FCC Part 74 Subpart H

EMI TEST REPORT

of

E.U.T. : Wireless Microphone

FCC ID. : JEBIEM-162

MODEL : IEM-162

Working Frequency : 790-806MHz

for

APPLICANT : WA GOL INDUSTRIAL CO., LTD.
ADDRESS : No. 85 chang Hsing First Street, Tai-tzu Village, Jen-Te Hsian, TAIWAN, R.O.C.

Test Performed by

ELECTRONICS TESTING CENTER, TAIWAN
NO. 8 LANE 29, WENMIMG ROAD,
LOSHAN TSUN, KWEISHAN HSIANG,
TAOYUAN, TAIWAN, R.O.C.

Tel: 886-2-26023052
Fax: 886-2-26010910
Report Number : ET91R-03-025

TEST REPORT CIRTIFICATION

Applicant : WA GOL INDUSTRIAL CO., LTD.
No. 85 chang Hsing First Street, Tai-tzu Village, Jen-Te Hsian, TAIWAN, R.O.C.

Manufacturer : WA GOL INDUSTRIAL CO., LTD.
No. 85 chang Hsing First Street, Tai-tzu Village, Jen-Te Hsian, TAIWAN, R.O.C.

Description of EUT :

a) Type of EUT	: Wireless Microphone
b) Trade Name	: N/A
c) Model No.	: IEM-162
d) FCC ID	: JEBIEM-162
e) Working Frequency	: 790-806 MHz
f) Power Supply	: AC adaptor (O/P: 12Vdc 300mA, I/P:120V 60Hz)

Regulation Applied : FCC Rules and Regulations Part 74 Subpart H (1999) & Part 15 Subpart B

I HEREBY CERTIFY THAT; The data shown in this report were made in accordance with the procedures given in ANSI C63.4 and the energy emitted by the device was founded to be within the limits applicable. I assume full responsibility for accuracy and completeness of these data.

Issued Date : Mar. 12, 2002

Test Engineer : Jeff Chuang
(Jeff Chuang)

Approve & Authorized Signer : Will Yauo
Will Yauo, Supervisor
EMI Test Site of ELECTRONICS TESTING CENTER, TAIWAN

Table of Contents *Page*

1. GENERAL INFORMATION

1.1 Product Description

a) Type of EUT	: Wireless Microphone
b) Trade Name	: N/A
c) Model No.	: IEM-162
d) FCC ID	: JEBIEM-162
e) Working Frequency	: 790-806MHz
f) Power Supply	: AC adaptor (O/P: 12Vdc 300mA, I/P:120V 60Hz)

1.2 Characteristics of Device:

The EUT is a frequency modulation Wireless Microphone with following features :
Operation Frequency Range: 790-806MHz. Type of Modulation: FM, 161K5F3E.
This Wireless Microphone is a stationary transmitter and operates within UHF band with PLL synthesized. There are 16 channels available and the channel used can be slected from a DIP switch.

1.3 Test Methodology

Both conducted and radiated testing were performed according to the procedures in chapter 13 of ANSI C63.4. and section 2.1046, 2.1047, 2.1049, 2.1051, 2.1053, and 2.1055 of Part 2 of CFR 47

1.4 Test Facility

The open area test site and conducted measurement facility used to collect the radiated data is located on the roof top of Building at No.34, 5 Lirn, Din Fu Tsun, Lin Kou, Taipei, Taiwan, R.O.C.

This site has been fully described in a report submitted to your office, and accepted in a letter dated Feb. 10 , 2000.

2. REQUIREMENTS OF PROVISIONS

2.1 Definition

Intentional radiator:
A device that intentionally generates and emits radio frequency energy by radiation or induction.

2.2 Frequencies Available

According to sec. 74.802 of Part 74, the following frequencies are available for low power auxiliary station :

Frequencies (MHz)

26.100-26.480	455.000-456.000
54.000-72.000	470.000-488.000
76.000-88.000	488.000-494.000
161.625-161.775	614.000-806.000
450.000-451.000	944.000-952.000

2.3 Requirements for Radio Equipment on Certification

(1) RF Output Power

For transmitters, the power output shall be measured at the RF output terminals.

(2) Modulation Characteristics

For Voice Modulated Communication Equipment, a curve or equivalent data showing the frequency response of the audio modulating circuit over a range of 100 to 5000 Hz shall be submitted.

(3) Occupied Bandwidth

For radiotelephone transmitter, other than single sideband or indenpent sideband transmitter, when modulateed by a 2.5kHz tone at an input level 16 dB greater than that necessary to produce 50 percent modulation.

(4) Spurious Emissions at Antenna Terminals

The radio frequency voltage or power generated within the equipment and appearing on a spurious frequency shall be checked at the equipment output terminal when properly loaded with a suitable artificial antenna.

(5) Field Strength of Spurious Emissions

Measurements shall be made to detect spurious emission that may be radiated directly from the cabinet, control circuits, power leads, or intermediate circuit elements under normal condition of installation and operation.

(6) Frequencies Tolerance

a) The frequency stability shall be measured with variation of ambient temperature.
b) The frequency stability shall be measured with variation of primary supply voltage.

2.4 Labeling Requirement

Each equipment for which a type acceptance application is filed on or after May 1,1981, shall bear an identification plate or label pursuant to § 2.925（Identification of equipment） and § 2.926（FCC identifier）.

3. OUTPUT POWER MEASUREMENT

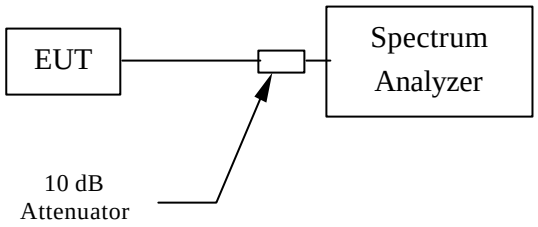
3.1 Provision Applicable

According to § 74.861(e)(1)(ii), the output power shall not exceed 250 milliwatts.

3.2 Measurement Procedure

The maximum peak output power was measured with a spectrum analyzer connected to the antenna terminal (conducted measurement) while EUT was operating in normal situation. Set RBW of spectrum analyzer to 100kHz and VBW to 100kHz.

Figure 1 : Output power measurement configuration



3.3 Test Data

Operated mode : Carrier Only
Temperature : 27 ℃
Test Date : 2002 March 02
Humidity : 65 %

Frequency (MHz)	Result (dBm)	Output Power (mW)	Limit (mW)
790.375	9.51	8.93	250
797.375	9.43	8.77	250
805.375	9.26	8.43	250

Please see Appendix 1 for plotted data.

3.4 Output Power Test Equipment

Equipment	Manufacturer	Model No.	Next Cal. Date
RF Test Receiver	R&S	ESBI	Oct. 16, 2002
Plotter	HP	7440A	N/A

4. MODULATION CHARACTERISTICS

4.1 Provisions Applicable

According to § 2.1047 (a), for Voice Modulated Communication Equipment, the frequency response of the audio modulating circuit over a range of 100 to 5000 Hz shall be measured.

4.2 Measurement Method

A) Frequency response of audio circuits

1. Position the EUT as shown in figure 2.

2. Vary the modulating frequency from 100 Hz to 5000 Hz with varying the input voltage from 0V to maximum permitted input voltage, and observe the change in output.

B) Modulation Limit

1. Position the EUT as shown in figure 2, adjust the audio input frequency to 100 Hz and the input level from 0V to maximum permitted input voltage with recording each carrier frequency deviation responding to respective input level.

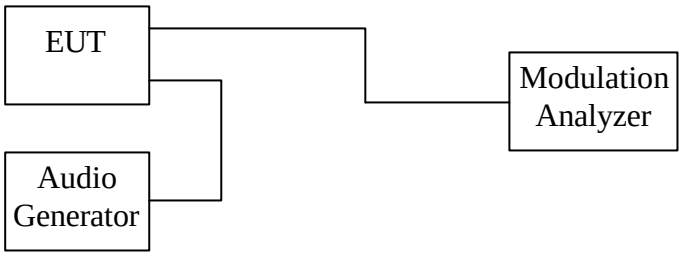
2. Repeat step 1 with changing the input frequency for 300, 500, 1000, 3000, and 5000 Hz in sequence.

C) Frequency response of all circuits

1. Position the EUT as shown in figure 2.

2. Vary the modulating frequency from 100 Hz to 15000 Hz with constant input voltage (derived from 5.4(a) of this test report), and observe the change in output.

Figure 2 : Modulation characteristic measurement configuration



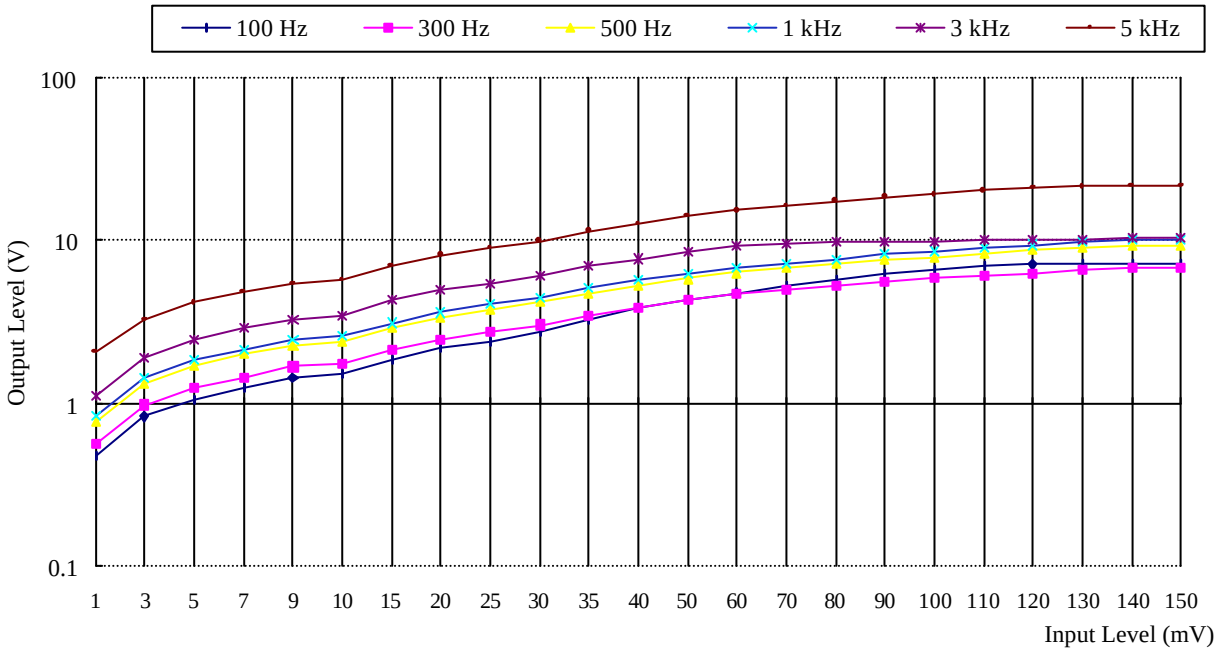
4.3 Measurement Instrument

Equipment	Manufacturer	Model No.	Next Cal. Date
Modulation Analyzer	Hewlett-Packard	8901A	Dec. 03, 2002
Multifunction Synthesizer	Hewlett-Packard	8904A	Dec. 07, 2002
Oscillscope	Lecroy	9350A	May 10, 2002

4.4 Measurement Result

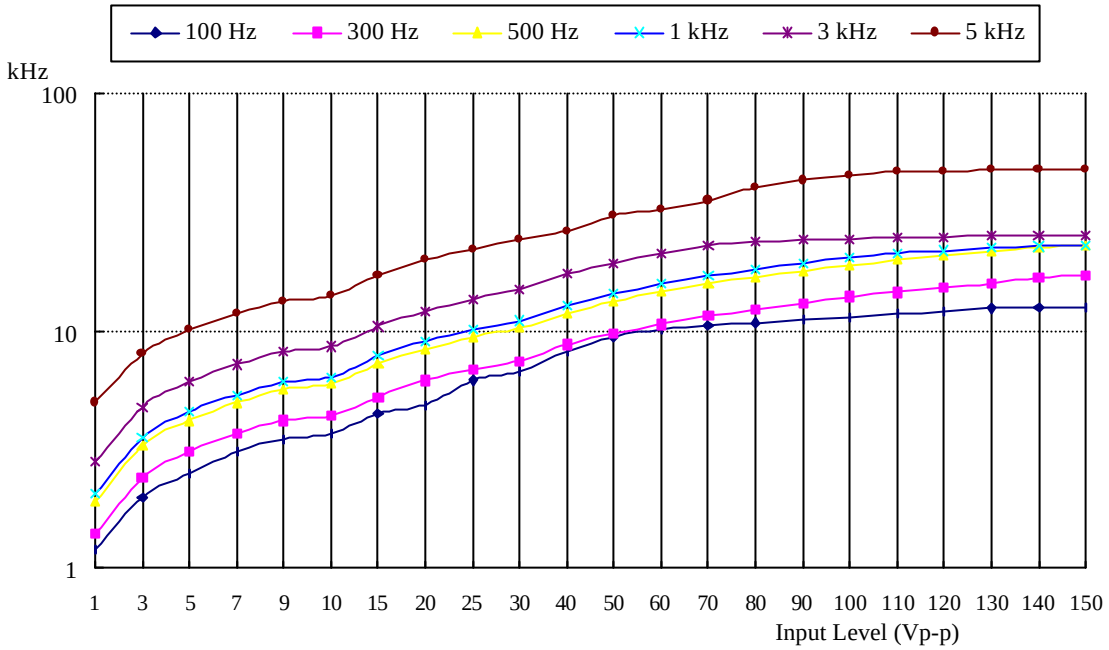
Operation Mode : Normal
Test Date : Mar. 02, 2002 Temperature : 25 ℃ Humidity: 60%

A). Frequency response

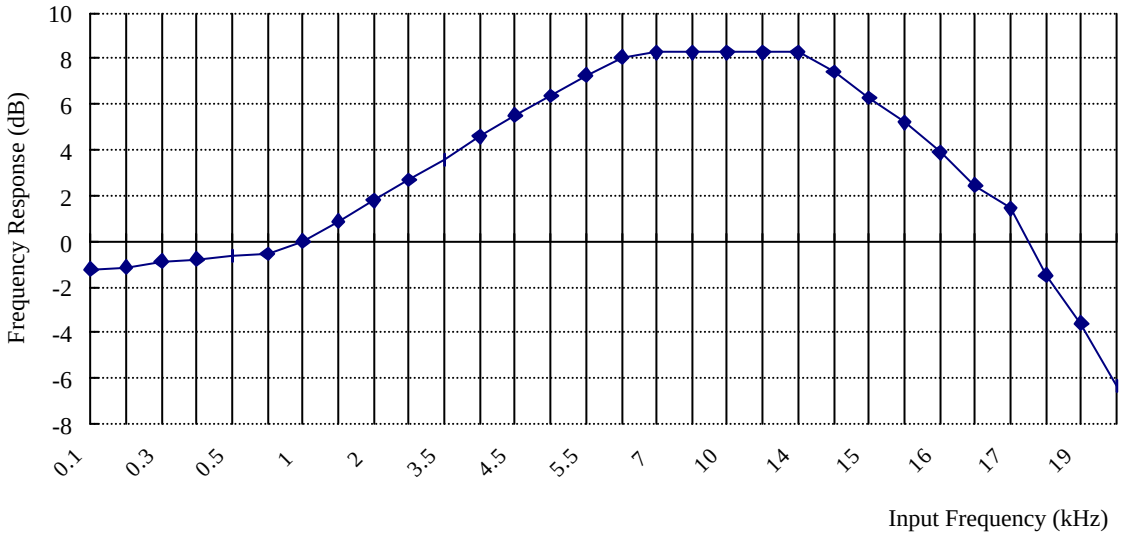


B). Modulation Limit

1) Headset Uint



C). Frequency response of all circuits



5. OCCUPIED BANDWIDTH OF EMISSION

5.1 Provisions Applicable

According to § 2.1049 (c)(1), For radiotelephone transmitter, other than single sideband or indenpent sideband transmitter, when modulateed by a 2.5kHz tone at an input level 16 dB greater than that necessary to produce 50 percent modulation.
According to § 74.861(e)(5), the frequency emission bandwidth shall not exceed 200 kHz.

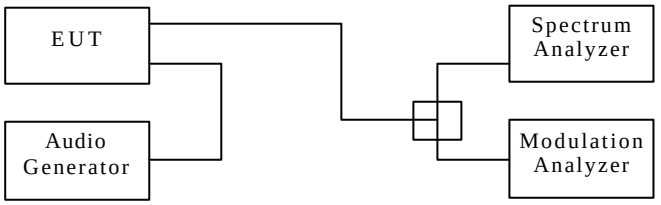
5.2 Measurement Method

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.

2. Position the EUT as shown in figure 3, and Install new batteries in the EUT. Turn on the EUT ant set it to any one convenient frequency within its operating range. Set a reference level on the measuring instrument equal to the highest peak value.

3. Apply a 2.5 kHz modulation signal to EUT and measure the frequencies of the modulated signal from the EUT where it is the specified number of dB below the reference level set in step 2. This is the occupied bandwidth specified.

Figure 3 : Occupied bandwidth measurement configuration



5.3 Occupied Bandwidth Test Equipment

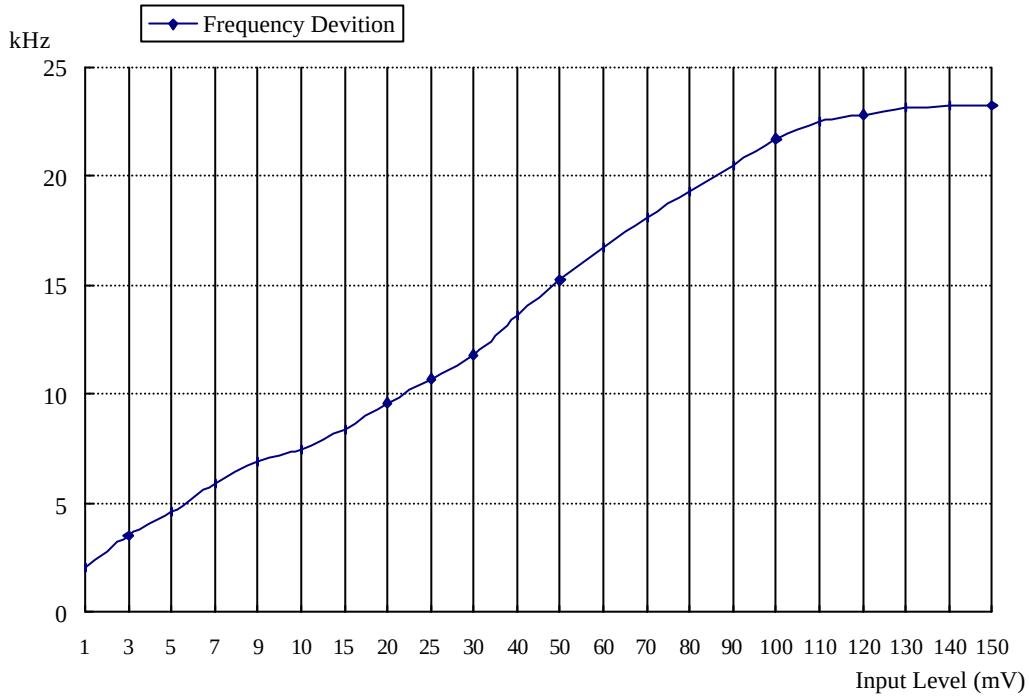
Equipment	Manufacturer	Model No.	Next Cal. Date
Spectrum Analyzer	R&S	ESBI	Oct. 16, 2002
Modulation Analyzer	Hewlett-Packard	8901A	Dec. 03, 2002
Multifunction Synthesizer	Hewlett-Packard	8904A	Dec. 07, 2002
Plotter	Hewlett-Packard	7440A	N/A

5.4 Bandwidth Measured

5.4.1 Input Level Derived

Operation Mode : Normal
Test Date : Mar. 02, 2002 Temperature : 25 ℃ Humidity: 60%

Input Audio Frequency : 2.5 kHz, Sine Wave



The Level input to produce 50 % modulation is 32 mV, therefore the magnitude 16 dB greater than it is 199.5mV.

5.4.2 Occupied Bandwidth Plotted

Frequency (MHz)	Occupied Bandwidth (kHz)
790.375	160.0
797.375	156.7
805.375	156.7

Please see appendix 2 for plotted data.

6. SPURIOUS EMISSIONS AT ANTENNA TERMINALS

6.1 Provisions Applicable

According to § 2.1051, the radio frequency voltage or power generated within the equipment and appearing on a spurious frequency shall be checked at the equipment output terminal when properly loaded with a suitable artificial antenna.

According to § 74.861(e)(6), the mean power of emissions shall be attenuated below the mean output power of the transmitter in accordance with the follwing sceedule:

(i) on any frequency removed from the operating frequency by more than 50 percent up to and including 100 percent of the authorized bandwidth: at least 25 dB.

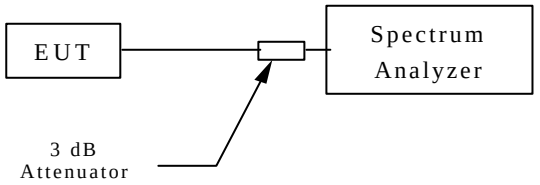
(ii) on any frequency removed from the operating frequency by more than 100 percent up to and including 250 percent of the authorized bandwidth: at least 35 dB.

(iii) on any frequency removed from the operating frequency by more than 250 percent of the authorized bandwidth shall be attenuated below the unmodulated carrier by at least 43 plus 10 Log(output power in watts) dB.

6.2 Measurement Procedure

1. Setup the configure per figure 4, adjusting the input voltage to produce the maximum power as measured in chapter 3.
2. Adjust the analyzer frequency span from 30 MHz to 1 GHz, record any frequency attenuated less than 20 dB relative to the permitted emission and then adjust the analyzer frequency span from 1 GHz to 2 GHz and record emissions frequency should be measured.
3. Adjust the analyzer for each frequency measured above on a 2 MHz frequency span and 1MHz resolution bandwidth. Record the highest value on spectrum analyzer.

Figure 4 : Conducted spurious emission measurement configuration



6.3 Measurement Equipment

Equipment	Manufacturer	Model No.	Next Cal. Date
RF Test Receiver	R&S	ESBI	Oct. 16, 2002
Plotter	Hewlett-Packard	7440A	N/A

6.3 Measurement Data

Operated mode : Normal
Temperature : 26 ℃
Test Date : 2002 March 06
Humidity : 65 %

A. Channel 1:

Unmodulated carrier power is 9.51 dBm , or 8.93 mW (Conducted).
The limit of spurious or harmonics is 9.51-[43+10log(output power in W)], or -13dBm

Frequency (MHz)	SA Reading (dBm)	Cable Loss (dB)	Attenuator (dB)	Result (dBm)	Limit (dBm)	Margin (dB)
30-1000	---				-13.0	
1000 - 8500	---				-13.0	

Remark "---" means the emission is too weak to be measured.

B. Channel 8:

Unmodulated carrier power is 9.43 dBm , or 8.77 mW (Conducted).
The limit of spurious or harmonics is 9.51-[43+10log(output power in W)], or -13dBm

Frequency (MHz)	SA Reading (dBm)	Cable Loss (dB)	Attenuator (dB)	Result (dBm)	Limit (dBm)	Margin (dB)
30-1000	---				-13.0	
1000 - 8500	---				-13.0	

Remark "---" means the emission is too weak to be measured.

C. Channel 16:

Unmodulated carrier power is 9.26 dBm , or 8.43 mW (Conducted).
The limit of spurious or harmonics is 9.51-[43+10log(output power in W)], or -13dBm

Frequency (MHz)	SA Reading (dBm)	Cable Loss (dB)	Attenuator (dB)	Result (dBm)	Limit (dBm)	Margin (dB)
30-1000	---				-13.0	
1000 - 8500	---				-13.0	

Remark "---" means the emission is too weak to be measured.

Please see appendix 3 for plotted data

7. FIELD STRENGTH OF EMISSION

7.1 Provisions Applicable

According to § 2.1053, measurements shall be made to detect spurious emission that may be radiated directly from the cabinet, control circuits, power leads, or intermediate circuit elements under normal condition of installation and operation. Information submitted shall include the relative radiated power of spurious emission with reference to the rated power output of the transmitter, assuming all emissions are radiated from a halfwave dipole antenna.

.

According to § 74.861(e)(6), the mean power of emissions shall be attenuated below the mean output power of the transmitter in accordance with the follwing sceedule:

(i) on any frequency removed from the operating frequency by more than 50 percent up to and including 100 percent of the authorized bandwidth: at least 25 dB.

(ii) on any frequency removed from the operating frequency by more than 100 percent up to and including 250 percent of the authorized bandwidth: at least 35 dB.

(iii) on any frequency removed from the operating frequency by more than 250 percent of the authorized bandwidth shall be attenuated below the unmodulated carrier by at least 43 plus 10 Log(output power in watts) dB.

7.2 Measurement Procedure

1. Setup the configuration per figure 5 and 6 for frequencies measured below and above 1 GHz respectively, adjusting the input voltage to produce the maximum power as measured in chapter 3.
2. Adjust the analyzer for each frequency measured in chapter 6 on a 1 MHz frequency span and 100 kHz resolution bandwidth.
3. The search antenna is to be raised and lowered over a range from 1 to 4 meters in horizontally polarized orientation. Position the highness when the highest value is indicated on spectrum analyzer, then change the orientation of EUT on test table over a range from 0◦ to 360 ◦ , and record the highest value indicated on spectrum analyzer as reference value.
4. Repeat step 3 until all frequencies need to be measured were complete.
5. Repeat step 4 with search antenna in vertical polarized orientations.

6. Replace the EUT with a tuned dipole antenna (horn antenna for above 1 GHz) relative to each frequency in horizontally polarized orientation and as the same polarized orientation with search antenna. Connect the tuned dipole antenna to a standard signal generator (SG) via a low loss cable. Power on the SG and tune the right frequency in measuring as well as set SG at a appreciated output level. Rise and lower the search antenna to get the highest value on spectrum analyzer, and then hold this position. Adjust the SG output to get a identical value derived from step 3 on spectrum analyzer. Record this value for result calculated.

7. Repeat step 6 until all frequencies need to be measured were complete.

8. Repeat step 7 with both dipole antenna (horn antenna for above 1 GHz) and search antenna in vertical polarized orientations.

Figure 5 : Frequencies measured below 1 GHz configuration

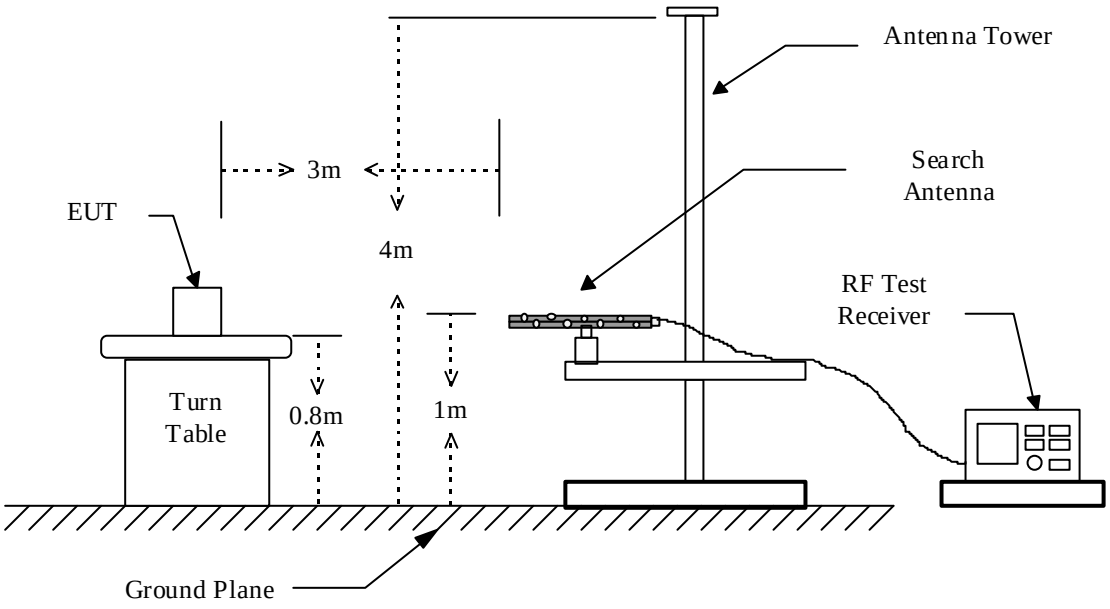
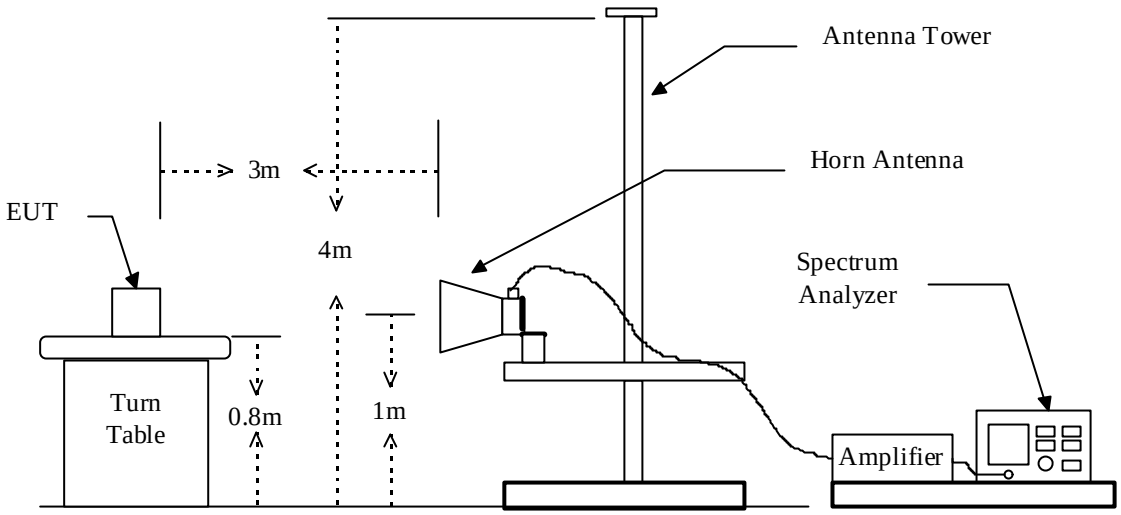


Figure 6 : Frequencies measured above 1 GHz configuration



7.3 Measuring Instrument

Equipment	Manufacturer	Model No.	Next Cal. Date
Spectrum Analyzer	Hewlett-Packard	8568B	Jan. 10, 2003
Quasi Peak Detector	Hewlett-Packard	85650A	Jan. 10, 2003
Pre-selector	Hewlett-Packard	85685A	Jan. 10, 2003
Spectrum Analyzer	Hewlett-Packard	8564E	Apr. 22, 2002
Horn Antenna	EMCO	3115	May 09, 2002
Log periodic Antenna	EMCO	3146	Nov. 04, 2002
Biconical Antenna	EMCO	3110B	Nov. 04, 2002
Preamplifier	Hewlett-Packard	8449B	May 10, 2002
Preamplifier	Hewlett-Packard	8447D	Oct. 14. 2002

Measuring instrument setup in frequency band measured is as following :

Frequency Band (MHz)	Instrument	Function	Resolution bandwidth	Video Bandwidth
30 to 1000	Spectrum Analyzer	Peak	100 kHz	100 kHz
Above 1000	Spectrum Analyzer	Peak	1 MHz	1 MHz

7.4 Measuring Data

Operated mode : Normal
Test Date : 2002 March 06
Temperature : 26 ℃
Humidity : 68 %

A. Channel 1:

The limit of spurious or harmonics is calculated as following :

Fundamental ERP-[43+10log(carrier ERP in W)]

Frequency (MHz)	Meter Reading (dBuV)	SG Reading (dbuV)	Cable Loss (dB)	Antenna Gain Corrected	Result (dBm)	Limit (dBm)	Margin (dB)
790.375	79.7	67.4	-2.6	0	9.8	24	-14.2
1580.750	---	---	---			-13	
2371.125	---	---	---			-13	
3161.500	---	---	---			-13	
3951.875	---	---	---			-13	
4742.250	---	---	---			-13	
5532.625	---	---	---			-13	
6323.000	---	---	---			-13	
7113.375	---	---	---			-13	
7903.750	---	---	---			-13	

Note :

1. Remark "---" means that the emission level is too weak to be detected.
2. Result calculation is as following :

   Result = Meter Reading - SG Reading +Cable Loss +Antenna Gain Corrected

   Antenna Gain Corrected : is used for antenna other than dipole to convert radiated power to ERP.

B. Channel 8:

The limit of spurious or harmonics is calculated as following :

Fundamental ERP-[43+10log(carrier ERP in W)]

Frequency (MHz)	Meter Reading (dBuV)	SG Reading (dbuV)	Cable Loss (dB)	Antenna Gain Corrected	Result (dBm)	Limit (dBm)	Margin (dB)
797.375	80.7	67.6	-2.6	0	10.5	24	-13.5
1594.750	---	---	---			-13	
2392.125	---	---	---			-13	
3189.500	---	---	---			-13	
3986.875	---	---	---			-13	
4784.250	---	---	---			-13	
5581.625	---	---	---			-13	
6379.000	---	---	---			-13	
7176.375	---	---	---			-13	
7973.750	---	---	---			-13	

Note :

1. Remark "---" means that the emission level is too weak to be detected.
2. Result calculation is as following :

   Result = Meter Reading - SG Reading +Cable Loss +Antenna Gain Corrected

   Antenna Gain Corrected : is used for antenna other than dipole to convert radiated power to ERP.

C. Channel 16:

The limit of spurious or harmonics is calculated as following :

Fundamental ERP-[43+10log(carrier ERP in W)]

Frequency (MHz)	Meter Reading (dBuV)	SG Reading (dbuV)	Cable Loss (dB)	Antenna Gain Corrected	Result (dBm)	Limit (dBm)	Margin (dB)
805.375	81.3	67.7	-2.6	0	11.0	24.0	-13.0
1610.750	---	---	---			-13	
2416.125	---	---	---			-13	
3221.500	---	---	---			-13	
4026.875	---	---	---			-13	
4832.250	---	---	---			-13	
5637.625	---	---	---			-13	
6443.000	---	---	---			-13	
7248.375	---	---	---			-13	
8053.750	---	---	---			-13	

Note :

1. Remark "---" means that the emission level is too weak to be detected.
2. Result calculation is as following :

   Result = Meter Reading - SG Reading +Cable Loss +Antenna Gain Corrected

   Antenna Gain Corrected : is used for antenna other than dipole to convert radiated power to ERP.

7.5 Radiated Measurement Photos

Please see Setup Photos in Exhibit F.

8. FREQUENCY STABILITY MEASUREMENT

8.1 Provisions Applicable

According to § 2.1055 (a)(1), the frequency stability shall be measured with variation of ambient temperature from -30°C to +50°C centigrade, and according to § 2.1055 (d)(2), the frequency stability shall be measured with reducing primary supply voltage to the battery operating end point which is specified by the manufacturer.

According to § 74.861(e)(4), the frequency tolerance of the transmitter shall be less than 0.005 percent.

8.2 Measurement Procedure

A) Frequency stability versus environmental temperature

1. Setup the configuration per figure 7 for frequencies measured at ambient temperature if it is within 15°C to 25°C. Otherwise, an environmental chamber set for a temperature of 20°C shall be used. Install new batteries in the EUT.

2. Turn on EUT and set SA center frequency to the right frequency needs to be measured. Then set SA RBW to 30 kHz, VBW to 100kHz and frequency span to 500 kHz. Record this frequency to be a reference.

3. Set the temperature of chamber to 50°C. Allow sufficient time (approximately 30 min) for the temperature of the chamber to stabilize. While maintaining a constant temperature inside the chamber, turn the EUT on and measure the EUT operating frequency.

4. Repeat step 2 with a 10°C decreased per stage until the lowest temperature -30°C is measured, record all measurement frequencies.

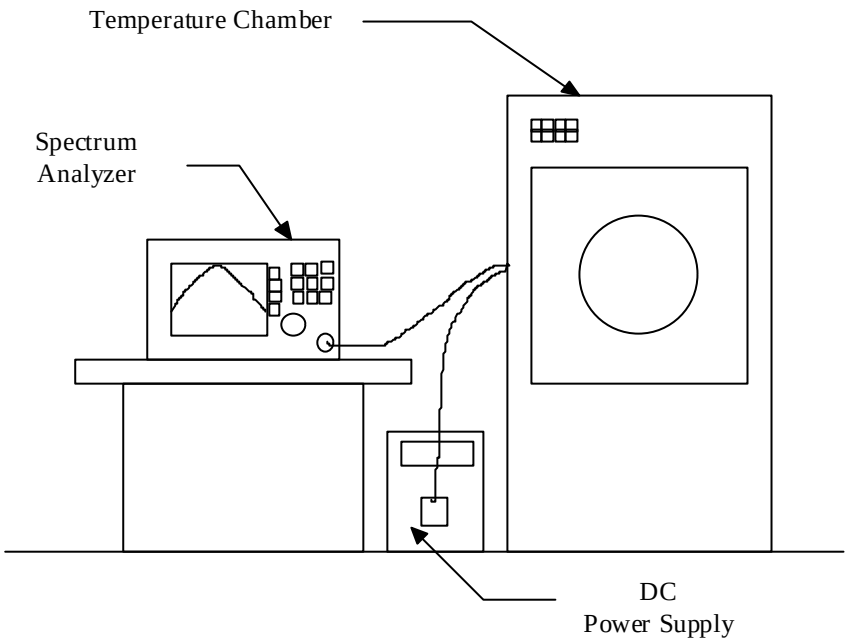
B) Frequency stability versus input voltage

1. Setup the configuration per figure 7 for frequencies measured at ambient temperature if it is within 15°C to 25°C. Otherwise, an environmental chamber set for a temperature of 20°C shall be used. Install new batteries in the EUT.

2. Set SA center frequency to the right frequency needs to be measured. Then set SA RBW to 30 kHz, VBW to 100kHz and frequency span to 500 kHz. Record this frequency to be a reference.

3. For battery operated only device, supply the EUT primary voltage at the battery operating end point which is specified by the manufacturer and record the frequency.

Figure 7 : Frequency stability measurement configuration



8.3 Measurement Instrument

Equipment	Manufacturer	Model No.	Next Cal. Date
Spectrum Analyzer	Adventest	R3361A	Aug. 22, 2002
Temperature Chamber	ACS	EOS 200T	Jan. 17, 2003

8.4 Measurement Data

Operation Mode : Carrier only
Test Date : Mar. 10, 2002

Reference Frequency : 790.3756 MHz		Limit：0.005%					
Enviroment Tempture (℃)	Power Supplied (Vdc)	Frequency measured with time elapsed					
		2 minute		5 minute		10 minute	
		(MHz)	(%)	(MHz)	(%)	(MHz)	(%)
50	102.00	790.3660	-0.00121	790.3491	-0.00335	790.3662	-0.00119
	120.00	790.4048	0.00369	790.3882	0.00159	790.3808	0.00066
	138.00	790.3831	0.00095	790.3741	-0.00019	790.3910	0.00195
40	102.00	790.4046	0.00367	790.3760	0.00005	790.3776	0.00025
	120.00	790.3730	-0.00033	790.3563	-0.00244	790.3678	-0.00099
	138.00	790.3569	-0.00237	790.4044	0.00364	790.3648	-0.00137
30	102.00	790.3541	-0.00272	790.3630	-0.00159	790.4031	0.00348
	120.00	790.3665	-0.00115	790.3700	-0.00071	790.3930	0.00220
	138.00	790.3458	-0.00377	790.3533	-0.00282	790.3869	0.00143
20	102.00	790.4023	0.00338	790.3797	0.00052	790.4058	0.00382
	120.00	790.3681	-0.00095	790.3757	0.00001	790.3592	-0.00207
	138.00	790.4043	0.00363	790.3984	0.00288	790.3943	0.00237
10	102.00	790.3529	-0.00287	790.3824	0.00086	790.3530	-0.00286
	120.00	790.3885	0.00163	790.3834	0.00099	790.3989	0.00295
	138.00	790.3999	0.00307	790.3870	0.00144	790.3809	0.00067
0	102.00	790.3599	-0.00199	790.3529	-0.00287	790.3513	-0.00307
	120.00	790.3832	0.00096	790.3679	-0.00097	790.3605	-0.00191
	138.00	790.3517	-0.00302	790.3995	0.00302	790.3864	0.00137
-10	102.00	790.3892	0.00172	790.3848	0.00116	790.3501	-0.00323
	120.00	790.3560	-0.00248	790.3838	0.00104	790.3642	-0.00144
	138.00	790.3550	-0.00261	790.3857	0.00128	790.3662	-0.00119
-20	102.00	790.3465	-0.00368	790.3665	-0.00115	790.3565	-0.00242
	120.00	790.3508	-0.00314	790.3874	0.00149	790.3934	0.00225
	138.00	790.3949	0.00244	790.3701	-0.00070	790.3828	0.00091

Reference Frequency : 797.3753 MHz		Limit：0.005%					
Enviroment Tempture (℃)	Power Supplied (Vdc)	Frequency measured with time elapsed					
		2 minute		5 minute		10 minute	
		(MHz)	(%)	(MHz)	(%)	(MHz)	(%)
50	102.00	797.3750	-0.00004	797.3643	-0.00138	797.3981	0.00286
	120.00	797.3626	-0.00159	797.3712	-0.00051	797.3977	0.00281
	138.00	797.3957	0.00256	797.3840	0.00109	797.4026	0.00342
40	102.00	797.3905	0.00191	797.3856	0.00129	797.3587	-0.00208
	120.00	797.3746	-0.00009	797.3583	-0.00213	797.4045	0.00366
	138.00	797.3675	-0.00098	797.3501	-0.00316	797.3876	0.00154
30	102.00	797.3450	-0.00380	797.3736	-0.00021	797.3565	-0.00236
	120.00	797.3727	-0.00033	797.3915	0.00203	797.3952	0.00250
	138.00	797.3565	-0.00236	797.3993	0.00301	797.3678	-0.00094
20	102.00	797.3583	-0.00213	797.3553	-0.00251	797.3771	0.00023
	120.00	797.3927	0.00218	797.3714	-0.00049	797.3461	-0.00366
	138.00	797.4031	0.00349	797.3902	0.00187	797.3993	0.00301
10	102.00	797.3956	0.00255	797.3740	-0.00016	797.3825	0.00090
	120.00	797.3665	-0.00110	797.3667	-0.00108	797.3483	-0.00339
	138.00	797.4017	0.00331	797.4050	0.00372	797.3949	0.00246
0	102.00	797.3924	0.00214	797.3458	-0.00370	797.3558	-0.00245
	120.00	797.3738	-0.00019	797.3894	0.00177	797.4057	0.00381
	138.00	797.3964	0.00265	797.3592	-0.00202	797.3973	0.00276
-10	102.00	797.4031	0.00349	797.3471	-0.00354	797.3892	0.00174
	120.00	797.3508	-0.00307	797.3712	-0.00051	797.3461	-0.00366
	138.00	797.3545	-0.00261	797.3494	-0.00325	797.3997	0.00306
-20	102.00	797.4022	0.00337	797.3551	-0.00253	797.3464	-0.00362
	120.00	797.3877	0.00156	797.3465	-0.00361	797.3680	-0.00092
	138.00	797.3812	0.00074	797.3692	-0.00077	797.3815	0.00078

Reference Frequency : 805.3753 MHz		Limit：0.005%					
Enviroment Tempture (℃)	Power Supplied (Vdc)	Frequency measured with time elapsed					
		2 minute		5 minute		10 minute	
		(MHz)	(%)	(MHz)	(%)	(MHz)	(%)
50	102.00	805.4029	0.00343	805.3471	-0.00350	805.3715	-0.00047
	120.00	805.3972	0.00272	805.3666	-0.00108	805.3554	-0.00247
	138.00	805.3575	-0.00221	805.3502	-0.00312	805.3755	0.00002
40	102.00	805.4058	0.00379	805.3907	0.00191	805.3678	-0.00093
	120.00	805.3826	0.00091	805.3508	-0.00304	805.3995	0.00300
	138.00	805.4051	0.00370	805.3849	0.00119	805.3660	-0.00115
30	102.00	805.3732	-0.00026	805.3594	-0.00197	805.3819	0.00082
	120.00	805.3619	-0.00166	805.3581	-0.00214	805.3716	-0.00046
	138.00	805.3830	0.00096	805.3917	0.00204	805.3981	0.00283
20	102.00	805.4020	0.00332	805.3703	-0.00062	805.4060	0.00381
	120.00	805.3803	0.00062	805.3713	-0.00050	805.3657	-0.00119
	138.00	805.3720	-0.00041	805.3703	-0.00062	805.3462	-0.00361
10	102.00	805.3736	-0.00021	805.3933	0.00223	805.3474	-0.00346
	120.00	805.3975	0.00276	805.3775	0.00027	805.3874	0.00150
	138.00	805.3517	-0.00293	805.3597	-0.00194	805.3806	0.00066
0	102.00	805.3593	-0.00199	805.3882	0.00160	805.3563	-0.00236
	120.00	805.3557	-0.00243	805.3528	-0.00279	805.4032	0.00346
	138.00	805.3532	-0.00274	805.3873	0.00149	805.3677	-0.00094
-10	102.00	805.3511	-0.00300	805.3457	-0.00368	805.3947	0.00241
	120.00	805.3872	0.00148	805.3839	0.00107	805.4053	0.00372
	138.00	805.3865	0.00139	805.3568	-0.00230	805.3622	-0.00163
-20	102.00	805.3902	0.00185	805.3867	0.00142	805.3930	0.00220
	120.00	805.3484	-0.00334	805.4048	0.00366	805.3683	-0.00087
	138.00	805.3913	0.00199	805.3889	0.00169	805.3929	0.00219

9 CONDUCTED EMISSION MEASUREMENT

9.1 Standard Applicable

For intentional device, Line Conducted Emission Limits are in accordance to § 15.207(a), any emissions level shall not exceed 48 dBuV.

9.2 Measurement Procedure

1. Setup the configuration per figure 3.

2. A preliminary scan with a spectrum monitor is performed to identify the frequency of emission that has the highest amplitude relative to the limit by operating the EUT in selected modes of operation, typical cable positions, and with a typical system configuration.

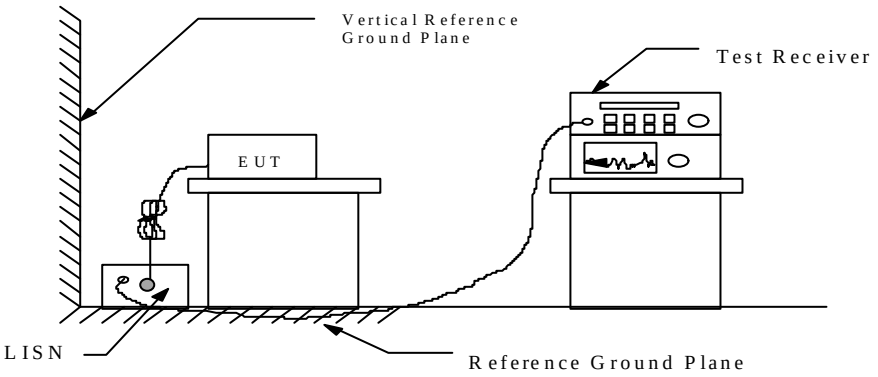
3. Record the 6 or 8 highest emissions relative to the limit.

4. Measure each frequency obtained from step 3 by a test receiver set on quasi peak detector function, and then record the accuracy frequency and emission level. If all emissions measured in the specified band are attenuated more than 20 dB from the limit, this step would be ignored, and the peak detector function would be used.

5. Confirm the highest three emissions with variation of the EUT cable configuration and record the final data.

6. Repeat all above procedures on measuring each operation mode of EUT.

Figure 3 : Conducted emissions measurement configuration



9.3 Conducted Emission Data

Operation Mode : Normal
Test Date : Mar. 04, 2002 Temperature : 22 ℃ Humidity: 60%

A. Channel 1:

Frequency	Reading (dBuV)		Factor	Result (dBuV)		Limit	Margin
(MHz)	Va	Vb	(dB)	Va	Vb	(dBuV)	(dB)
0.4500	33.6	30.5	0.2	33.8	30.7	48.0	-14.2
2.4255	19.0	19.1	0.3	19.3	19.4	48.0	-28.6
4.3072	18.6	18.2	0.3	18.9	18.5	48.0	-29.1
20.2793	24.8	23.1	0.9	25.7	24.0	48.0	-22.3
25.3508	32.2	25.7	1.0	33.2	26.7	48.0	-14.8
27.0408	39.8	32.0	1.0	40.8	33.0	48.0	-7.2

B. Channel 8:

Frequency	Reading (dBuV)		Factor	Result (dBuV)		Limit	Margin
(MHz)	Va	Vb	(dB)	Va	Vb	(dBuV)	(dB)
0.4500	34.2	30.2	0.2	34.4	30.4	48.0	-13.6
2.4255	19.0	19.1	0.3	19.3	19.4	48.0	-28.6
4.3072	18.8	18.5	0.3	19.1	18.9	48.0	-28.9
20.2793	25.0	23.7	0.9	25.9	24.7	48.0	-22.1
25.3508	33.0	26.0	1.0	34.0	27.0	48.0	-14.0
27.0408	40.1	31.8	1.0	41.1	32.8	48.0	-6.9

C. Channel 16:

Frequency	Reading (dBuV)		Factor	Result (dBuV)		Limit	Margin
(MHz)	Va	Vb	(dB)	Va	Vb	(dBuV)	(dB)
0.4500	34.4	29.9	0.2	34.6	30.1	48.0	-13.4
2.4255	18.7	19.4	0.3	19.0	19.7	48.0	-28.3
4.3072	19.4	17.9	0.3	19.8	18.2	48.0	-28.2
20.2793	25.7	22.8	0.9	26.6	23.7	48.0	-21.4
25.3508	32.4	25.3	1.0	33.4	26.3	48.0	-14.6
27.0408	39.6	32.4	1.0	40.7	33.5	48.0	-7.3

Please see appendix 4 for plotted data

9.4 Result Data Calculation

The result data is calculated by adding the LISN Factor to the measured reading. The basic equation with a sample calculation is as follows:

RESULT = READING + LISN FACTOR

9.5 Conducted Measurement Equipment

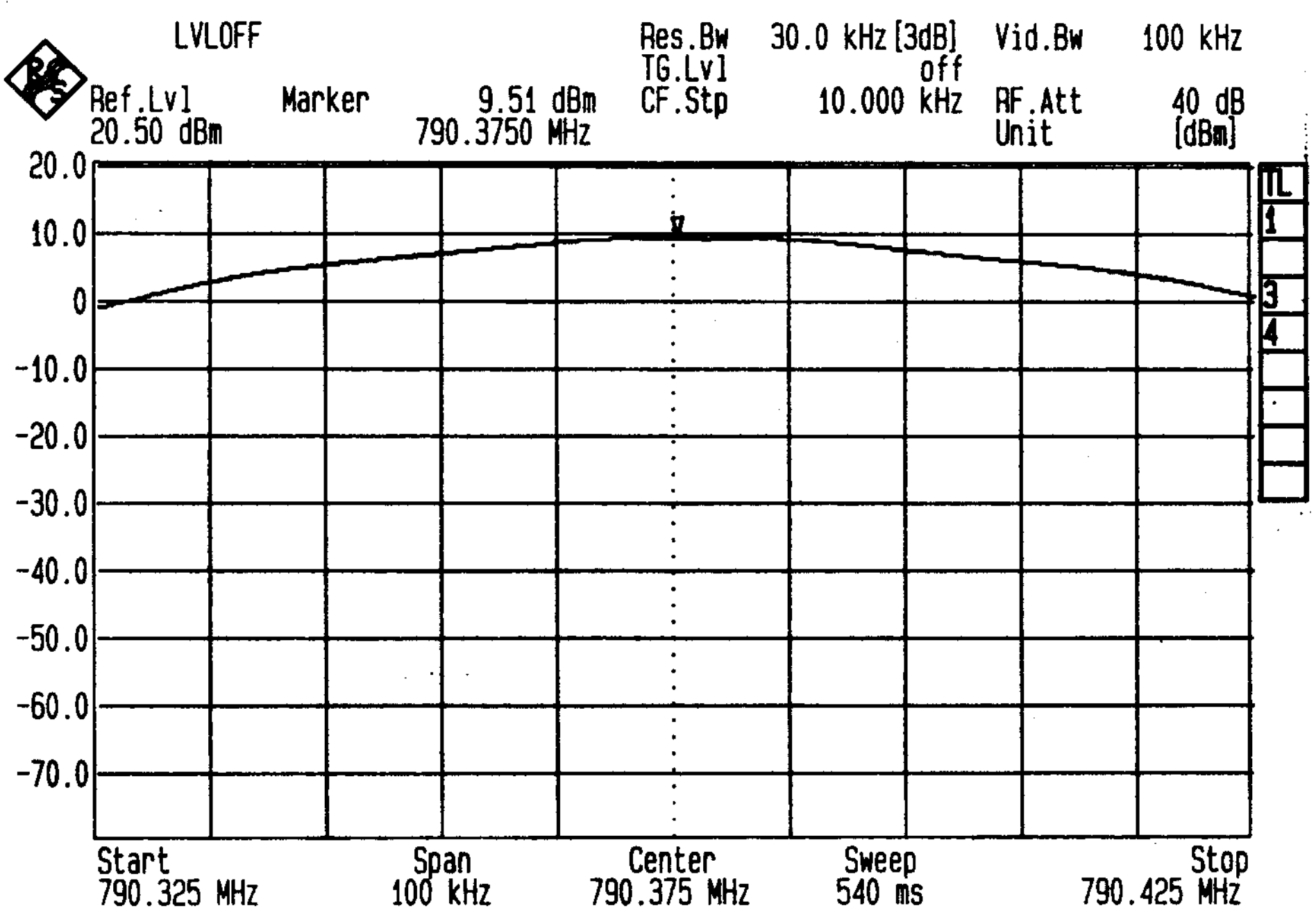
The following test equipment are used during the conducted test .

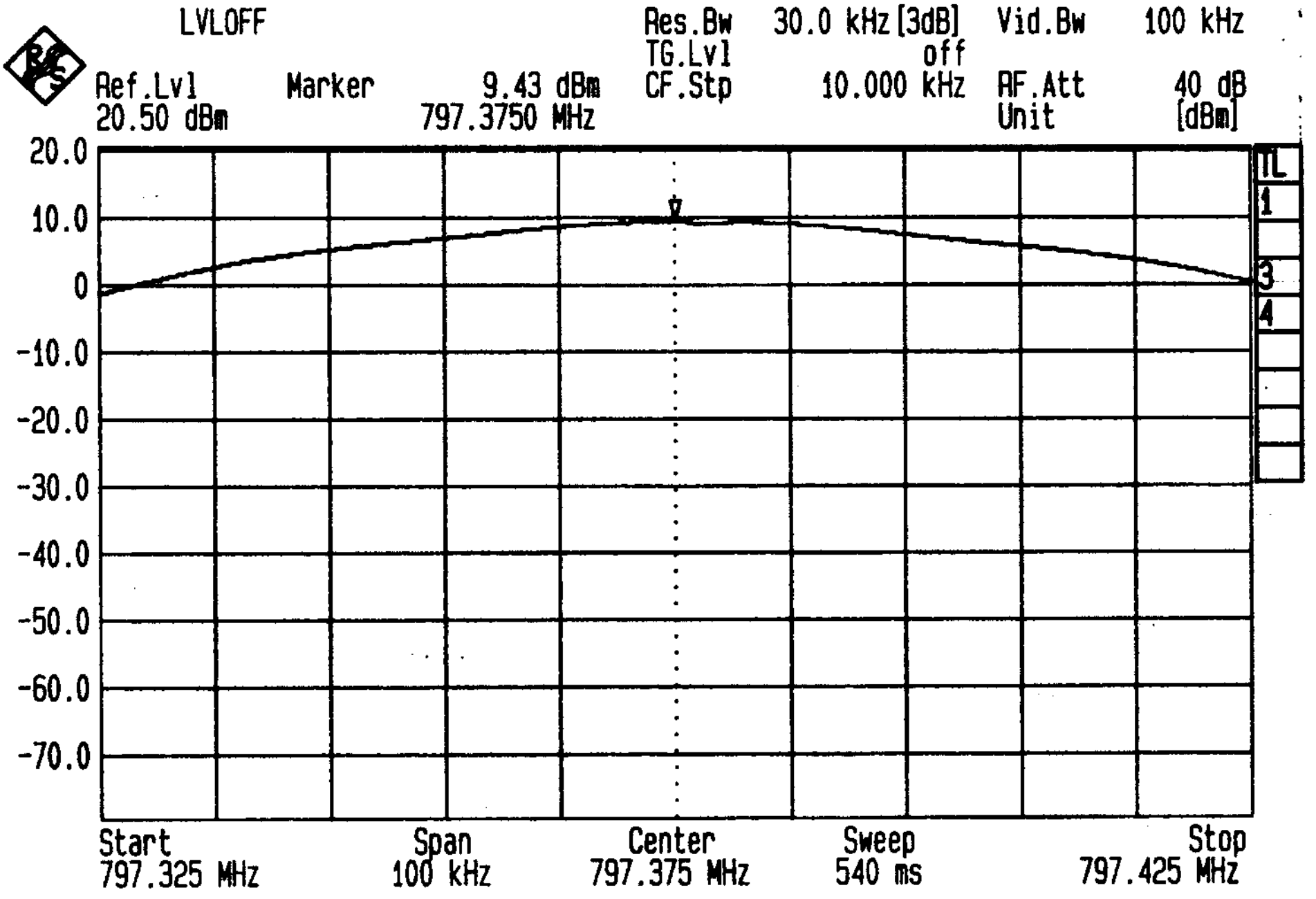
Equipment	Manufacturer	Model No.	Next Cal. Date
RF Test Receiver	Rohde and Schwarz	ESH3	Jan. 03, 2003
Spectrum Monitor	Rohde and Schwarz	EZM	N.C.R.
Line Impedance Stabilization network	Kyoritsu	KNW-407	Dec. 02, 2002
Plotter	Hewlett-Packard	7440A	N/A
Shielded Room	Riken	N/A	N.C.R.

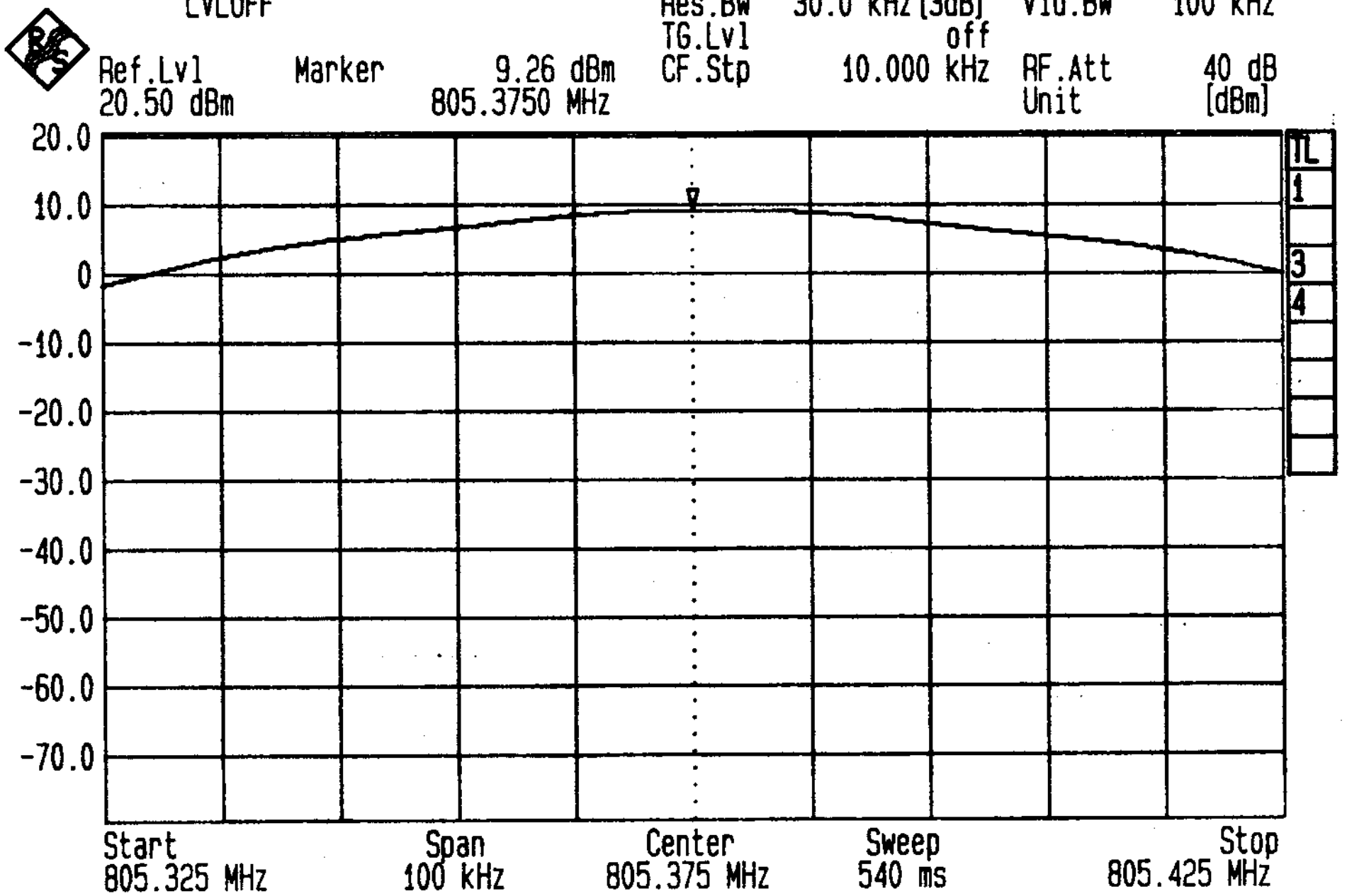
9.6 Photos of Conduction Measuring Setup

Please see Setup Photos in Exhibit F.

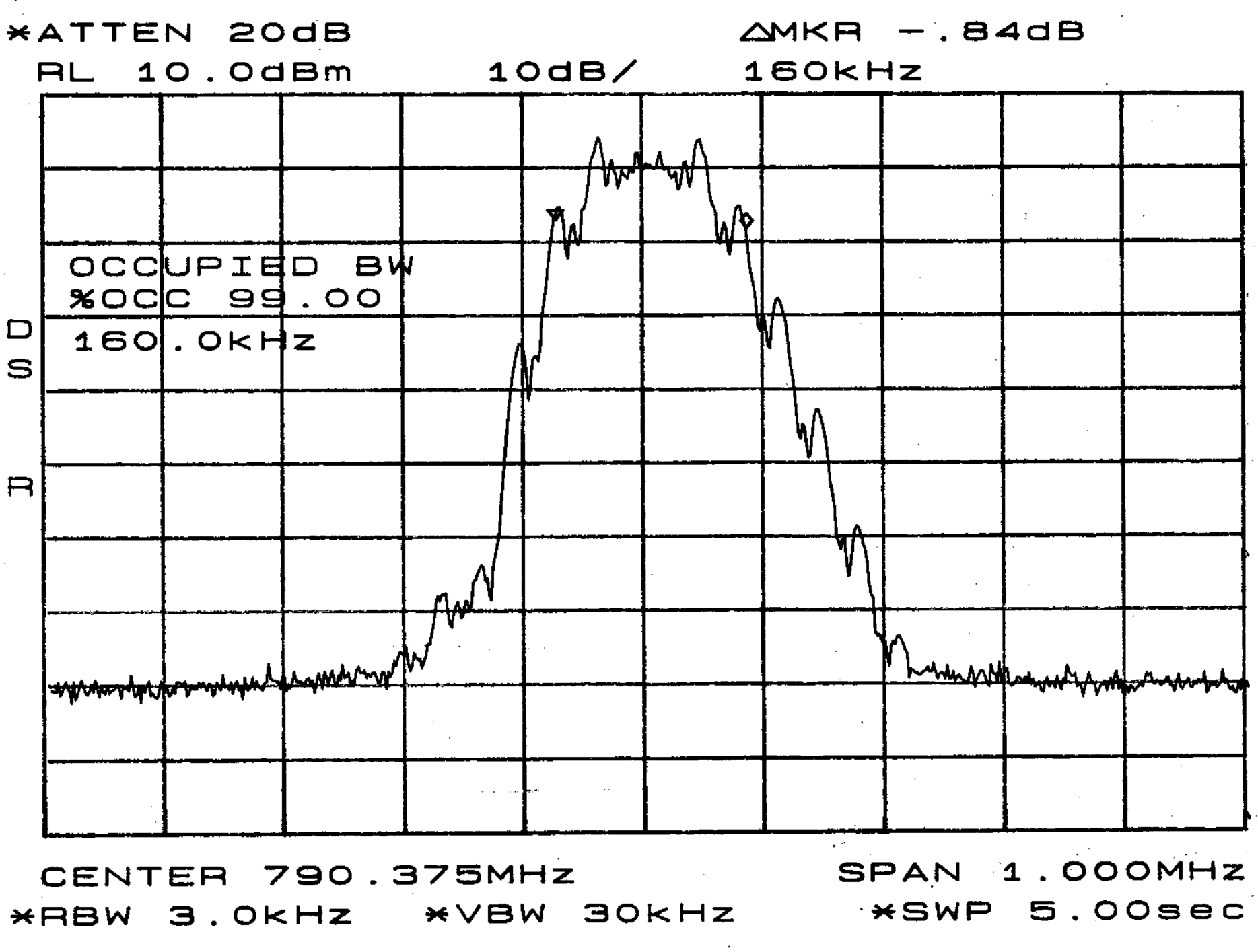
Appendix 1 Ouput Power Plotted Data

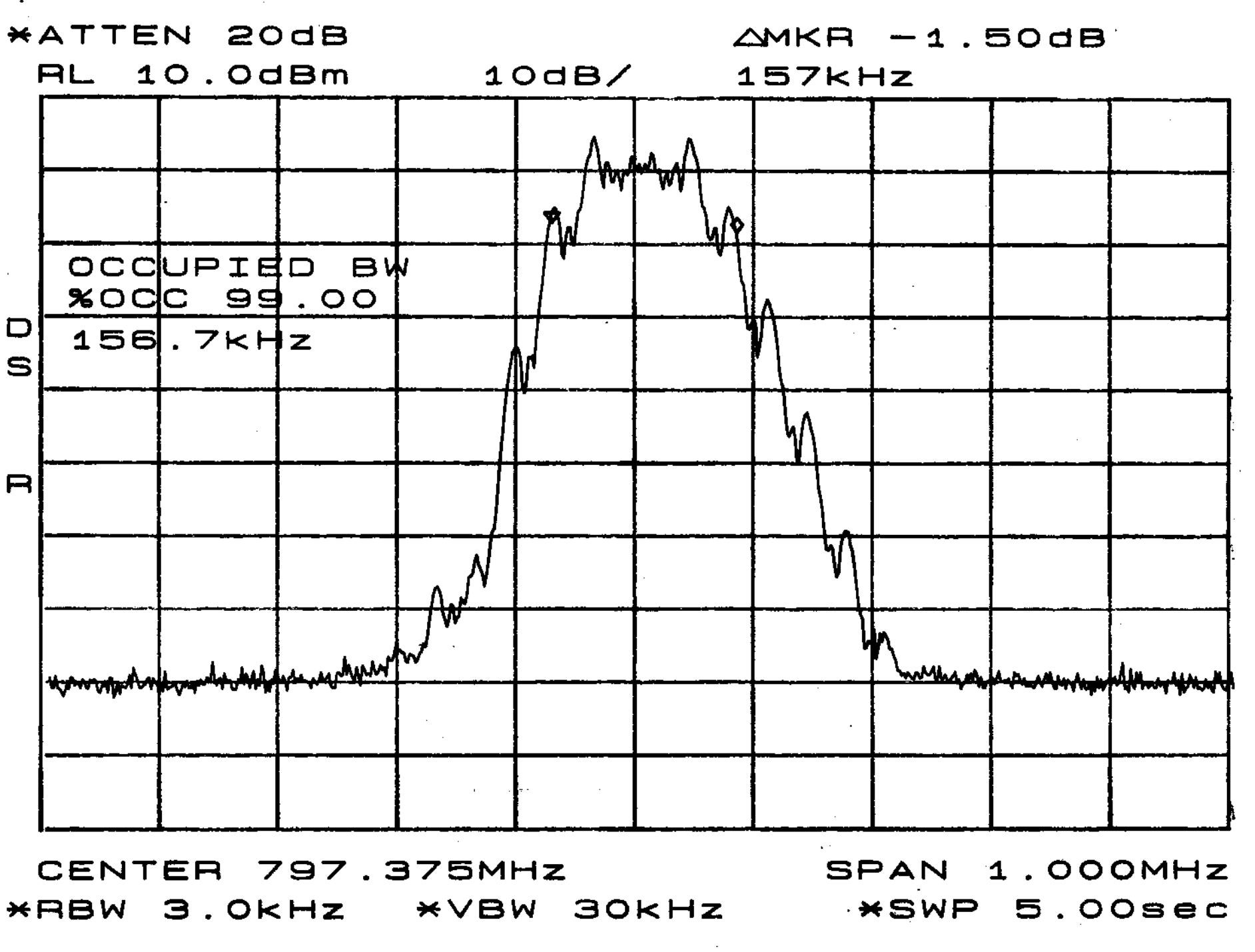

LVLOFF
Res.Bw 30.0 kHz [3dB]
Vid.Bw 100 kHz
TG.Lvl off
Ref.Lvl 20.50 dBm
Marker 790.3750 MHz 9.51 dBm
CF.Stp 10.000 kHz
RF.Att 40 dB
Unit [dBm]
20.0
10.0
0
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
TL
1
3
4
Start 790.325 MHz
Span 100 kHz
Center 790.375 MHz
Sweep 540 ms
Stop 790.425 MHz

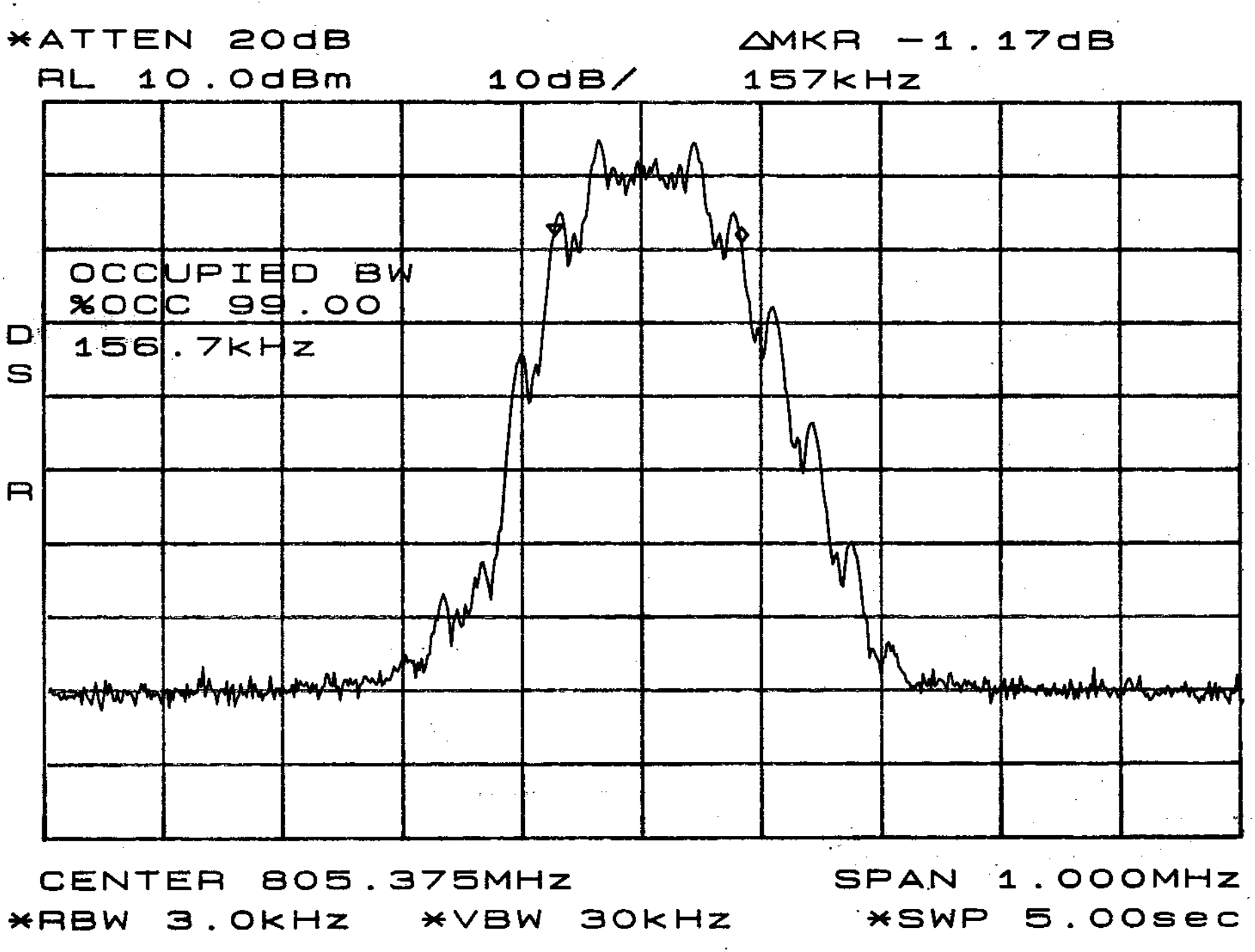

LVLOFF
Res.Bw 30.0 kHz [3dB]
Vid.Bw 100 kHz
TG.Lvl off
Ref.Lvl 20.50 dBm
Marker 797.3750 MHz 9.43 dBm
CF.Stp 10.000 kHz
RF.Att 40 dB
Unit [dBm]
20.0
10.0
0
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
TL
1
3
4
Start 797.325 MHz
Span 100 kHz
Center 797.375 MHz
Sweep 540 ms
Stop 797.425 MHz


LVLOFF
Res.Bw 30.0 kHz [3dB]
Vid.Bw 100 kHz
TG.Lvl off
Ref.Lvl 20.50 dBm
Marker 9.26 dBm
805.3750 MHz
CF.Stp 10.000 kHz
RF.Att 40 dB
Unit [dBm]
20.0
10.0
0
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
TL
1
3
4
Start 805.325 MHz
Span 100 kHz
Center 805.375 MHz
Sweep 540 ms
Stop 805.425 MHz

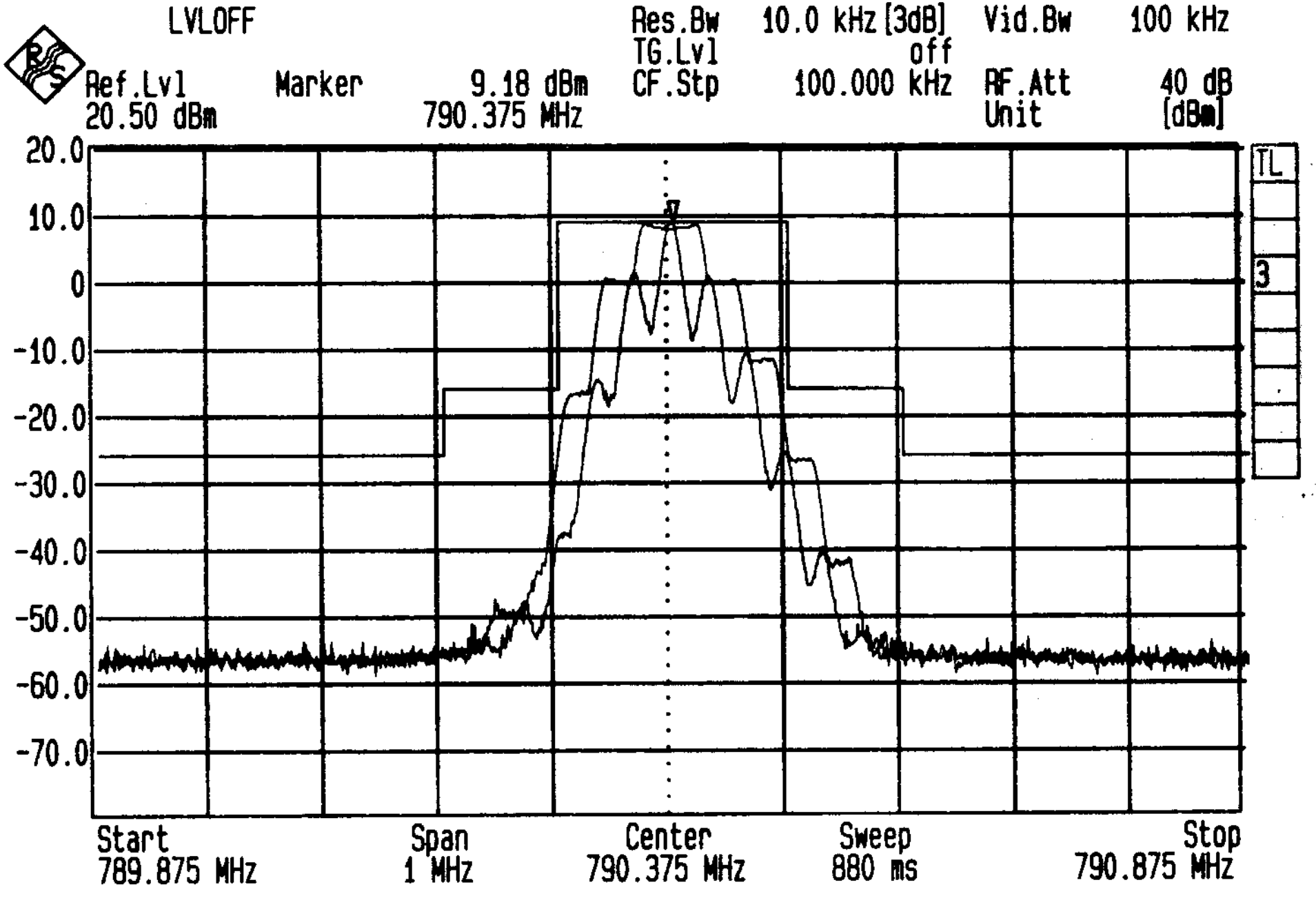
Appendix 2 Occupied Emission Bandwidth Plotted Data

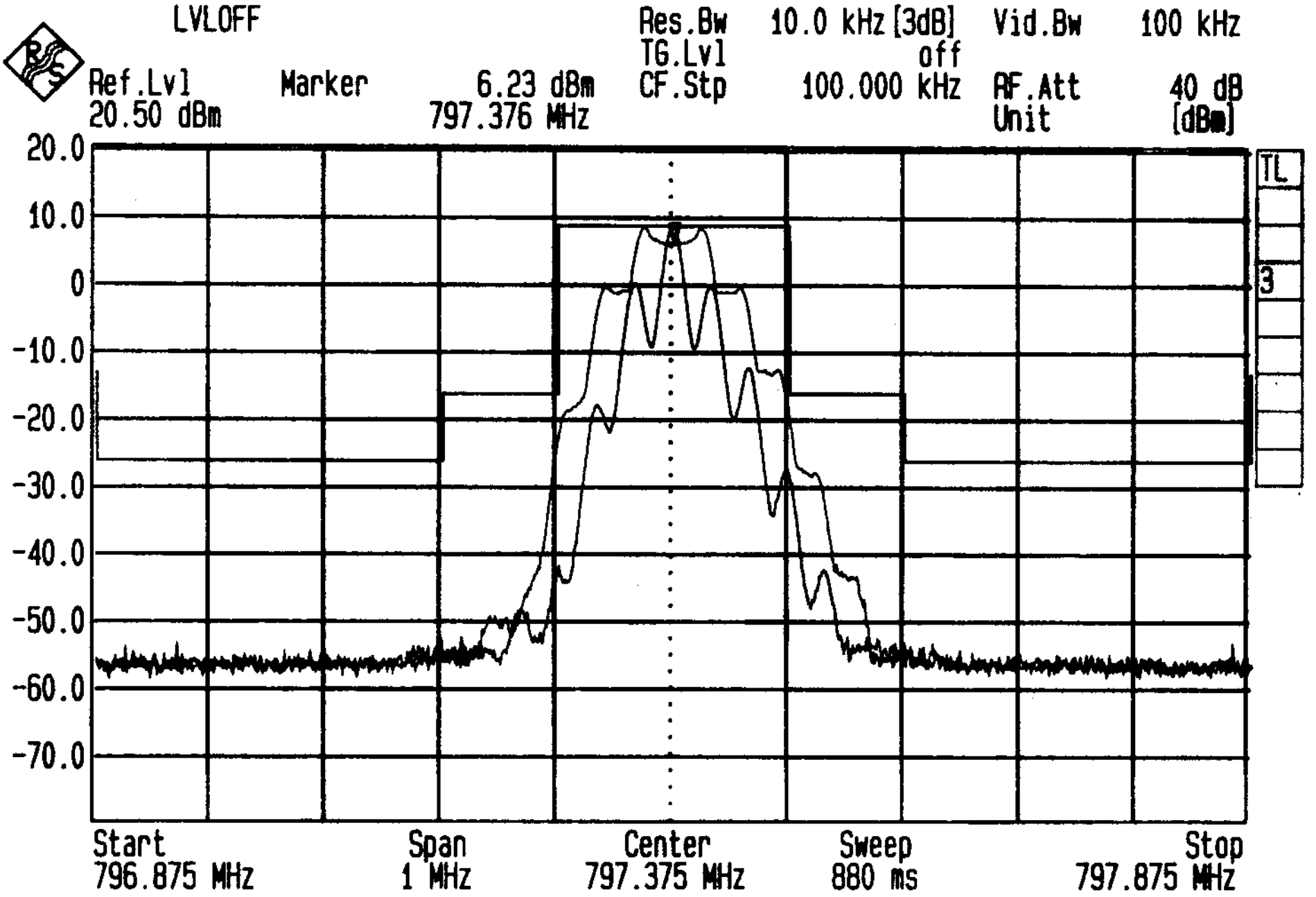

*ATTEN 20dB
ΔMKR -.84dB
RL 10.0dBm
10dB/
160kHz
OCCUPIED BW
%OCC 99.00
160.0kHz
DSR
CENTER 790.375MHz
SPAN 1.000MHz
*RBW 3.0kHz
*VBW 30kHz
*SWP 5.00sec

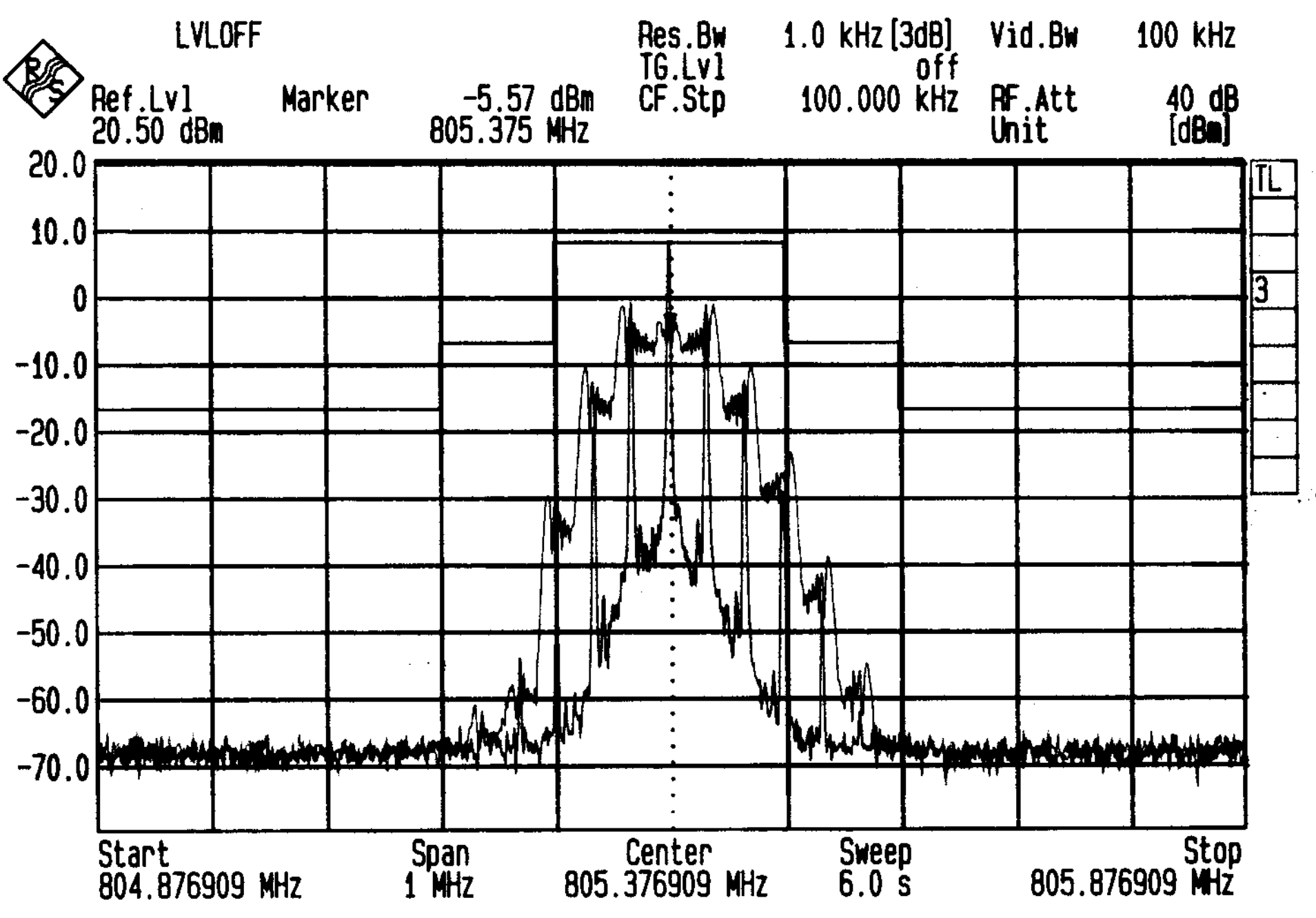

*ATTEN 20dB
ΔMKR -1.50dB
RL 10.0dBm
10dB/
157kHz
OCCUPIED BW
%OCC 99.00
156.7kHz
D
S
R
CENTER 797.375MHz
SPAN 1.000MHz
*RBW 3.0kHz
*VBW 30kHz
*SWP 5.00sec

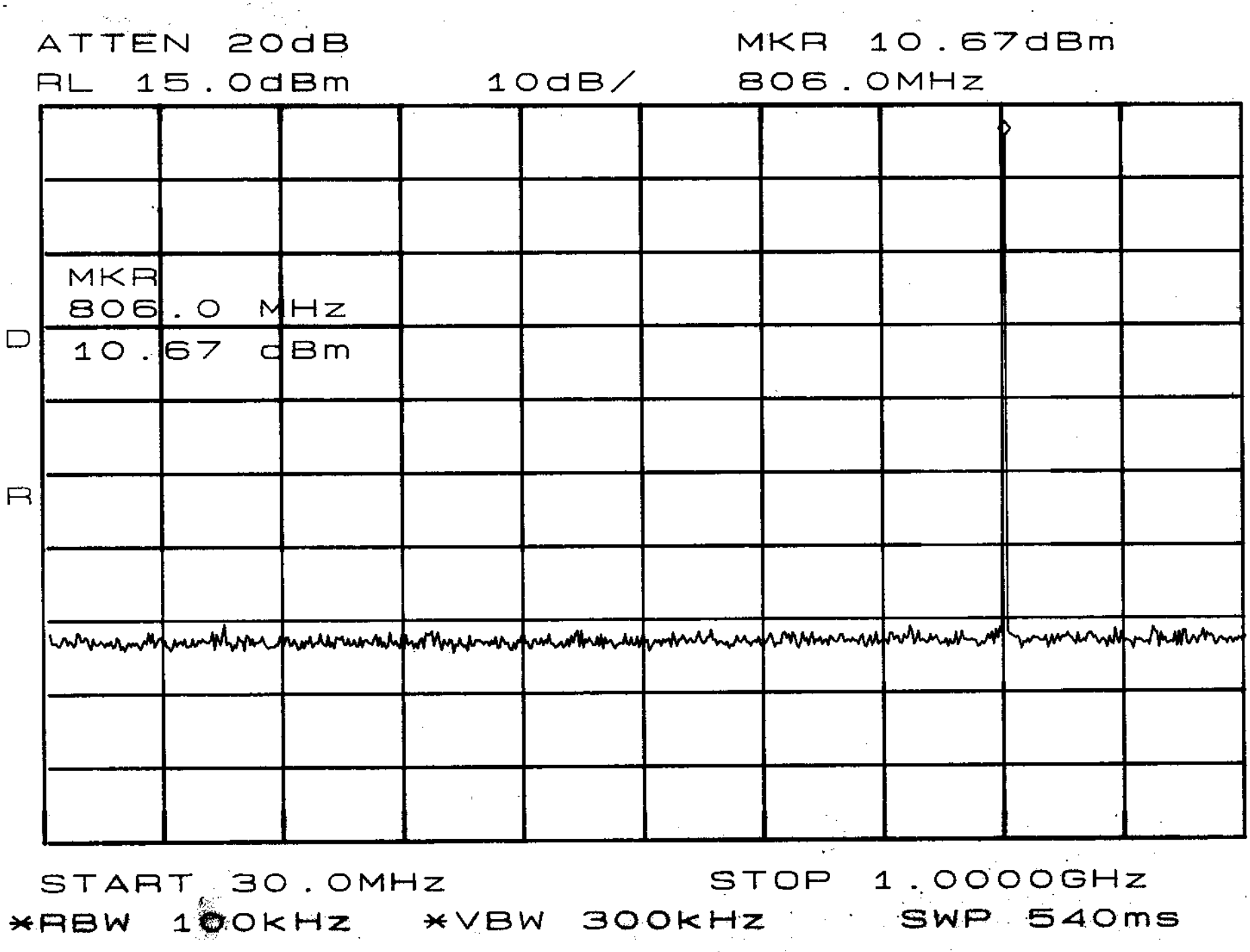

*ATTEN 20dB
ΔMKR -1.17dB
RL 10.0dBm
10dB/
157kHz
OCCUPIED BW
%OCC 99.00
156.7kHz
D
S
R
CENTER 805.375MHz
SPAN 1.000MHz
*RBW 3.0kHz
*VBW 30kHz
*SWP 5.00sec

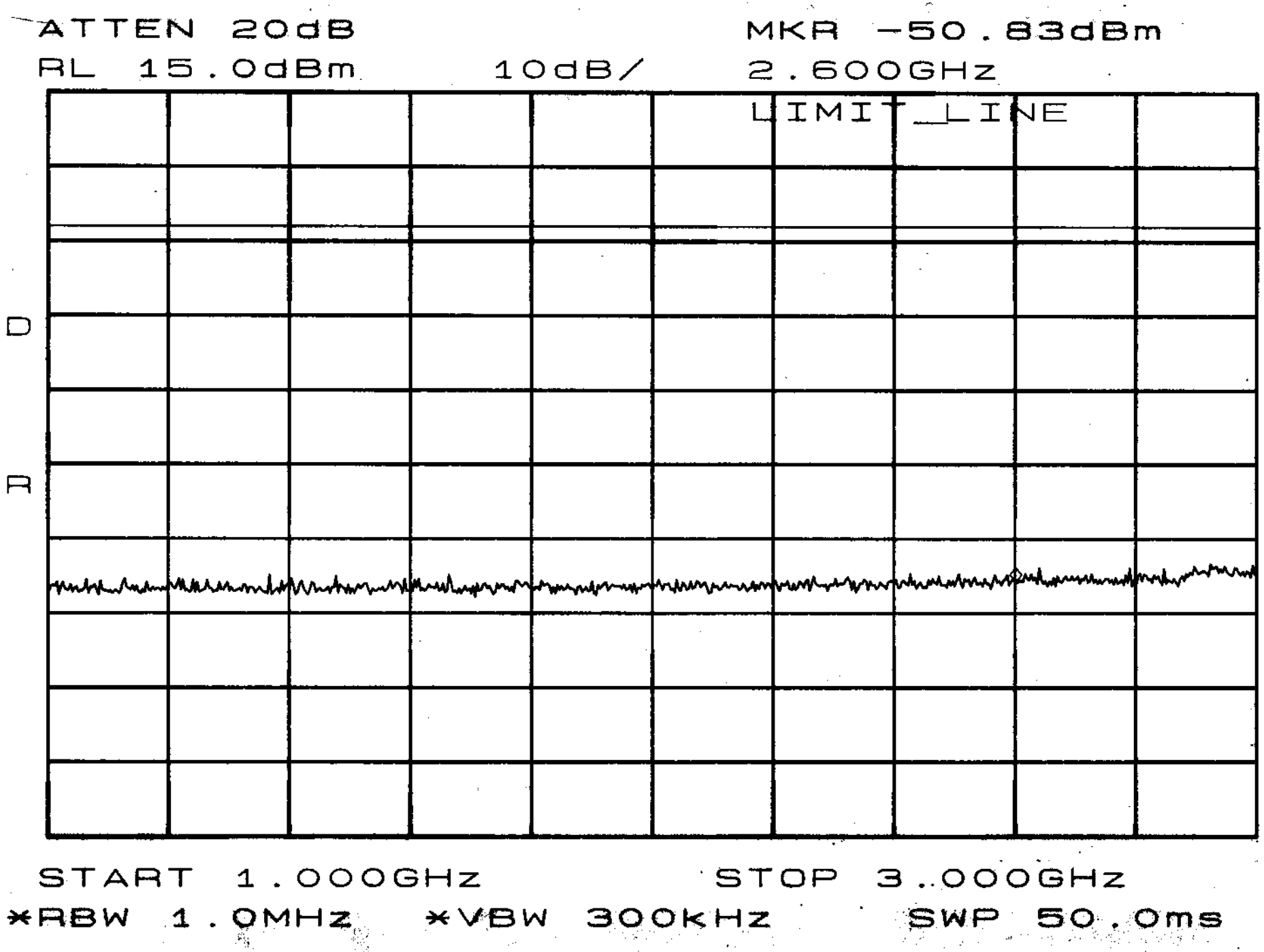
Appendix 3 Spuriuos Emissions at Antenna Terminal

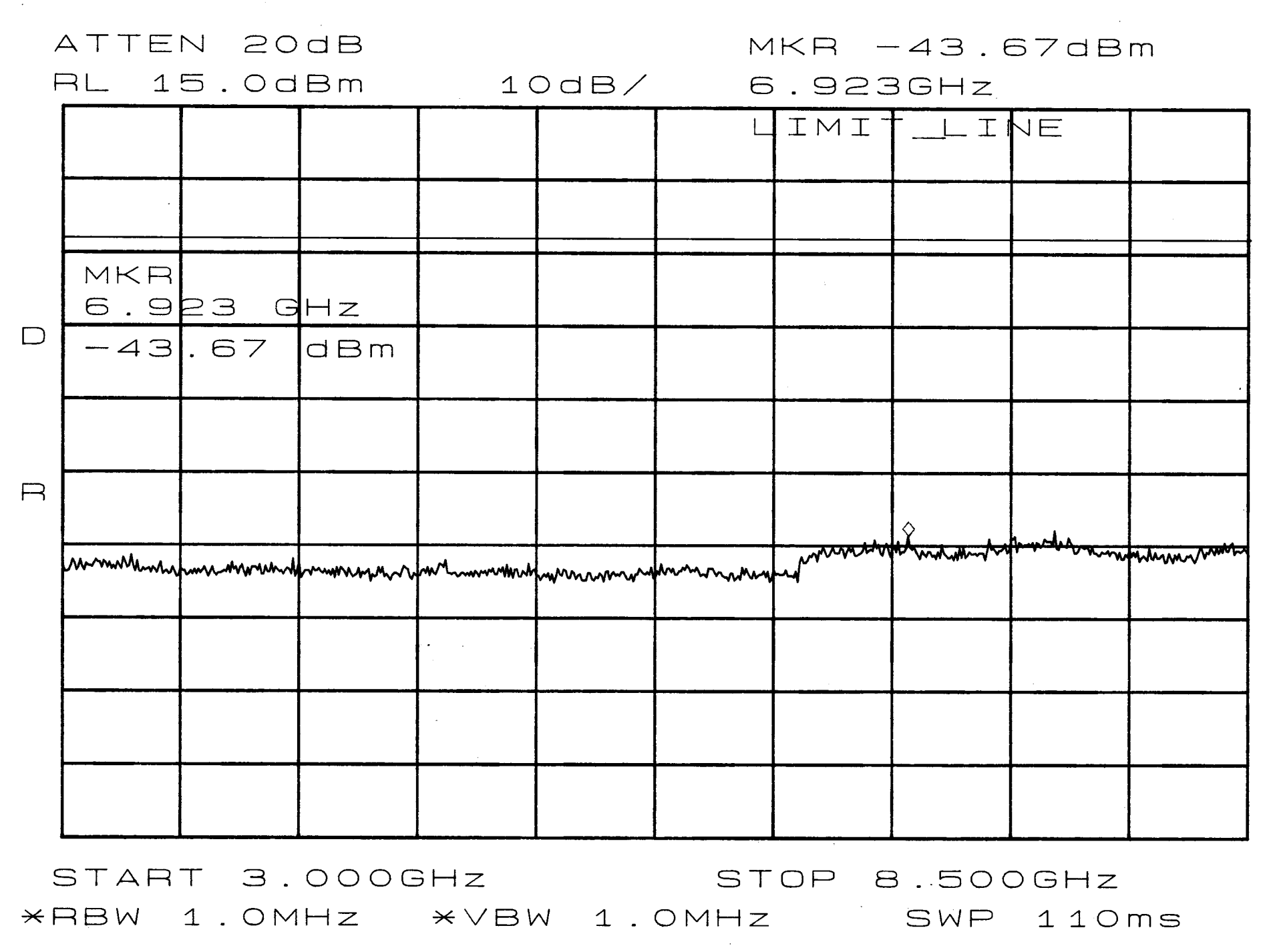

LVLOFF
Res.Bw 10.0 kHz [3dB]
Vid.Bw 100 kHz
TG.Lvl off
Ref.Lvl 20.50 dBm
Marker 9.18 dBm 790.375 MHz
CF.Stp 100.000 kHz
RF.Att 40 dB
Unit [dBm]
20.0
10.0
0
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
TL
3
Start 789.875 MHz
Span 1 MHz
Center 790.375 MHz
Sweep 880 ms
Stop 790.875 MHz


LVLOFF
Res.Bw 10.0 kHz [3dB]
Vid.Bw 100 kHz
TG.Lvl off
Ref.Lvl 20.50 dBm
Marker 6.23 dBm 797.376 MHz
CF.Stp 100.000 kHz
RF.Att 40 dB
Unit [dBm]
20.0
10.0
0
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
TL
3
Start 796.875 MHz
Span 1 MHz
Center 797.375 MHz
Sweep 880 ms
Stop 797.875 MHz

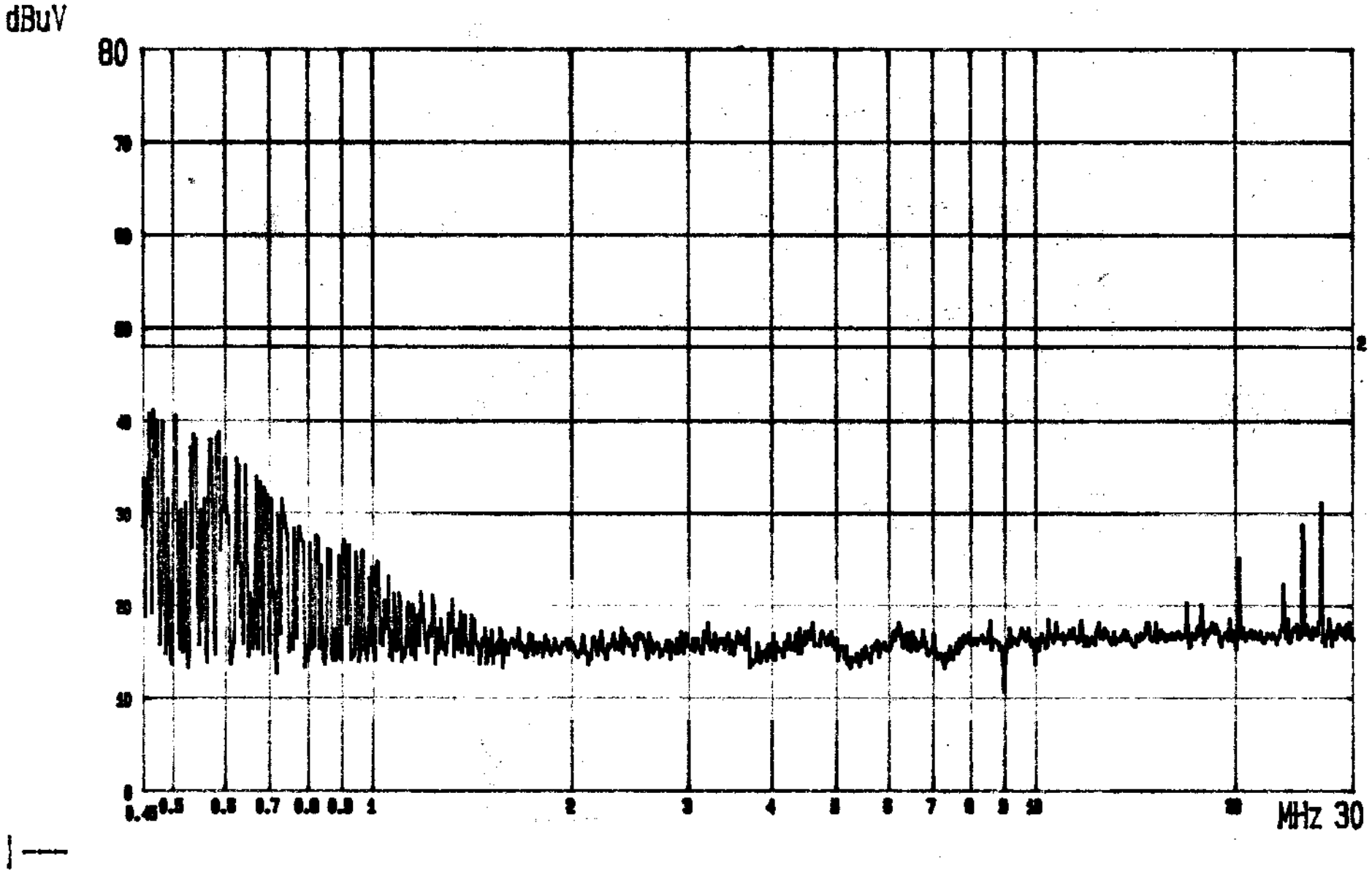

LVLOFF
Res.Bw 1.0 kHz [3dB]
Vid.Bw 100 kHz
TG.Lvl off
Ref.Lvl 20.50 dBm
Marker -5.57 dBm 805.375 MHz
CF.Stp 100.000 kHz
RF.Att 40 dB
Unit [dBm]
20.0
10.0
0
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
TL
3
Start 804.876909 MHz
Span 1 MHz
Center 805.376909 MHz
Sweep 6.0 s
Stop 805.876909 MHz


ATTEN 20dB
MKR 10.67dBm
RL 15.0dBm
10dB/
806.0MHz
MKR
806.0 MHz
10.67 dBm
D
R
START 30.0MHz
STOP 1.0000GHz
*RBW 100kHz
*VBW 300kHz
SWP 540ms

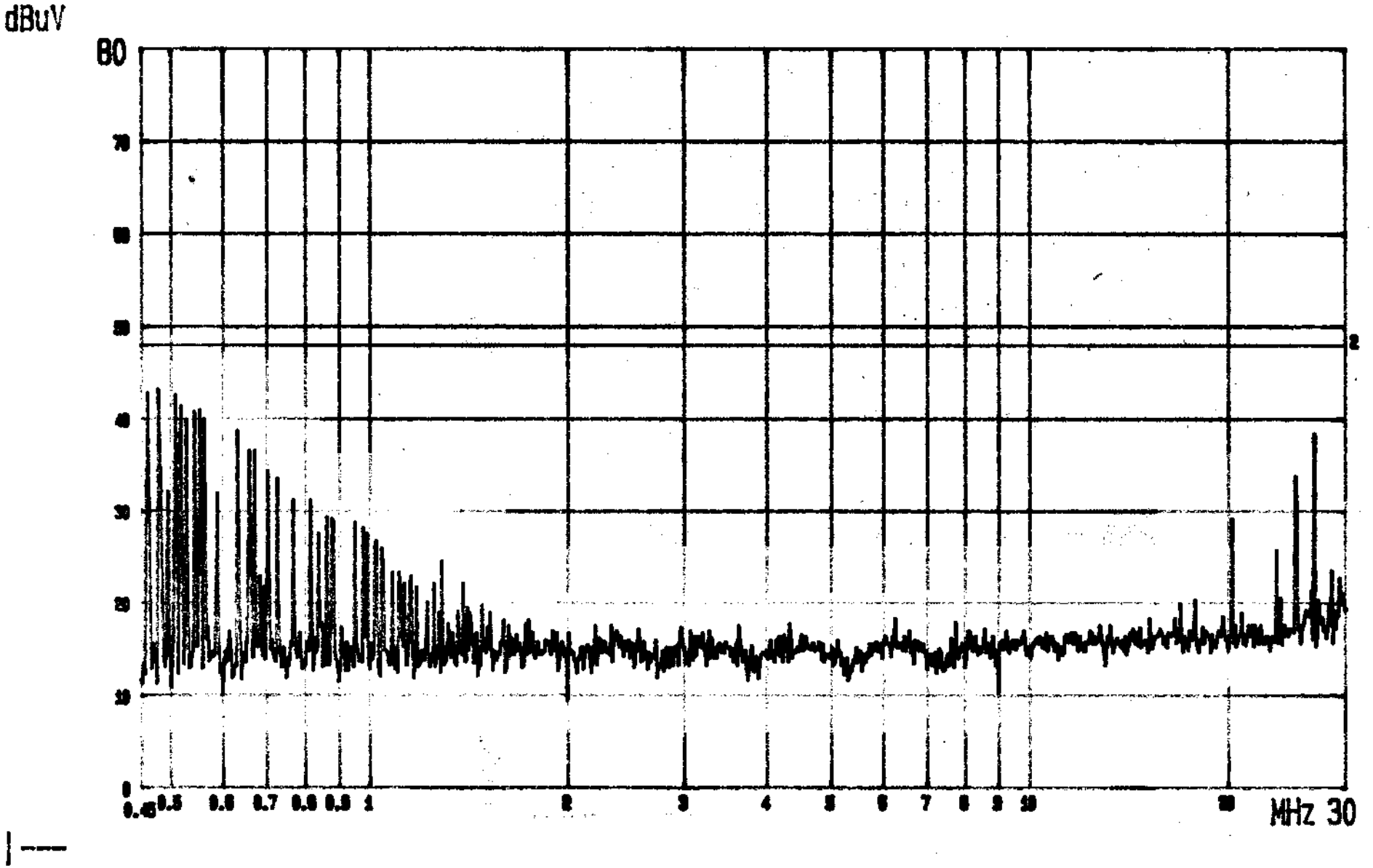

ATTEN 20dB
MKR -50.83dBm
RL 15.0dBm
10dB/
2.600GHz
LIMIT LINE
D
R
START 1.000GHz
STOP 3.000GHz
*RBW 1.0MHz
*VBW 300kHz
SWP 50.0ms


ATTEN 20dB
RL 15.0dBm
10dB/
MKR -43.67dBm
6.923GHz
LIMIT LINE
MKR
6.923 GHz
-43.67 dBm
D
R
START 3.000GHz
STOP 8.500GHz
*RBW 1.0MHz
*VBW 1.0MHz
SWP 110ms

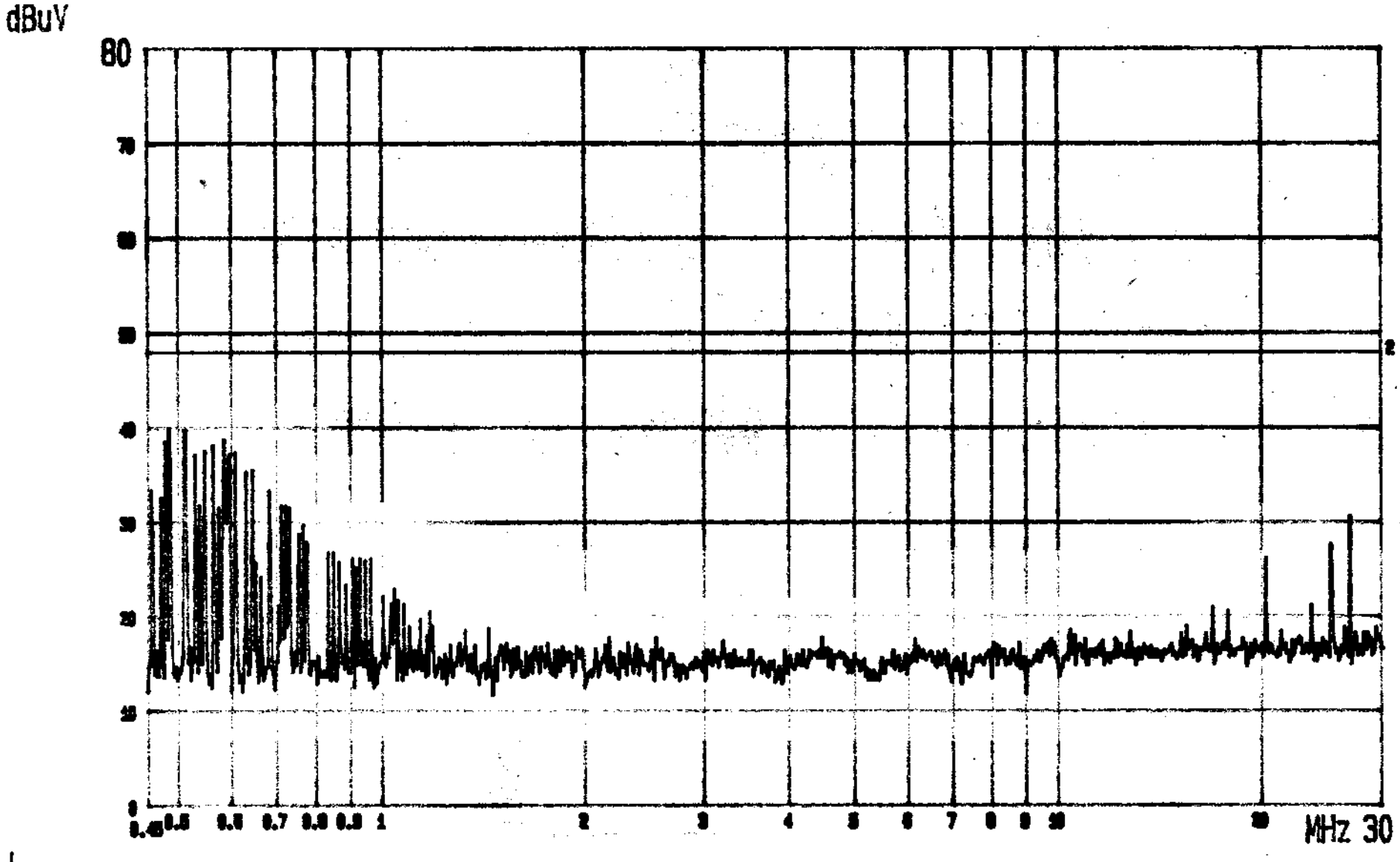
Appendix 4 Power Line Conducted Emissions Plotted Data



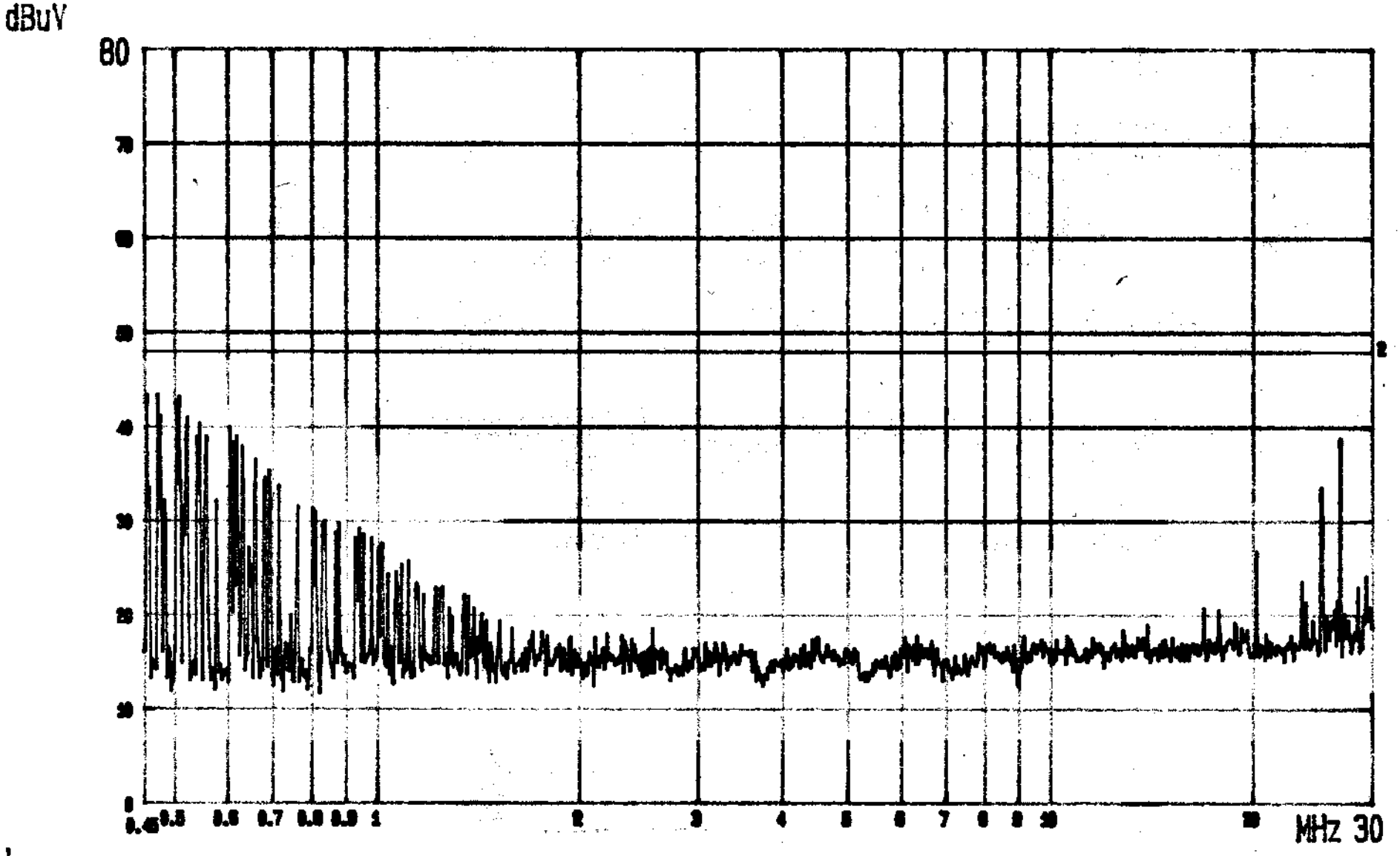
MODE: CHANNEL 1
LISN: VA



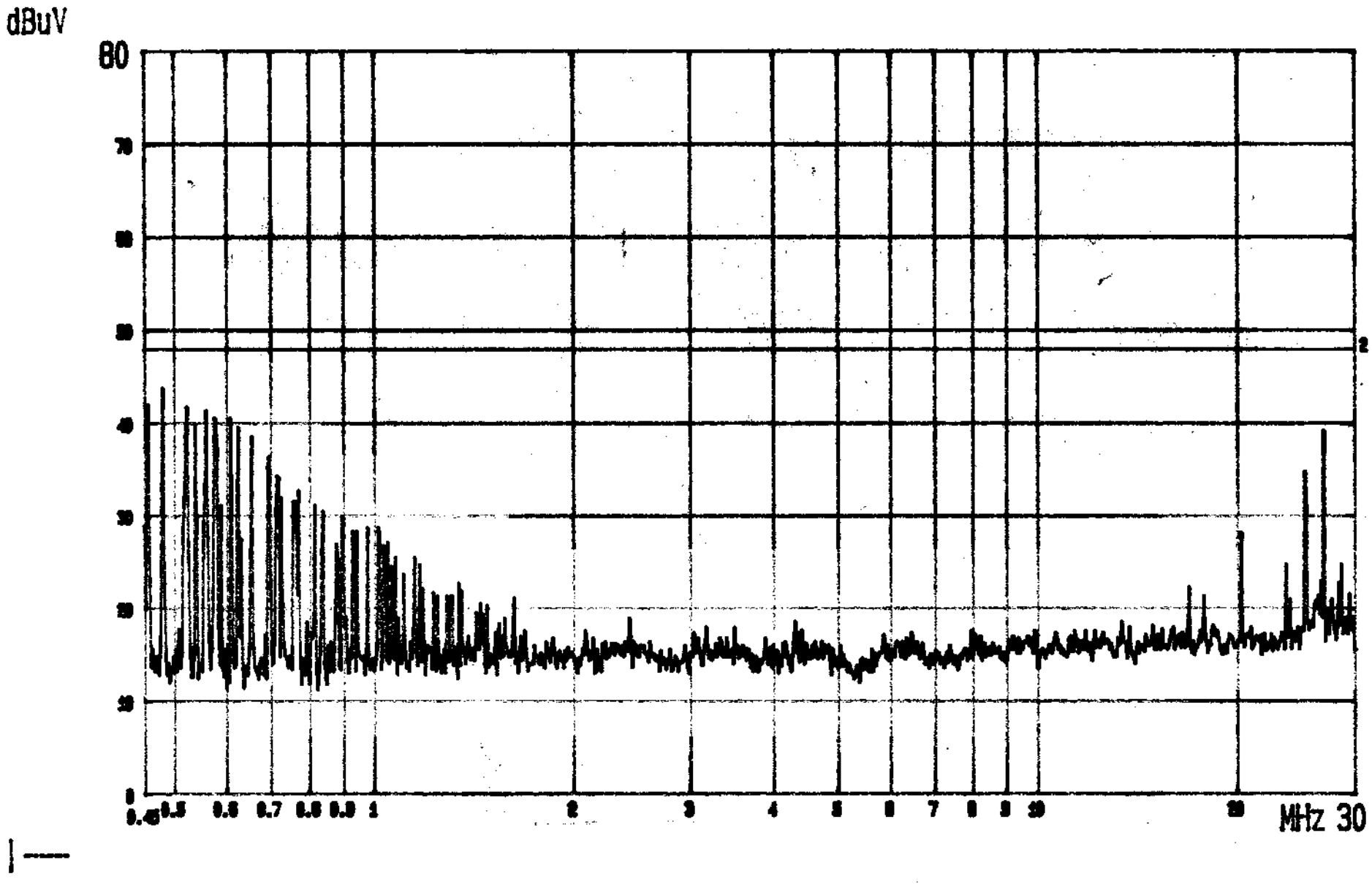
MODE: CHANNEL 1
LISN: VB



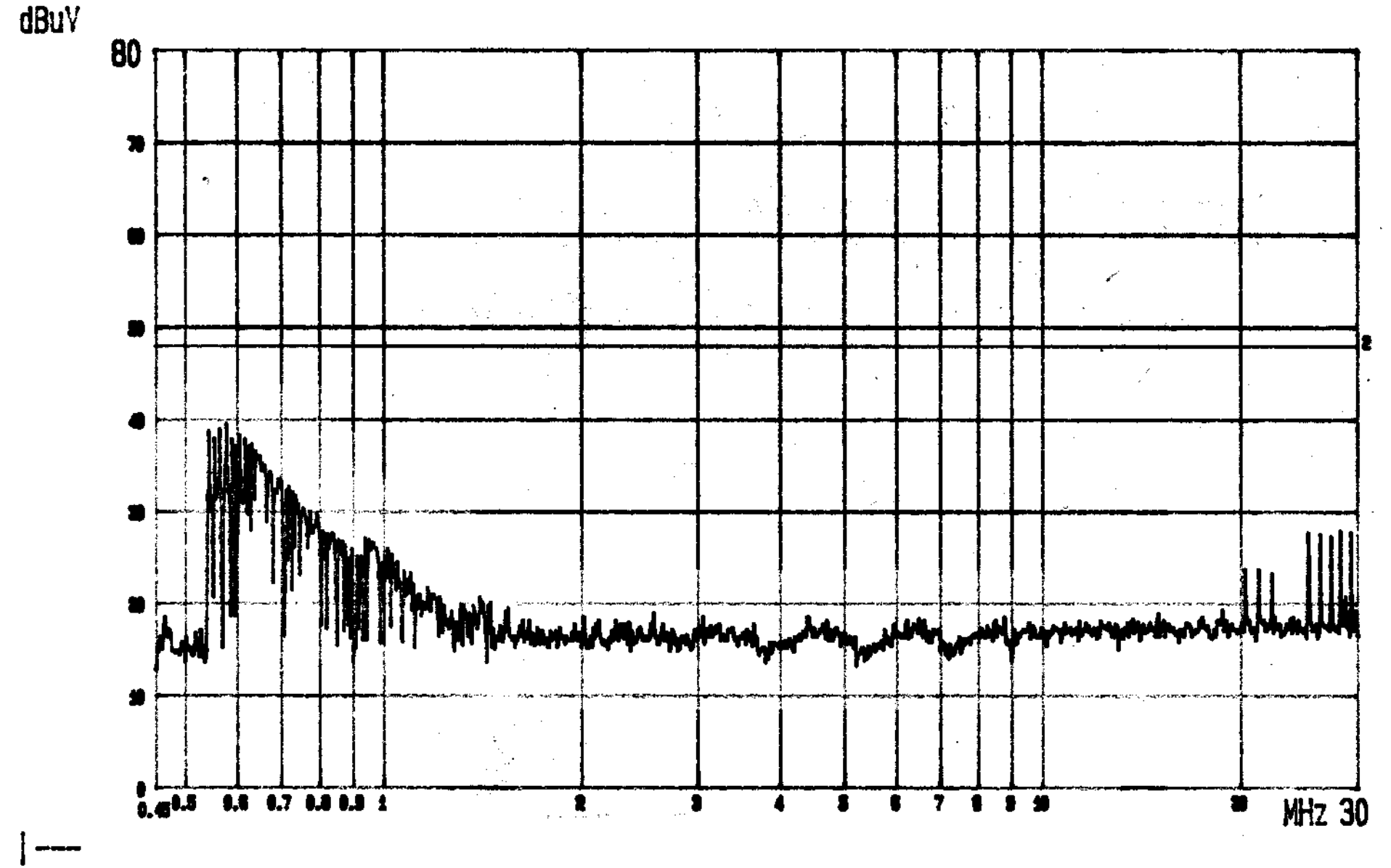
MODE: CHANNEL 8
LISN VA



MODE: CHANNEL 8
LISN: VB



MODE: CHANNEL 16
LISN: VA



MODE: CHANNEL 16
LISN: VB