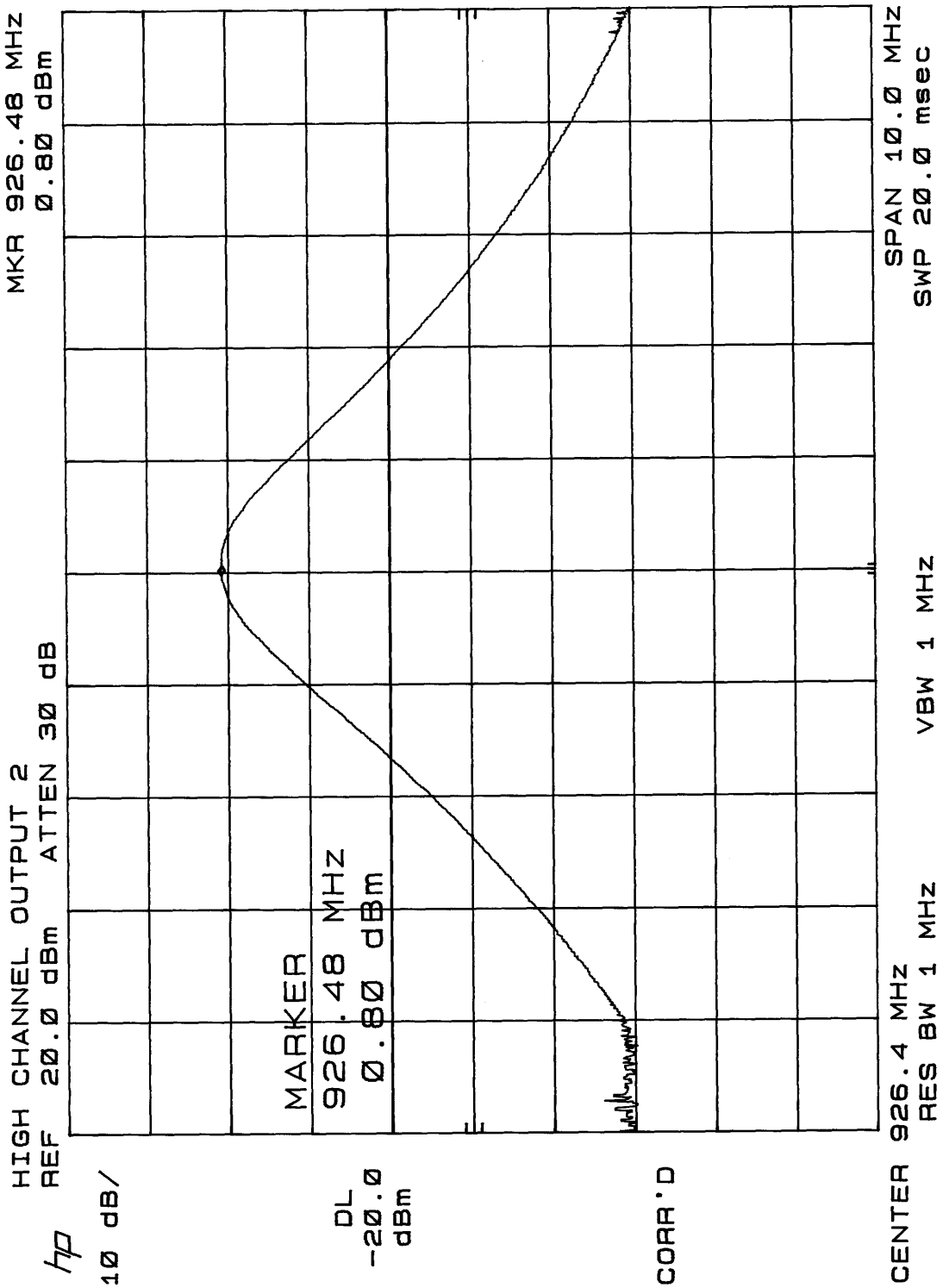

MKR 914.92 MHz
-3.00 dBm
SPAN 10.0 MHz
SWP 20.0 msec
MID CHANNEL OUTPUT 1
REF 20.0 dBm
ATTEN 30 dB
VBW 1 MHz
MARKER
914.92 MHz
-3.00 dBm
10 dB/
DL
-20.0
dBm
CORR'D
CENTER 914.9 MHz
RES BW 1 MHz

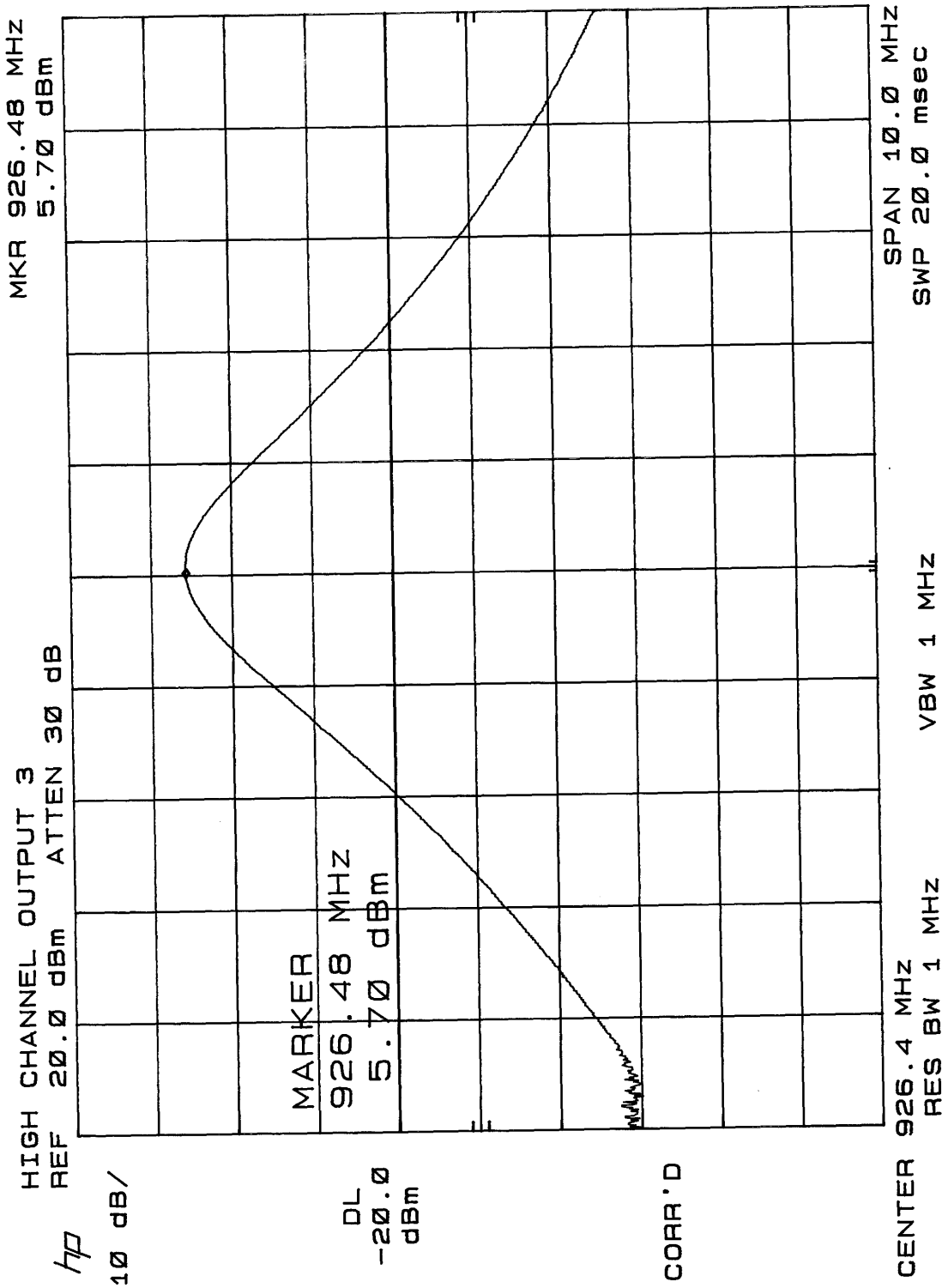

MKR 914.95 MHz
1.20 dBm
SPAN 10.0 MHz
SWP 20.0 msec
MID CHANNEL OUTPUT 2
REF 20.0 dBm
ATTEN 30 dB
VBW 1 MHz
MARKER
914.95 MHz
1.20 dBm
10 dB/
DL
-20.0
dBm
CORR'D
CENTER 914.9 MHz
RES BW 1 MHz

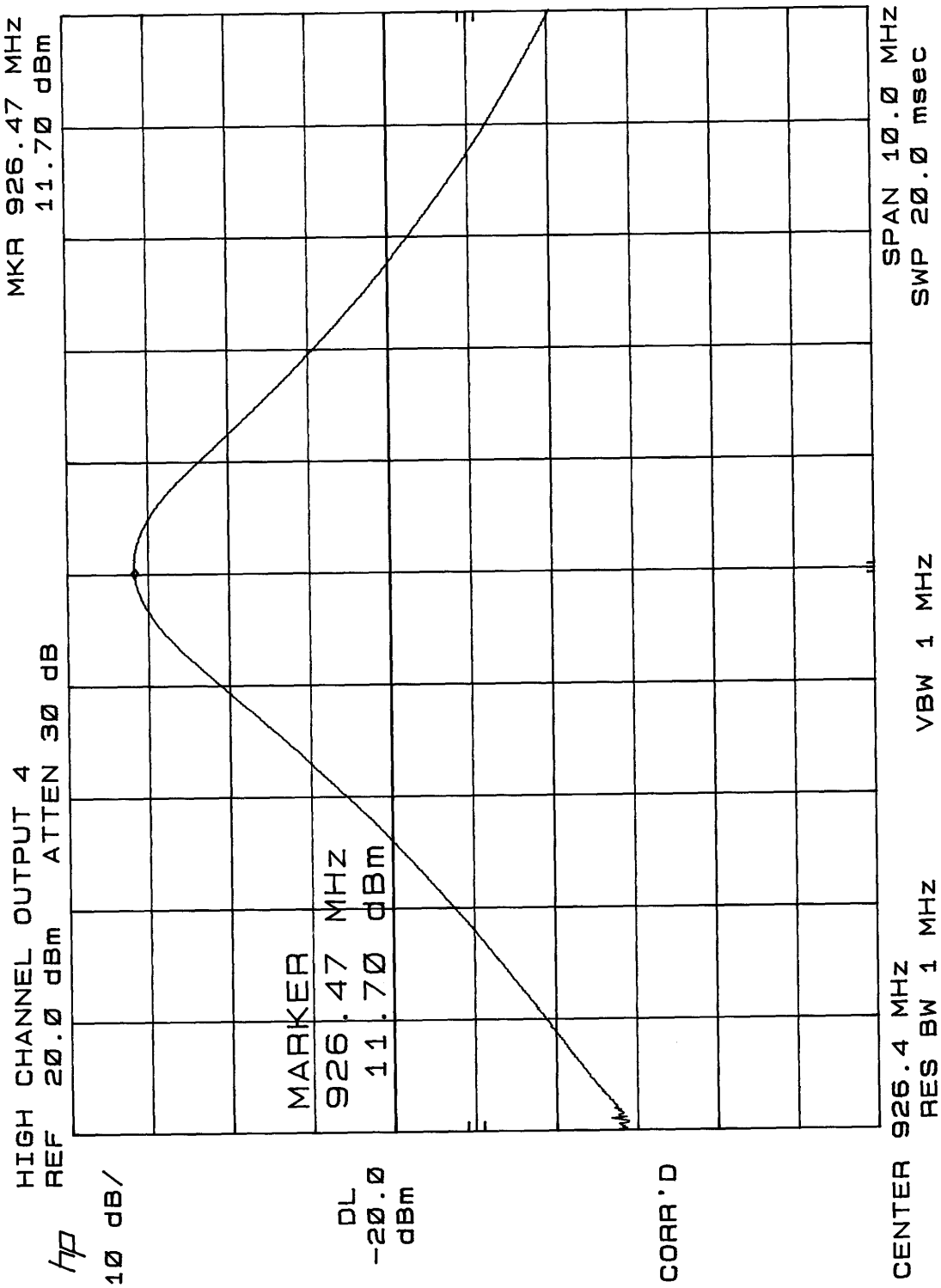

MKR 914.92 MHz
6.20 dBm
SPAN 10.0 MHz
SWP 20.0 msec
MID CHANNEL OUTPUT 3
REF 20.0 dBm ATTEN 30 dB
VBW 1 MHz
MARKER
914.92 MHz
6.20 dBm
10 dB/
DL
-20.0
dBm
CORR'D
CENTER 914.9 MHz
RES BW 1 MHz


MKR 914.94 MHz
12.30 dBm
SPAN 10.0 MHz
SWP 20.0 msec
MID CHANNEL OUTPUT 4
REF 20.0 dBm
ATTEN 30 dB
VBW 1 MHz
MARKER
914.94 MHz
12.30 dBm
10 dB/
DL
-20.0
dBm
CORR'D
CENTER 914.9 MHz
RES BW 1 MHz


MKR 926.47 MHz
-3.20 dBm
SPAN 10.0 MHz
SWP 20.0 msec
HIGH CHANNEL OUTPUT 1
REF 20.0 dBm
ATTEN 30 dB
VBW 1 MHz
MARKER
926.47 MHz
-3.20 dBm
10 dB/
DL
-20.0 dBm
CORR'D
CENTER 926.4 MHz
RES BW 1 MHz

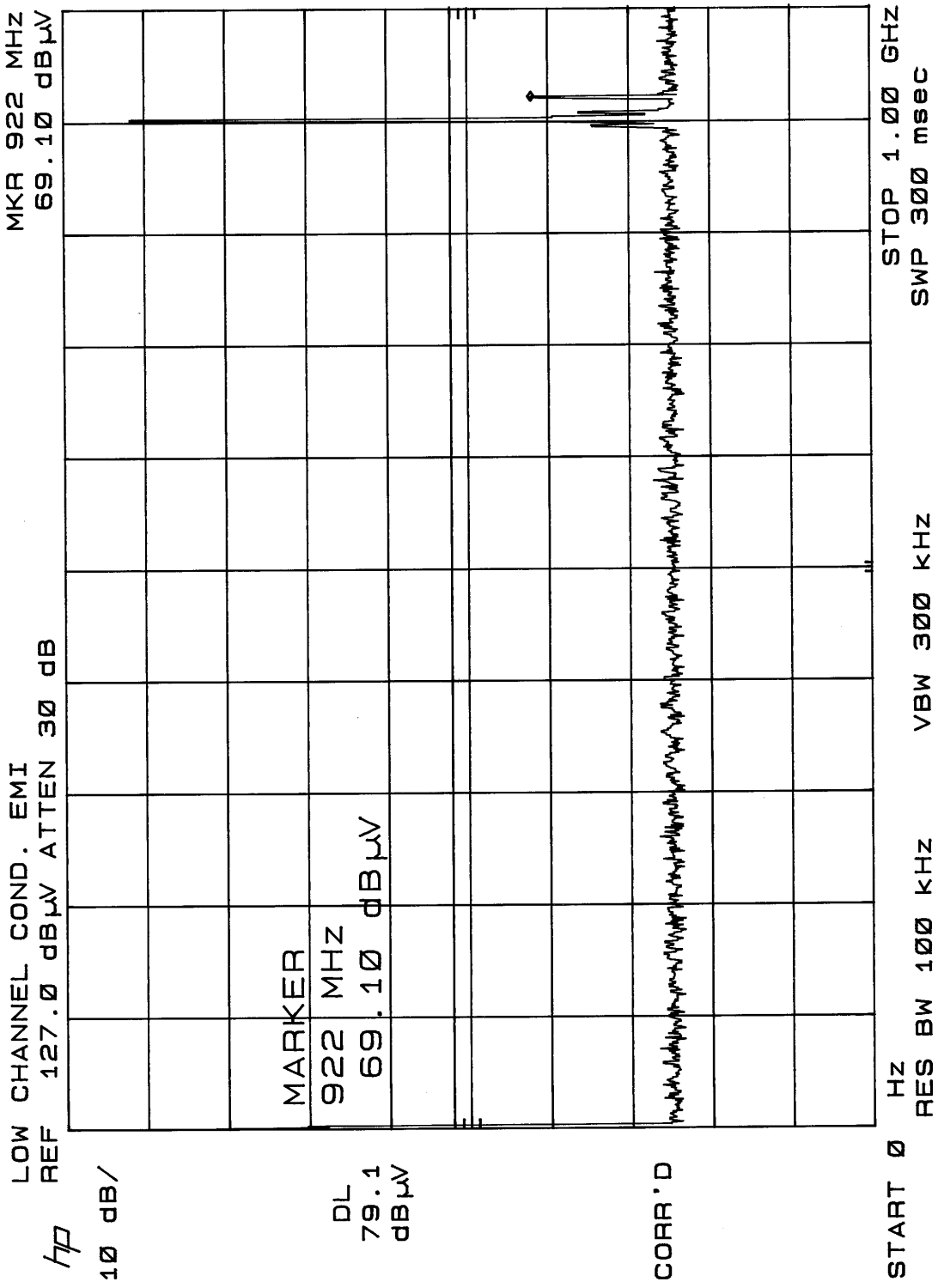

MKR 926.48 MHz
0.80 dBm
SPAN 10.0 MHz
SWP 20.0 msec
HIGH CHANNEL OUTPUT 2
REF 20.0 dBm
ATTEN 30 dB
VBW 1 MHz
MARKER
926.48 MHz
0.80 dBm
hp
10 dB/
DL
-20.0
dBm
CORR'D
CENTER 926.4 MHz
RES BW 1 MHz

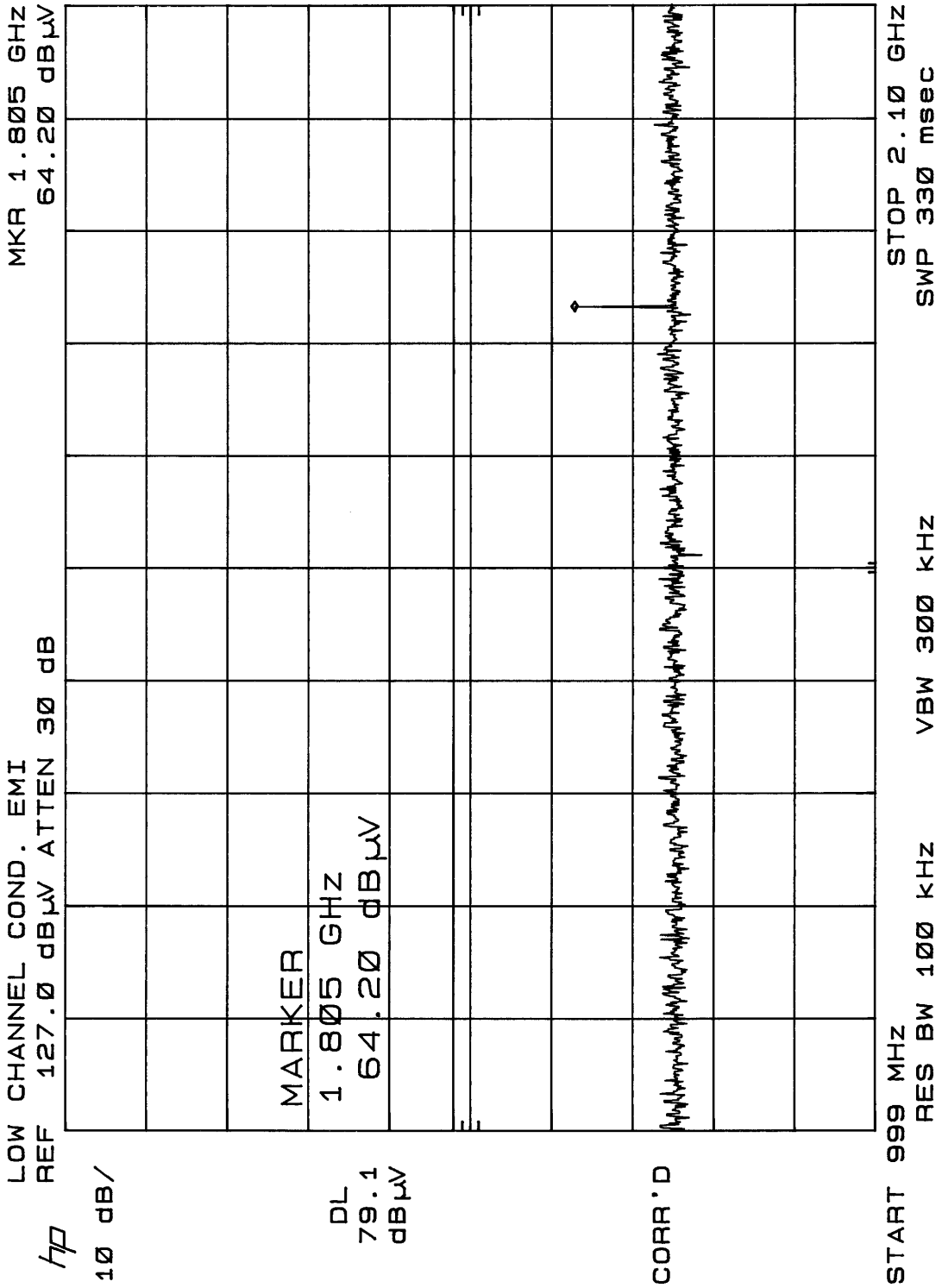

MKR 926.48 MHz
5.70 dBm
SPAN 10.0 MHz
SWP 20.0 msec
HIGH CHANNEL OUTPUT 3
REF 20.0 dBm
ATTEN 30 dB
VBW 1 MHz
MARKER
926.48 MHz
5.70 dBm
10 dB/
DL
-20.0
dBm
CORR'D
CENTER 926.4 MHz
RES BW 1 MHz

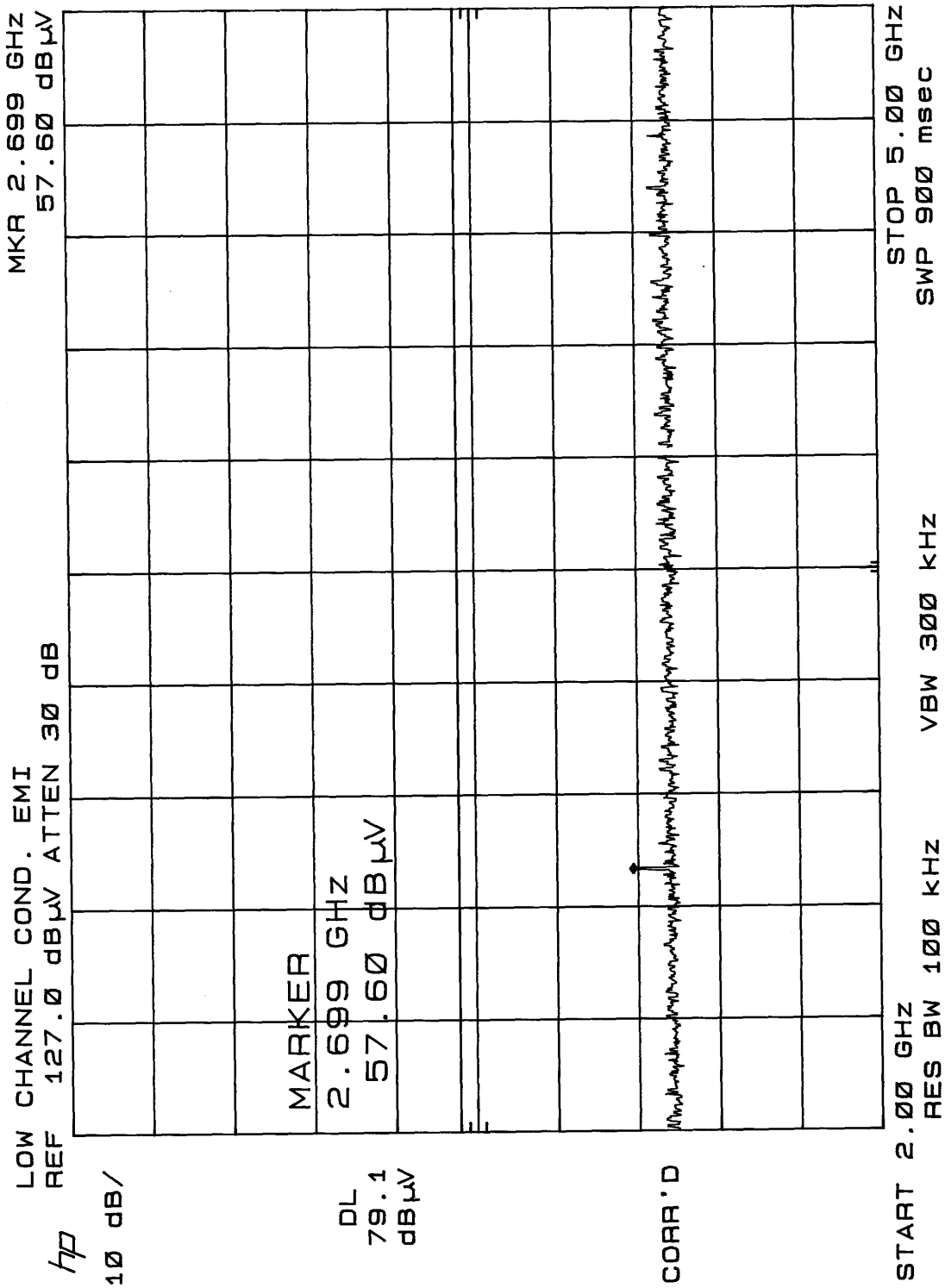

MKR 926.47 MHz
11.70 dBm
SPAN 10.0 MHz
SWP 20.0 msec
HIGH CHANNEL OUTPUT 4
REF 20.0 dBm ATTEN 30 dB
VBW 1 MHz
MARKER
926.47 MHz
11.70 dBm
10 dB/
DL
-20.0
dBm
CORR'D
CENTER 926.4 MHz
RES BW 1 MHz

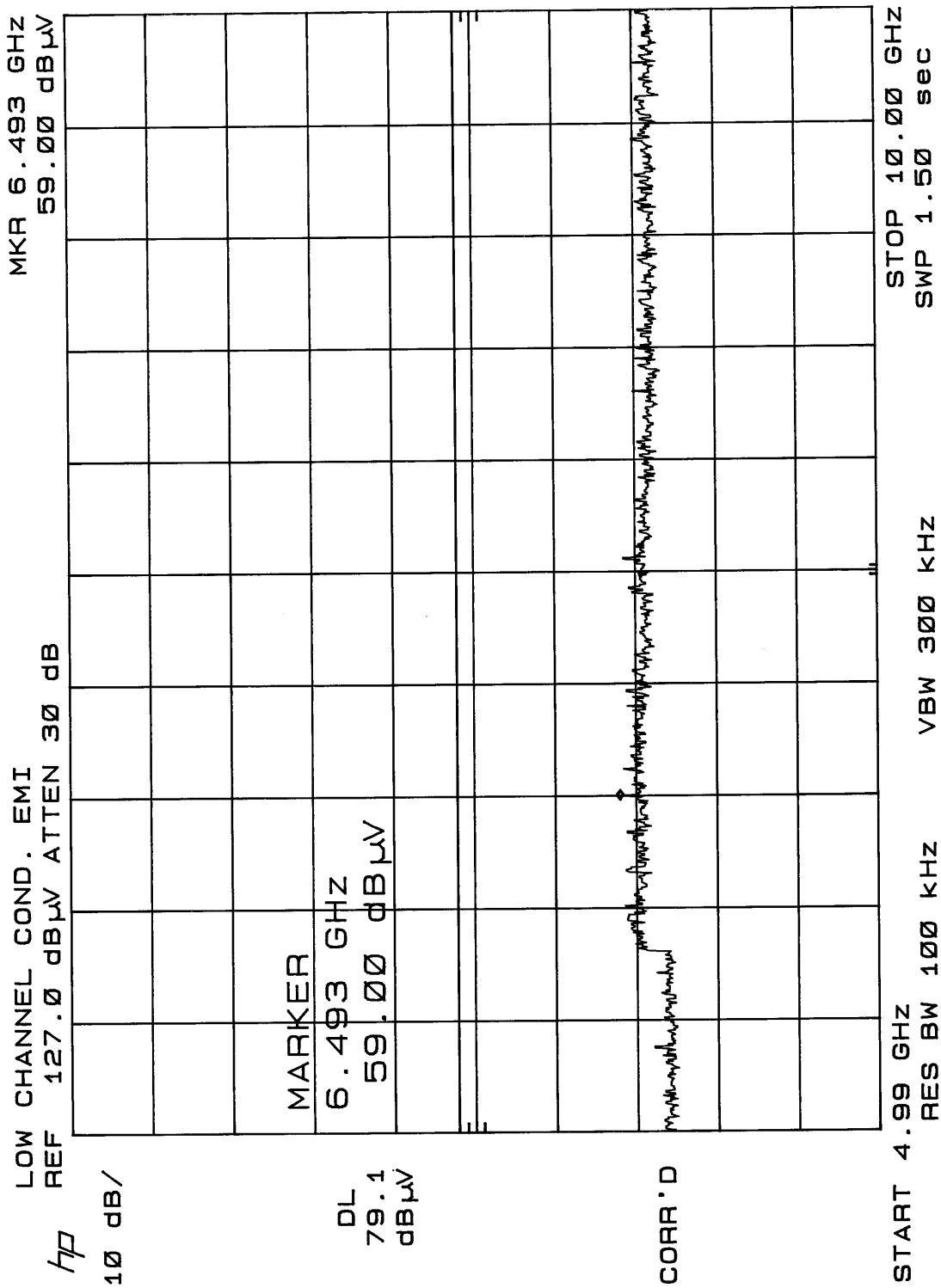
RF CONDUCTED ANTENNA TEST

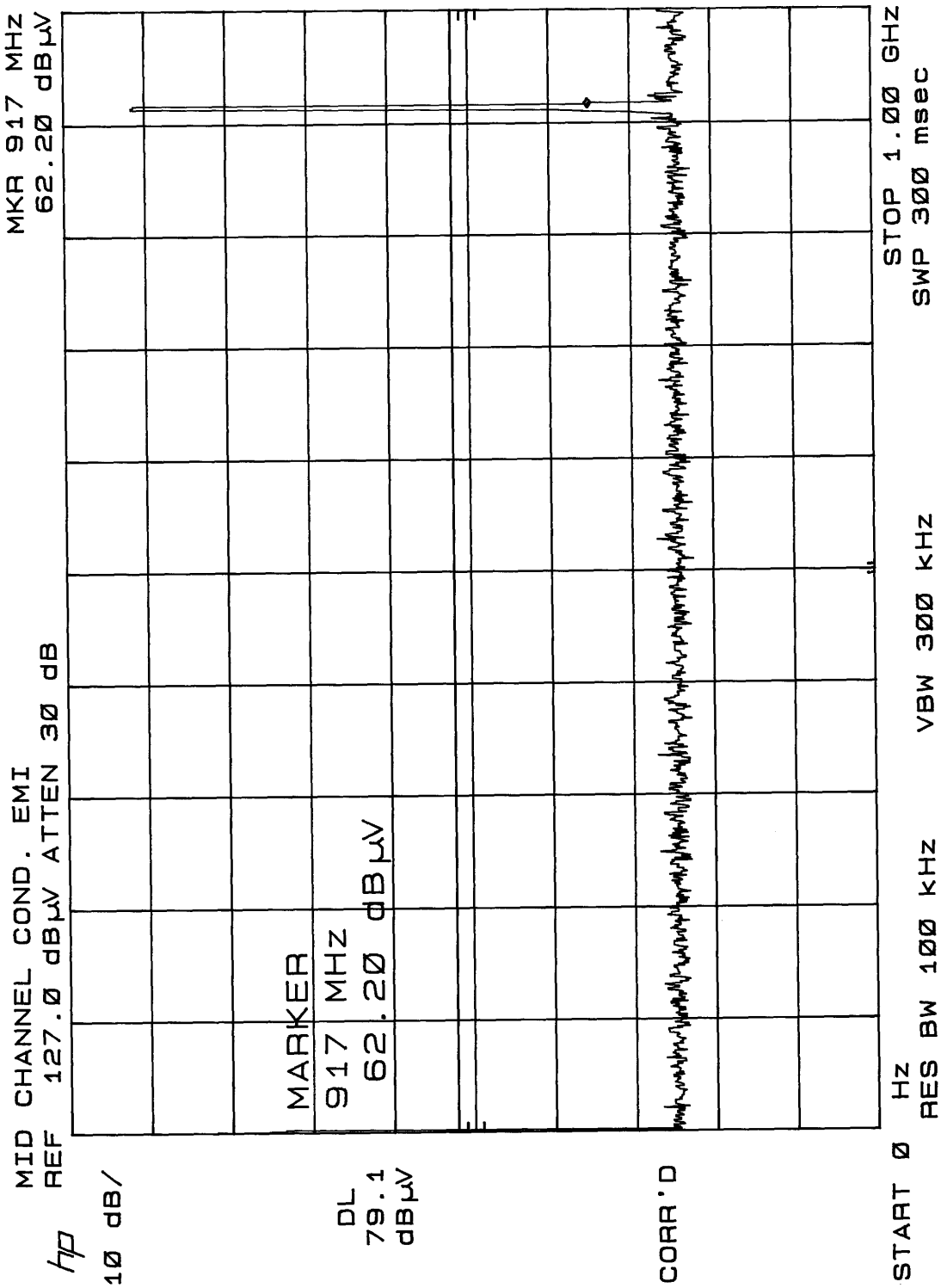
DATA SHEETS

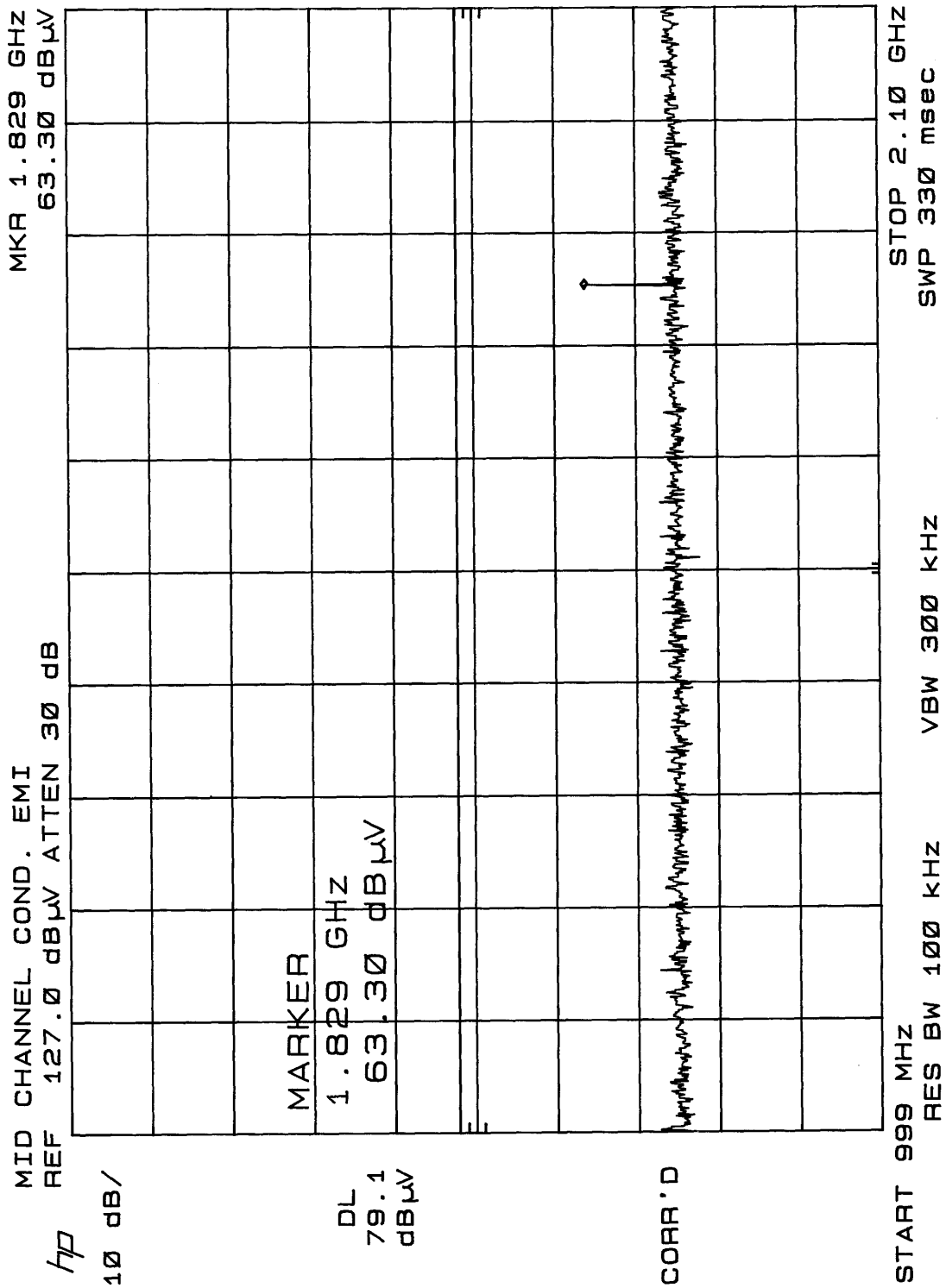

MKR 922 MHz
69.10 dBµV
LOW CHANNEL COND. EMI
REF 127.0 dBµV ATTEN 30 dB
10 dB/
DL
79.1
dBµV
MARKER
922 MHz
69.10 dBµV
CORR'D
START 0 Hz
RES BW 100 kHz
VBW 300 kHz
STOP 1.00 GHz
SWP 300 msec

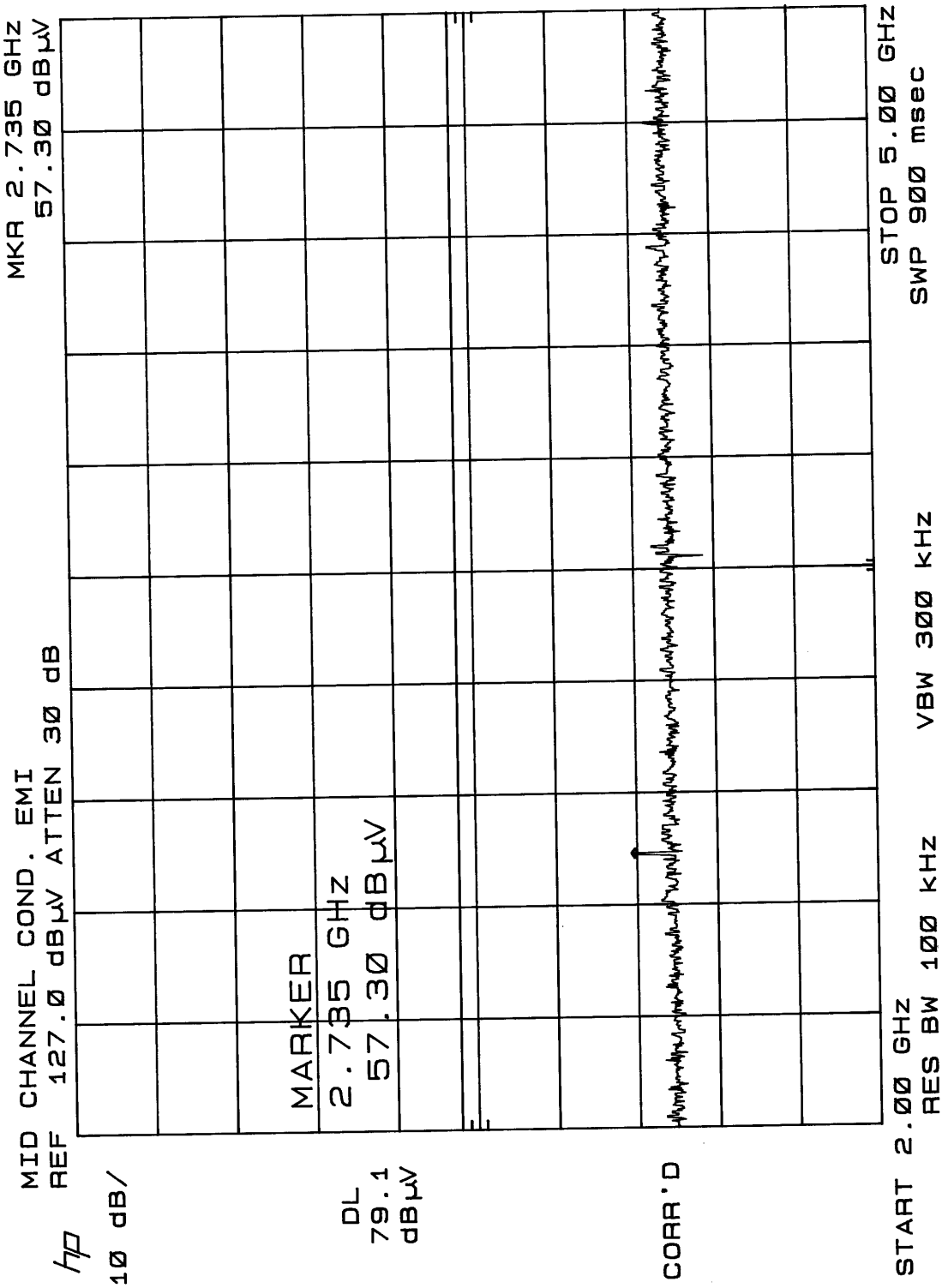

LOW CHANNEL COND. EMI
REF 127.0 dBµV ATTEN 30 dB
10 dB/
MKR 1.805 GHz
64.20 dBµV
MARKER
1.805 GHz
64.20 dBµV
DL
79.1
dBµV
CORR'D
START 999 MHz
RES BW 100 kHz
VBW 300 kHz
STOP 2.10 GHz
SWP 330 msec

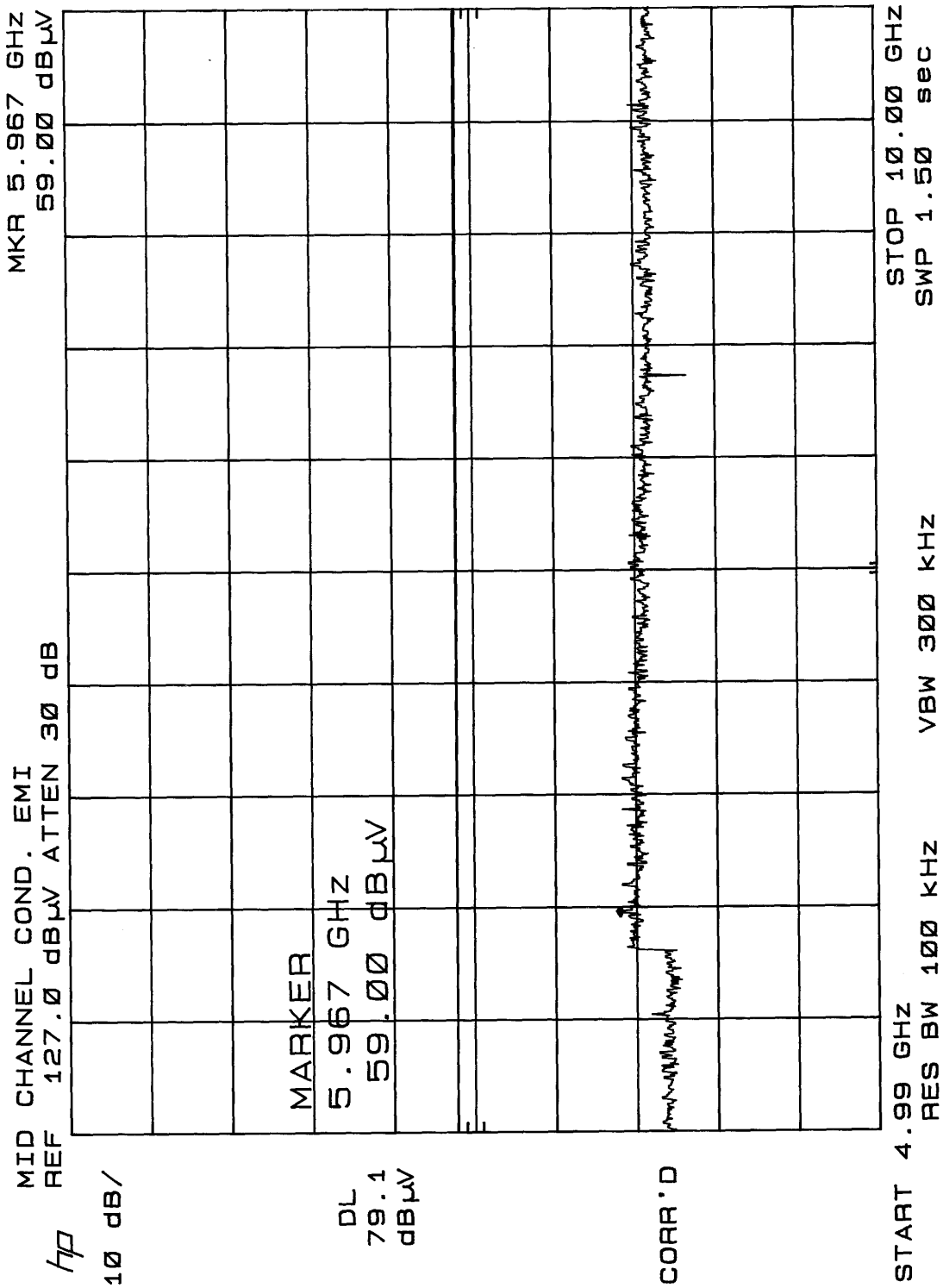

LOW CHANNEL COND. EMI
REF 127.0 dBµV ATTEN 30 dB
10 dB/
MKR 2.699 GHz
57.60 dBµV
MARKER
2.699 GHz
57.60 dBµV
DL
79.1
dBµV
CORR'D
START 2.00 GHz
RES BW 100 kHz
VBW 300 kHz
STOP 5.00 GHz
SWP 900 msec

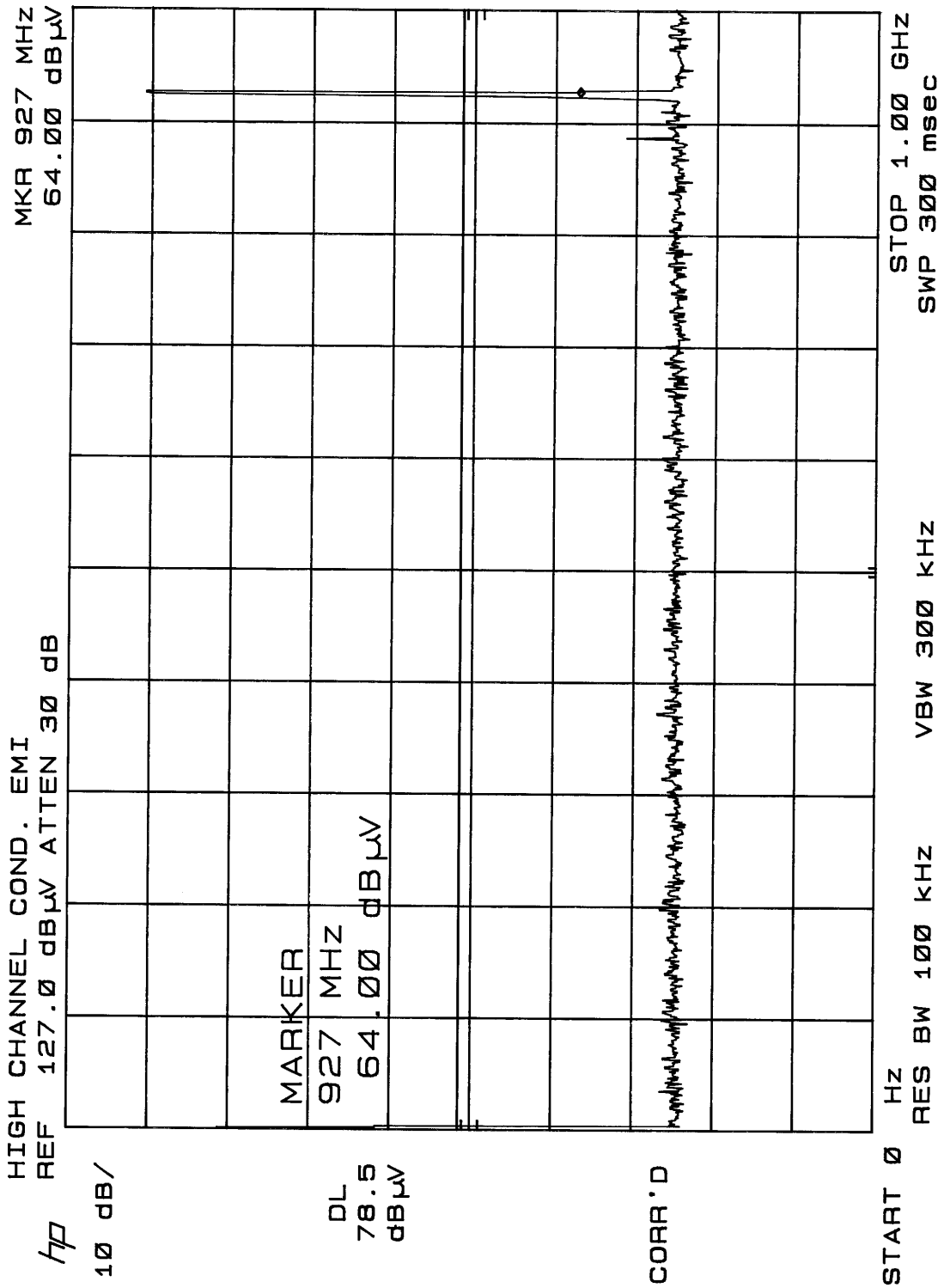

MKR 6.493 GHz
59.00 dBµV
LOW CHANNEL COND. EMI
REF 127.0 dBµV ATTEN 30 dB
10 dB/
MARKER
6.493 GHz
59.00 dBµV
DL
79.1
dBµV
CORR'D
START 4.99 GHz
RES BW 100 kHz
VBW 300 kHz
STOP 10.00 GHz
SWP 1.50 sec

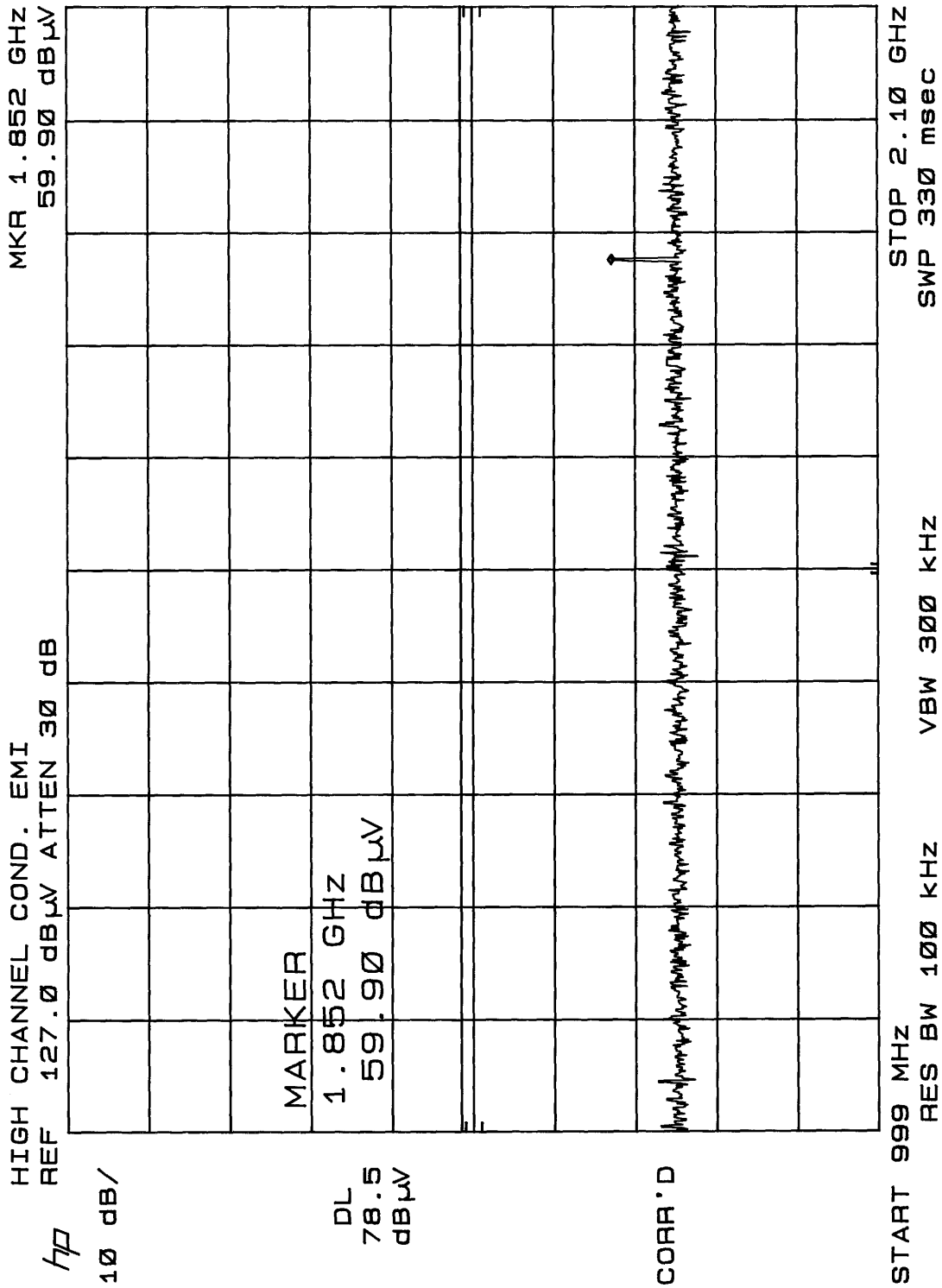

MKR 917 MHz
62.20 dBµV
STOP 1.00 GHz
SWP 300 msec
MID CHANNEL COND. EMI
REF 127.0 dBµV ATTEN 30 dB
VBW 300 kHz
MARKER
917 MHz
62.20 dBµV
10 dB/
DL
79.1
dBµV
CORR'D
START 0 Hz
RES BW 100 kHz

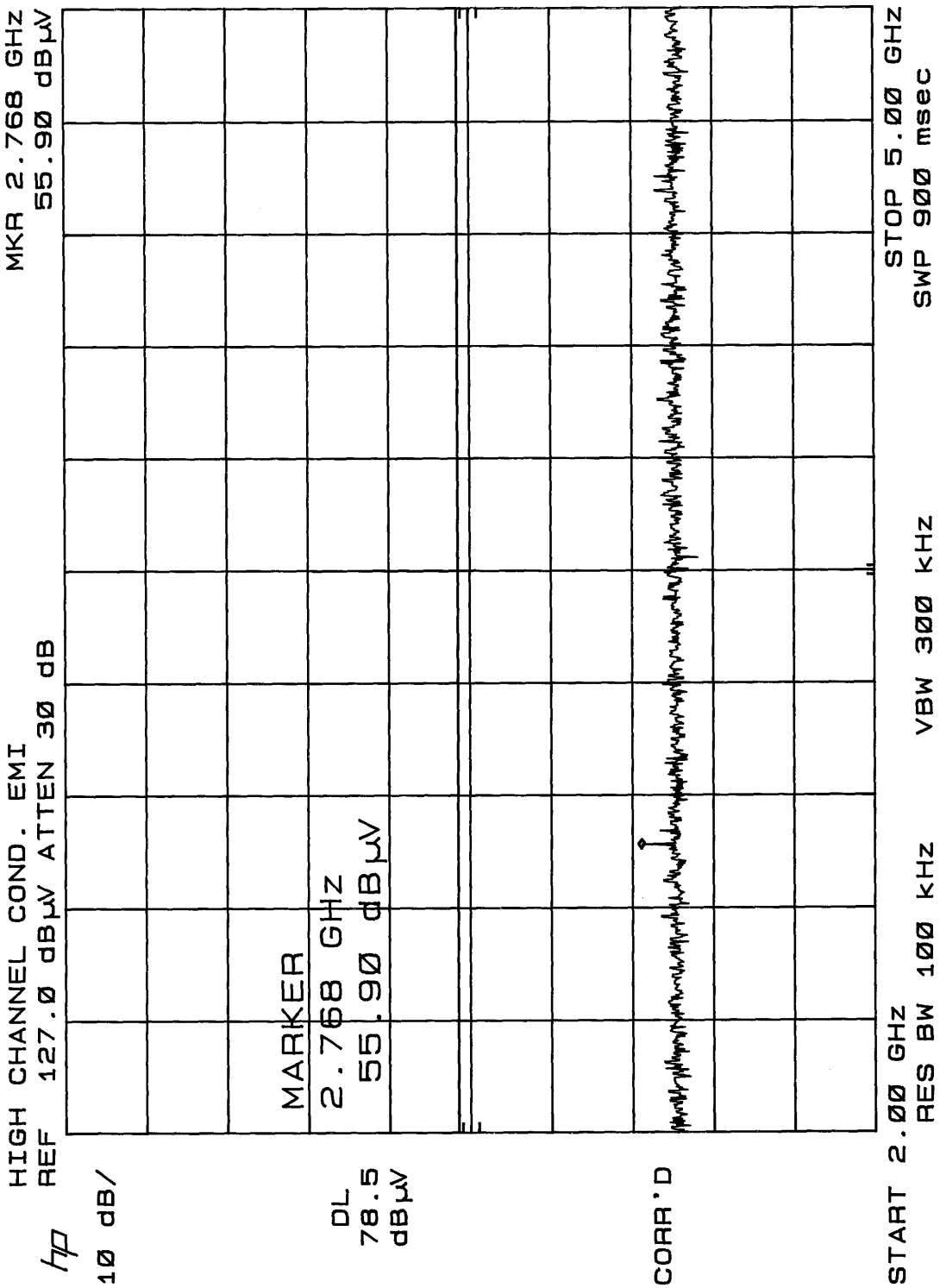

MKR 1.829 GHz
63.30 dBµV
MID CHANNEL COND. EMI
REF 127.0 dBµV ATTEN 30 dB
10 dB/
MARKER
1.829 GHz
63.30 dBµV
DL
79.1
dBµV
CORR'D
START 999 MHz
RES BW 100 kHz
VBW 300 kHz
STOP 2.10 GHz
SWP 330 msec

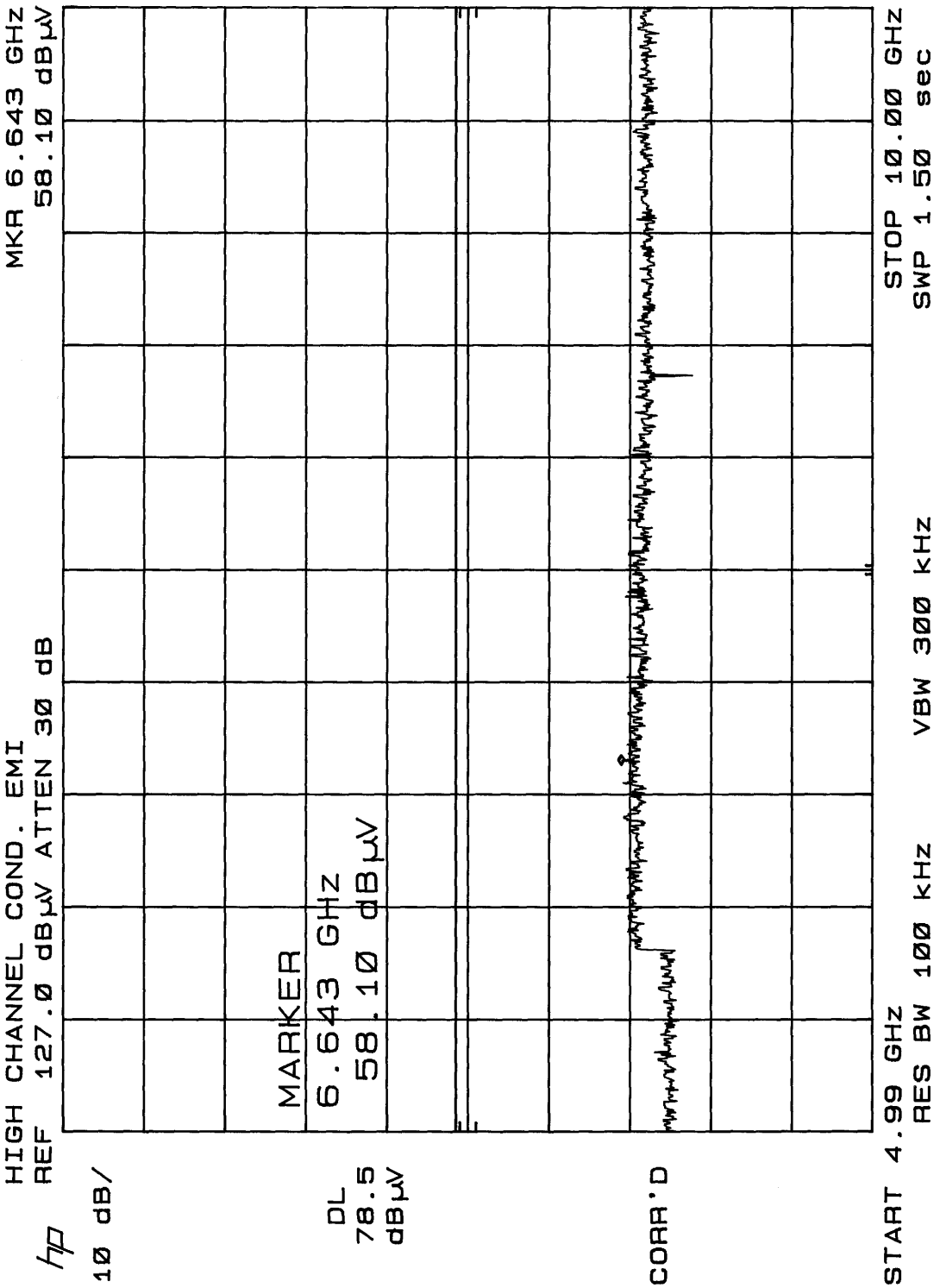

MKR 2.735 GHz
57.30 dBµV
STOP 5.00 GHz
SWP 900 msec
MID CHANNEL COND. EMI
REF 127.0 dBµV ATTEN 30 dB
VBW 300 kHz
MARKER
2.735 GHz
57.30 dBµV
10 dB/
DL
79.1
dBµV
CORR'D
START 2.00 GHz
RES BW 100 kHz


MKR 5.967 GHz
59.00 dBµV
MID CHANNEL COND. EMI
REF 127.0 dBµV ATTEN 30 dB
10 dB/
MARKER
5.967 GHz
59.00 dBµV
DL
79.1
dBµV
CORR'D
START 4.99 GHz
RES BW 100 kHz
VBW 300 kHz
STOP 10.00 GHz
SWP 1.50 sec


HIGH CHANNEL COND. EMI
REF 127.0 dBµV ATTEN 30 dB
10 dB/
MKR 927 MHz
64.00 dBµV
MARKER
927 MHz
64.00 dBµV
DL
78.5
dBµV
CORR'D
START 0 Hz
RES BW 100 kHz
VBW 300 kHz
STOP 1.00 GHz
SWP 300 msec

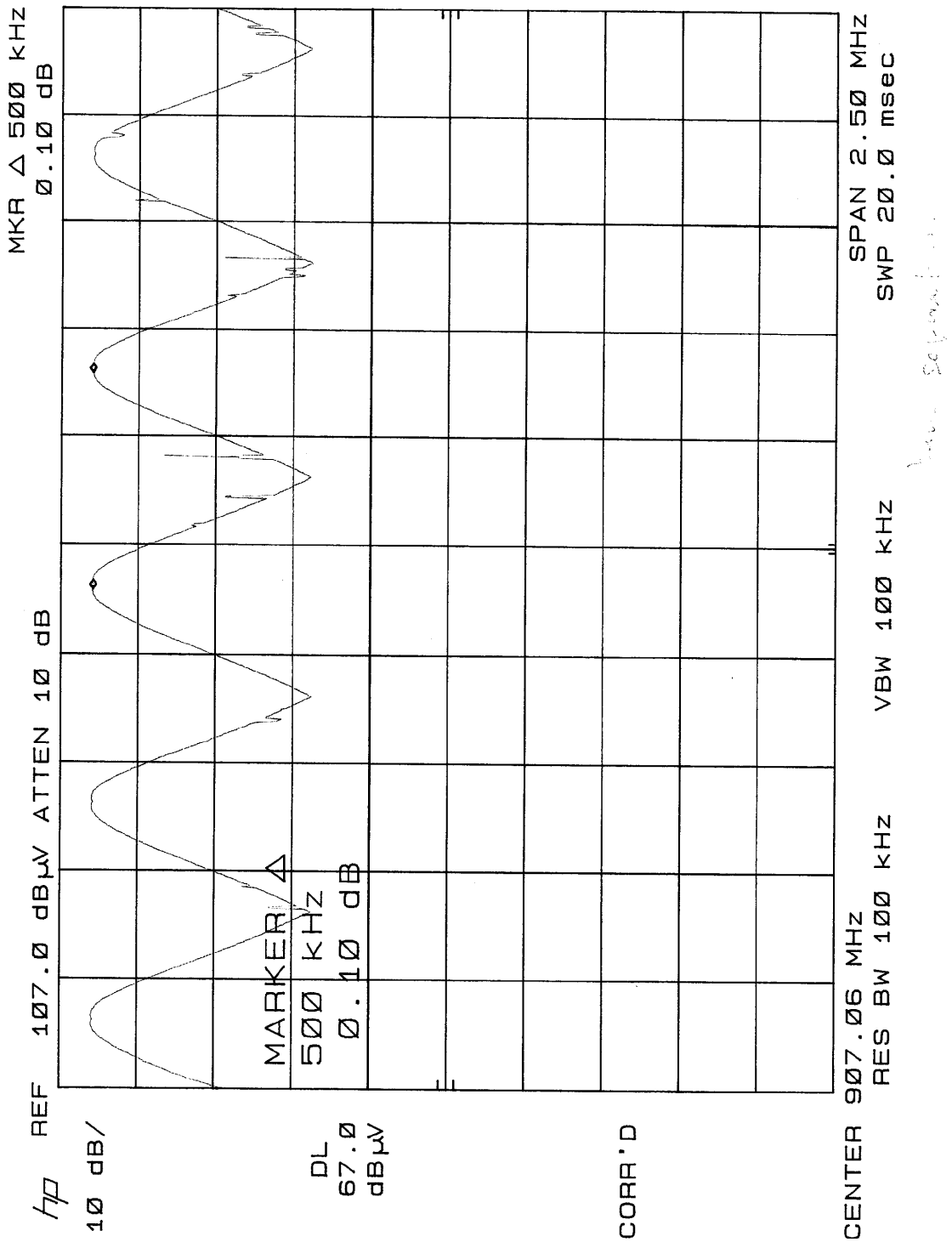

HIGH CHANNEL COND. EMI
REF 127.0 dBµV ATTEN 30 dB
10 dB/
MKR 1.852 GHz
59.90 dBµV
MARKER
1.852 GHz
59.90 dBµV
DL
78.5
dBµV
CORR'D
START 999 MHz
RES BW 100 kHz
VBW 300 kHz
STOP 2.10 GHz
SWP 330 msec


HIGH CHANNEL COND. EMI
REF 127.0 dBµV ATTEN 30 dB
MKR 2.768 GHz
55.90 dBµV
10 dB/
DL
78.5
dBµV
MARKER
2.768 GHz
55.90 dBµV
CORR'D
START 2.00 GHz
RES BW 100 kHz
VBW 300 kHz
STOP 5.00 GHz
SWP 900 msec


HIGH CHANNEL COND. EMI
REF 127.0 dBµV ATTEN 30 dB
MKR 6.643 GHz
58.10 dBµV
10 dB/
DL
78.5
dBµV
MARKER
6.643 GHz
58.10 dBµV
CORR'D
START 4.99 GHz
RES BW 100 kHz
VBW 300 kHz
STOP 10.00 GHz
SWP 1.50 sec

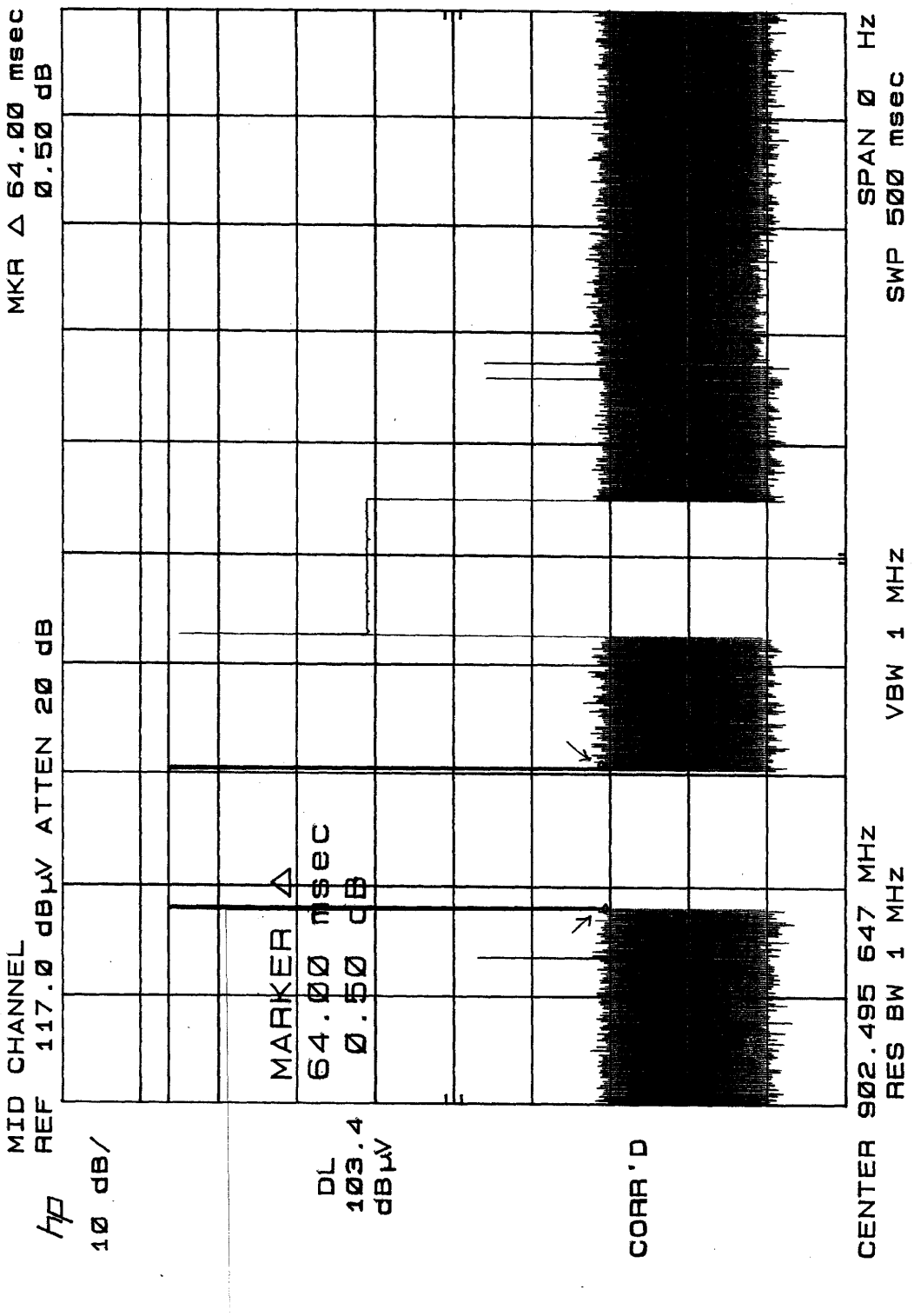
CHANNEL HOPPING SEPARATION

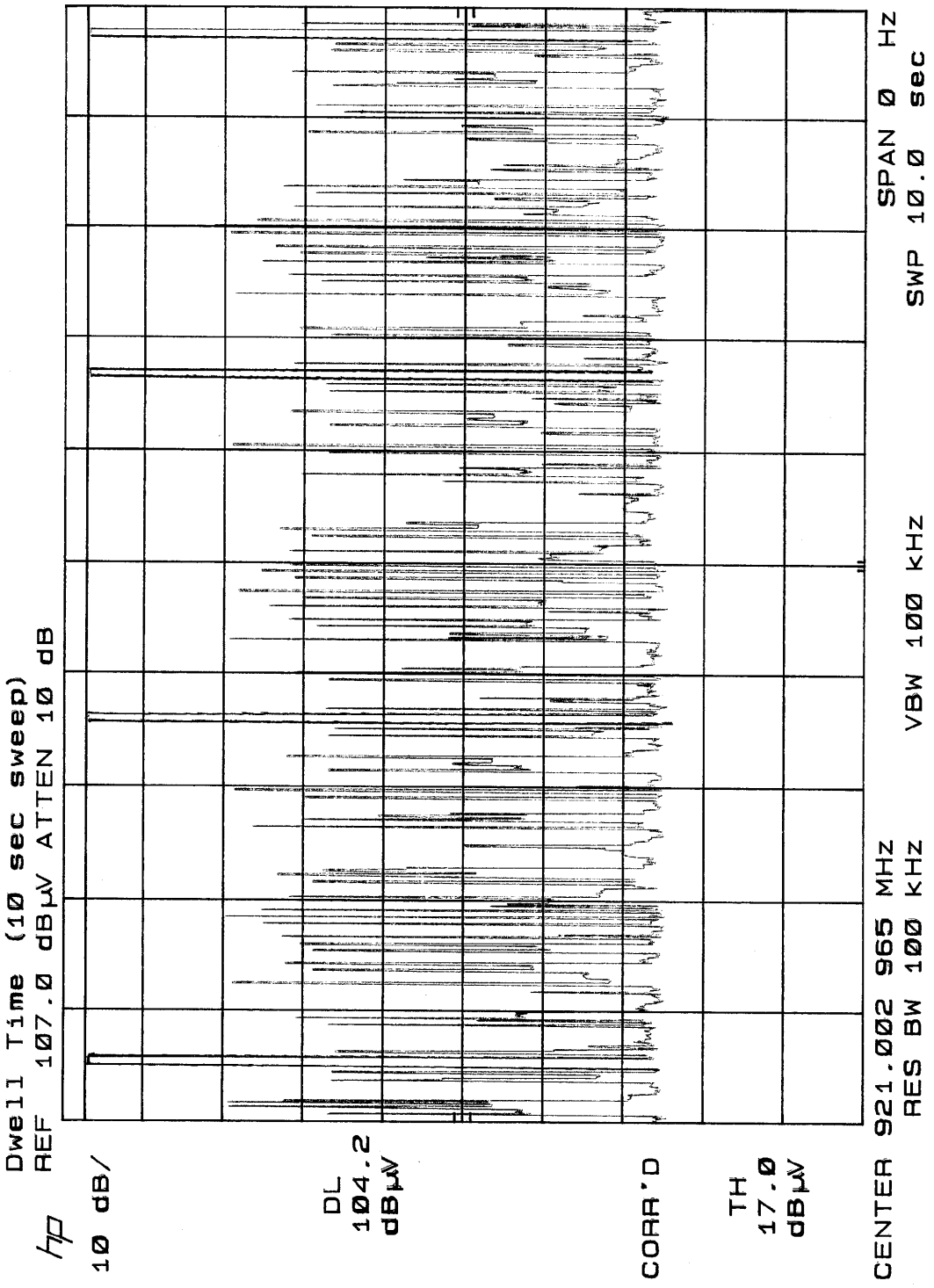
DATA SHEET


MKR Δ 500 kHz
Ø.10 dB
SPAN 2.50 MHz
SWP 20.Ø msec
REF 107.Ø dBµV
ATTEN 10 dB
VBW 100 kHz
MARKER Δ
500 kHz
Ø.10 dB
10 dB/
DL
67.Ø
dBµV
CORR'D
CENTER 907.Ø6 MHz
RES BW 100 kHz

AVERAGE TIME OF OCCUPANCY

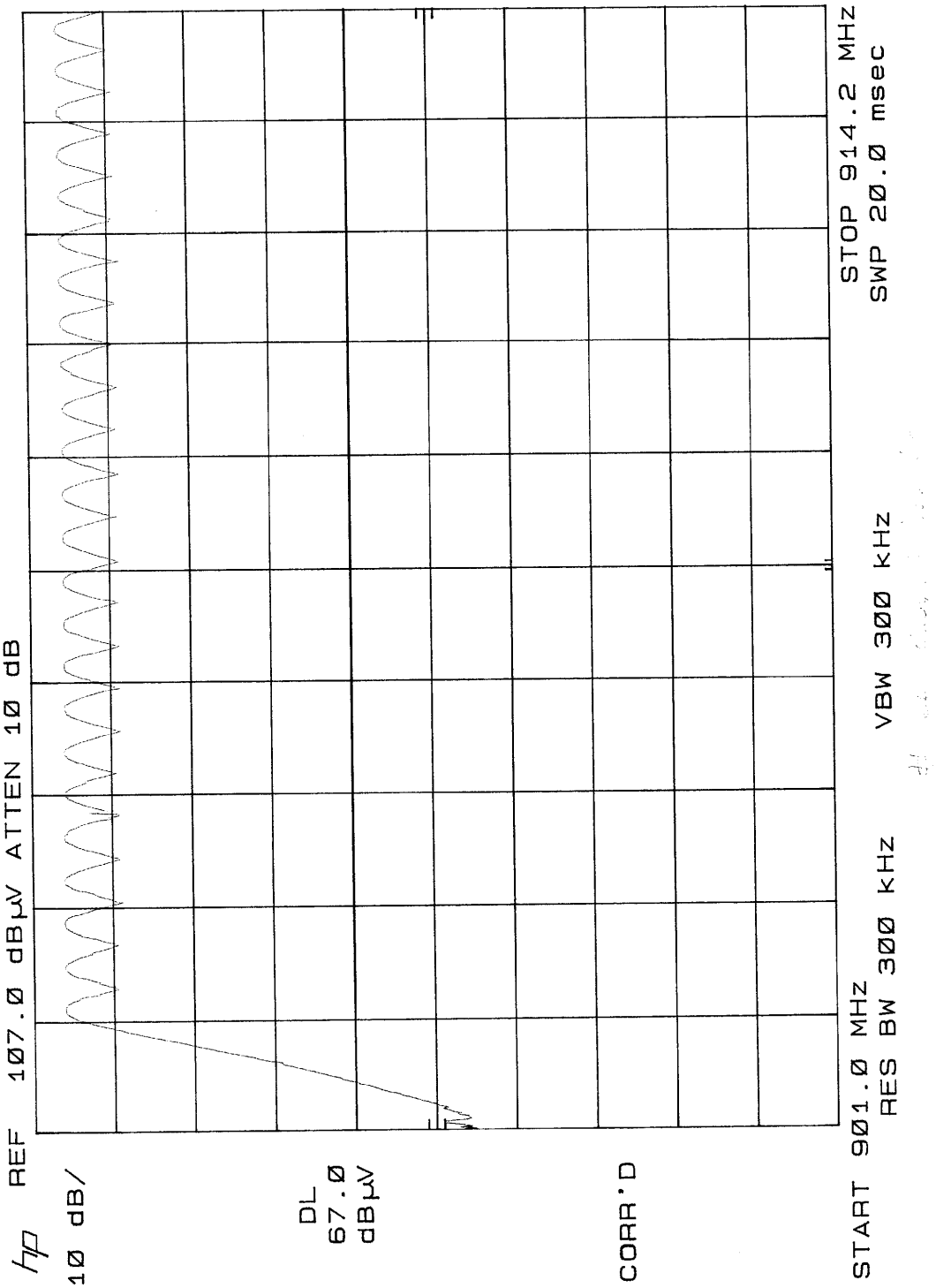
DATA SHEETS

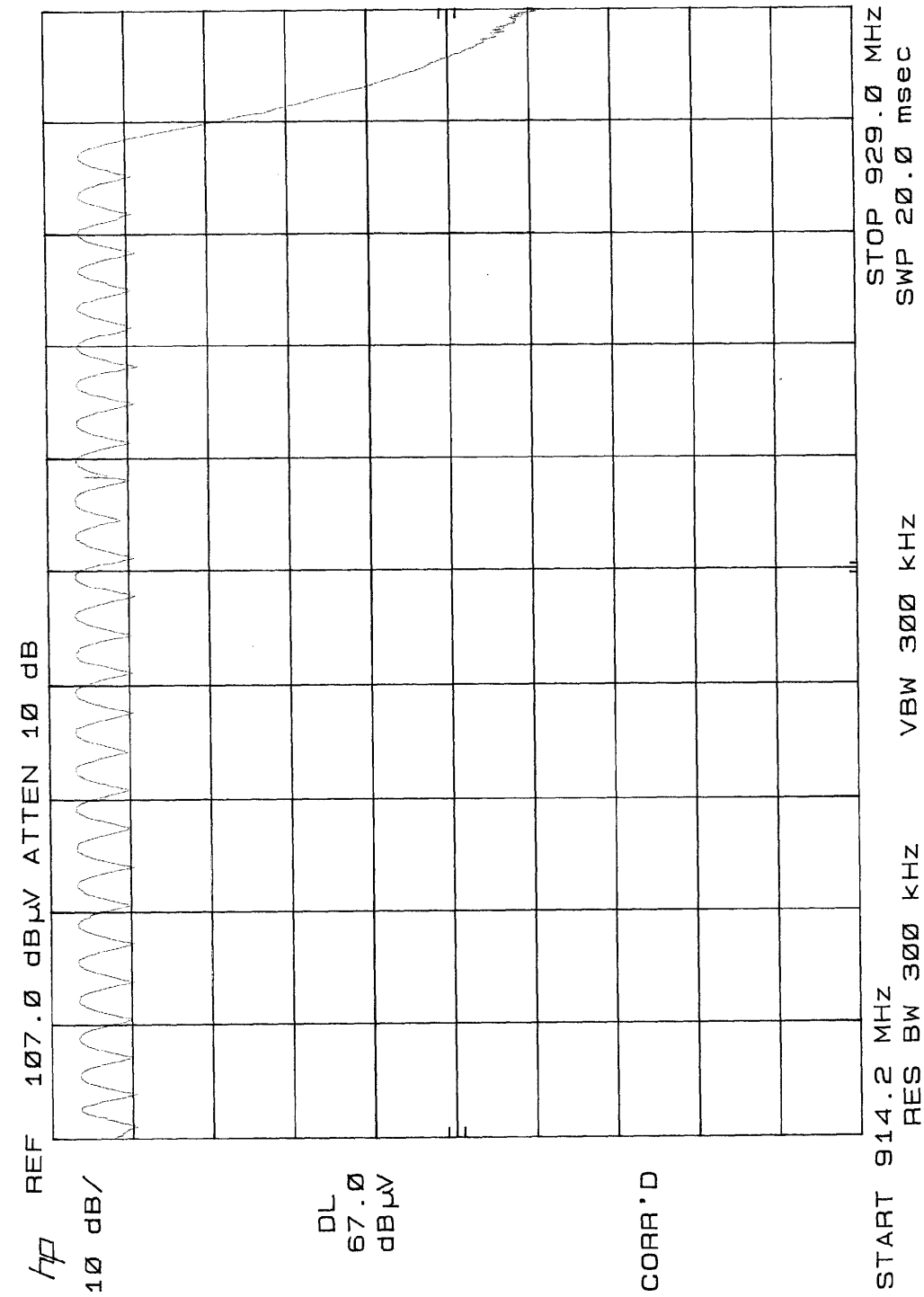

MKR Δ 64.00 msec
0.50 dB
SPAN 0 Hz
SWP 500 msec
MID CHANNEL
REF 117.0 dBµV ATTEN 20 dB
VBW 1 MHz
MARKER Δ
64.00 msec
0.50 dB
10 dB/
DL
103.4
dBµV
CORR'D
CENTER 902.495 647 MHz
RES BW 1 MHz


Dwell Time (10 sec sweep)
REF 107.0 dBµV ATTEN 10 dB
10 dB/
DL
104.2
dBµV
CORR'D
TH
17.0
dBµV
CENTER 921.002 965 MHz
RES BW 100 kHz
VBW 100 kHz
SPAN 0 Hz
SWP 10.0 sec

NUMBER OF HOPPING FREQUENCIES

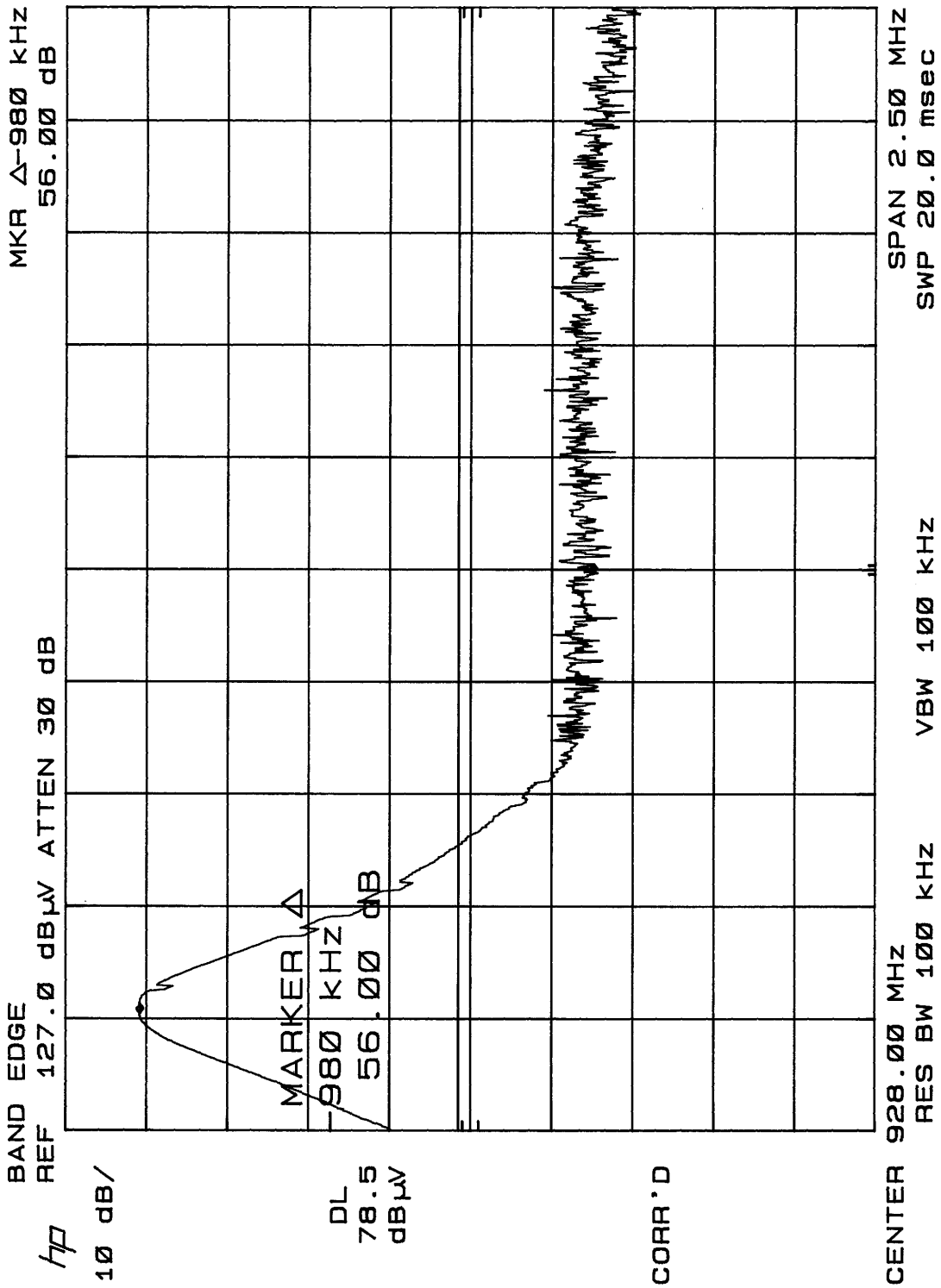
DATA SHEET

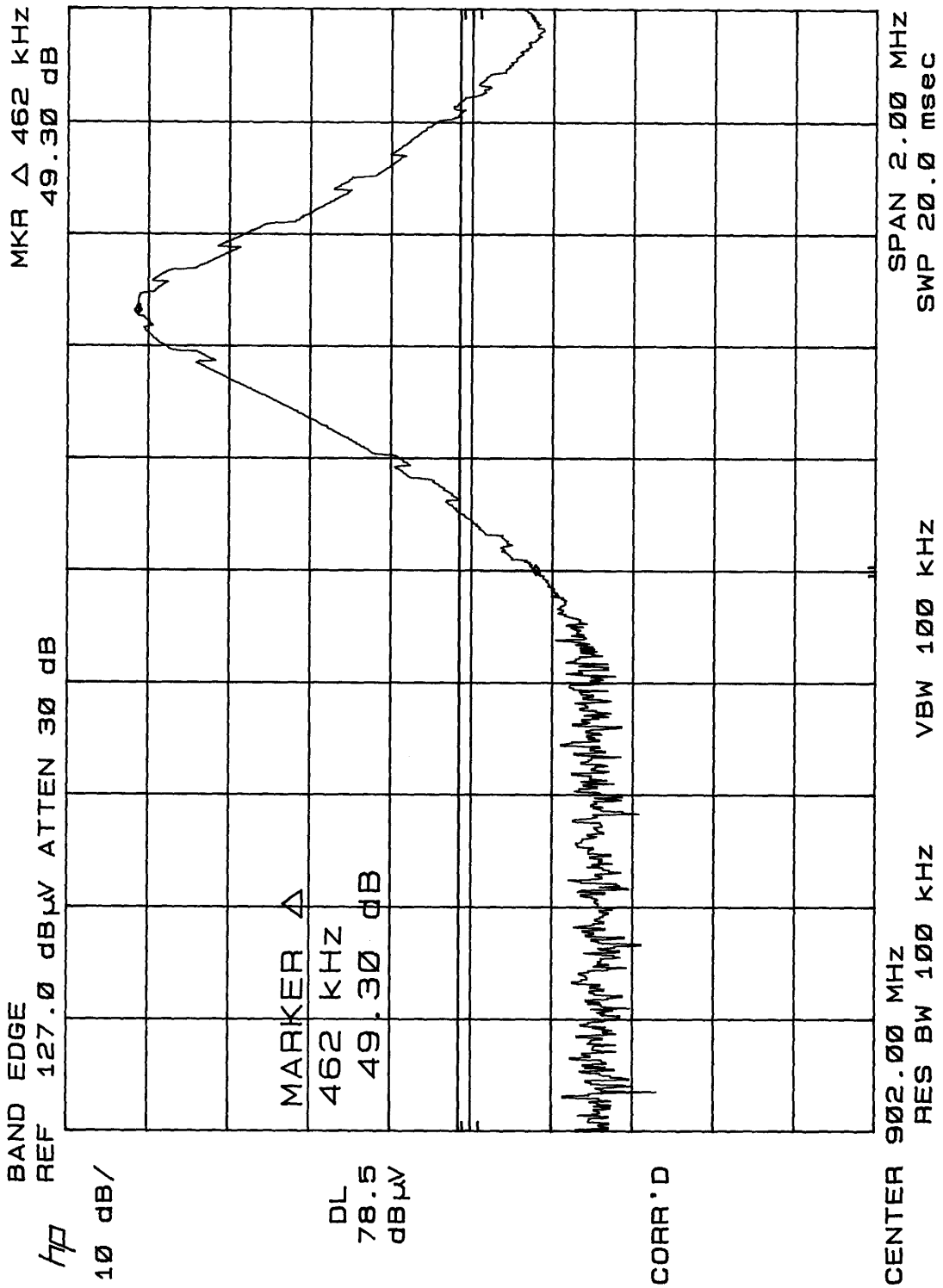

REF 107.0 dBµV ATTEN 10 dB
10 dB/
DL
67.0
dBµV
CORR'D
START 901.0 MHz
RES BW 300 kHz
VBW 300 kHz
STOP 914.2 MHz
SWP 20.0 msec


REF 107.0 dBµV ATTEN 10 dB
10 dB/
DL
67.0
dBµV
CORR'D
START 914.2 MHz
RES BW 300 kHz
VBW 300 kHz
STOP 929.0 MHz
SWP 20.0 msec

RF BAND EDGES

INFORMATION AND DATA SHEET


MKR Δ-980 kHz
56.00 dB
SPAN 2.50 MHz
SWP 20.0 msec
BAND EDGE
REF 127.0 dBµV ATTEN 30 dB
VBW 100 kHz
MARKER Δ
-980 kHz
56.00 dB
10 dB/
DL
78.5
dBµV
CORR'D
CENTER 928.00 MHz
RES BW 100 kHz


MKR Δ 462 kHz
49.30 dB
SPAN 2.00 MHz
SWP 20.0 msec
BAND EDGE
REF 127.0 dBµV ATTEN 30 dB
VBW 100 kHz
MARKER Δ
462 kHz
49.30 dB
10 dB/
DL
78.5
dBµV
CORR'D
CENTER 902.00 MHz
RES BW 100 kHz