

TEST REPORT FROM RADIO FREQUENCY INVESTIGATION LTD.

Test Of: Red-M (Communications) Ltd.
Bluetooth Clip-On For Palm Vx (code no. 0400-001)

To: F.C.C. Part 15 Subpart C: 2000
(Intentional Radiators)
Section 15.247

Test Report Serial No:
RFI/EMCB1/RP42145B

This Test Report Is Issued Under The Authority Of Richard Jacklin, Operations Director: 	Checked By: 
Tested By: 	Release Version No: PDF01
Issue Date: 05 June 2001	Test Dates: 30 April 2001 to 2 March 2001

This report is issued in Adobe Acrobat portable document format (PDF). It is only a valid copy of the report if it is being viewed in PDF format with the following security options not allowed: Changing the document, Selecting text and graphics, Adding or changing notes and form fields. Furthermore, the date of creation must match the issue date stated above. This report may be copied in full.

Radio Frequency Investigation Ltd, Ewhurst Park, Ramsdell, Basingstoke, Hampshire, RG26 5RQ, ENGLAND. Tel: +44 (0) 1256 851193 Fax: +44 (0) 1256 851192	Registered in England, No. 211 7901. Registered Office: Ewhurst Park, Ramsdell, Basingstoke, Hampshire RG26 5RQ	 0644
---	---	---

RADIO FREQUENCY INVESTIGATION LTD.

EMC Department

Test Of: **Red-M (Communications) Ltd.**

Bluetooth Clip-On For Palm Vx (code no. 0400-001)

To: **F.C.C. Part 15 Subpart C: 1998 (Intentional Radiators) Section 15.247**

TEST REPORT

S.No: RFI/EMCB1/RP42145B

Page 2 of 52

Issue Date: 05 June 2001

This page has been left intentionally blank.

RADIO FREQUENCY INVESTIGATION LTD.

EMC Department

Test Of: Red-M (Communications) Ltd.

Bluetooth Clip-On For Palm Vx (code no. 0400-001)

To: F.C.C. Part 15 Subpart C: 1998 (Intentional Radiators) Section 15.247

TEST REPORT

S.No: RFI/EMCB1/RP42145B

Page 3 of 52

Issue Date: 05 June 2001

Table of Contents

1. Client Information	4
2. Equipment Under Test (EUT)	5
3. Test Specification, Methods And Procedures	10
4. Deviations From The Test Specification.....	12
5. Operation Of The EUT During Testing	13
6. Summary Of Test Results.....	14
7. Measurements, Examinations And Derived Results.....	15
8. Measurement Uncertainty.....	29
Appendix 1. Test Equipment Used.....	30
Appendix 2. Measurement Methods.....	31
Appendix 3. Test Configuration Drawings.....	41
Appendix 4. Graphical Test Results.....	46
Appendix 5. Photographs of EUT	51

RADIO FREQUENCY INVESTIGATION LTD.

EMC Department

TEST REPORT

S.No: RFI/EMCB1/RP42145B

Page 4 of 52

Issue Date: 05 June 2001

Test Of: Red-M (Communications) Ltd.

Bluetooth Clip-On For Palm Vx (code no. 0400-001)

To: F.C.C. Part 15 Subpart C: 1998 (Intentional Radiators) Section 15.247

1. Client Information

Company Name:	Red-M (Communications) Ltd.
Address:	Wexham Springs Framewood Road Wexham Slough SL3 6PJ.
Contact Name:	Mark Bailey.

Test Of: Red-M (Communications) Ltd.

Bluetooth Clip-On For Palm Vx (code no. 0400-001)

To: F.C.C. Part 15 Subpart C: 1998 (Intentional Radiators) Section 15.247

2. Equipment Under Test (EUT)

The following information (with the exception of the Date of Receipt) has been supplied by the client:

2.1. Identification Of Equipment Under Test (EUT)

Brand Name:	Red-M
Model Name or Number:	Bluetooth Clip-On For Palm Vx (code no. 0400-001)
Unique Type Identification:	0400-001
Serial Number:	020
Country of Manufacture:	UK
FCC ID Number:	Not applicable
Date of Receipt:	30 April 2001

2.2. Description Of EUT

The equipment under test is a clip-on Bluetooth module for Palm Vx personal digital assistants (PDAs).

2.3. Modifications Incorporated In EUT

The EUT has not been modified from what is described by the Model Name and Unique Type Identification stated above.

RADIO FREQUENCY INVESTIGATION LTD.

EMC Department

TEST REPORT

S.No: RFI/EMCB1/RP42145B

Page 6 of 52

Issue Date: 05 June 2001

Test Of: Red-M (Communications) Ltd.

Bluetooth Clip-On For Palm Vx (code no. 0400-001)

To: F.C.C. Part 15 Subpart C: 1998 (Intentional Radiators) Section 15.247

2.4. Additional Information Related To Testing

Power Supply Requirement:	Nominal 3.9 volts battery, supplied by PDA.
Intended Operating Environment:	Commercial, Light Industry
Weight:	0.1 kg
Dimensions:	145 mm x 85 mm x 10 mm
Interface Ports:	None

Test Of: Red-M (Communications) Ltd.

Bluetooth Clip-On For Palm Vx (code no. 0400-001)

To: F.C.C. Part 15 Subpart C: 1998 (Intentional Radiators) Section 15.247

2.5. Support Equipment

The following support equipment was used to exercise the EUT during testing:

Description:	PDA.
Brand Name:	Palm Inc
Model Name or Number:	Palm Vx
Serial Number:	None
FCC ID Number:	50GK11H13659
Cable Length And Type:	Direct Connection
Connected to Port:	Direct Connection

Description:	Palm Cradle
Brand Name:	Palm Inc
Model Name or Number:	HotSync Cradle
Serial Number:	None
FCC ID Number:	None given
Cable Length And Type:	2 meter serial.
Connected to Port:	Fixed to Palm HotSync cradle.

Description:	AC Power Supply.
Brand Name:	Motorola
Model Name or Number:	None
Serial Number:	163-0045
FCC ID Number:	0047
Cable Length And Type:	DC power output
Connected to Port:	DC power input on HotSync cradle.

RADIO FREQUENCY INVESTIGATION LTD.

EMC Department

TEST REPORT

S.No: RFI/EMCB1/RP42145B

Page 8 of 52

Issue Date: 05 June 2001

Test Of: Red-M (Communications) Ltd.

Bluetooth Clip-On For Palm Vx (code no. 0400-001)

To: F.C.C. Part 15 Subpart C: 1998 (Intentional Radiators) Section 15.247

Support Equipment (continued)

Description:	Bluetooth Access Server
Brand Name:	Red-M
Model Name or Number:	3000AS
Serial Number:	None given
FCC ID Number:	None given
Cable Length And Type:	Coax, 1.0m
Connected to Port:	Antenna

Description:	Ethernet hub.
Brand Name:	3COM
Model Name or Number:	OfficeConnect Dual Speed Hub
Serial Number:	1675-010-051-2.00
FCC ID Number:	0101/7P1F167471
Cable Length And Type:	DC Power, 2 x 5m CAT 5 UTP
Connected to Port:	Power input ports, Ethernet ports.

Description:	Personal Computer.
Brand Name:	DELL
Model Name or Number:	Latitude CP M233XT
Serial Number:	0009321C-12800-840-2517
FCC ID Number:	None given
Cable Length And Type:	2m Power, 5m CAT 5 UTP
Connected to Port:	Power input port, ethernet port

Test Of: Red-M (Communications) Ltd.

Bluetooth Clip-On For Palm Vx (code no. 0400-001)

To: F.C.C. Part 15 Subpart C: 1998 (Intentional Radiators) Section 15.247

Support Equipment (continued)

Description:	Personal Computer
Brand Name:	DELL
Model Name or Number:	Latitude CPi D266XT
Serial Number:	0009321C-12800-89A-3900
FCC ID Number:	None given
Cable Length And Type:	2m Power
Connected to Port:	Power input port

Description:	Bluetooth Network interface card.
Brand Name:	Motorola
Model Name or Number:	BTPCM101
Serial Number:	0050CD13A1B4
FCC ID Number:	None given
Cable Length And Type:	Direct Connection
Connected to Port:	Fitted to Dell Latitude Cpi D266XT PC.

RADIO FREQUENCY INVESTIGATION LTD.

EMC Department

TEST REPORT

S.No: RFI/EMCB1/RP42145B

Page 10 of 52

Issue Date: 05 June 2001

Test Of: Red-M (Communications) Ltd.

Bluetooth Clip-On For Palm Vx (code no. 0400-001)

To: F.C.C. Part 15 Subpart C: 1998 (Intentional Radiators) Section 15.247

3. Test Specification, Methods And Procedures

3.1. Test Specification

Reference:	FCC Part 15 Subpart C: 2000 (Section 15.247)
Title:	Code of Federal Regulations, Part 15 (47CFR15) Radio Frequency Devices: Digital Devices.
Comments:	A description of the test facility used for this test is on file with, and has been accepted by, the Federal Communications Commission as required by Section 2.948 of Federal Rules.
Purpose of Test:	To determine whether the equipment complied with the requirements of the specification for the purposes of certification.

Reference:	FCC Part 15 Subpart B: 2000. (Section 15.107 and 15.109)
Title:	Code of Federal Regulations, Part 15 (47CFR15) Radio Frequency Devices: Radio Frequency Devices.
Comments:	A description of the test facility used for this test is on file with, and has been accepted by, the Federal Communications Commission as required by Section 2.948 of Federal Rules.
Purpose of Test:	To determine whether the equipment complied with the requirements of the specification for the purposes of certification.

RADIO FREQUENCY INVESTIGATION LTD.

EMC Department

Test Of: **Red-M (Communications) Ltd.**

Bluetooth Clip-On For Palm Vx (code no. 0400-001)

To: **F.C.C. Part 15 Subpart C: 1998 (Intentional Radiators) Section 15.247**

TEST REPORT

S.No: RFI/EMCB1/RP42145B

Page 11 of 52

Issue Date: 05 June 2001

3.2. Methods And Procedures

The methods and procedures used were as detailed in:

FCC Code of Federal Regulations 47.

Telecommunication. Parts 0 to 19, October 2000.

ANSI C63.2 (1987)

Title: American National Standard for Instrumentation - Electromagnetic noise and field strength.

ANSI C63.4 (1992)

Title: American National Standard Methods of Measurement of Electromagnetic Emissions from Low Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz.

ANSI C63.5 (1988)

Title: American National Standard for the Calibration of antennas used for Radiated Emission measurements in Electromagnetic Interference (EMI) control.

ANSI C63.7 (1988)

Title: American National Standard Guide for Construction of Open Area Test Sites for performing Radiated Emission Measurements.

CISPR 16-1: (1999)

Title: Specification For Radio Disturbance and Immunity Measuring Apparatus and Methods. Part 1: Radio Disturbance and Immunity Measuring Apparatus.

3.3. Definition Of Measurement Equipment

The measurement equipment used complied with the requirements of the standards referenced in the Methods & Procedures section above. Appendix 1 contains a list of the test equipment used.

RADIO FREQUENCY INVESTIGATION LTD.

EMC Department

Test Of: Red-M (Communications) Ltd.

Bluetooth Clip-On For Palm Vx (code no. 0400-001)

To: F.C.C. Part 15 Subpart C: 1998 (Intentional Radiators) Section 15.247

TEST REPORT

S.No: RFI/EMCB1/RP42145B

Page 12 of 52

Issue Date: 05 June 2001

4. Deviations From The Test Specification

None.

5. Operation Of The EUT During Testing

5.1. Operating Conditions

The EUT was tested in a normal laboratory environment.

During testing, the EUT was powered by a +3.9 V fully charged battery supply.

5.2. Operating Modes

The EUT was tested in the following operating modes:

1: Test Mode: The EUT operated in a test mode with its channels Fixed either on Top, Bottom or Middle channel, as specified in FCC Part 15.31(m) and FCC Public Notice DA 00-705.

2: Receive Mode: The EUT did not transmit on any channels but received on all hopping frequencies.

The reason for choosing these modes was that it was defined by the client as being likely to be the worst case with regards EMC.

5.3. Configuration And Peripherals

The EUT was tested in the following configuration:

During the tests, the EUT was configured as intended. However, due to the operation of the EUT the following tests were performed with the integral antenna removed, and test equipment connected to the antenna port:

1: Conducted Antenna Port Transmit Power.

2: Conducted Antenna Port Spurious Emissions (30 to 26000 MHz)

3: Modulation Requirements / Channel Spacing / Timing Requirements.

NB Section 2 of this report contains a full list of support equipment used and Appendix 3 contains a schematic diagram of the test configuration.

Test Of: Red-M (Communications) Ltd.

Bluetooth Clip-On For Palm Vx (code no. 0400-001)

To: F.C.C. Part 15 Subpart C: 1998 (Intentional Radiators) Section 15.247

6. Summary Of Test Results

6.1. Emissions: Transmit Mode

Range Of Measurements	Specification Reference	Compliance Status
Conducted AC Mains Emissions	C.F.R. 47 FCC Part 15: 2000. Section 15.207	Complied
Conducted Antenna Port Transmit Power	C.F.R. 47 FCC Part 15: 2000. Section 15.247 (b)	Complied
Conducted Antenna Port Spurious Emissions (30 to 26000 MHz)	C.F.R. 47 FCC Part 15: 2000. Section 15.247 (c)	Complied
Modulation Requirements / Channel Spacing / Timing Requirements	C.F.R. 47 FCC Part 15: 2000. Section 15.247 (a)	Complied
Isotropic Effective Radiated Power (EIRP)	C.F.R. 47 FCC Part 15: 2000. Section 15.247 (b) (1)	Complied
Radiated Electric Field Strength Spurious Emissions (30 to 26000 MHz)	C.F.R. 47 FCC Part 15: 2000. Section 15.247 (c) (15.209)	Complied

6.2. Emissions: Receive Mode

Range Of Measurements	Specification Reference	Compliance Status
Conducted AC Mains Emissions	C.F.R. 47 FCC Part 15: 2000. Section 15.107	Complied
Radiated Electric Field Strength Spurious Emissions (30 to 26000 MHz)	C.F.R. 47 FCC Part 15: 2000. Section 15.109	Complied

6.3. Location Of Tests

All the measurements described in this report were performed at the premises of Radio Frequency Investigation Ltd, Ewhurst Park, Ramsdell, Basingstoke, Hampshire, RG26 5RQ, England.

7. Measurements, Examinations And Derived Results

7.1. General Comments

7.1.1. This section contains test results only. Details of the test methods and procedures can be found in Appendix 2 of this report.

7.1.2. The measurement uncertainties stated were calculated in accordance with the requirements of UKAS Document NIS 81 with a confidence level of 95%. Please refer to Section 8 for details of measurement uncertainties.

7.1.3. Band edge compliance of RF conducted emissions was performed on the top and bottom channels as specified in FCC Public Notice DA 00-705, Filing and Measurement Guidelines for Frequency Hopping Spread Spectrum Systems. It should be noted that the frequency hopping requirement of this test can be seen in the accompanying supplementary report.

Test Of: Red-M (Communications) Ltd.

Bluetooth Clip-On For Palm Vx (code no. 0400-001)

To: F.C.C. Part 15 Subpart C: 1998 (Intentional Radiators) Section 15.247

7.2. Test Results For AC Mains Conducted Emissions: Transmit Mode**7.2.1. Quasi-Peak Detector Measurements On Live And Neutral Lines**

7.2.1.1. The following table indicates measured results to the limits specified in Part 15.207.(a) and (b)

7.2.1.2. Preliminary Conducted spurious scans were performed with the EUT set to Top, Middle and Bottom channels stated in section 5.2.

7.2.1.3. Plots of all the initial scans can be found in Appendix 4.

7.2.1.4. The following table lists frequencies at which emissions were measured using a Quasi-Peak detector:

Bottom Channel.

Frequency (kHz)	Line	Q-P Level (dB _m V)	Q-P Limit (dB _m V)	Margin (dB)	Result
450.472	Live	47.6	48.0	0.4	Complied
566.597	Live	45.6	48.0	2.4	Complied
709.034	Live	42.7	48.0	5.3	Complied
450.472	Neutral	47.8	48.0	0.2	Complied
566.597	Neutral	45.8	48.0	2.2	Complied
709.034	Neutral	42.4	48.0	5.6	Complied

Middle Channel.

Frequency (kHz)	Line	Q-P Level (dB _m V)	Q-P Limit (dB _m V)	Margin (dB)	Result
450.472	Live	47.3	48.0	0.7	Complied
566.597	Live	46.3	48.0	1.7	Complied
709.034	Live	43.4	48.0	4.6	Complied
450.472	Neutral	47.4	48.0	0.6	Complied
566.597	Neutral	46.0	48.0	2.0	Complied
709.034	Neutral	43.6	48.0	4.4	Complied

Test Of: Red-M (Communications) Ltd.

Bluetooth Clip-On For Palm Vx (code no. 0400-001)

To: F.C.C. Part 15 Subpart C: 1998 (Intentional Radiators) Section 15.247

Test Results For AC Mains Conducted Emissions: Transmit Mode (continued)**Top Channel**

Frequency (kHz)	Line	Q-P Level (dBmV)	Q-P Limit (dBmV)	Margin (dB)	Result
450.472	Live	48.4	48.0	-0.4	*See Note
566.597	Live	46.7	48.0	1.3	Complied
709.034	Live	43.2	48.0	4.8	Complied
450.472	Neutral	48.6	48.0	-0.6	*See Note
566.597	Neutral	46.7	48.0	1.3	Complied
709.034	Neutral	43.3	48.0	4.7	Complied

* Note: These measurements were made and found to be just over the specified limit. As a result, measurements were made in line with FCC Part 15.207 (b) which states that if an emission exceeds the limit specified in FCC Part 15.207 (a) then the measurement procedure specified in part (b) may be applied. Using this method, relevant emissions were measured and were seen to be reduced by more than 6 dB. They were thus deemed wideband. The QP measurements can thus be reduced by 13 dB as specified in FCC Part 15.207 (b). The following table shows the above noted levels measured using an average detector and the corresponding corrected level after subtracting 13 dB. The levels measured can now be seen to show compliance.

Frequency (kHz)	Line	Average Level (dBmV)	Corrected Q-P Level (dBmV) -	Q-P Limit (dBmV)	Margin (dB)	Result
450.472	Live	35.0	35.4	48.0	12.6	Complied
450.472	Neutral	34.8	33.6	48.0	14.4	Complied

Test Of: Red-M (Communications) Ltd.

Bluetooth Clip-On For Palm Vx (code no. 0400-001)

To: F.C.C. Part 15 Subpart C: 1998 (Intentional Radiators) Section 15.247

7.3. Test Results For AC Mains Conducted Emissions: Receive Mode**7.3.1. Quasi-Peak Detector Measurements On Live And Neutral Lines**

7.3.1.1. The following table indicates measured results to the limits specified in Part 15.207.

7.3.1.2. Plots of the initial scans can be found in Appendix 4.

7.3.1.3. The following table lists frequencies at which emissions were measured using a Quasi-Peak detector:

Frequency (MHz)	Line	Q-P Level (dBmV)	Q-P Limit (dBmV)	Margin (dB)	Result
450.472	Live	48.2	48.0	-0.2	*See Note
566.597	Live	46.7	48.0	1.3	Complied
709.034	Live	43.7	48.0	4.3	Complied
450.472	Neutral	48.1	48.0	-0.1	*See Note
566.597	Neutral	46.6	48.0	1.4	Complied
709.034	Neutral	43.5	48.0	4.5	Complied

* Note: These measurements were made and found to be just over the specified limit. As a result, measurements were made in line with FCC Part 15.107 (d) Which states that if an emission exceeds the limit specified in FCC Part 15.107 (a) then the measurement procedure specified in part (d) may be applied. Using this method, relevant emissions were measured and were seen to be reduced by more than 6 dB. They were thus deemed wideband. The QP measurements can thus be reduced by 13 dB as specified in FCC Part 15.107 (d). The following table shows the above noted levels measured using an average detector and the corresponding corrected level after subtracting 13 dB. The levels measured can now be seen to show compliance.

Frequency (kHz)	Line	Average Level (dBmV)	Corrected Q-P Level (dBmV) -	Q-P Limit (dBmV)	Margin (dB)	Result
450.472	Live	33.6	35.2	48.0	12.8	Complied
450.472	Neutral	32.7	35.1	48.0	12.9	Complied

AC Mains conducted emissions testing was also performed with the applicants EUT removed from its host cradle and PDS to show that all indicated emissions are present regardless of whether the applicants EUT is fitted or not. This shows that the emissions are a result of the host support cradle and PDS, and not the radio under test. All preliminary scans can be seen in Appendix 4 of this test report.

Test Of: Red-M (Communications) Ltd.

Bluetooth Clip-On For Palm Vx (code no. 0400-001)

To: F.C.C. Part 15 Subpart C: 1998 (Intentional Radiators) Section 15.247

7.4. Test Results for Conducted Transmitter Power: Transmit Mode.

7.4.1. Tests were performed to identify the maximum transmit power in accordance with FCC Part 15.247(b)(1) and FCC Public Notice DA 00-705.

7.4.2. The client has provided a temporary antenna port to allow a direct connection to be made.

7.4.3. The client has specified that the EUT employs frequency hopping with 79 hopping channels. Therefore the maximum transmitter power level under FCC Part 15.247(b)(1) is 1 Watt.

7.4.4. It can be confirmed from Plot GPH/42145/02 Appendix 4 that the number of hopping channels employed by the EUT was 79.

7.4.5. Results are shown for the EUT set to Top, Middle and Bottom channels as stated in FCC Part 15.31 (m) and section 5.2 of this report. Graphical measurements are shown for the transmit power levels within GPH/42145/06 to GPH/42145/08.

7.4.6. Measurements were performed on the Top, Middle and Bottom channels using a fully charged battery as specified in FCC Part 15.31(e) for battery operated devices:

Test Of: Red-M (Communications) Ltd.

Bluetooth Clip-On For Palm Vx (code no. 0400-001)

To: F.C.C. Part 15 Subpart C: 1998 (Intentional Radiators) Section 15.247

7.5.Test Results for Conducted Transmitter Power: Transmit Mode
(continued)

Channel	Battery Input Voltage (DC)	Maximum Transmitter Output Level (Watts)	Limit (Watts)	Margin	Result
Bottom	3.9	0.000658	1.0	0.999342	Complied

Channel	Battery Input Voltage (DC)	Maximum Transmitter Output Level (Watts)	Limit (Watts)	Margin	Result
Middle	3.9	0.000704	1.0	0.999296	Complied

Channel	Battery Input Voltage (DC)	Maximum Transmitter Output Level (Watts)	Limit (Watts)	Margin	Result
Top	3.9	0.000658	1.0	0.999342	Complied

RADIO FREQUENCY INVESTIGATION LTD.

EMC Department

Test Of: **Red-M (Communications) Ltd.**

Bluetooth Clip-On For Palm Vx (code no. 0400-001)

To: **F.C.C. Part 15 Subpart C: 1998 (Intentional Radiators) Section 15.247**

TEST REPORT

S.No: RFI/EMCB1/RP42145B

Page 21 of 52

Issue Date: 05 June 2001

7.6. Test Results for Conducted Antenna Port Spurious Emissions: Transmit Mode.

7.6.1. Spurious emissions tests on the antenna port were performed in accordance with FCC Part 15.247(c).

7.6.2. Section 15.247(c) specifies that all spurious emissions should be attenuated at least 20 dB below the level of the highest fundamental level measured between the range of 2400 to 2483.5 MHz.

7.6.3. Scans were performed between 30 and 26000 MHz with the EUT operating in Top, Middle and Bottom channels, as specified within clause 15.31 (m). Initial scans indicated that all spurious emissions were of an amplitude of at least 20 dB below the reference limit line, therefore as per 15.21(o), final measurements were not required.

7.6.4. Plots of all the initial scans can be found in Appendix 4.

Test Of: Red-M (Communications) Ltd.

Bluetooth Clip-On For Palm Vx (code no. 0400-001)

To: F.C.C. Part 15 Subpart C: 1998 (Intentional Radiators) Section 15.247

7.7. Test Results For Radiated Emissions: Transmit Mode.**7.7.1. Electric Field Strength Measurements: 30 to 1000 MHz.**

7.7.1.1. The following table specifies frequencies, which fall close to the restricted bands as specified in section FCC Part 15.205.

7.7.1.2. Preliminary Radiated spurious scans were performed with the EUT set to Top, Middle and Bottom as stated in section 5.2.

7.7.1.3. Plots of the initial scans can be found in Appendix 4.

7.7.1.4. The following table lists frequencies at which emissions were measured using a Quasi-Peak detector at a test distance of 3m (results incorporate antenna factors and cable losses):

7.7.1.5. The following results are for the EUT configured with an internal antenna connected and operating.

Bottom Channel.

Frequency (MHz)	Ant. Pol.	Q-P Level (dB _m V/m)	Limit (dB _m V/m)	Margin (dB)	Result
74.9	Vert.	25.1	40.0	14.9	Complied
967.8	Vert.	31.4	54.0	22.6	Complied

Middle Channel.

Frequency (MHz)	Ant. Pol.	Q-P Level (dB _m V/m)	Limit (dB _m V/m)	Margin (dB)	Result
108.9	Vert.	18.1	43.5	15.4	Complied
136.5	Vert.	23.5	46.0	22.5	Complied
267.9	Vert	15.4	46.0	30.6	Complied
965.5	Vert.	31.3	54.0	22.7	Complied

Top Channel.

Frequency (MHz)	Ant. Pol.	Q-P Level (dB _m V/m)	Limit (dB _m V/m)	Margin (dB)	Result
262.306	Vert.	14.0	46.0	32.0	Complied
990.771	Vert.	31.5	54.0	22.5	Complied

Test Of: Red-M (Communications) Ltd.

Bluetooth Clip-On For Palm Vx (code no. 0400-001)

To: F.C.C. Part 15 Subpart C: 1998 (Intentional Radiators) Section 15.247

7.8. Test Results For Radiated Emissions: Transmit Mode (Bottom Channel)**7.8.1. Electric Field Strength Measurements: 1.0 to 26.0 GHz**

7.8.1.1. The following table specifies frequencies, which fall within the bands as specified in section 15.205.

7.8.1.2. The client has stated that the highest clock frequency for the EUT was 2.480 GHz. Therefore tests were performed up to 26 GHz.

7.8.1.3. Preliminary Radiated spurious scans were performed with the EUT set to Bottom, Middle and Top channels as stated in section 5.2.

7.8.1.4. Due to dynamic range limitations of the measuring receiver, scans at high frequencies above 12 GHz were performed at 1 meter and 30 cm measurement distances, with an corrected limit line for the reduced test distances.

7.8.1.5. Plots of all the initial scans can be found in Appendix 4.

7.8.1.6. The following table lists frequencies at which emissions were measured using an Average and Peak detector, a measurement test distance of 3 meters was used for the indicated results (results incorporate antenna factors and cable losses):

7.8.1.7. The following results are for the EUT configured with an internal antenna connected and operating.

Highest Average Level:

Frequency (GHz)	Antenna Polarity (H/V)	Average Detector level (dBmV)	Antenna factor (dB)	Cable loss (dB)	Actual Average Level (dBmV/m)	Average Limit (dBmV/m)	Average Margin (dB)	Result
2.2088	Vert.	24.4	20.5	0.8	45.7	54.0	8.3	Complied
3.7622	Vert	15.0	21.0	1.2	37.2	54.0	16.8	Complied

Highest Peak Level:

Frequency (GHz)	Antenna Polarity (H/V)	Peak Detector level (dBmV)	Antenna factor (dB)	Cable loss (dB)	Actual Peak Level (dBmV/m)	Peak Limit (dBmV/m)	Peak Margin (dB)	Result
2.2088	Vert.	26.9	20.5	0.8	48.2	74.0	25.8	Complied
3.7622	Vert	26.5	21.0	1.2	48.7	74.0	25.3	Complied

Test Of: Red-M (Communications) Ltd.

Bluetooth Clip-On For Palm Vx (code no. 0400-001)

To: F.C.C. Part 15 Subpart C: 1998 (Intentional Radiators) Section 15.247

7.9. Test Results For Radiated Emissions: Transmit Mode (Middle Channel)**7.9.1. Electric Field Strength Measurements: 1.0 to 26.0 GHz**

7.9.1.1. The following table specifies frequencies, which fall within the bands as specified in section 15.205.

7.9.1.2. The client has stated that the highest clock frequency for the EUT was 2.480 GHz. Therefore tests were performed up to 26 GHz.

7.9.1.3. Preliminary Radiated spurious scans were performed with the EUT set to Bottom, Middle and Top channels as stated in section 5.2.

7.9.1.4. Due to dynamic range limitations of the measuring receiver, scans at high frequencies above 12 GHz were performed at 1 meter and 30 cm measurement distances, with an corrected limit line for the reduced test distances.

7.9.1.5. Plots of all the initial scans can be found in Appendix 4.

7.9.1.6. The following table lists frequencies at which emissions were measured using an Average and Peak detector, a measurement test distance of 3 meters was used for the indicated results (results incorporate antenna factors and cable losses):

7.9.1.7. The following results are for the EUT configured with an internal antenna connected and operating.

Highest Average Level:

Frequency (GHz)	Antenna Polarity (H/V)	Average Detector level (dBmV)	Antenna factor (dB)	Cable loss (dB)	Actual Average Level (dBmV/m)	Average Limit (dBmV/m)	Average Margin (dB)	Result
3.8822	Vert	14.5	21.0	1.2	36.7	54.0	17.3	Complied

Highest Peak Level:

Frequency (GHz)	Antenna Polarity (H/V)	Peak Detector level (dBmV)	Antenna factor (dB)	Cable loss (dB)	Actual Peak Level (dBmV/m)	Peak Limit (dBmV/m)	Peak Margin (dB)	Result
3.8822	Vert	25.8	21.0	1.2	48.0	74.0	26.0	Complied

Test Of: Red-M (Communications) Ltd.

Bluetooth Clip-On For Palm Vx (code no. 0400-001)

To: F.C.C. Part 15 Subpart C: 1998 (Intentional Radiators) Section 15.247

7.10. Test Results For Radiated Emissions: Transmit Mode (Top Channel)**7.10.1. Electric Field Strength Measurements: 1.0 to 26.0 GHz**

7.10.1.1. The following table specifies frequencies, which fall within the bands as specified in section 15.205.

7.10.1.2. The client has stated that the highest clock frequency for the EUT was 2.480 GHz. Therefore tests were performed up to 26 GHz.

7.10.1.3. Preliminary Radiated spurious scans were performed with the EUT set to Bottom, Middle and Top channels as stated in section 5.2.

7.10.1.4. Due to dynamic range limitations of the measuring receiver, scans at high frequencies above 12 GHz were performed at 1 meter and 30 cm measurement distances, with an corrected limit line for the reduced test distances.

7.10.1.5. Plots of all the initial scans can be found in Appendix 4.

7.10.1.6. The following table lists frequencies at which emissions were measured using an Average and Peak detector, a measurement test distance of 3 meters was used for the indicated results (results incorporate antenna factors and cable losses):

7.10.1.7. The following results are for the EUT configured with an internal antenna connected and operating.

Highest Average Level:

Frequency (GHz)	Antenna Polarity (H/V)	Average Detector level (dBmV)	Antenna factor (dB)	Cable loss (dB)	Actual Average Level (dBmV/m)	Average Limit (dBmV/m)	Average Margin (dB)	Result
2.2088	Vert.	23.8	21.0	1.2	46.0	54.0	8.0	Complied
3.7466	Vert.	25.2	20.5	1.8	46.5	54.0	7.5	Complied

Highest Peak Level:

Frequency (GHz)	Antenna Polarity (H/V)	Peak Detector level (dBmV)	Antenna factor (dB)	Cable loss (dB)	Actual Peak Level (dBmV/m)	Peak Limit (dBmV/m)	Peak Margin (dB)	Result
2.2088	Vert.	34.1	21.0	1.2	56.3	74.0	17.7	Complied
3.7466	Vert.	35.0	20.5	1.8	56.3	74.0	17.7	Complied

Test Of: Red-M (Communications) Ltd.

Bluetooth Clip-On For Palm Vx (code no. 0400-001)

To: F.C.C. Part 15 Subpart C: 1998 (Intentional Radiators) Section 15.247

7.11. Test Results For Radiated Emissions: Receive Mode

7.11.1. Electric Field Strength Measurements (Frequency Range: 30 to 1000 MHz)

7.11.1.1. The following table indicates measured results with the EUT operated in receive mode to the limits specified in Part 15.109.

7.11.1.2. Plots of the initial scans can be found in Appendix 4.

7.11.1.3. The following table lists frequencies at which emissions were measured using a Quasi-Peak detector at a test distance of 3m (results incorporate antenna factors and cable losses):

Frequency (MHz)	Ant. Pol.	Q-P Level (dB _m V/m)	Limit (dB _m V/m)	Margin (dB)	Result
32.1	Vert.	28.1	40.0	11.9	Complied
126.8	Vert.	29.9	43.5	13.6	Complied
276.4	Vert.	18.4	46.0	27.6	Complied
575.0	Vert.	33.3	46.0	12.7	Complied

Test Of: Red-M (Communications) Ltd.

Bluetooth Clip-On For Palm Vx (code no. 0400-001)

To: F.C.C. Part 15 Subpart C: 1998 (Intentional Radiators) Section 15.247

7.12. Radiated Emissions: Receive Mode**7.12.1. Electric Field Strength Measurements (Frequency Range: 1.0 to 26.0 GHz)**

7.12.1.1. The following table indicates measured results with the EUT operated in receive mode to the limits specified in Part 15.109.

7.12.1.2. Plots of all the initial scans can be found in Appendix 4.

Highest Average Level:

Frequency (GHz)	Antenna Polarity (H/V)	Average Detector level (dBmV)	Antenna factor (dB)	Cable loss (dB)	Actual Average Level (dBmV/m)	Average Limit (dBmV/m)	Average Margin (dB)	Result
1.8844	Vert	26.7	20.5	0.8	48.0	54.0	6.0	Complied
2.1977	Vert	24.8	20.5	0.8	46.1	54.0	7.6	Complied
3.0844	Vert.	24.4	21.0	1.0	46.4	54.0	8.0	Complied
3.7444	Vert	23.8	21.0	1.2	46.0	54.0	7.9	Complied

Highest Peak Level:

Frequency (GHz)	Antenna Polarity (H/V)	Peak Detector level (dBmV)	Antenna factor (dB)	Cable loss (dB)	Actual Peak Level (dBmV/m)	Peak Limit (dBmV/m)	Peak Margin (dB)	Result
1.8844	Vert	40.4	20.5	0.8	61.7	74.0	12.3	Complied
2.1977	Vert	37.4	20.5	0.8	58.7	74.0	14.9	Complied
3.0844	Vert.	37.1	21.0	1.0	59.1	74.0	17.3	Complied
3.7444	Vert	34.5	21.0	1.2	56.7	74.0	15.3	Complied

7.13. Test Results for Occupied Bandwidth, Channel Separation and Time Occupancy.

7.13.1. Tests were performed to identify the Occupied Bandwidth, Channel Separation and Time Occupancy to FCC Part 15.247.

Occupied Bandwidth and Channel Separation:

7.13.2. Section 15.247 (a)(1) specifies that the channels should be separated by at least 25 kHz or the 20 dB bandwidth of the channel, which ever is greater. Section 15.247 (a1)(ii) specifies that the maximum bandwidth of the channel should be 1 MHz.

7.13.3. A graphical plot of the characteristics of two adjacent channels was performed. The following results were noted:

20 dB Bandwidth: 913.828 kHz. (Refer to Appendix 4 Plot GPH/42145/05)

Channel Separation: 987.976 kHz. (Refer to Appendix 4 Plot GPH/42145/01)

Time Occupancy:

7.13.4. The time occupancy of the system was tested on a single carrier. The maximum packet length was measured to be 2.896 ms and can be seen in Appendix 4 (Plot GPH/42145/03). The maximum time the carrier was used in a 30 second period was measured as 0.316 seconds and can be seen in Appendix 4 (Plot GPH/42145/04).

Test Of: Red-M (Communications) Ltd.

Bluetooth Clip-On For Palm Vx (code no. 0400-001)

To: F.C.C. Part 15 Subpart C: 1998 (Intentional Radiators) Section 15.247

8. Measurement Uncertainty

8.1. Company Policy, as based on the NAMAS Accreditation Standard, M10, paragraph 12.11 (o), states that Test Reports shall include estimated uncertainty of the calibration or test result (this information need only appear in test reports and test certificates where it is relevant to the validity or application of the test result, where a client's instructions so require or where uncertainty affects compliance to a specification or limit).

8.2. The reported expanded uncertainties below are based on a standard uncertainty multiplied by an appropriate coverage factor, such that a confidence level of approximately 95% is maintained. The uncertainty evaluation has been carried out in accordance with UKAS requirements.

Measurement Type	Range	Confidence Level (%)	Calculated Uncertainty
Conducted Emissions	0.15 MHz to 30 MHz	95%	+/- 3.25 dB
Time Occupancy	Not applicable	95%	+/- 10 %
Channel Separation	Not applicable	95%	+/- 10 %
Occupied Bandwidth	Not applicable	95%	+/- 2.5 kHz
Effective Isotropic Radiated Power	1.0 GHz to 26 GHz	95%	+/- 4.0 dB
Radiated Emissions at 3.0 metres	30 MHz to 1000 MHz	95%	+/- 5.26 dB
Radiated Emissions at 3.0 metres	1 GHz to 26 GHz	95%	+/- 4.18 dB

8.3. Measurement uncertainties have been applied in accordance with UKAS document NIS 81 (edition 1, May 1994), and in the absence of any specification criteria, guidance, or code of practice, compliance has been judged on the basis of shared risk.

8.4. In the case of emissions tests, the measured value of the disturbance from the product sample shall be compared directly with the limits. If the measured value is equal to or less than the limit the product is deemed to pass the test.

8.5. In the case of immunity tests, the equipment is deemed to pass the test if it fulfils the stated performance criteria at the required or a higher severity level. The measurement uncertainty has been taken into account in the calibration procedures stated in the relevant basic standard.

8.6. The methods used to calculate the above uncertainties are in line with those used for calibration laboratories contained in NAMAS document NIS 3003 Edition 8 "The Expression of Uncertainty and Confidence in Measurement" May 1995, which align with international recommendations "Guide to the Expression of Uncertainty in Measurement" ISO/IEC/OIML/BIPM (Prepared by ISO/TAG 4: January 1993).

Test Of: Red-M (Communications) Ltd.

Bluetooth Clip-On For Palm Vx (code no. 0400-001)

To: F.C.C. Part 15 Subpart C: 1998 (Intentional Radiators) Section 15.247

Appendix 1. Test Equipment Used

Instrument	Manufacturer	Model	RFI No.
Horn Antenna	Eaton	9188-2	A027
2 to 4 GHz Eaton Horn Antenna	Eaton	91889-2	A031
ESH3-Z5	Rohde & Schwarz	ESH3-Z5	A1069
WG 20 Horn Antenna	Flann Microwave Ltd	20240-20	A201
20 dB Attenuator	Schaffner	6820-17-B	A243
WG 12 Microwave Horn	Flann Microwave	12240-20	A253
WG 14 Microwave Horn	Flann Microwave	14240-20	A254
WG 16 Microwave Horn	Flann Microwave	16240-20	A255
WG 18 Microwave Horn	Flann Microwave	18240-20	A256
Bilog Antenna	Chase	CBL6111	A259
SMHU Signal Generator	Rohde & Schwarz	SMHU	G013
Spectrum Monitor	Rohde & Schwarz	EZM	M003
ESMI Spectrum Analyser / Receiver	Rohde & Schwarz	ESMI	M069
Fluke 77 DVM	Fluke	77	M105
Spectrum Analyser	Rohde & Schwarz	FSEB 30	M127
Thermometer/Barometer/Hydrometer	Oregan Scientific	BA-116	M170
Thermal Power Sensor	Rohde & Schwarz	NRV-Z52	M198
Power Meter	Rohde & Schwarz	NRVS	M199
Power Control	Zen	E08	S003
Site 1	RFI	1	S201
Site 15	RFI	15	S215

NB In accordance with UKAS requirements, all the measurement equipment is on a calibration schedule.

Test Of: Red-M (Communications) Ltd.

Bluetooth Clip-On For Palm Vx (code no. 0400-001)

To: F.C.C. Part 15 Subpart C: 1998 (Intentional Radiators) Section 15.247

Appendix 2. Measurement Methods

AC Mains Conducted Emissions

AC mains conducted emissions measurements were performed in accordance with the standard, against appropriate limits for each detector function.

The test was performed in a shielded enclosure with the equipment arranged as detailed in the standard on a wooden bench using the floor of the screened enclosure as the ground reference plane and with the EUT powered via a 60 Hz AC mains supply.

Initial measurements in the form of swept scans covering the entire measurement band were performed in order to identify frequencies on which the EUT was generating interference. In order to minimise the time taken for these swept measurements, a Peak detector was used in conjunction with the appropriate detector IF measuring bandwidths (see table below). Repetitive scans were performed to allow for emissions with low repetition rates, and the duty cycle of the EUT. The test configuration was the same for the initial scans as for the final measurements.

Following the initial scans, a graph was produced giving an overview of the emissions from the EUT plotted against the appropriate specification limit. A tolerance line was set 6 dB below the specification limit and levels above the tolerance line were re-tested (at individual frequencies) using the appropriate detector function.

The test equipment settings for conducted emissions measurements were as follows:

Receiver Function	Initial Scan	Final Measurements
Detector Type:	Peak	Quasi-Peak (CISPR)*
Mode:	Max Hold	Not applicable
Bandwidth:	9 kHz	9 kHz
Amplitude Range:	100 dB	20 dB
Measurement Time:	Not applicable	> 1 s
Observation Time:	Not applicable	> 15 s
Step Size:	Continuous sweep	Not applicable
Sweep Time:	Coupled	Not applicable

* In some instances an Average detector function may also have been used.

Test Of: **Red-M (Communications) Ltd.****Bluetooth Clip-On For Palm Vx (code no. 0400-001)****To:** **F.C.C. Part 15 Subpart C: 1998 (Intentional Radiators) Section 15.247**

Radiated Field Strength Emissions

Radiated emissions measurements were performed in accordance with the standard, against appropriate limits for each detector function.

Initial measurements covering the entire measurement band in the form of swept scans in a shielded enclosure were performed in order to identify frequencies on which the EUT was generating interference. This determined the frequencies on which the EUT should be re-measured in full on the open area test site. In order to minimise the time taken for the swept measurements, a Peak detector was used in conjunction with the appropriate detector IF measuring bandwidth (see table below). Repetitive scans were performed to allow for emissions with low repetition rates, and for the duty cycle of the EUT. The test configuration was the same for the initial scans as for the final measurements.

The initial scans were performed using an antenna height of 1.5 m and a measurement distance of 3 m, in some circumstances at high frequencies above 12 GHz, scans were performed at 30 cm's with a corrected limit line. This was necessary due to the limited dynamic range of the measuring receiver. Following the initial scans, graphs were produced giving an overview of the emissions from the EUT plotted against the appropriate specification limit. A tolerance line was set 6 dB below the specification limit and levels above the tolerance line were re-tested on the open area test site, at the appropriate distance, using a measuring receiver with a Quasi-Peak (below 1000 MHz), Average and Peak (above 1000 MHz) detector, where applicable.

For the main (final) measurements the EUT was arranged on a non-conducting table on an open area test site, as detailed in the specification.

All measurements on the open area test site were performed using broadband antennas.

On the open area test site, at each frequency where a signal was found, the levels were maximised by initially rotating the turntable through 360°. For frequencies below 1000 MHz, the antenna was varied in height between 1 m and 4 m. For frequencies above 1000 MHz, the antenna was fixed at a height of 1.5m. At this point, any signals found to be between the limit and a level 6 dB below it were further maximised by changing the configuration of the EUT, e.g. re-routing cables to peripherals and moving peripherals with respect to the EUT.

Test Of: Red-M (Communications) Ltd.

Bluetooth Clip-On For Palm Vx (code no. 0400-001)

To: F.C.C. Part 15 Subpart C: 1998 (Intentional Radiators) Section 15.247

The test equipment settings for radiated emissions measurements were as follows:

Receiver Function	Initial Scan Below 1000 MHz	Final Measurements Below 1000 MHz
Detector Type:	Peak	Quasi-Peak (CISPR)
Mode:	Max Hold	Not applicable
Bandwidth:	100 kHz	120 kHz
Amplitude Range:	100 dB	20 dB
Measurement Time:	Not applicable	> 1 s
Observation Time:	Not applicable	> 15 s
Step Size:	Continuous sweep	Not applicable
Sweep Time:	Coupled	Not applicable

Receiver Function	Initial Scan Above 1000 MHz	Final Measurements Above 1000 MHz
Detector Type:	Peak	Peak/Average
Mode:	Max Hold	Not applicable
Bandwidth:	1 MHz	1 MHz
Amplitude Range:	100 dB	20 dB (typical)
Measurement Time:	Not applicable	> 1 s
Observation Time:	Not applicable	> 15 s
Step Size:	Continuous sweep	Not applicable
Sweep Time:	Coupled	Not applicable

Test Of: **Red-M (Communications) Ltd.****Bluetooth Clip-On For Palm Vx (code no. 0400-001)****To:** **F.C.C. Part 15 Subpart C: 1998 (Intentional Radiators) Section 15.247**

Conducted Antenna Port Emissions

Conducted Antenna Port Emissions measurements were performed in accordance with the standard, against appropriate limits for each detector function.

Prior to testing being performed a suitable RF attenuator and cable were calibrated for the required frequency range. For each measurement range performed, the calibrated level of the attenuator and cable were entered as an offset into the spectrum analyser to compensate for the measurement setup.

Initial measurements covering the entire measurement band in the form of swept scans were performed in order to identify frequencies on which the EUT was generating interference. This determined the frequencies on which measurements were performed. In order to minimise the time taken for the swept measurements, a Peak detector was used in conjunction with the appropriate detector IF measuring bandwidth (see table below). Repetitive scans were performed to allow for emissions with low repetition rates, and for the duty cycle of the EUT. The test configuration was the same for the initial scans as for the final measurements.

To determine the transmitter output power, the EUT was operated as intended with the spectrum analyser operated in a maximum hold on the bottom, middle and top channels of the EUT.

To determine spurious emissions levels, the EUT was operated as intended with the spectrum analyser operated in a maximum hold mode over selected frequency ranges between 30 MHz and 26 GHz. A reference limit line of 20dB below the maximum output of the transmitter was noted. Levels within 20dB of this limit line were then recorded.

Channel Separation FCC 15.247(1)

The EUT and spectrum analyser was configured as for conducted antenna port measurements, And as per FCC Public Notice DA 00-705, Filing and Measurement Guidelines for Frequency Hopping Spread Spectrum Systems.

To determine the bandwidth and separation of each transmission channel the analyser was configured to measure two adjacent channels.

To determine the occupied bandwidth, A resolution bandwidth of 10 kHz was used, which is greater than 1% of the 20 dB bandwidth. A video bandwidth of a least the same value was used. The analyser was set for a maximum hold scan to capture the profile of the signal. The peak level was then determined, and a reference line was drawn 20dB below the peak level. The bandwidth was determined at the points where the 20dB reference crossed the profile of the emission.

RADIO FREQUENCY INVESTIGATION LTD.

EMC Department

Test Of: **Red-M (Communications) Ltd.**

Bluetooth Clip-On For Palm Vx (code no. 0400-001)

To: **F.C.C. Part 15 Subpart C: 1998 (Intentional Radiators) Section 15.247**

TEST REPORT

S.No: RFI/EMCB1/RP42145B

Page 36 of 52

Issue Date: 05 June 2001

Occupied Bandwidth FCC 15.247(1)

For channel separation, the analyser was configured with a resolution bandwidth and video bandwidth of at least 1% of the frequency span set on the analyser. A setting of 50 kHz was used.

The EUT was operated as intended and the analyser set to a maximum hold mode scan to capture the profile of the signals.

The peak points on the two adjacent channels were noted and the separation between them recorded.

The channel separation was then determined as the greater of 25kHz or the 20dB bandwidth.

RADIO FREQUENCY INVESTIGATION LTD.

EMC Department

Test Of: **Red-M (Communications) Ltd.**

Bluetooth Clip-On For Palm Vx (code no. 0400-001)

To: **F.C.C. Part 15 Subpart C: 1998 (Intentional Radiators) Section 15.247**

TEST REPORT

S.No: RFI/EMCB1/RP42145B

Page 37 of 52

Issue Date: 05 June 2001

Average Time of Occupancy FCC 15.247(1)(ii)

The EUT and spectrum analyser was configured as for conducted antenna port measurements

To determine the maximum packet length on any given channel, the analyser was configured in the time domain mode and the EUT was configured to operate as intended.

To determine the average occupancy time on any given channel the analyser was configured in the time domain and a 30 second sweep carried out. The number of times the channel was occupied in any 30 second period multiplied by the maximum packet length will give the total time on the given channel.

RADIO FREQUENCY INVESTIGATION LTD.

EMC Department

Test Of: **Red-M (Communications) Ltd.**

Bluetooth Clip-On For Palm Vx (code no. 0400-001)

To: **F.C.C. Part 15 Subpart C: 1998 (Intentional Radiators) Section 15.247**

TEST REPORT

S.No: RFI/EMCB1/RP42145B

Page 38 of 52

Issue Date: 05 June 2001

Number Of Hopping Frequencies FCC 15.247(a)(1)(ii)

The EUT and spectrum analyser was configured as for conducted antenna port measurements, And as per FCC Public Notice DA 00-705, Filing and Measurement Guidelines for Frequency Hopping Spread Spectrum Systems.

To determine the number of hopping frequencies the EUT was set to operate in its normal mode of operation, hopping over all channels that it is intended to operate on.

The spectrum analyser had a span set to cover the frequency band of operation. The resolution bandwidth was set to $\geq 1\%$ of the span. The video bandwidth was set to be no less than the resolution bandwidth. The sweep was set to auto, the detector function to peak and trace to max hold.

RADIO FREQUENCY INVESTIGATION LTD.

EMC Department

Test Of: **Red-M (Communications) Ltd.**

Bluetooth Clip-On For Palm Vx (code no. 0400-001)

To: **F.C.C. Part 15 Subpart C: 1998 (Intentional Radiators) Section 15.247**

TEST REPORT

S.No: RFI/EMCB1/RP42145B

Page 39 of 52

Issue Date: 05 June 2001

Peak Output Power FCC 15.247(b)

The EUT and spectrum analyser was configured as for conducted antenna port measurements, And as per FCC Public Notice DA 00-705, Filing and Measurement Guidelines for Frequency Hopping Spread Spectrum Systems.

A temporary antenna port was provided by the applicant to allow for conducted measurements.

As the frequency range of operation was greater than 10 MHz, The test was performed on the BOTTOM, MIDDLE and TOP channels as per FCC 15.31(m).

The tests were performed with a fully charged battery as specified in FCC Part 15.31(e) for battery operated devices:

The analyser was setup as per FCC Public Notice DA 00-705.

Band Edge Compliance of RF Conducted Emissions FCC 15.247(c)

The EUT and spectrum analyser was configured as for conducted antenna port measurements, And as per FCC Public Notice DA 00-705, Filing and Measurement Guidelines for Frequency Hopping Spread Spectrum Systems.

A temporary antenna port was provided by the applicant to allow for conducted measurements.

To determine band-edge compliance, the analyser bandwidth resolution bandwidth was set to \geq the analyser span. The video bandwidth was set to be no less than the resolution bandwidth. The sweep was set to auto and the detector to peak. The trace was set to max hold and a trace was produced.

A Plot of the upper channel and the protected band closest to the upper channel was produced. A marker was set to the peak of the highest channel and a delta marker set to the highest out of band peak. (The specification states that either the band edge level must be measured or the highest out of band emission. Which ever is greater). The plots show that the emission complies with the 20 dBc limit.

A Plot of the lower channel and the protected band closest to the lower channel was produced. A marker was set to the peak of the lowest channel and a delta marker set to the highest out of band peak. (The specification states that either the band edge level must be measured or the highest out of band emission. Which ever is greater). The plots show that the emission complies with the 20 dBc limit.

RADIO FREQUENCY INVESTIGATION LTD.

EMC Department

TEST REPORT

S.No: RFI/EMCB1/RP42145B

Page 41 of 52

Issue Date: 05 June 2001

Test Of: Red-M (Communications) Ltd.

Bluetooth Clip-On For Palm Vx (code no. 0400-001)

To: F.C.C. Part 15 Subpart C: 1998 (Intentional Radiators) Section 15.247

Appendix 3. Test Configuration Drawings

This appendix contains the following drawings:

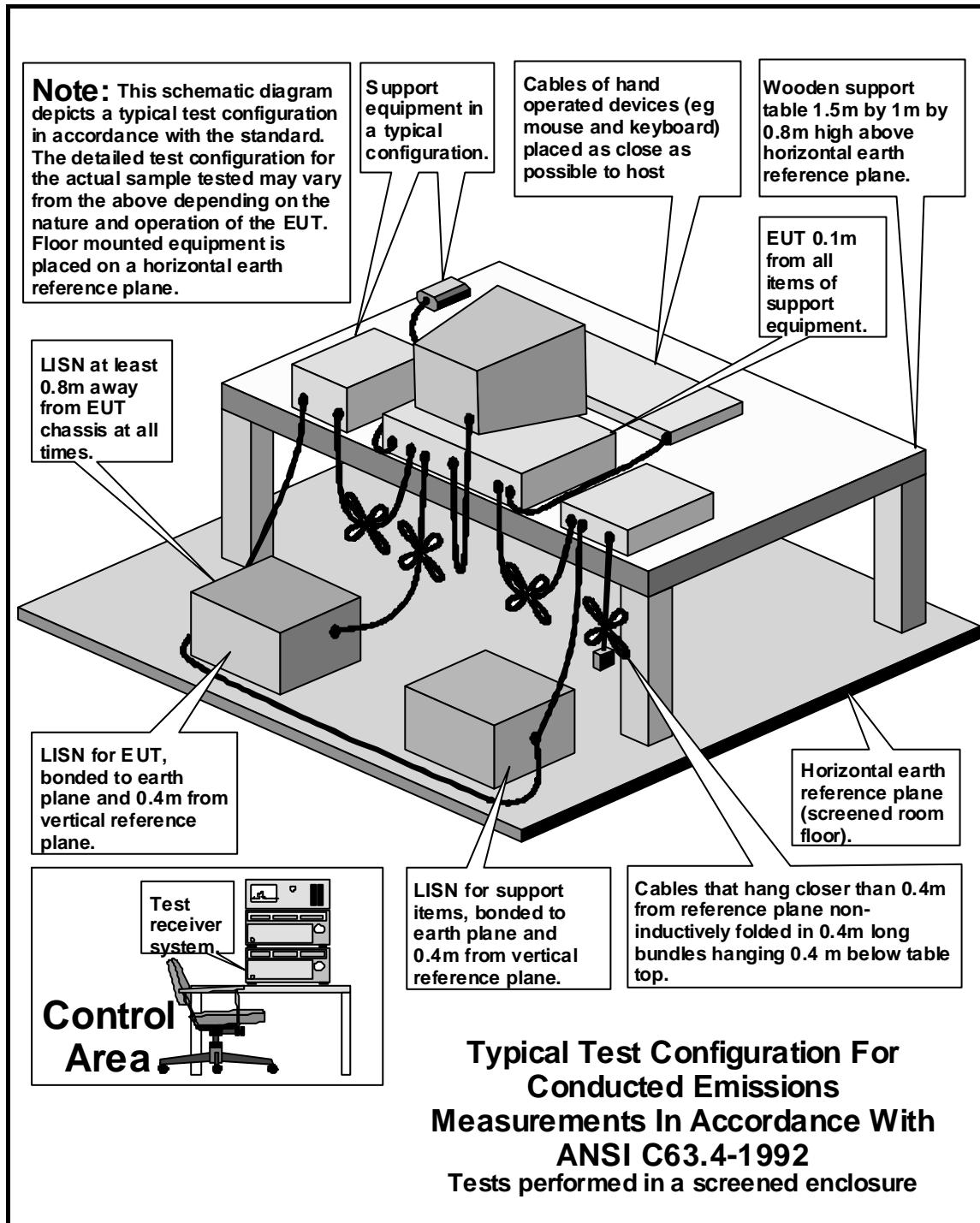
Drawing Reference Number	Title
DRG\42145JD02\EMICON	Test configuration for measurement of conducted emissions
DRG\42145JD02\EMIRAD	Test configuration for measurement of radiated emissions
DRG\42145JD02\001	Test configuration for Conducted RF Antenna Port
DRG\42145JD02\002	Schematic diagram of the EUT, support equipment and interconnecting cables used for the test

Test Of: Red-M (Communications) Ltd.

Bluetooth Clip-On For Palm Vx (code no. 0400-001)

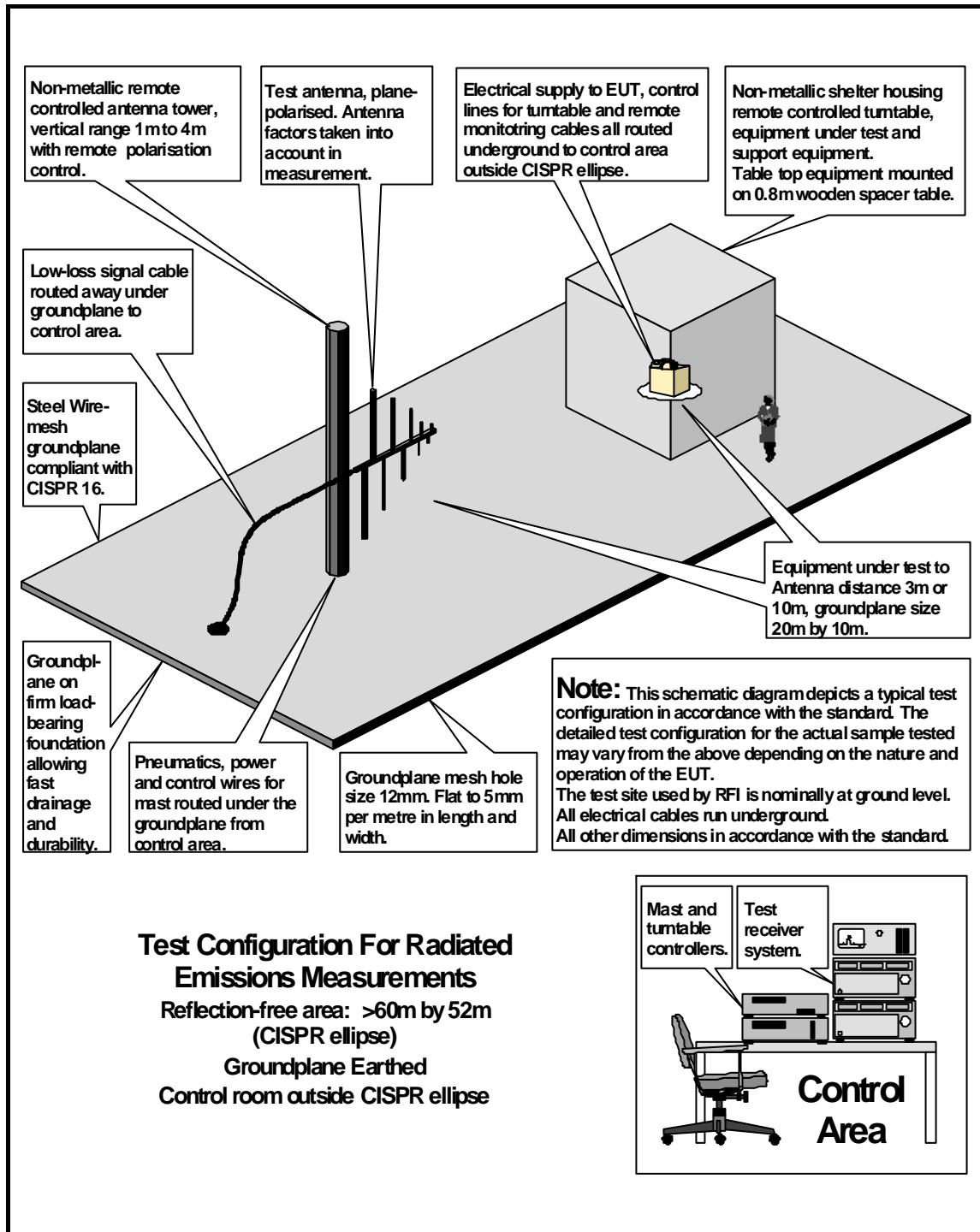
To: F.C.C. Part 15 Subpart C: 1998 (Intentional Radiators) Section 15.247

DRG\42145JD02\EMICON



Test Of: Red-M (Communications) Ltd.
 Bluetooth Clip-On For Palm Vx (code no. 0400-001)
 To: F.C.C. Part 15 Subpart C: 1998 (Intentional Radiators) Section 15.247

DRG\42145\JD02\EMIRAD



Test Of: Red-M (Communications) Ltd.

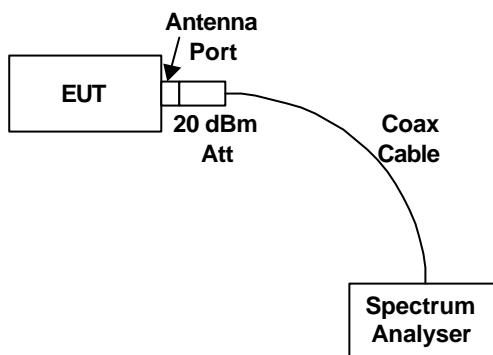
Bluetooth Clip-On For Palm Vx (code no. 0400-001)

To: F.C.C. Part 15 Subpart C: 1998 (Intentional Radiators) Section 15.247

DRG\42145\JD02\001

Conducted RF Antenna Port Configuration

Antenna Port
Emissions



RADIO FREQUENCY INVESTIGATION LTD.

EMC Department

Test Of: Red-M (Communications) Ltd.

Bluetooth Clip-On For Palm Vx (code no. 0400-001)

To: F.C.C. Part 15 Subpart C: 1998 (Intentional Radiators) Section 15.247

TEST REPORT

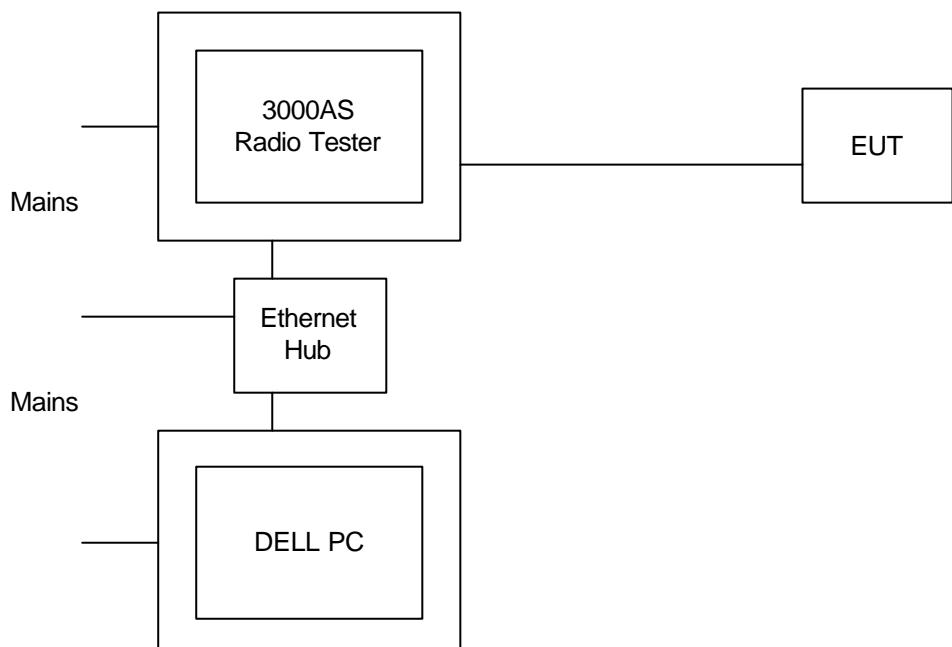
S.No: RFI/EMCB1/RP42145B

Page 45 of 52

Issue Date: 05 June 2001

DRG\42145\JD02\002

Configuration of EUT and Local Support Equipment



Test Of: Red-M (Communications) Ltd.

Bluetooth Clip-On For Palm Vx (code no. 0400-001)

To: F.C.C. Part 15 Subpart C: 1998 (Intentional Radiators) Section 15.247

Appendix 4. Graphical Test Results

This appendix contains the following graphs:

Graph Reference Number	Title
GPH\42145\2\ACCE002	Conducted Emissions, Live Line, Palm Only (150 kHz to 30 MHz) Part 15.207
GPH\42145\2\ACCE001	Conducted Emissions, Neutral Line, Palm Only (150 kHz to 30 MHz) Part 15.207
GPH\42145\2\ACCE010	Conducted Emissions, Live Line, Receive Mode (150 kHz to 30 MHz) Part 15.107
GPH\42145\2\ACCE009	Conducted Emissions, Neutral Line, Receive Mode (150 kHz to 30 MHz) Part 15.107
GPH\42145\2\ACCE008	Conducted Emissions, Neutral Line, Top Channel (150 kHz to 30 MHz) Part 15.207
GPH\42145\2\ACCE007	Conducted Emissions, Live Line, Top Channel (150 kHz to 30 MHz) Part 15.207
GPH\42145\2\ACCE006	Conducted Emissions, Live Line, Middle Channel (150 kHz to 30 MHz) Part 15.207
GPH\42145\2\ACCE005	Conducted Emissions, Neutral Line, Middle Channel (150 kHz to 30 MHz) Part 15.207
GPH\42145\2\ACCE004	Conducted Emissions, Neutral Line, Bottom Channel (150 kHz to 30 MHz) Part 15.207
GPH\42145\2\ACCE003	Conducted Emissions, Live Line, Bottom Channel (150 kHz to 30 MHz) Part 15.207
GPH\42145\CE001	Spurious Conducted Emissions, Receive Mode (0 MHz to 1 GHz) Part 15.247(c)
GPH\42145\CE002	Spurious Conducted Emissions, Receive Mode (1 GHz to 10 GHz) Part 15.247(c)
GPH\42145\CE003	Spurious Conducted Emissions, Receive Mode (10 GHz to 26.5 GHz) Part 15.247(c)
GPH\42145\CE006	Spurious Conducted Emissions, Top Channel (0 MHz to 1 GHz) Part 15.247(c)
GPH\42145\CE005	Spurious Conducted Emissions, Middle Channel (1 GHz to 10 GHz) Part 15.247(c)
GPH\42145\CE004	Spurious Conducted Emissions, Bottom Channel (10 GHz to 26.5 GHz) Part 15.247(c)

Test Of: Red-M (Communications) Ltd.

Bluetooth Clip-On For Palm Vx (code no. 0400-001)

To: F.C.C. Part 15 Subpart C: 1998 (Intentional Radiators) Section 15.247

Graphical Test Results – (Continued)

Graph Reference Number	Title
GPH\42145\11	Spurious RF Conducted Emissions, Bottom Channel (30 MHz to 2.4 GHz) Part 15.247(c)
GPH\42145\12	Spurious RF Conducted Emissions, Middle Channel (30 MHz to 2.4 GHz) Part 15.247(c)
GPH\42145\13	Spurious RF Conducted Emissions, Top Channel (30 MHz to 2.4 GHz) Part 15.247(c)
GPH\42145\14	Spurious RF Conducted Emissions, Band Edges Bottom Channel Part 15.247(c)
GPH\42145\15	Spurious RF Conducted Emissions, Band Edges Middle Channel Part 15.247(c)
GPH\42145\16	Spurious RF Conducted Emissions, Band Edges Top Channel Part 15.247(c)
GPH\42145\18	Spurious RF Conducted Emissions, Band Edges Middle Channel (2.4835 GHz to 7 GHz) Part 15.247(c)
GPH\42145\17	Spurious RF Conducted Emissions, Band Edges Bottom Channel (2.4835 GHz to 7 GHz) Part 15.247(c)
GPH\42145\19	Spurious RF Conducted Emissions, Band Edges Top Channel (2.4835 GHz to 7 GHz) Part 15.247(c)
GPH\42145\20	Spurious RF Conducted Emissions, Bottom Channel (7 GHz to 26 GHz) Part 15.247(c)
GPH\42145\21	Spurious RF Conducted Emissions, Middle Channel (7 GHz to 26 GHz) Part 15.247(c)
GPH\42145\22	Spurious RF Conducted Emissions, Middle Channel (7 GHz to 26 GHz) Part 15.247(c)
GPH\42145\RE027	Spurious Radiated Emissions, Top Channel (1 GHz to 2 GHz) Part 15.209
GPH\42145\RE034	Spurious Radiated Emissions, Top Channel (2 GHz to 4 GHz) Part 15.209
GPH\42145\RE05	Spurious Radiated Emissions, Top Channel (4 GHz to 5 GHz) Part 15.209
GPH\42145\RE06	Spurious Radiated Emissions, Top Channel (5 GHz to 6 GHz) Part 15.209

Test Of: Red-M (Communications) Ltd.

Bluetooth Clip-On For Palm Vx (code no. 0400-001)

To: F.C.C. Part 15 Subpart C: 1998 (Intentional Radiators) Section 15.247

Graphical Test Results – (Continued)

Graph Reference Number	Title
GPH\42145\RE010	Spurious Radiated Emissions, Top Channel (6 GHz to 8 GHz) Part 15.209
GPH\42145\RE014	Spurious Radiated Emissions, Top Channel (8 GHz to 12.5 GHz) Part 15.209
GPH\42145\RE018	Spurious Radiated Emissions, Top Channel (12.5 GHz to 18 GHz) Part 15.209
GPH\42145\RE022	Spurious Radiated Emissions, Top Channel (18 GHz to 26.5 GHz) Part 15.209
GPH\42145\RE026	Spurious Radiated Emissions, Center Channel (1 GHz to 2 GHz) Part 15.209
GPH\42145\RE032	Spurious Radiated Emissions, Middle Channel (2 GHz to 4 GHz) Part 15.209
GPH\42145\RE03	Spurious Radiated Emissions, Middle Channel (4 GHz to 5 GHz) Part 15.209
GPH\42145\RE04	Spurious Radiated Emissions, Middle Channel (5 GHz to 6 GHz) Part 15.209
GPH\42145\RE009	Spurious Radiated Emissions, Middle Channel (6 GHz to 8 GHz) Part 15.209
GPH\42145\RE013	Spurious Radiated Emissions, Middle Channel (8 GHz to 12.5 GHz) Part 15.209
GPH\42145\RE017	Spurious Radiated Emissions, Middle Channel (12.5 GHz to 18 GHz) Part 15.209
GPH\42145\RE021	Spurious Radiated Emissions, Middle Channel (18 GHz to 26.5 GHz) Part 15.209
GPH\42145\RE025	Spurious Radiated Emissions, Bottom Channel (1 GHz to 2 GHz) Part 15.209
GPH\42145\RE033	Spurious Radiated Emissions, Bottom Channel (2 GHz to 4 GHz) Part 15.209
GPH\42145\RE01	Spurious Radiated Emissions, Bottom Channel (4 GHz to 5 GHz) Part 15.209
GPH\42145\RE02	Spurious Radiated Emissions, Bottom Channel (5 GHz to 6 GHz) Part 15.209

Test Of: Red-M (Communications) Ltd.

Bluetooth Clip-On For Palm Vx (code no. 0400-001)

To: F.C.C. Part 15 Subpart C: 1998 (Intentional Radiators) Section 15.247

Graphical Test Results – (Continued)

Graph Reference Number	Title
GPH\42145\RE008	Spurious Radiated Emissions, Bottom Channel (6 GHz to 8 GHz) Part 15.209
GPH\42145\RE012	Spurious Radiated Emissions, Bottom Channel (8 GHz to 12.5 GHz) Part 15.209
GPH\42145\RE016	Spurious Radiated Emissions, Bottom Channel (12.5 GHz to 18 GHz) Part 15.209
GPH\42145\RE020	Spurious Radiated Emissions, Bottom Channel (18 GHz to 26.5 GHz) Part 15.209
GPH\42145\RE028	Spurious Radiated Emissions, Receive Mode (1 GHz to 2 GHz) Part 15.109
GPH\42145\RE035	Spurious Radiated Emissions, Receive Mode (2 GHz to 4 GHz) Part 15.109
GPH\42145\RE07	Spurious Radiated Emissions, Receive Mode (4 GHz to 5 GHz) Part 15.109
GPH\42145\RE08	Spurious Radiated Emissions, Receive Mode (5 GHz to 6 GHz) Part 15.109
GPH\42145\RE011	Spurious Radiated Emissions, Receive Mode (6 GHz to 8 GHz) Part 15.109
GPH\42145\RE015	Spurious Radiated Emissions, Receive Mode (8 GHz to 12.5 GHz) Part 15.109
GPH\42145\RE019	Spurious Radiated Emissions, Receive Mode (12.5 GHz to 18 GHz) Part 15.109
GPH\42145\RE023	Spurious Radiated Emissions, Receive Mode (18 GHz to 26.5 GHz) Part 15.109
GPH\42145\RE029	Spurious Radiated Emissions, Receive Mode (30 MHz to 1 GHz) Part 15.109
GPH\42145\RE030	Spurious Radiated Emissions, Top Channel (30 MHz to 1 GHz) Part 15.209
GPH\42145\RE031	Spurious Radiated Emissions, Middle Channel (30 MHz to 1 GHz) Part 15.209
GPH\42145\RE024	Spurious Radiated Emissions, Bottom Channel (30 MHz to 1 GHz) Part 15.209

Test Of: Red-M (Communications) Ltd.

Bluetooth Clip-On For Palm Vx (code no. 0400-001)

To: F.C.C. Part 15 Subpart C: 1998 (Intentional Radiators) Section 15.247

Graphical Test Results – (Continued)

Graph Reference Number	Title
GPH\42145\01	Carrier Frequency Separation, Hopping all Channels Part 15.247 (a) (1)
GPH\42145\02	Carrier Frequency Separation, Hopping all Channels (2.4 GHz to 2.4835 GHz) Part 15.247 (a) (1) (ii)
GPH\42145\03	Time of Occupancy (Dwell Time), Hopping all Channels Part 15.247 (a) (1) (ii)
GPH\42145\04	Time of Occupancy (Dwell Time), Hopping all Channels Part 15.247 (a) (1) (ii)
GPH\42145\05	20 dB Bandwidth, Hopping all Channels Part 15.247 (a) (1) (ii)
GPH\42145\06	Peak Output Power, Bottom Channel Part 15.247 (b)
GPH\42145\07	Peak Output Power, Middle Channel Part 15.247 (b)
GPH\42145\08	Peak Output Power, Top Channel Part 15.247 (b)
GPH\42145\09	Band Edge Compliance, Top Channel F1/F2 show Restricted Band, Part 15.247 (b)
GPH\42145\10	Band Edge Compliance, Bottom Channel F1/F2 show Restricted Band, Part 15.247 (b)

These pages are not included in the total number of pages for this report.



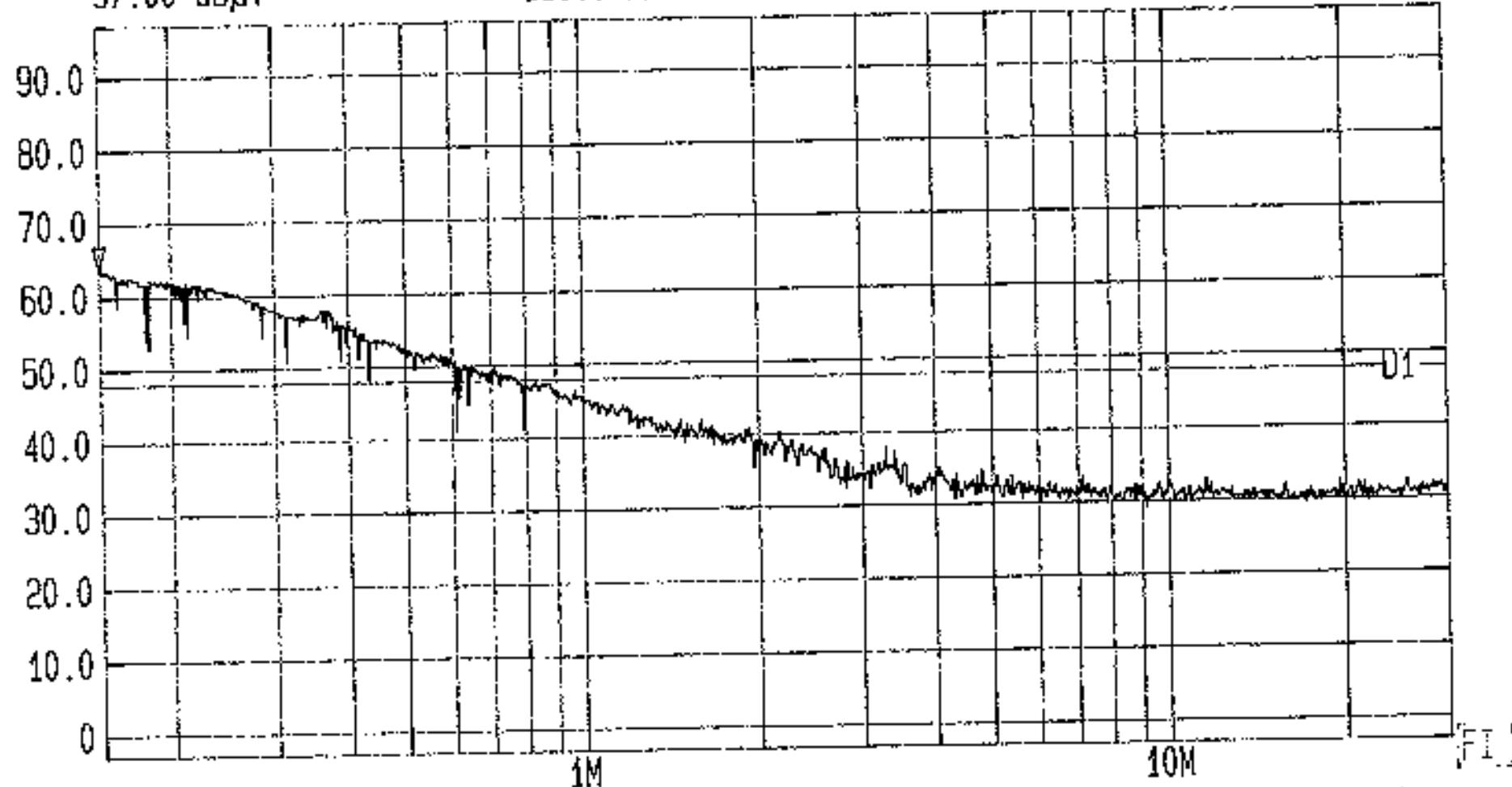
Date 02.May.'01 Time 10:24:48
Ref.Lvl Marker 63.87 dB μ V
97.00 dB μ V 150.0 kHz

Res.Bw
TG.Lvl
OF.Stp

9 kHz [imp]
off
2.985 MHz

Vid.Bw
AF.Att
Unit

100 kHz
20 dB
[dB μ V]



Start
150 kHz

Span
29.85 MHz

Center
2.12132 MHz

Sweep
60 ms

Stop
30 MHz

Conducted Emissions Live Line Spec: FCC Part 15.207 Tested By RFI For Red-M
EUT: Palm V Clip-on ENG: ND/JXK Palm Only GPH/42145/2/ACCE002



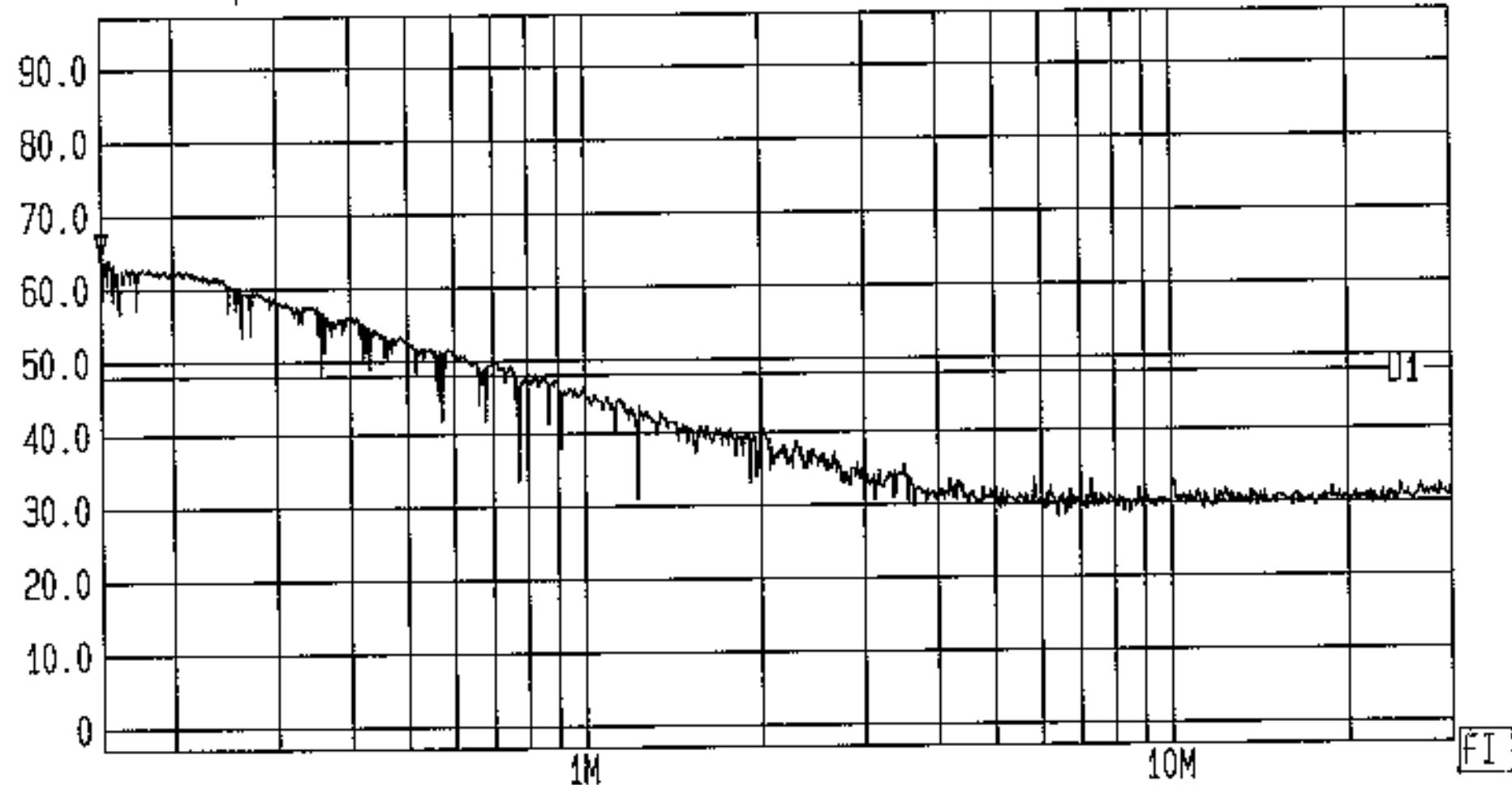
Date 02.May.'01 Time 10:18:49
Ref.Lvl Marker 64.53 dB μ V
97.00 dB μ V 150.0 kHz

Res.Bw
TG.Lvl
CF.Stp

9 kHz [imp]
off
2.985 MHz

Vid.Bw
RF.Att
Unit

100 kHz
20 dB
[dB μ V]



Start
150 kHz

Span
29.85 MHz

Center
2.12132 MHz

Sweep
1.94 s

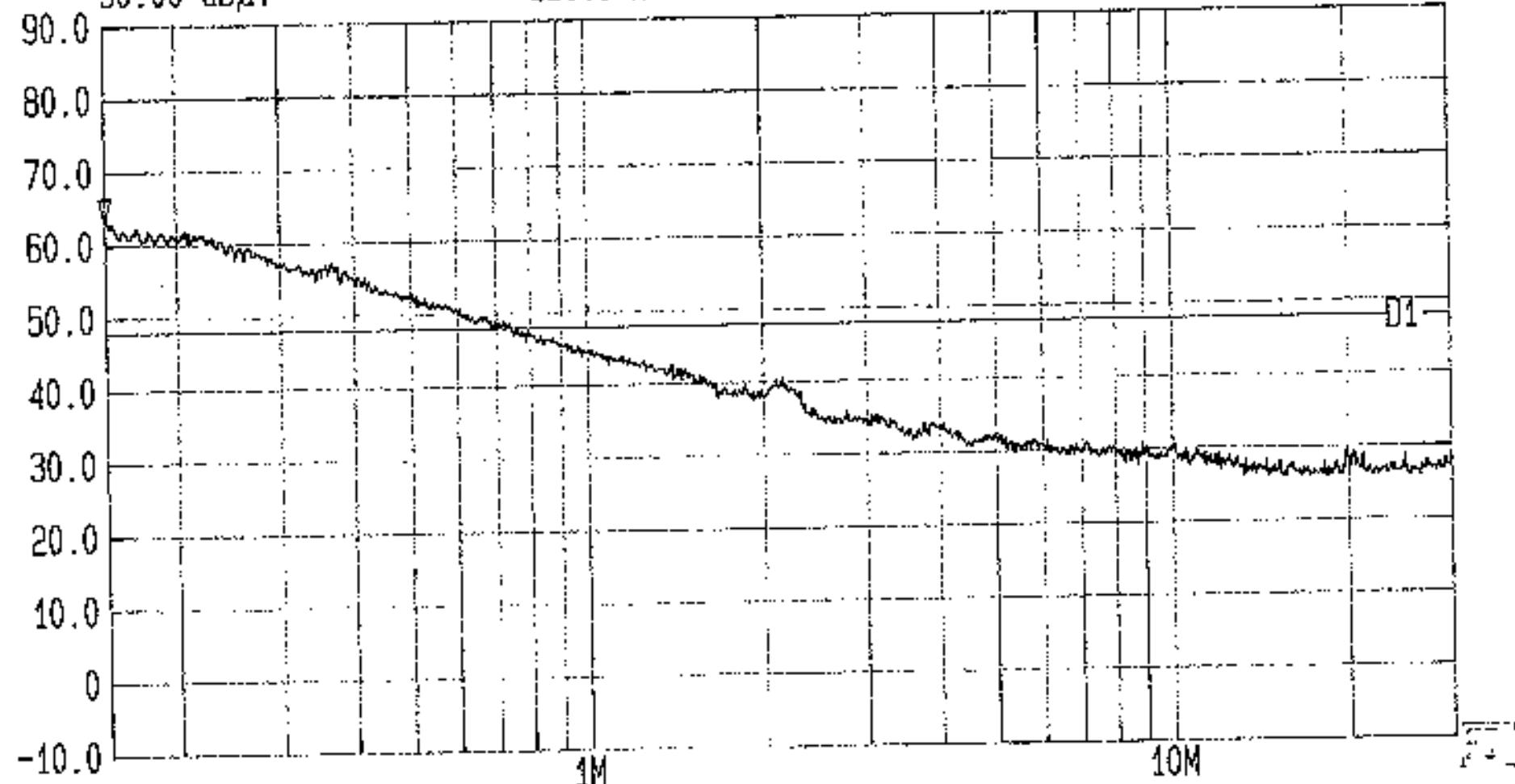
Stop
30 MHz

Conducted Emissions Neutral Line Spec: FCC Part 15.207 Tested By RFI For Red-M
EUT: Palm V Clip-on ENG: ND/JXK Palm Only GPH/42145/2/ACCE001



Date 02.May.'01 Time 11:42:05
Ref.Lvl Marker 63.44 dB μ V
90.00 dB μ V 150.0 kHz

Res.Bw 9 kHz [imp] Vid.Bw 100 kHz
TG.Lvl off
CF.Stp 2.985 MHz RF.Att 15 dB
Unit [dB μ V]



Start
150 kHz

Span
29.85 MHz

Center
2.12132 MHz

Sweep
60 ms

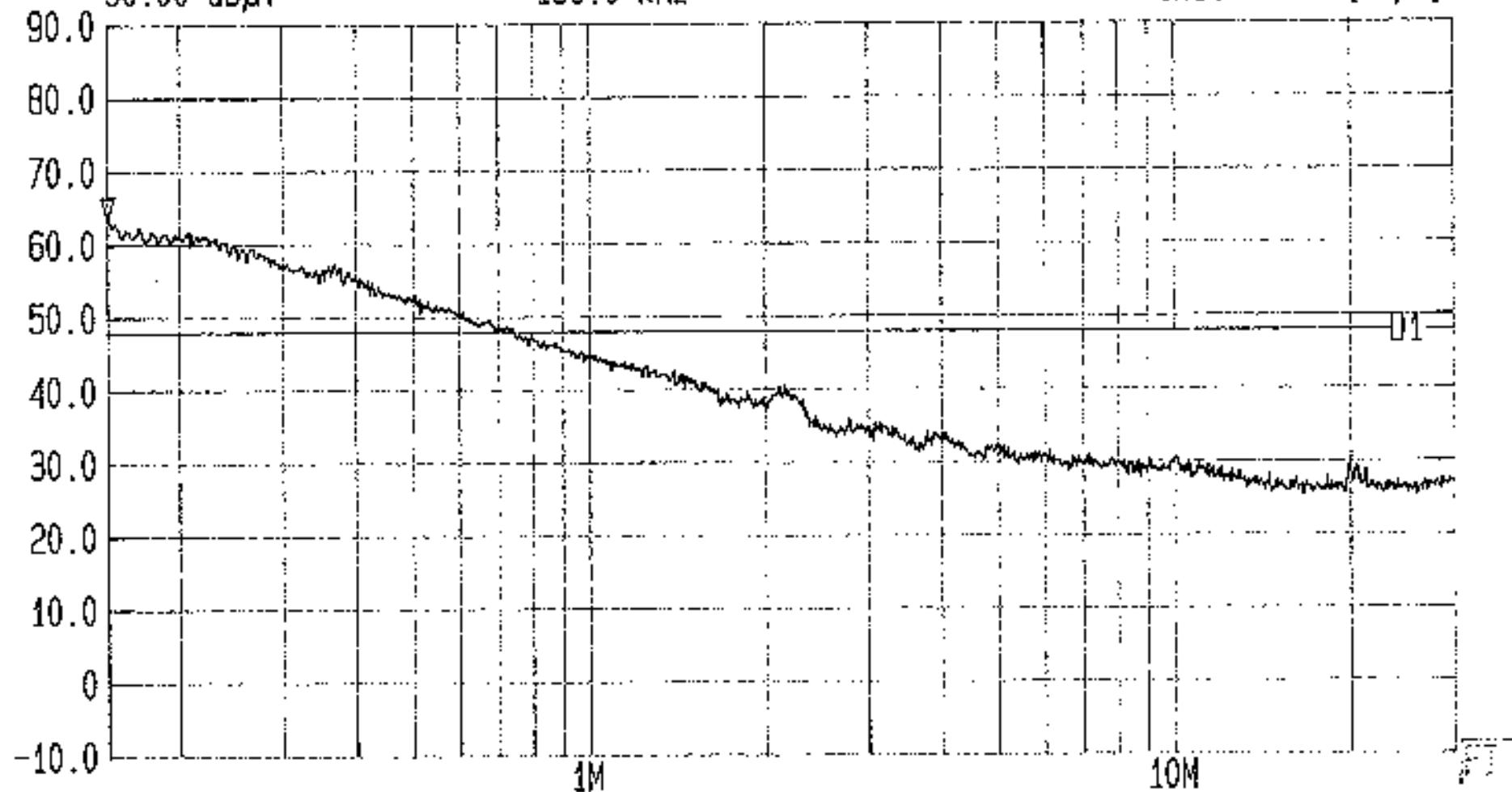
Stop
30 MHz

Conducted Emissions Live Line Spec: FCC Part 15.107 Tested By RFI For Red-M
EUT: Palm V Clip-on ENG: ND/JXK Rx Mode GPH/42145/2/ACCE000



Date 02.May.'01 Time 11:34:39
Ref.Lv1 Marker 63.44 dB μ V
90.00 dB μ V 150.0 kHz

Res.BW 9 kHz [imp] Vid.BW 100 kHz
TG.Lvl off
CF,Stp 2.985 MHz RF.Att 15 dB
Unit [dB μ V]



Start

150 kHz

Span

29.85 MHz

Center

2.12132 MHz

Sweep

60 ms

Stop

30 MHz

Conducted Emissions Neutral Line Spec: FCC Part 15.107 Tested By RFI For Red-M
EUT: Palm V Clip-on ENG: ND/JXK Rx Node GPH/42145/2/ACCE009



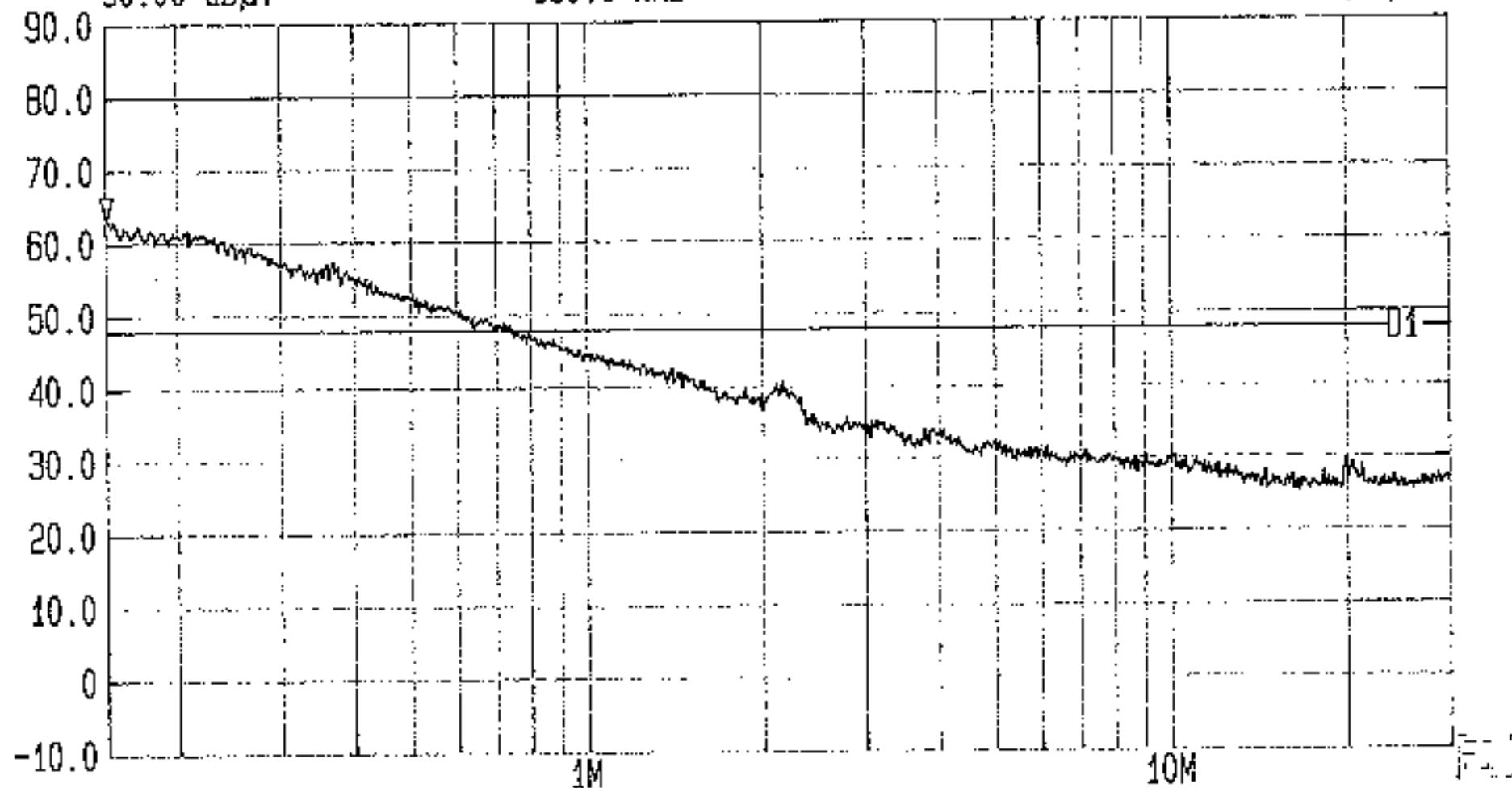
Date 02.May.'01 Time 11:31:56
Ref.Lvl Marker 63.44 dB μ V
90.00 dB μ V 150.0 kHz

Res.Bw
TG.Lvl
CF.Stp

9 kHz [imp]
off
2.985 MHz

Vid.Bw
RF.Att
Unit

100 kHz
15 dB
[dB μ V]



Start
150 kHz

Span
29.85 MHz

Center
2.12132 MHz

Sweep
340 ms

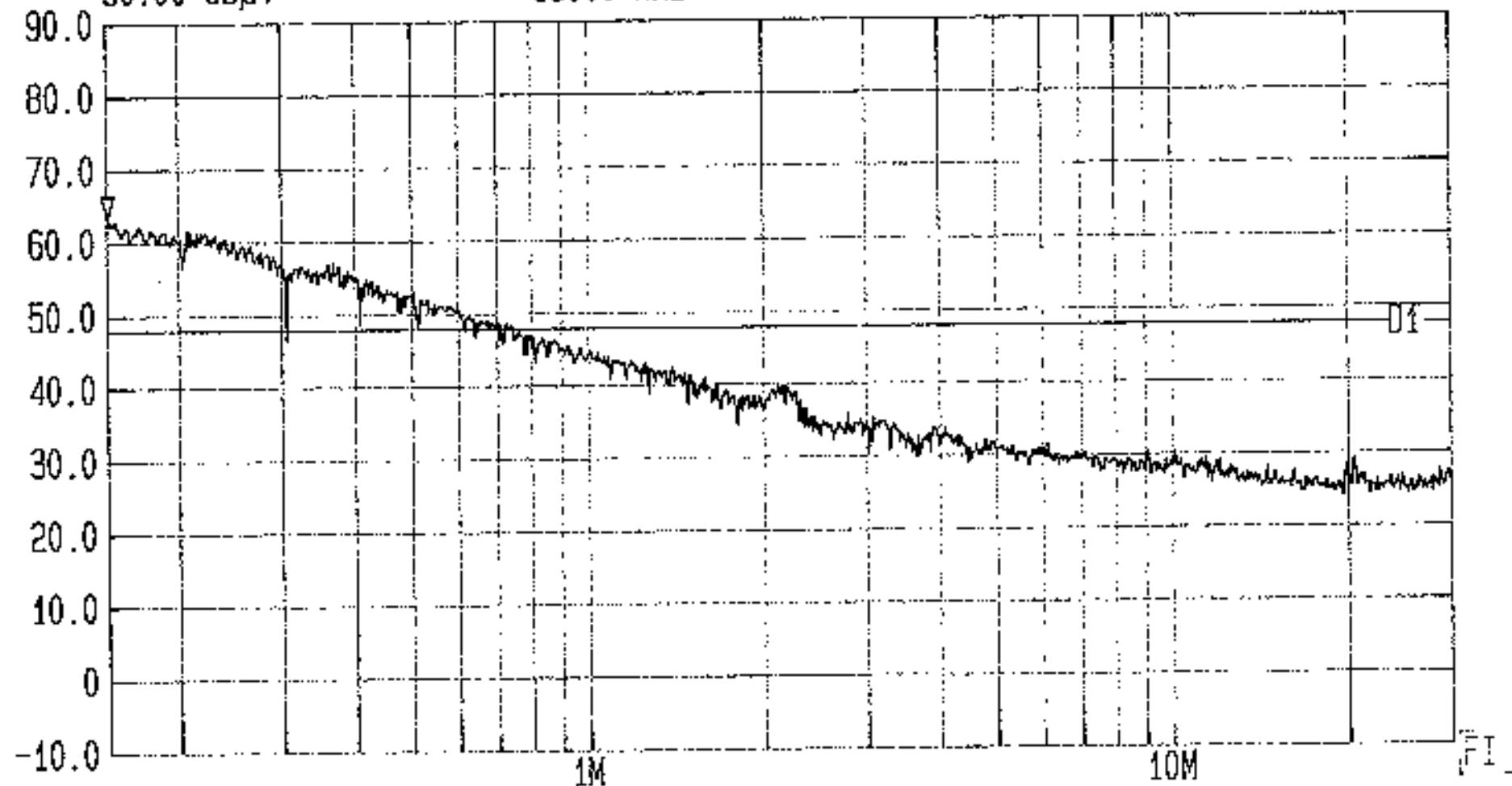
Stop
30 MHz

Conducted Emissions Neutral Line Spec: FCC Part 15.207 Tested By RFI For Red-M
EUT: Palm V Clip-on ENG: ND/JXK Top Channel GPH/42145/2/ACCE008



Date 02.May.'01 Time 11:28:27
Ref.Lvl Marker 63.44 dB μ V
90.00 dB μ V 150.0 kHz

Res.Bw 9 kHz [imp] Vid.Bw 100 kHz
TG.Lvl off RF.Att 15 dB
CF.Stp 2.985 MHz Unit [dB μ V]



Start
150 kHz

Span
29.85 MHz

Center
2.12132 MHz

Sweep
1.94 s

Stop
30 MHz

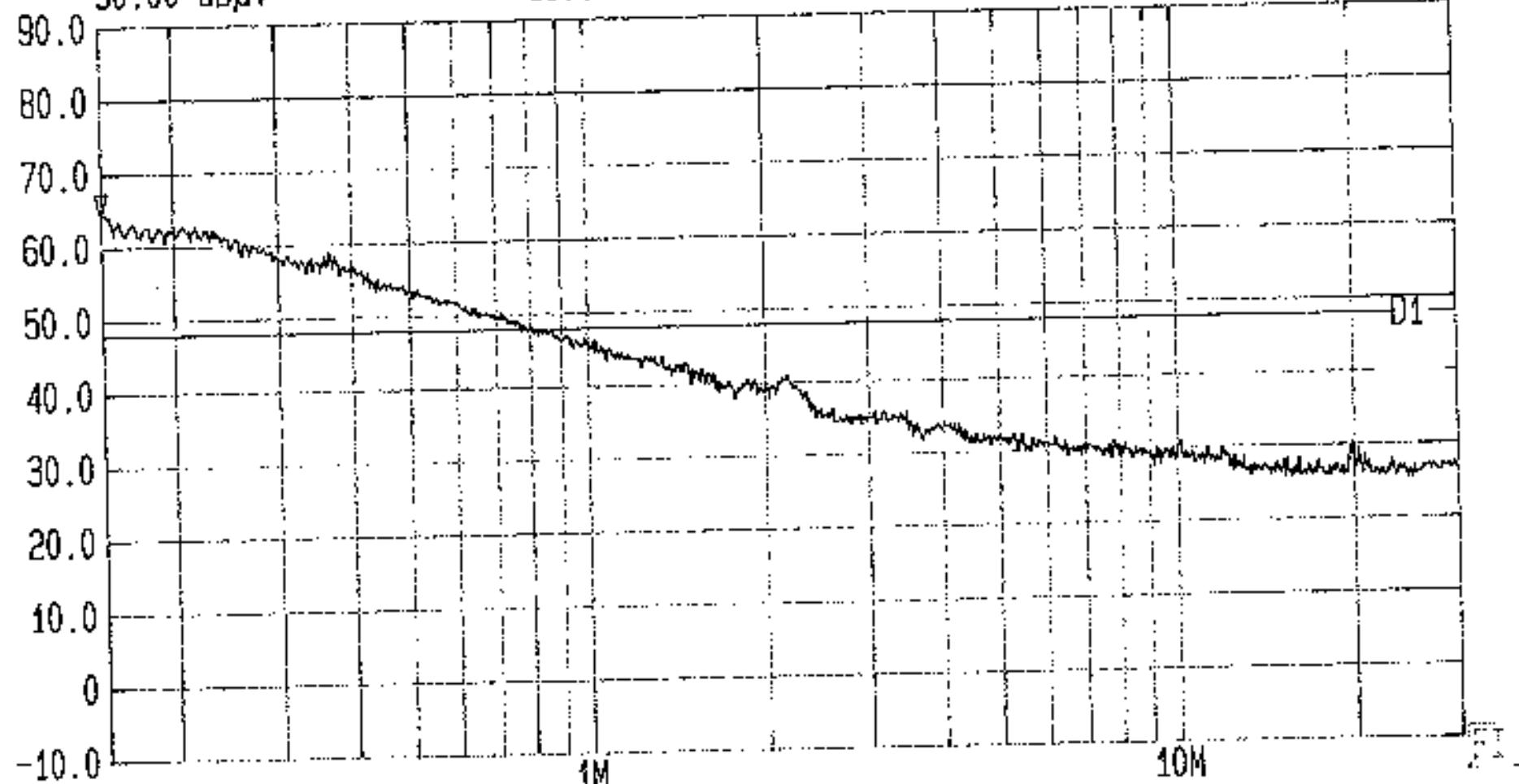
Conducted Emissions Live Line Spec: FCC Part 15.207 Tested By RFI For Red-M
EUT: Palm V Clip-on ENG: ND/JXK Top Channel GPH/42145/2/ACCE007



Date 02.May.'01 Time 11:25:29
Ref.Lvl Marker 64.33 dB μ V
90.00 dB μ V 150.0 kHz

Res.BW
TG.Lvl
CF.Stp

9 kHz [imp] off
2.985 MHz AF.Att
100 kHz Unit 15 dB
[dB μ V]



Start
150 kHz

Span
29.85 MHz

Center
2.12132 MHz

Sweep
340 ms

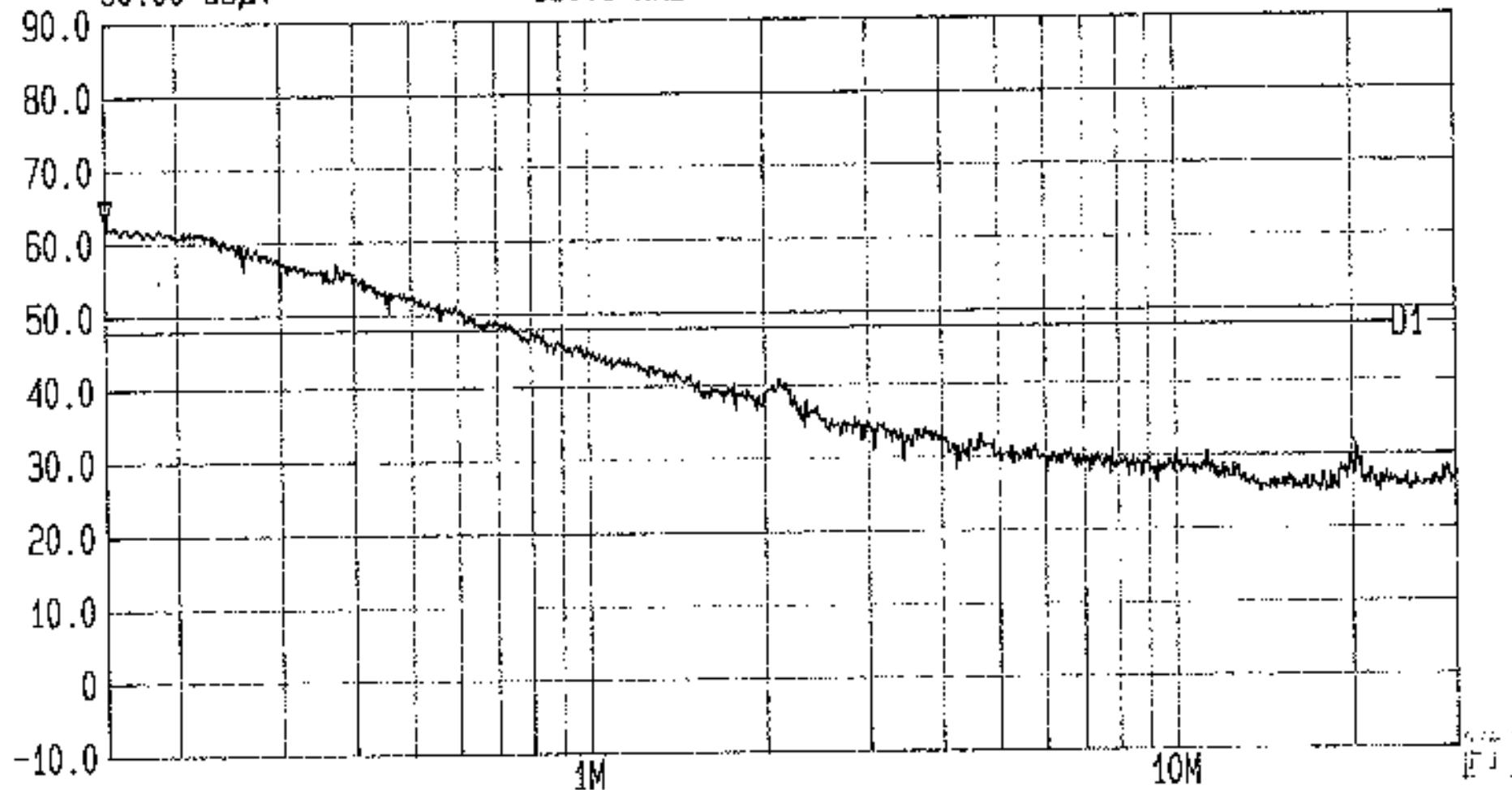
Stop
30 MHz

Conducted Emissions Live Line Spec: FCC Part 15.207 Tested By RFI For Red-M
EUT: Palm V Clip-on ENG: ND/JXK Middle Channel GPH/42145/2/ACCE006



Date 02.May.'01 Time 11:18:26
Ref.Lvl Marker 62.94 dB μ V
90.00 dB μ V 150.0 kHz

Res.Bw 9 kHz [imp] Vid.Bw 100 kHz
TG.Lvl off RF.Att 15 dB
CF.Stp 2.985 MHz Unit [dB μ V]



Start
150 kHz

Span
29.85 MHz

Center
2.412132 MHz

Sweep
340 ms

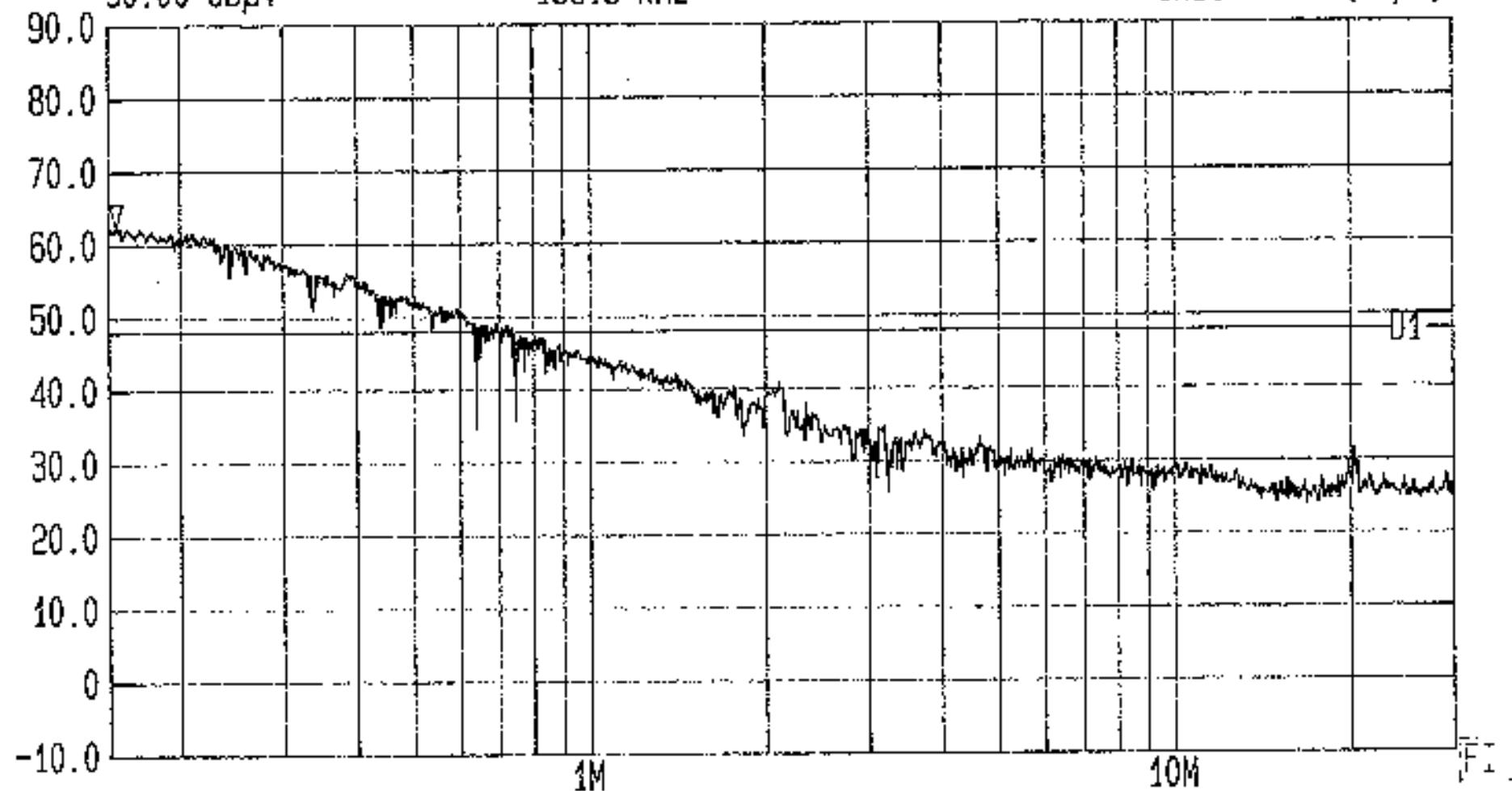
Stop
30 MHz

Conducted Emissions Neutral Line Spec: FCC Part 15.207 Tested By RFI For Red-M
EUT: Palm V Clip-on ENG: ND/JXK Middle Channel GPH/42145/2/ACCE005



Date 02.May.'01 Time 11:15:46
Ref.Lvl Marker 62.48 dB μ V
90.00 dB μ V 155.3 kHz

Res.Bw 9 kHz [imp] Vid.Bw 100 kHz
TG.Lvl off RF.Att 15 dB
CF.Stp 2.985 MHz Unit [dB μ V]



Start
150 kHz

Span
29.85 MHz

Center
2.12132 MHz

Sweep
1.94 s

Stop
30 MHz

Conducted Emissions Neutral Line Spec: FCC Part 15.207 Tested By RFI For Red-M
EUT: Palm V Clip-on ENG: ND/JXK Bottom Channel GPH/42145/2/ACCE004



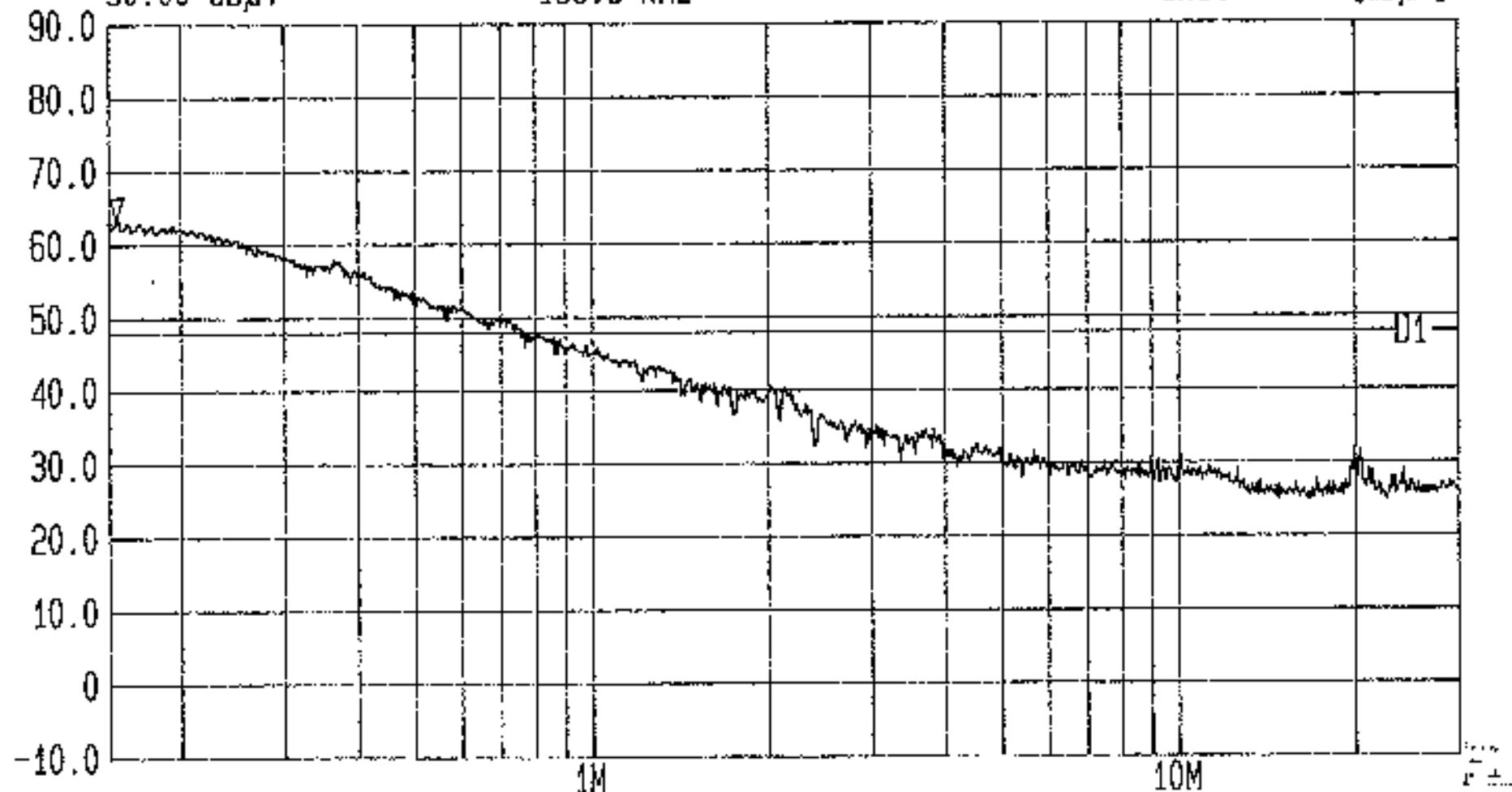
Date 02.May.'01 Time 11:11:10
Ref.Lvl Marker 63.27 dB μ V
90.00 dB μ V 155.3 kHz

Res.Bw
TG.Lvl
CF.Stp

9 kHz [imp]
off
2.985 MHz

Vid.Bw
RF.Att
Unit

100 kHz
15 dB
[dB μ V]



Start
150 kHz

Span
29.85 MHz

Center
2.12132 MHz

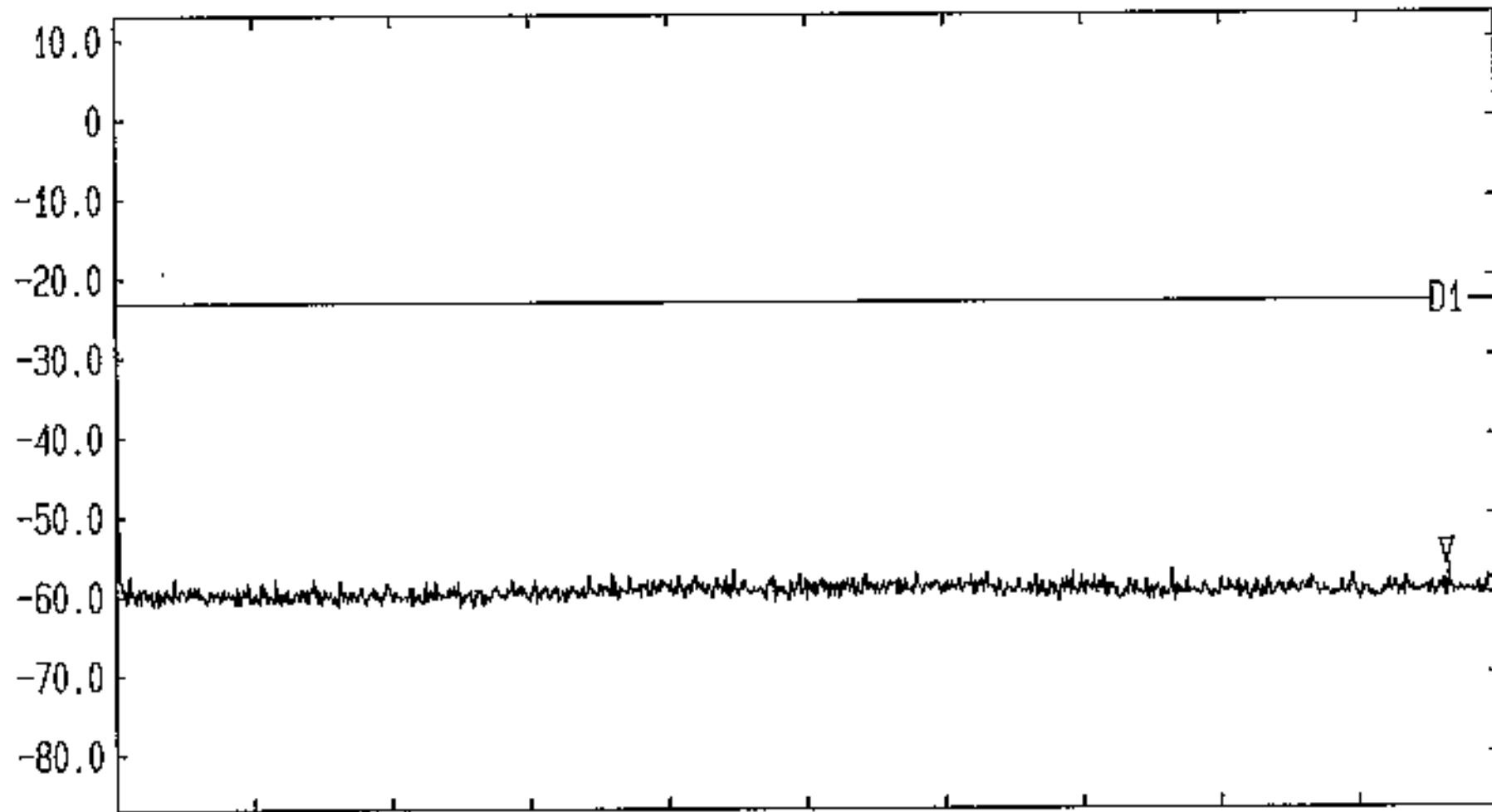
Sweep
60 ms

Stop
30 MHz

Conducted Emissions Live Line Spec: FCC Part 15.207 Tested By RFI For Red-M
EUT: Palm V Clip-on ENG: ND/JXK Bottom Channel GPH/42145/2/ACCE003

LVLOFF
Date 30.Apr.'01 Time 14:44:46
Ref.Lvl Marker -56.22 dBm
13.00 dBm 965.5 MHz

Res.Bw 100.0 kHz [3dB] Vid.Bw 100 kHz
CF.Stp 99.999 MHz RF.Att 10 dB
Unit [dBm]

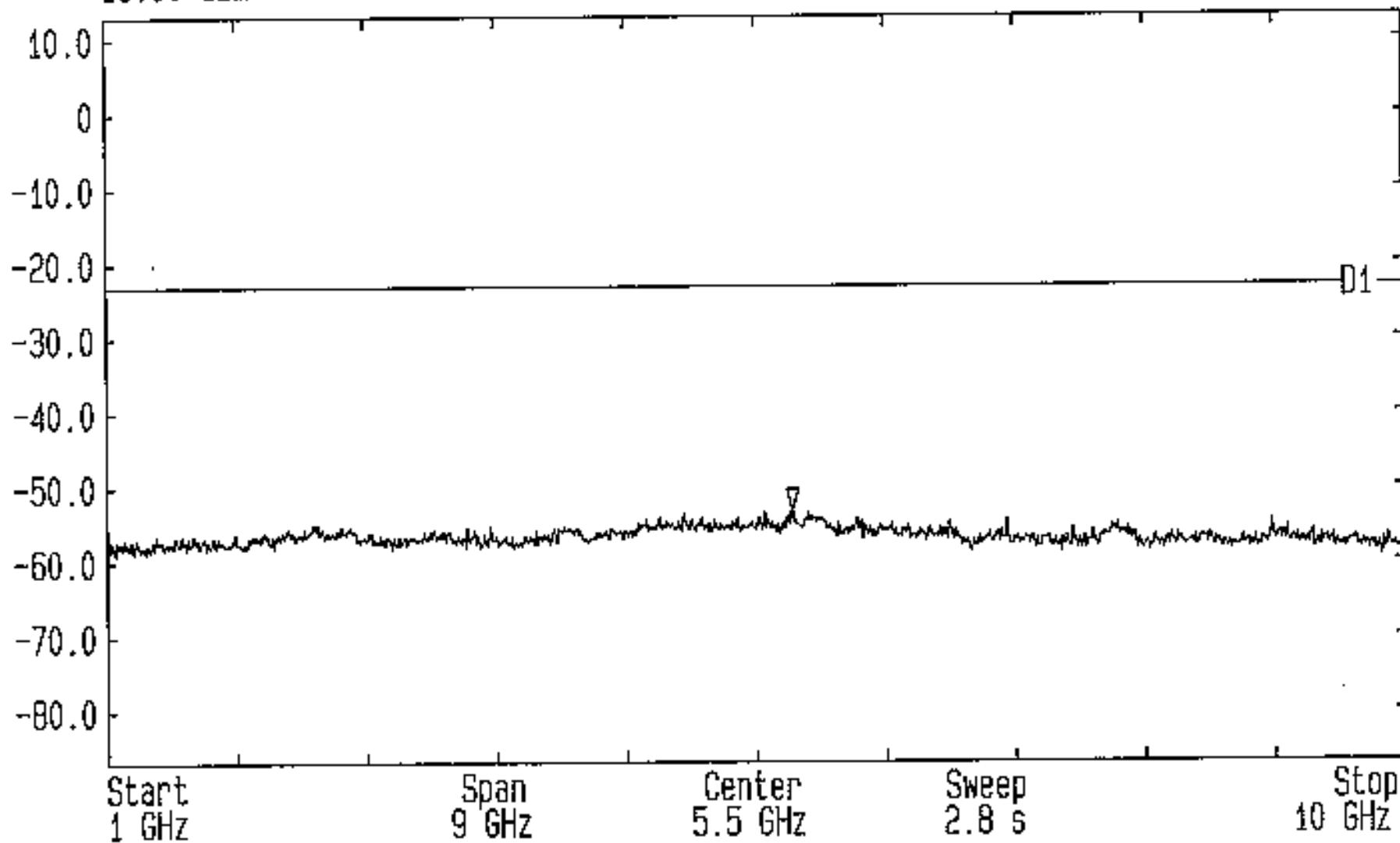


Start 0 MHz Span 999.9 MHz Center 500.0 MHz Sweep 300 ms Stop 1 GHz

Spurious Conducted Emissions Tested for Red-M by RFI Ltd. OpCond: RX Mode
FCC Part 15.247 (c) ENG: ND EUT: Palm V Clip-On GPH/42145/CE001

LVL OFF
Date 30.Apr.'01 Time 14:51:58
Ref.Lvl Marker -53.12 dBm
13.00 dBm 5.7600 GHz

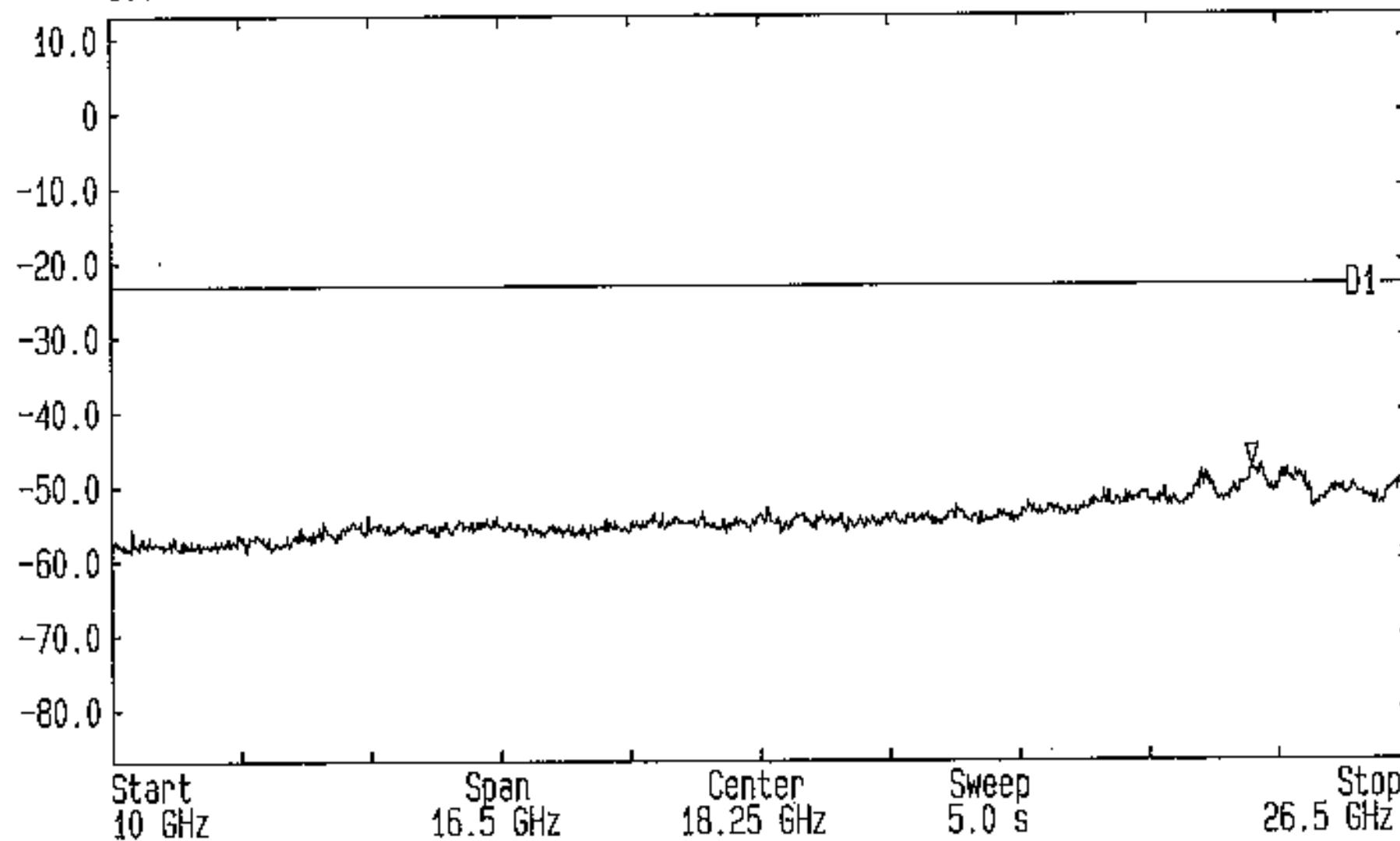
Res.Bw 100.0 kHz [3dB] Vid.Bw 100 kHz
CF.Stp 900.000 MHz RF.Att 10 dB
Unit [dBm]



Spurious Conducted Emissions Tested for Red-M by RFI Ltd. OpCond: RX Mode
FCC Part 15.247 (c) ENG: ND EUT: Palm V Clip-On GPH/42145/CE002

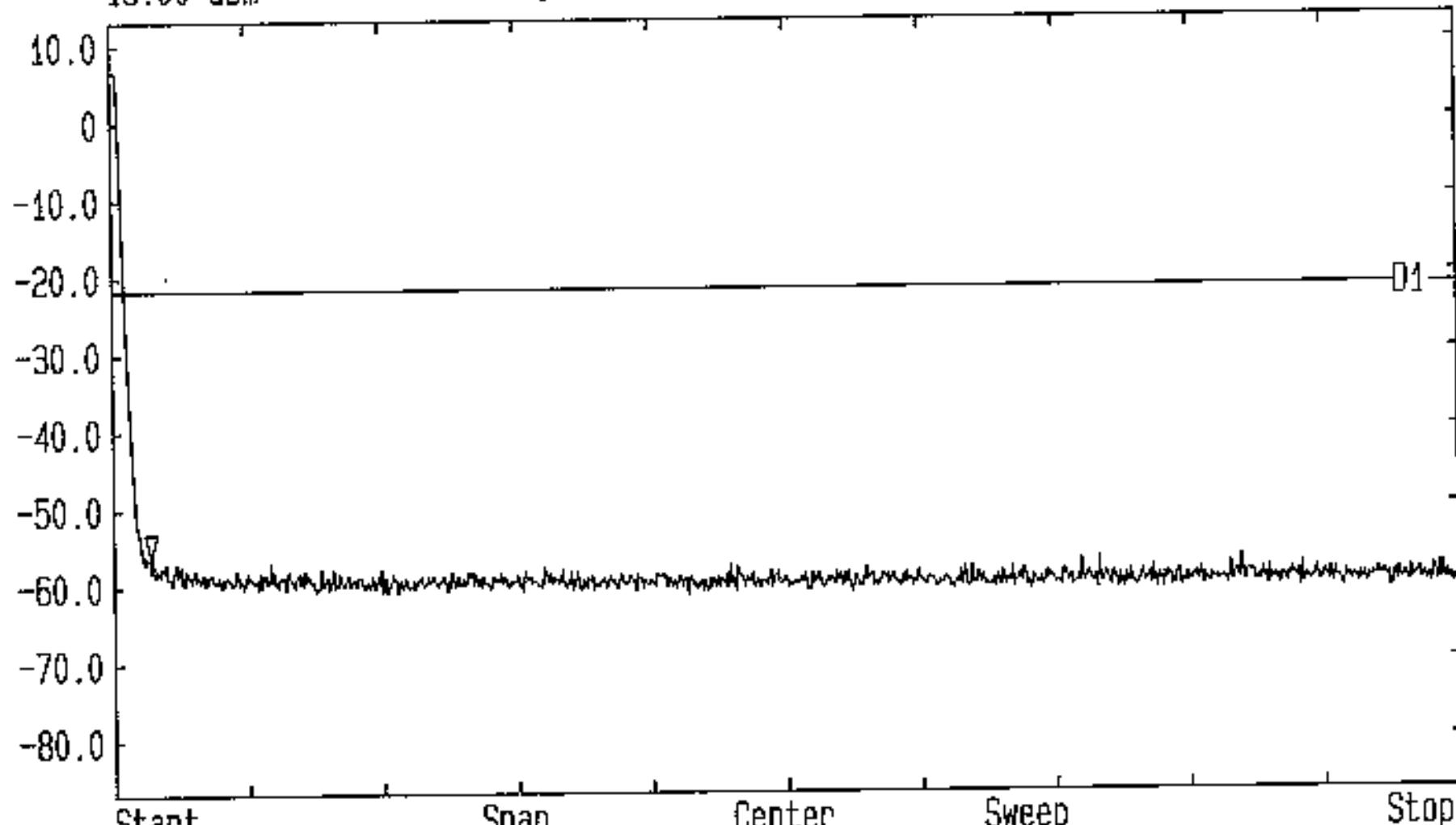
LVL OFF
Date 30.Apr.'01 Time 14:56:15
Ref.Lvl Marker -47.58 dBm
13.00 dBm 24.5383 GHz

Res.Bw 100.0 kHz [3dB] Vid.Bw 100 kHz
CF.Stp 1.650 GHz RF.Att 10 dB
Unit [dBm]



Spurious Conducted Emissions Tested for Red-M by RFI Ltd. OpCond: RX Mode
FCC Part 15.247 (c) ENG:ND EUT: Palm V Clip-On GPH/42145/CE003

LVL OFF
Date 30.Apr.'01 Time 15:19:34
Ref.Lvl Marker -55.89 dBm CF.Stp 2.999 MHz RF.Att
13.00 dBm 875.4 kHz Unit 10 dB
[dBm] 100 kHz

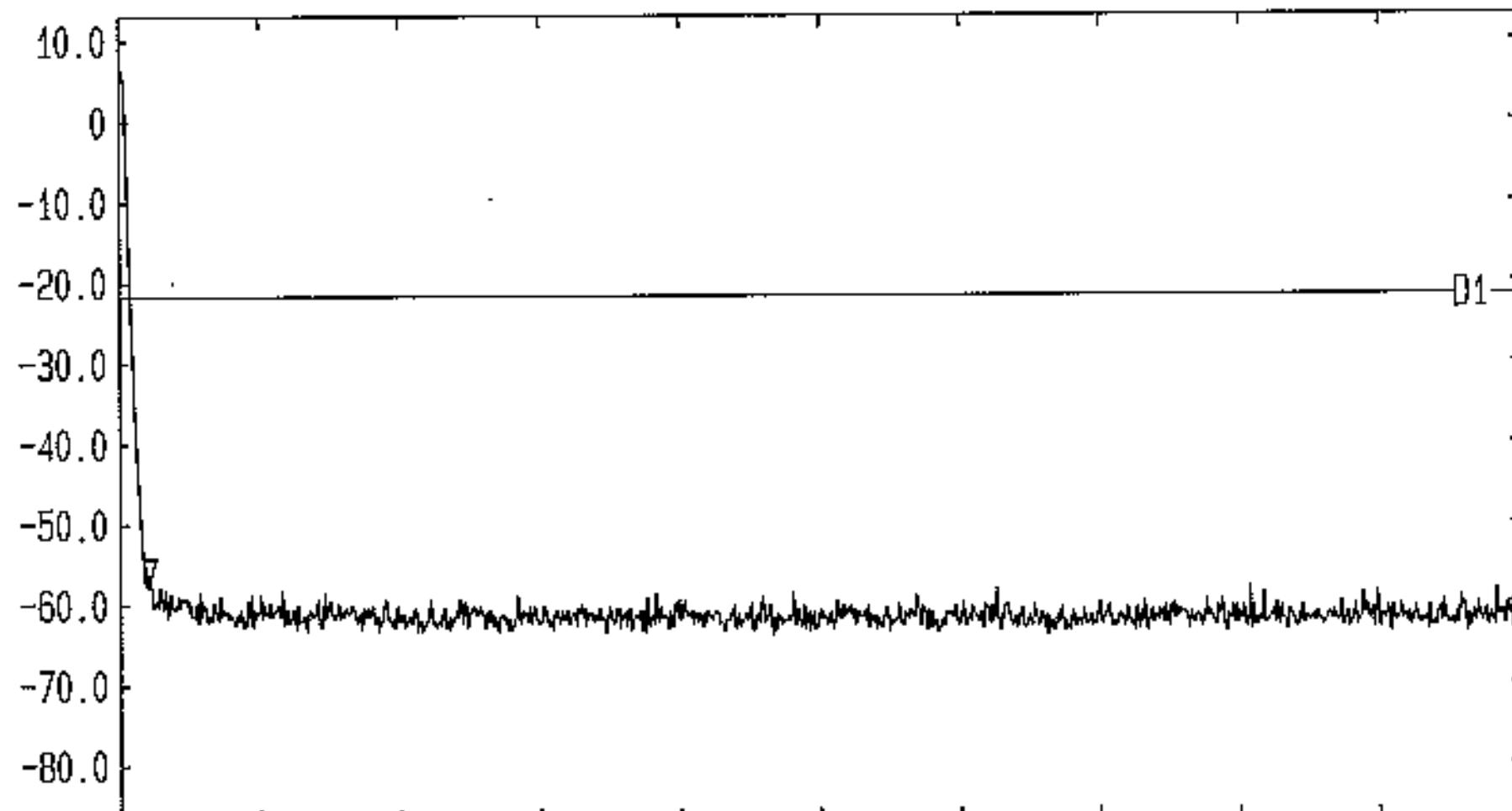


Start 0 MHz Span 29.99 MHz Center 15.00 MHz Sweep 20 ms Stop 30 MHz

Spurious Conducted Emissions Tested for Red-M by RFI Ltd. OpCond: Tx Top Channel
FCC Part 15.247 (c) ENG: ND EUT: Palm V Clip-On GPH/42145/CE006

LVL OFF
Date 30.Apr.'01 Time 15:09:11
Ref.Lvl Marker -57.08 dBm
13.00 dBm 608.8 kHz

Res.Bw 100.0 kHz [3dB] Vid.Bw 100 kHz
CF.Stp 2.999 MHz RF.Att 10 dB
Unit [dBm]

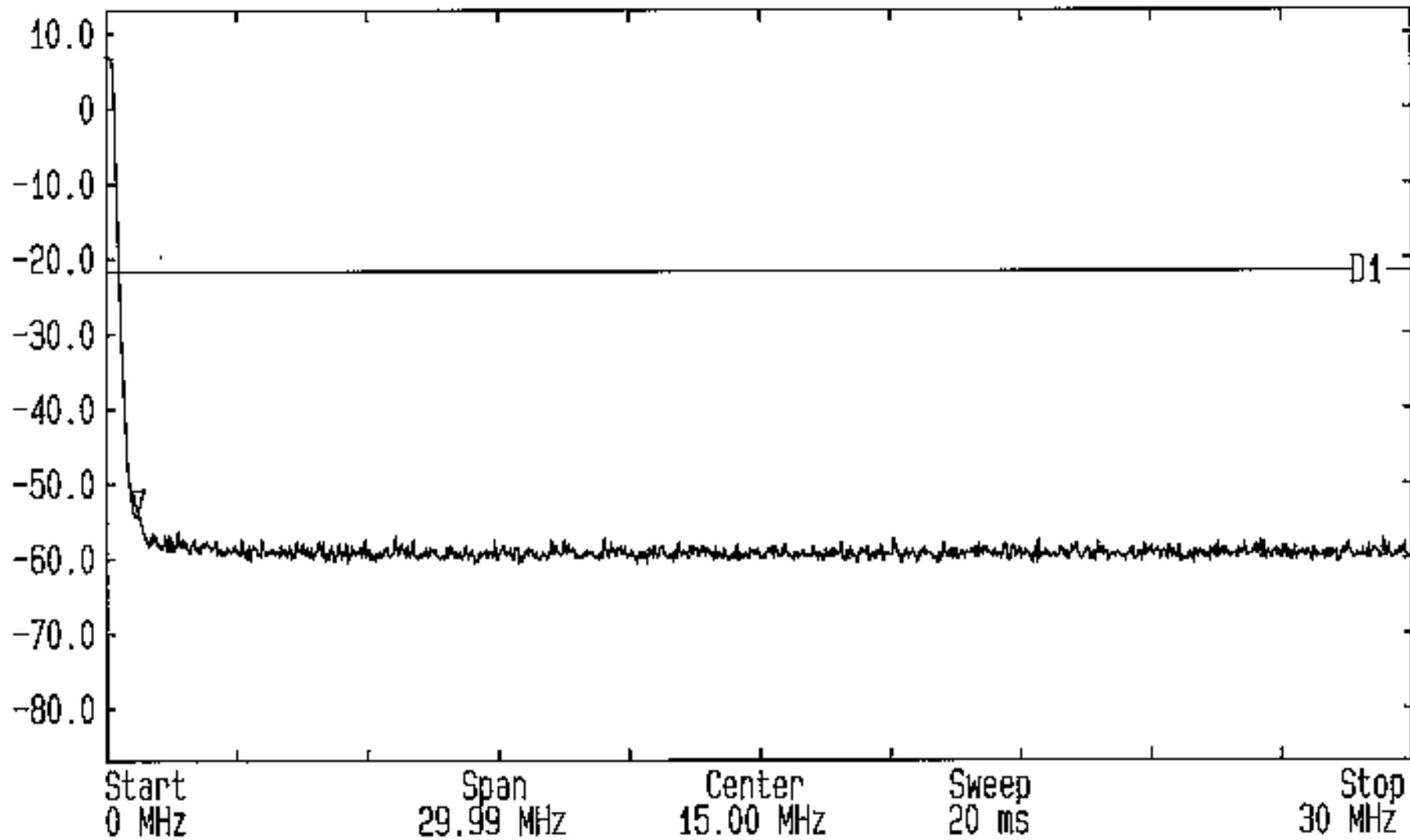


Start 0 MHz Span 29.99 MHz Center 15.00 MHz Sweep 20 ms Stop 30 MHz

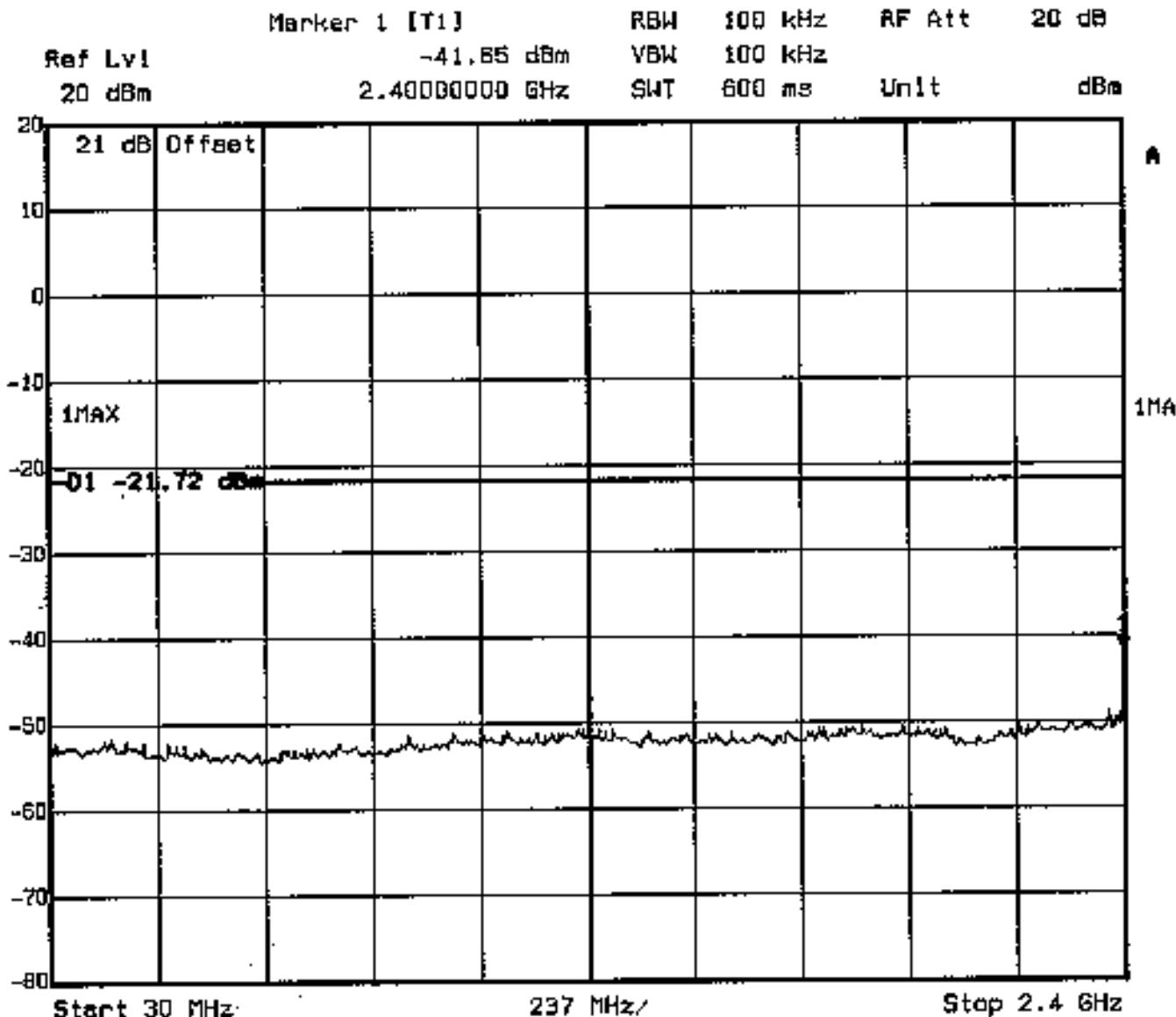
Spurious Conducted Emissions Tested for Red-M by RFI Ltd. OpCond: Tx Middle Channel
FCC Part 15.247 (c) ENG: ND EUT: Palm V Clip-On GPH/42145/CE005

LVLOFF
Date 30.Apr.'01 Time 15:03:14
Ref.Lvl Marker -53.75 dBm
13.00 dBm 742.1 kHz

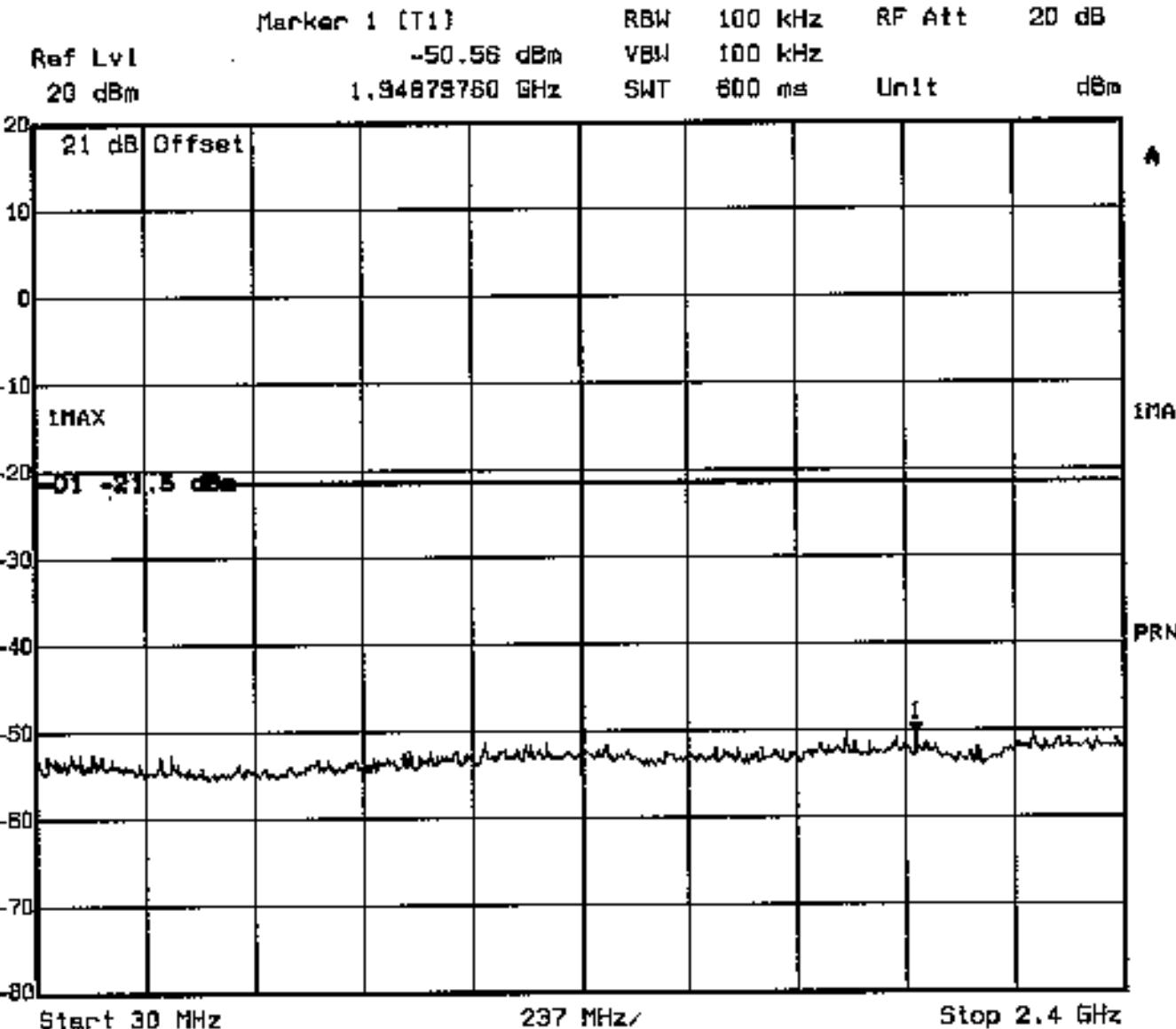
Res.Bw	100.0 kHz [3dB]	Vid.Bw	100 kHz
CF.Stp	2.999 MHz	RF.Att	10 dB
		Unit	[dBm]



Spurious Conducted Emissions Tested for Red-M by RFI Ltd. OpCond: Tx Bottom Channel
FCC Part 15.247 (c) ENG: ND EUT: Palm V Clip-On GPH/42145/CE004

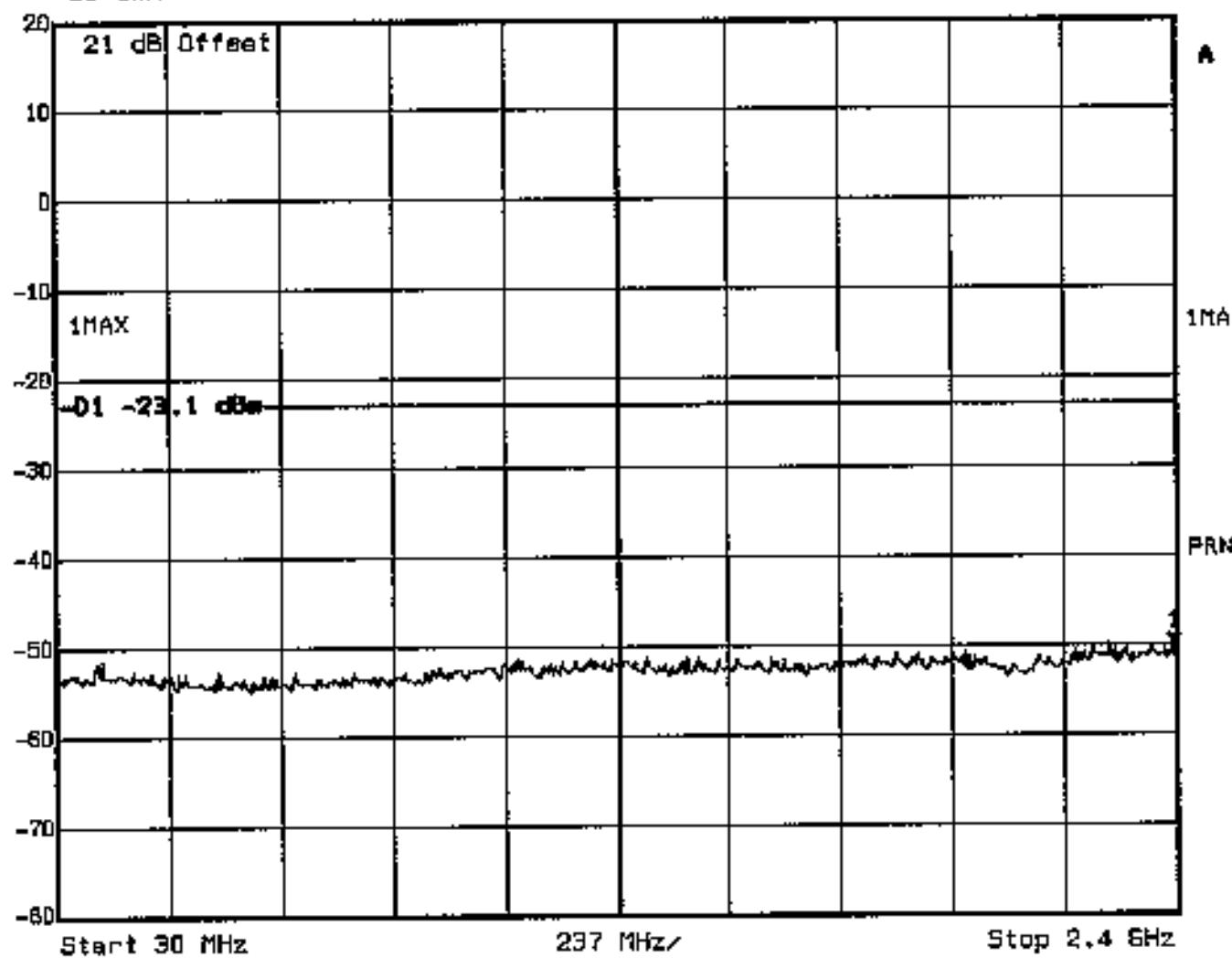


Title: Spurious RF Conducted Emissions FCC Part 15.247(c)
Comment A: Tested For RED-M by RFI Ltd EUT:Palm V Clip-on ENG:ND
OpCond: Bottom Channel GRH/42145/11
Date: 20/APR/2001 12:54:06

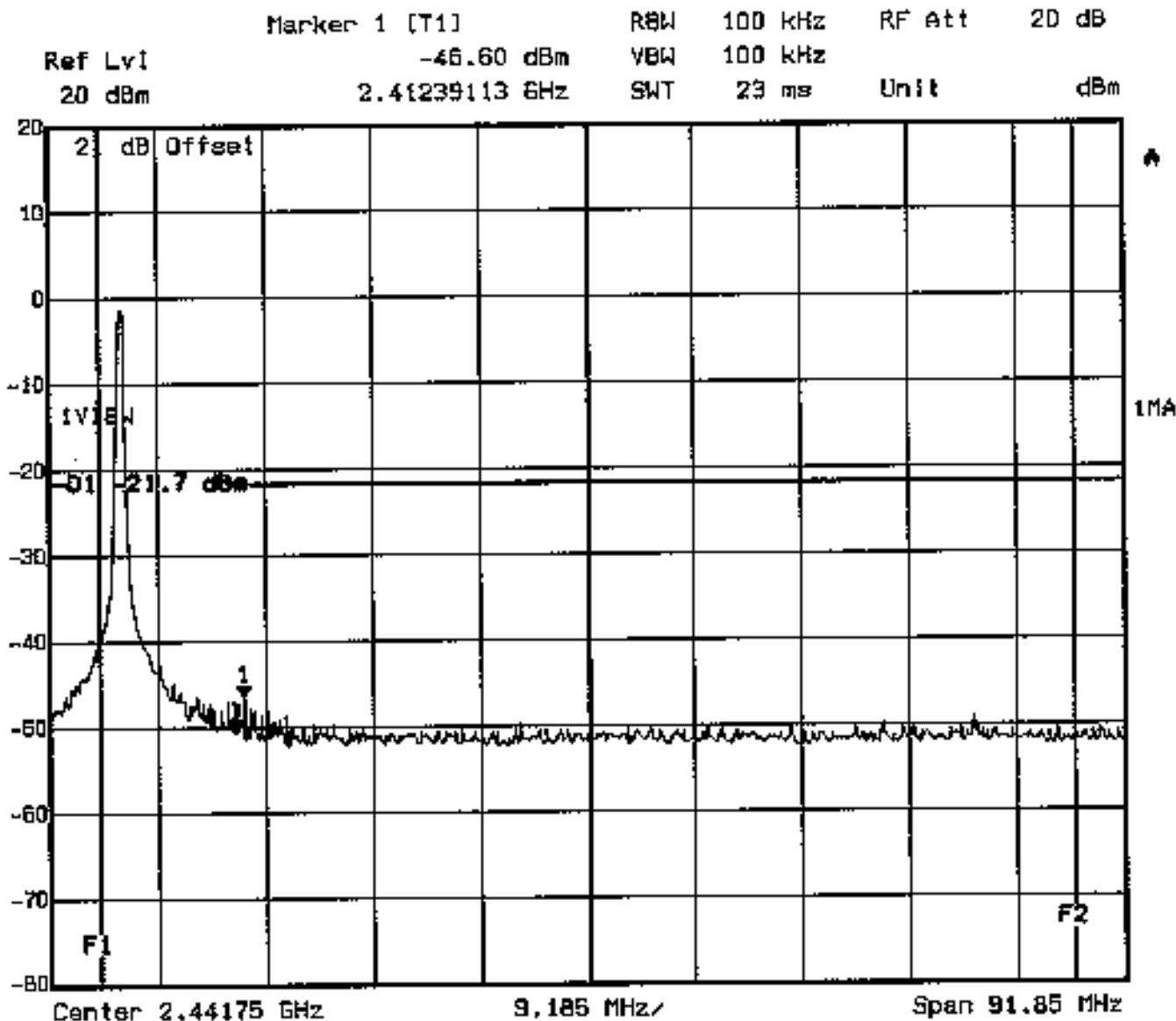


Title: Spurious RF Conducted Emissions FCC Part 15.247(c)
 Comment A: Tested For RED-M by RFI Ltd EUT:Palm V Clip-on ENG:ND
 OpCond: Middle Channel SPC/42145/t2
 Date: 20/APR/2001 13:04:12

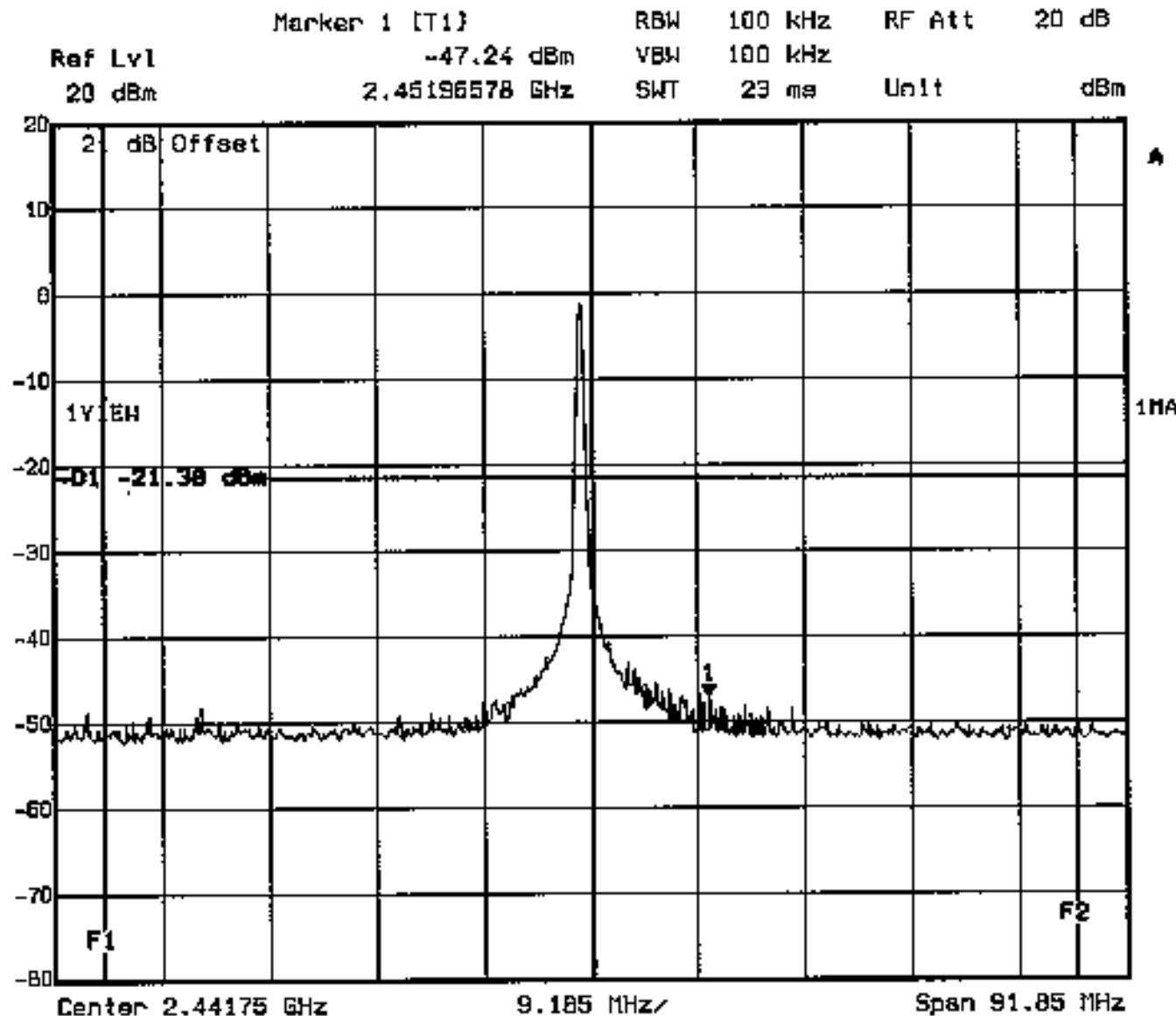
Marker 1 [T1] Ref Lvl -50.22 dBm RBW 100 kHz RF Att 20 dB
20 dBm 2.39525050 GHz VBW 100 kHz Unit dBm



Title: Spurious RF Conducted Emissions FCC Part 15.247(c)
Comment A: Tested For RED-M by RFI Ltd EUT:Palm V C1tp-on ENG:ND
OpCond: Top Channel GPH/42145/13
Date: 20/APR/2001 13:09:38



Title: Spurious RF Conducted Emissions FCC Part 15.247(c)
 Comment At: Tested For RED-M by RFI Ltd EUT: Palm V Clip-on ENG:ND
 OpCond: F1/F2 = Bend Edges Bottom Channel GPH/42145/14
 Date: 20.APR.2001 13:28:04



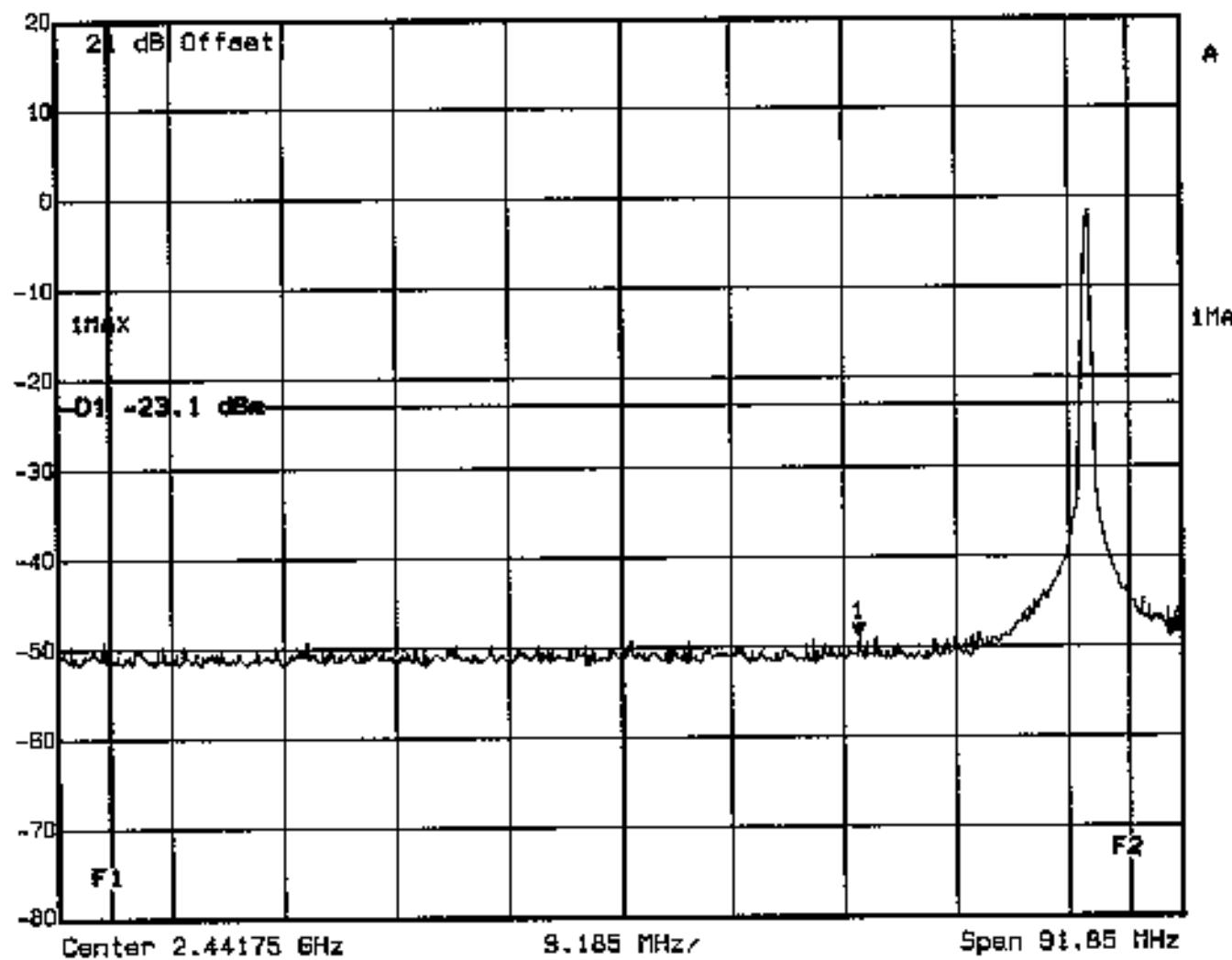
Title: Spurious RF Conducted Emissions FCC Part 15.247(c)

Comment A: Tested For RED-M by RFI Ltd EUT:Palm V Clip-on ENG:ND

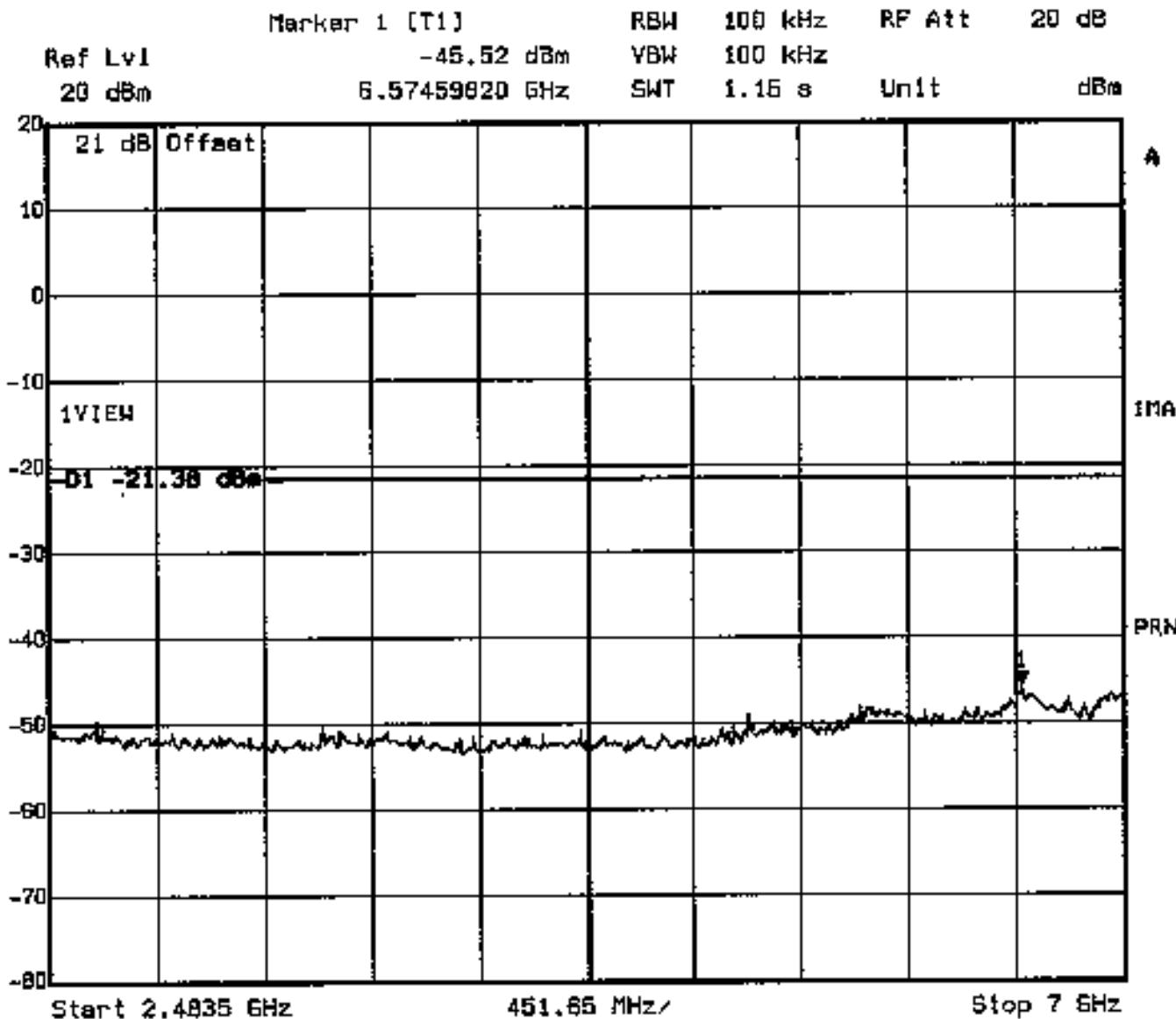
OpCond: F1/F2 = Band Edges Middle Channel GPH/42145/15

Date: 20.APR.2001 13:40:38

Marker 1 [T1] Ref Lv1 -48.82 dBm 20 dBm 2.46135326 GHz VSW 100 kHz SWT 23 ms Unit dBm

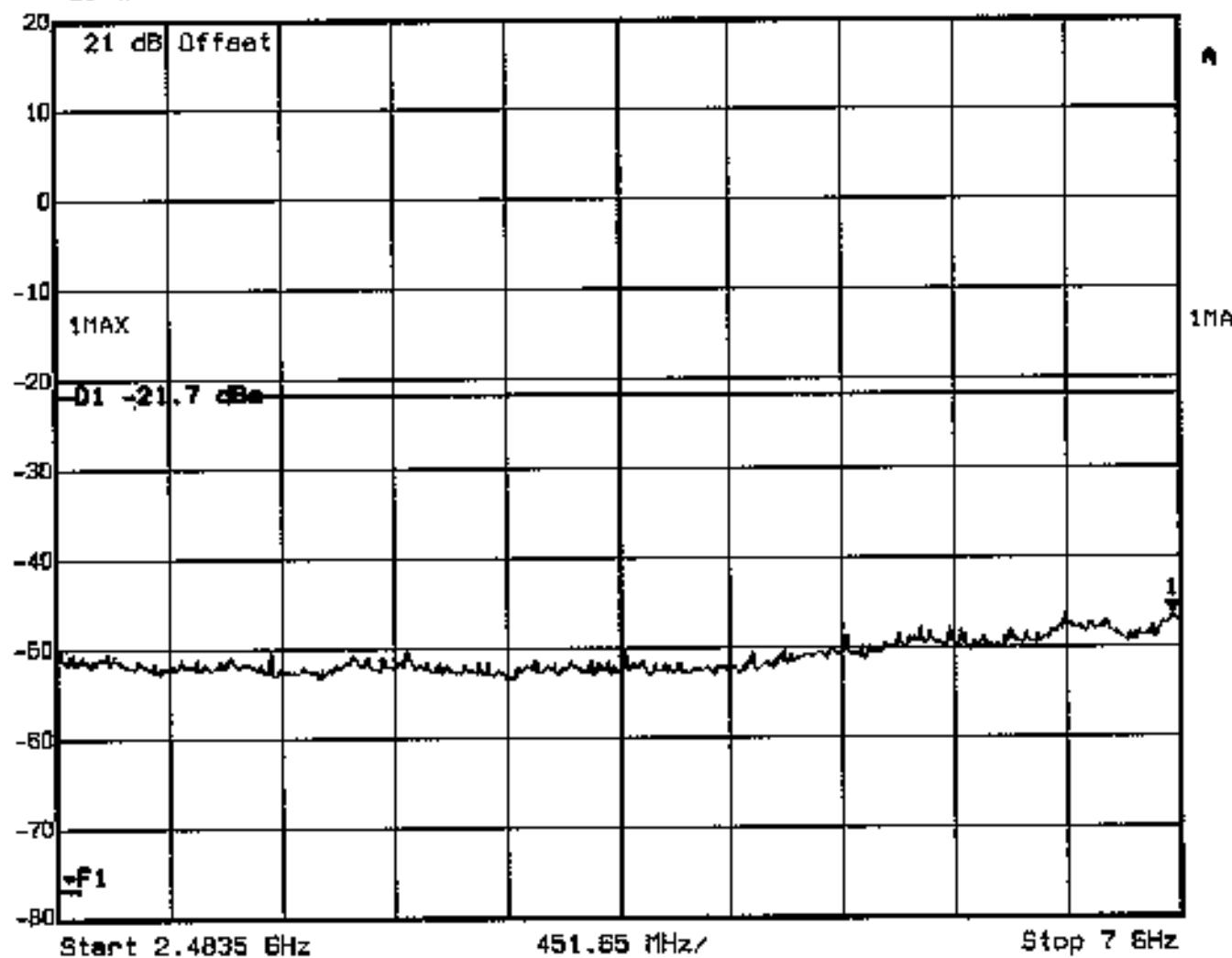


Title: Spurious RF Conducted Emissions FCC Part 15.247(c)
Comment A: Tested For RED-M by RFI Ltd EUT:Palm V Clip-on ENG:ND
OpCond: F1/F2 = Band Edges Top Channel GPH/42145/16
Date: 20.APR.2001 13:18:34



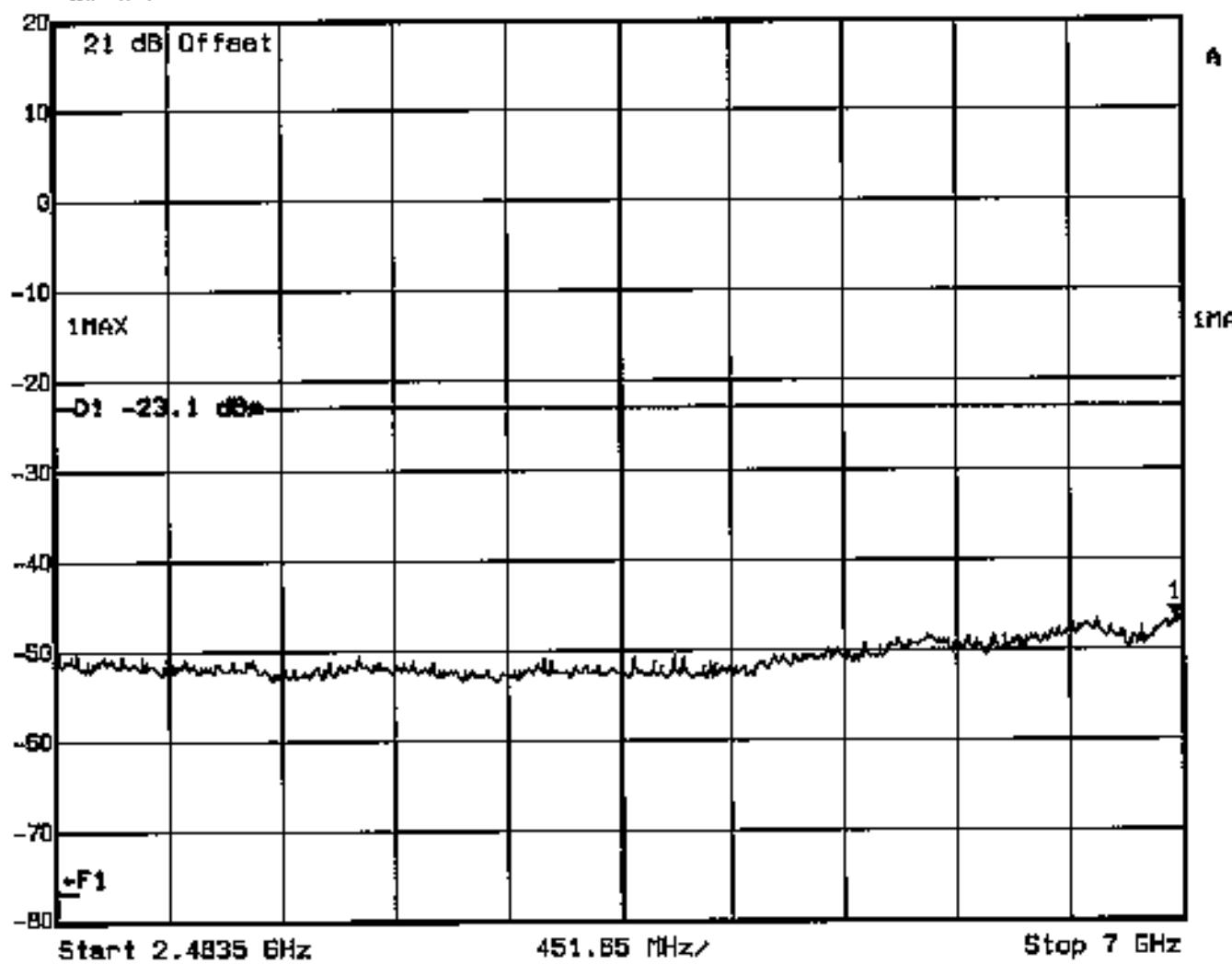
Title: Spurious RF Conducted Emissions FCC Part 15.247(c)
Comment A: Tested For RED-M by RFI Ltd EUT:Palm V C)ip-on ENG:ND
OpCond: F1/F2 = Band Edges Middle Channel GPH/42145/18
Date: 20.APR.2001 13:49:50

Marker 1 [T1] RBW 100 kHz RF Att 20 dB
Ref Lvl -46.36 dBm VBW 100 kHz
20 dBm 6.97284669 GHz SWT 1.15 s Unit dBm



Title: Spurious RF Conducted Emissions FCC Part 15.247(c)
Comment A: Tested For RED-M by RFI Ltd EUT:Palm V Clip-on ENG:ND
OpCond: F1/F2 = Band Edges Bottom Channel GPH/42145/17
Date: 20.APR.2001 13:58:17

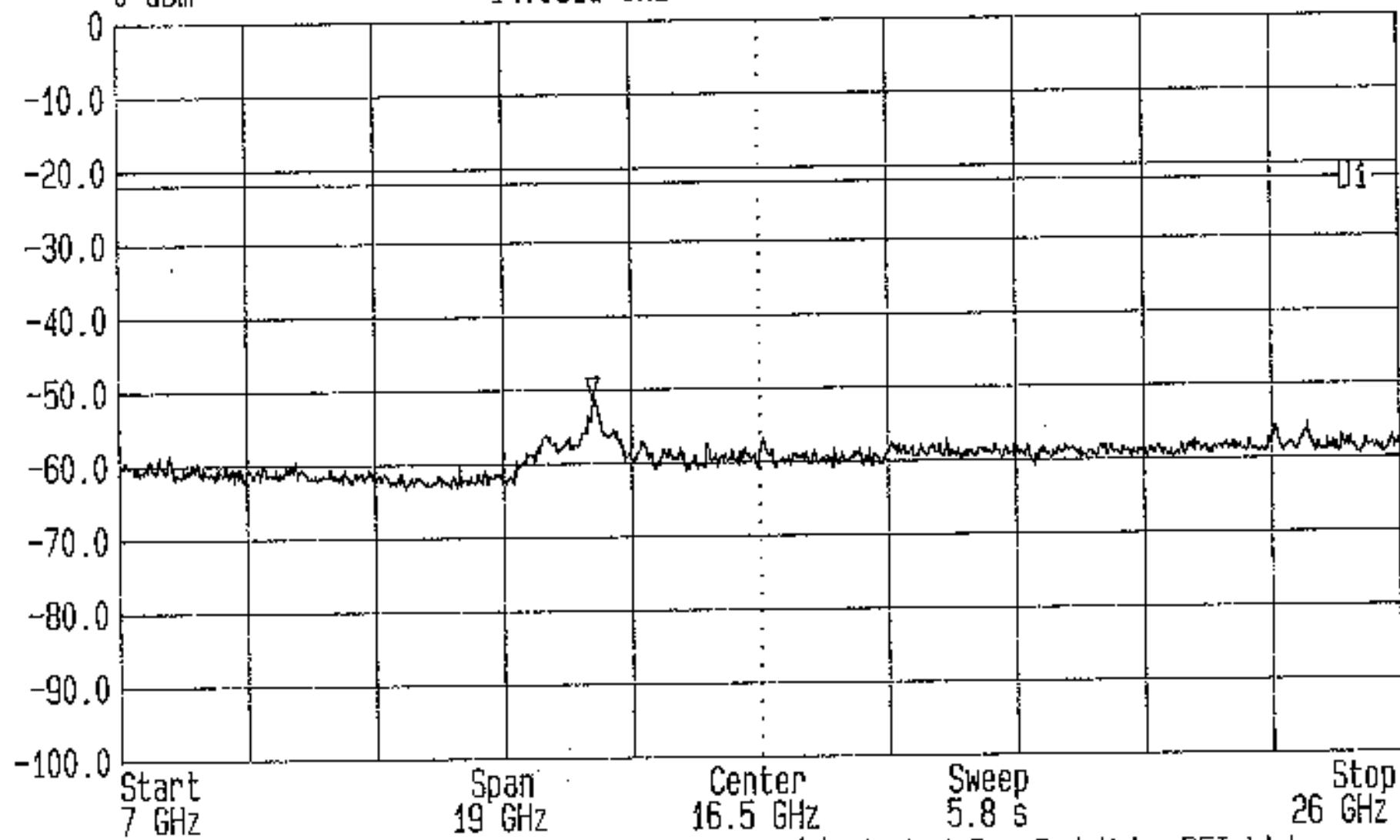
Marker 1 [T1] Ref Lvl -46.65 dBm RBW 100 kHz RF Att 20 dB
20 dBm 6.97284669 GHz VBW 100 kHz Unit dBm



Title: Spurious RF Conducted Emissions FCC Part 15.247(c)
Comment A: Tested For RED-M by RFI Ltd EUT:Palm V Clip-on ENG:ND
OpCond: F1/F2 = Band Edges Top Channel GPH/42145/19
Date: 20.APR.2001 14:09:49

LVL OFF
Date 20.Apr.'01 Time 15:29:01
Ref.Lvl Marker -51.24 dBm
0 dBm 14.0511 GHz

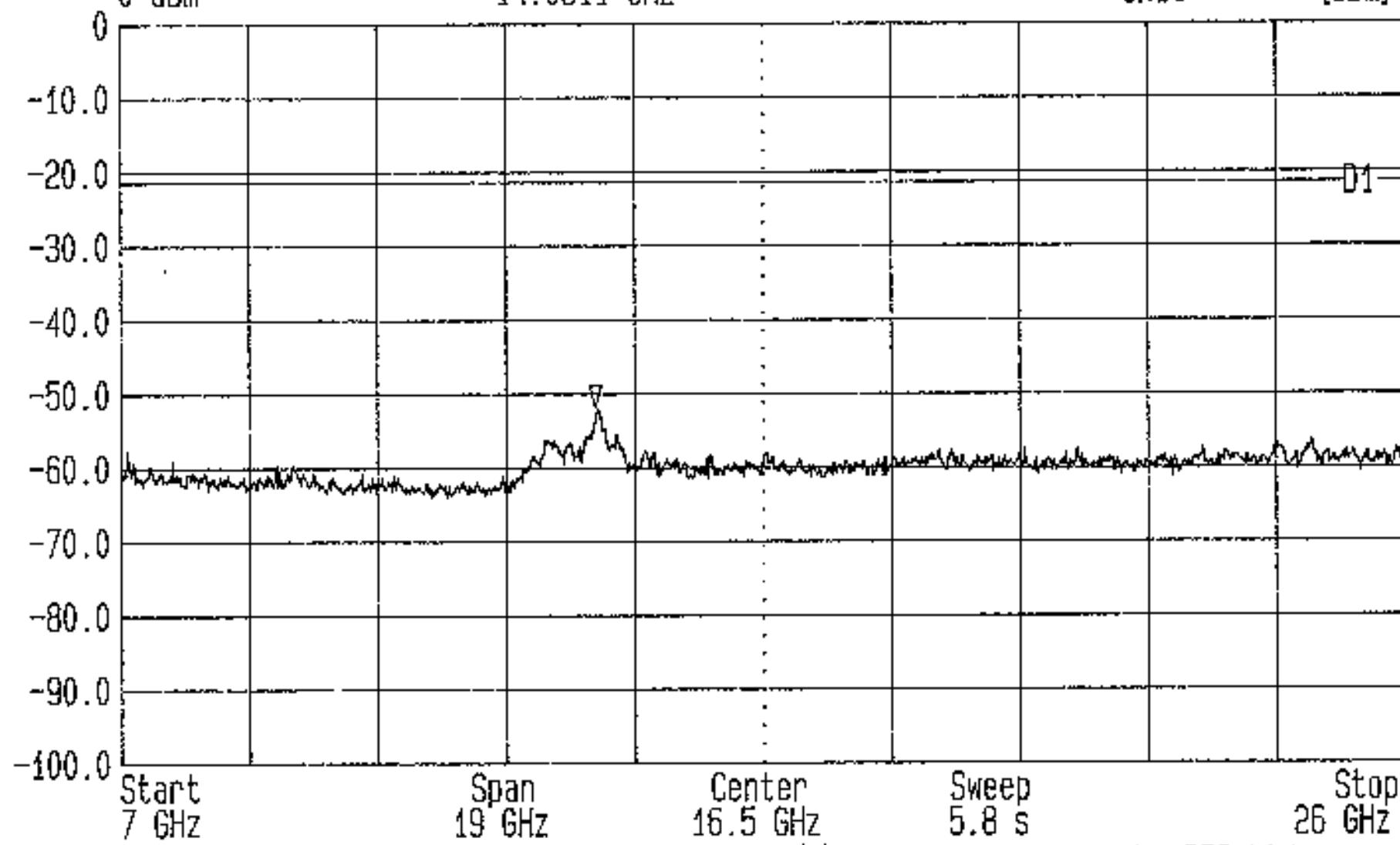
Res.Bw 100.0 kHz [3dB] Vid.Bw 100 kHz
TG.Lvl off
CF.Stp 1.900 GHz RF.Att 0 dB
Unit [dBm]



Spurious RF Conducted Emissions FCC Part 15.247 (c) Tested For Red-M by RFI Ltd.
Palm V Clip-on ENG: NDOpCond: Bottom Channel GPH/42145/20

LVL0FF
Date 20.Apr.'01 Time 15:31:28
Ref.Lvl Marker -51.82 dBm
0 dBm 14.0511 GHz

Res.Bw 100.0 kHz [3dB] Vid.Bw 100 kHz
TG.Lvl off
CF.Stp 1.900 GHz RF.Att 0 dB
Unit [dBm]



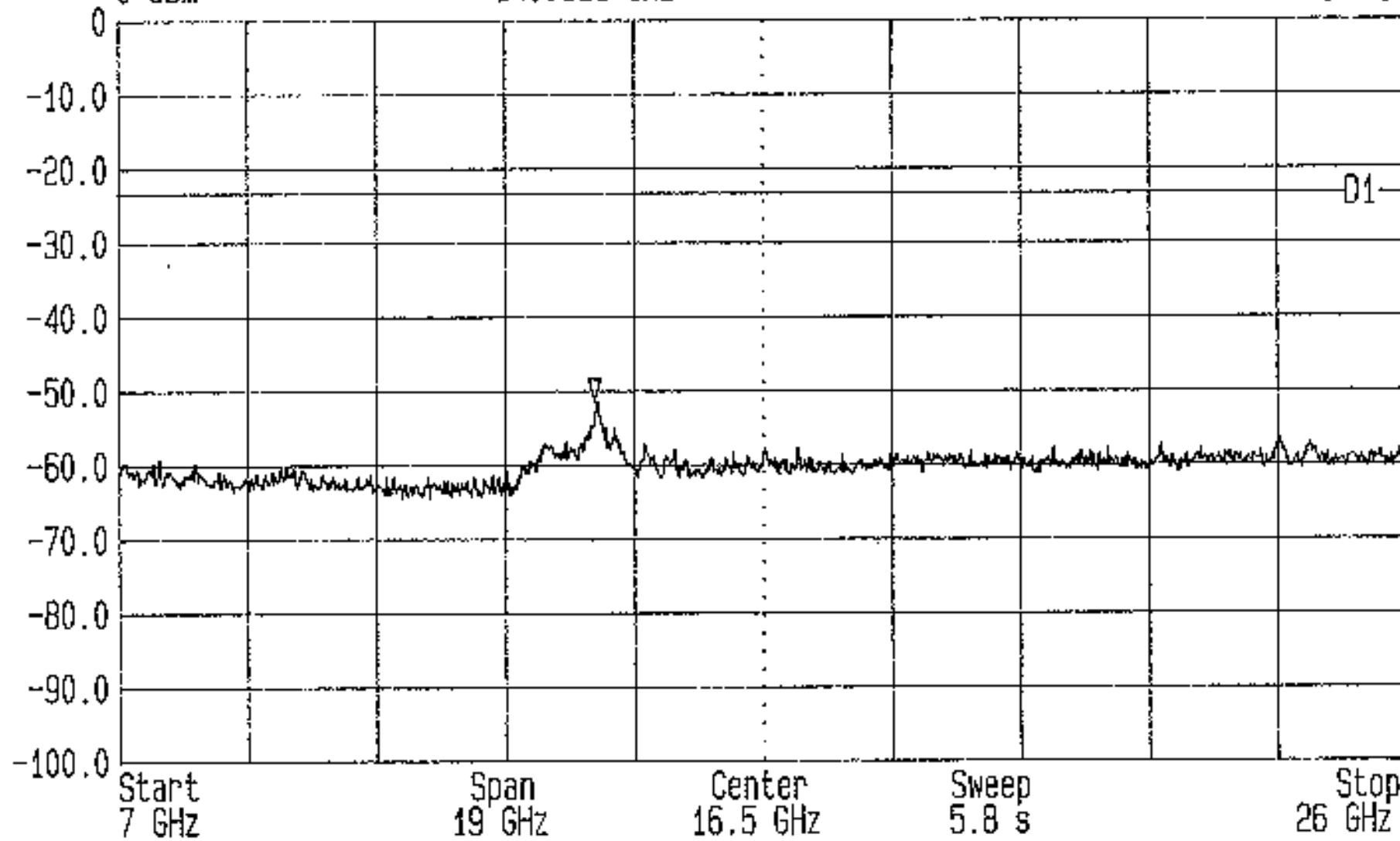
Spurious RF Conducted Emissions FCC Part 15.247 (c) Tested For Red-M by RFI Ltd.
Palm V Clip-on ENG: NDOpCond: Middle Channel GPH/42145/21

LVLOFF

Date 20.Apr.'01 Time 15:43:35

Ref.Lvl Marker -51.14 dBm
0 dBm 14.0511 GHz

Res.Bw 100.0 kHz [3dB] Vid.Bw 100 kHz
TG.Lvl off
CF.Stp 1.900 GHz RF.Att 0 dB
Unit [dBm]

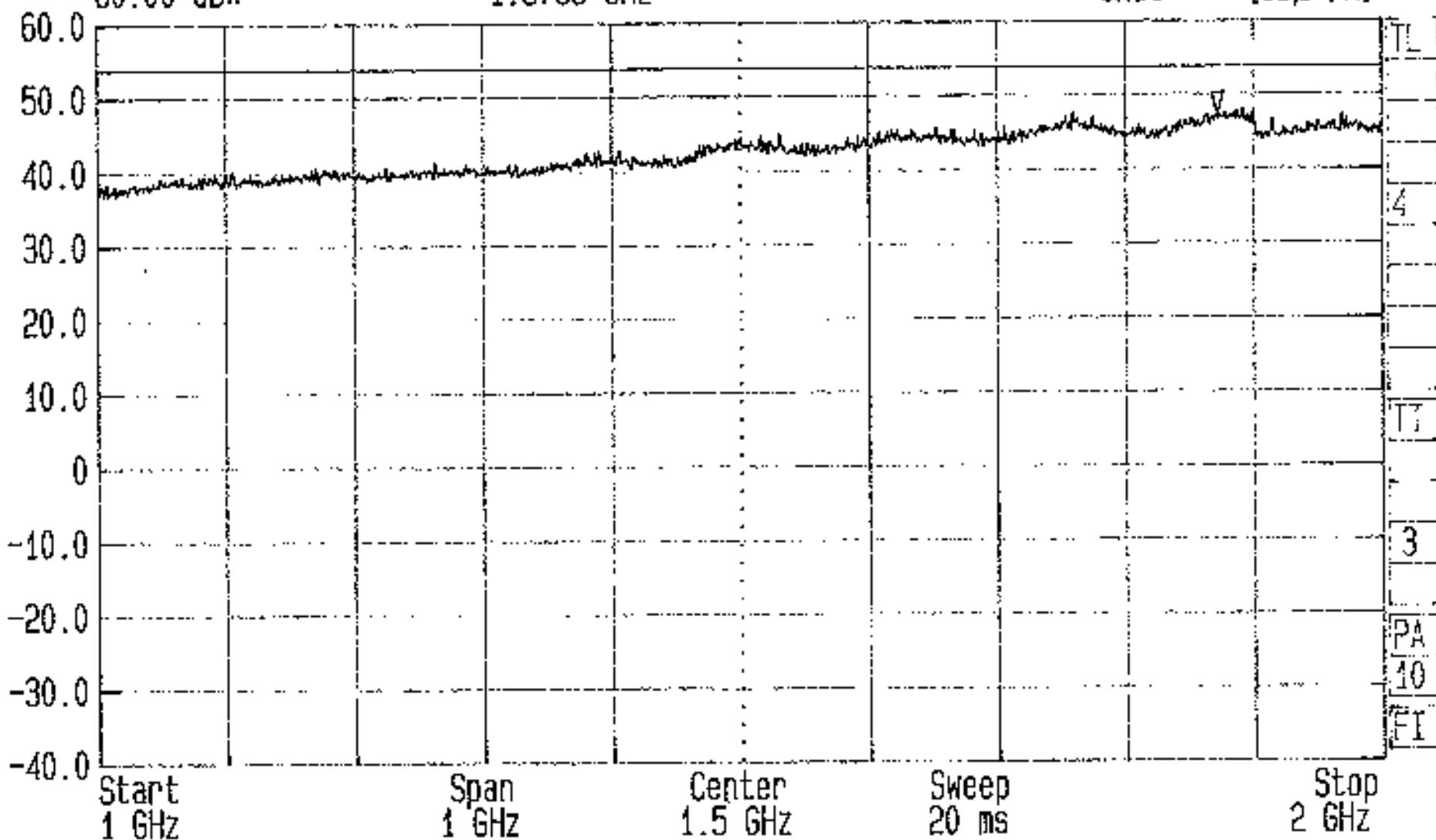


Spurious RF Conducted Emissions FCC Part 15.247 (c) Tested For Red-M by RFI Ltd
Palm V Clip-on ENG: ND OpCond: Middle Channel GPH/42145/22



Date 02.May.'01 Time 14:49:08
Ref.Lvl Marker 47.28 dB*
60.00 dB* 1.8733 GHz

Res.Bw TG.Lvl 1 MHz [imp] Vid.Bw 1 MHz
CF.Stp off off RF.Att 0 dB
Unit [dB μ V/m]



Spurious Radiated Emissions Test For Red-M by RFI Ltd. Op-Cond Top Channel
FCC Part 15.209 ENG: ND/JXK EUT: Palm V Clip-on GPH/42145/RE027



Date 02.May.'01 Time 16:10:29

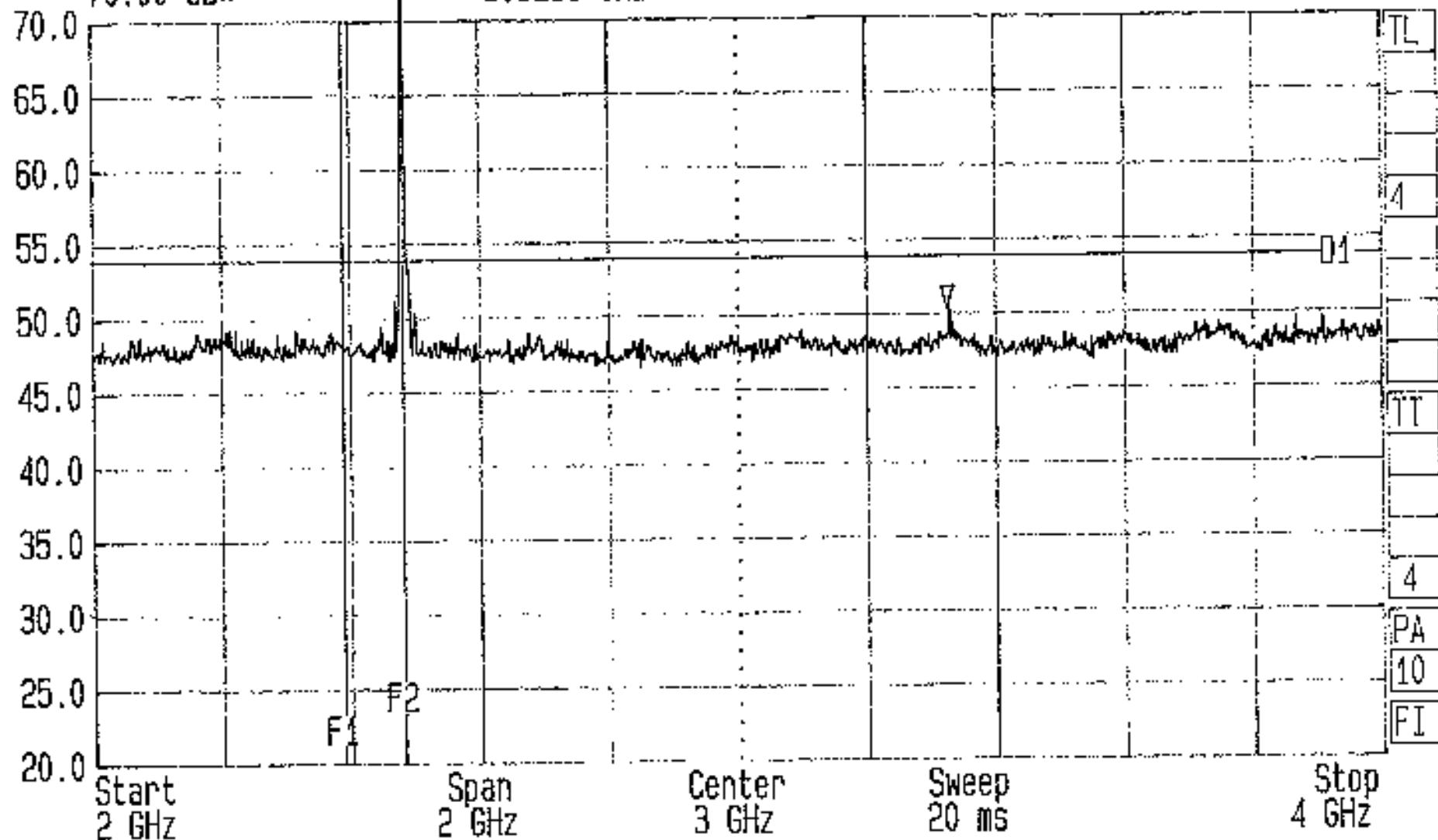
Ref.Lv1 Marker 50.30 dB*
70.00 dB* 3.3288 GHz

Res.Bw
TG.Lv1
CF.Stp

1 MHz [imp] off
200.000 MHz

Vid.Bw
RF.Att
Unit

1 MHz
0 dB
[dB μ V/m]



Start
2 GHz

Span
2 GHz

Center
3 GHz

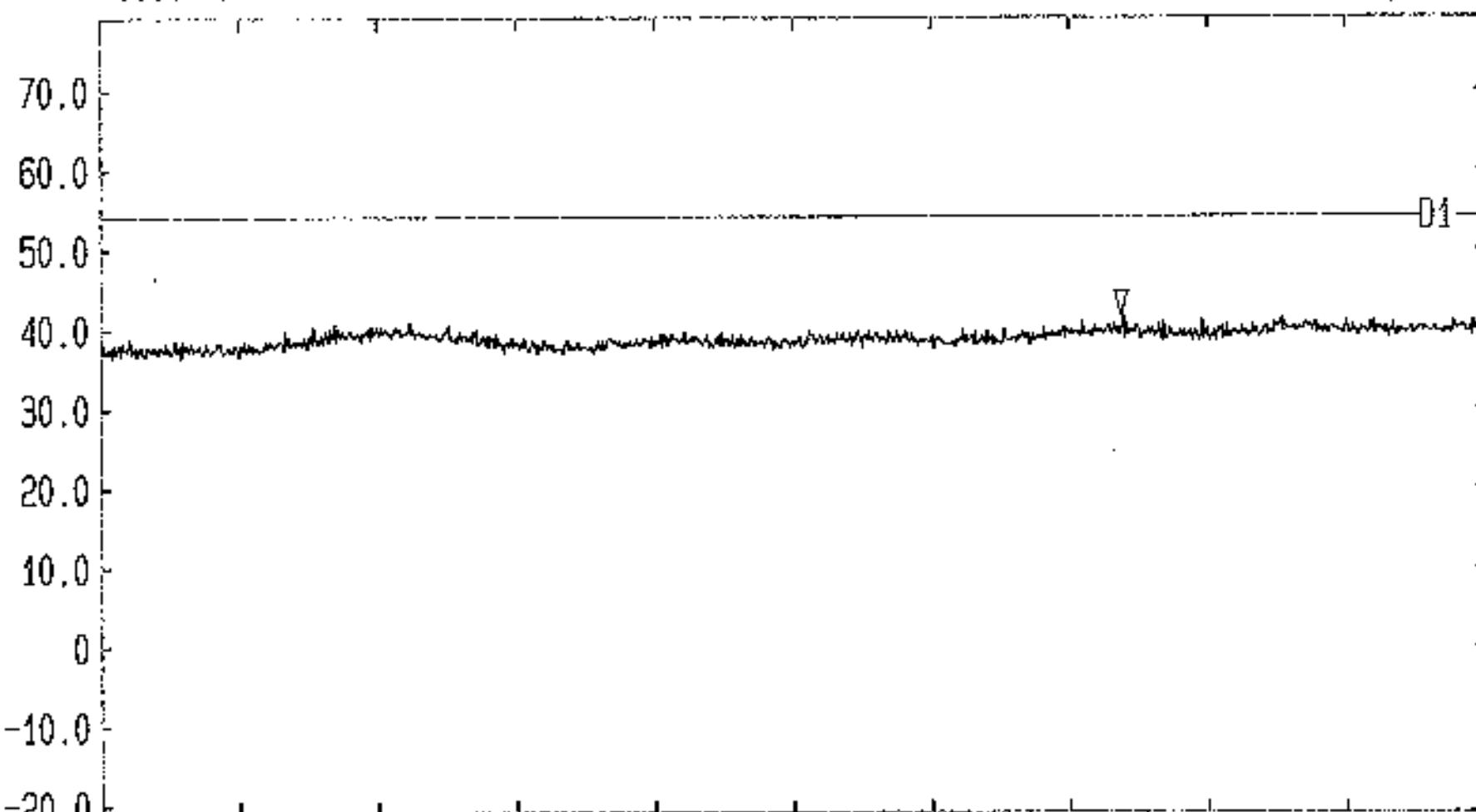
Sweep
20 ms

Stop
4 GHz

Spurious Radiated Emissions Test For Red-M by RFI Ltd. Op-Cond Top Channel
FCC Part 15.209 ENG:ND/JXK EUT: Palm V Clip-on

GPH/42145/RE034

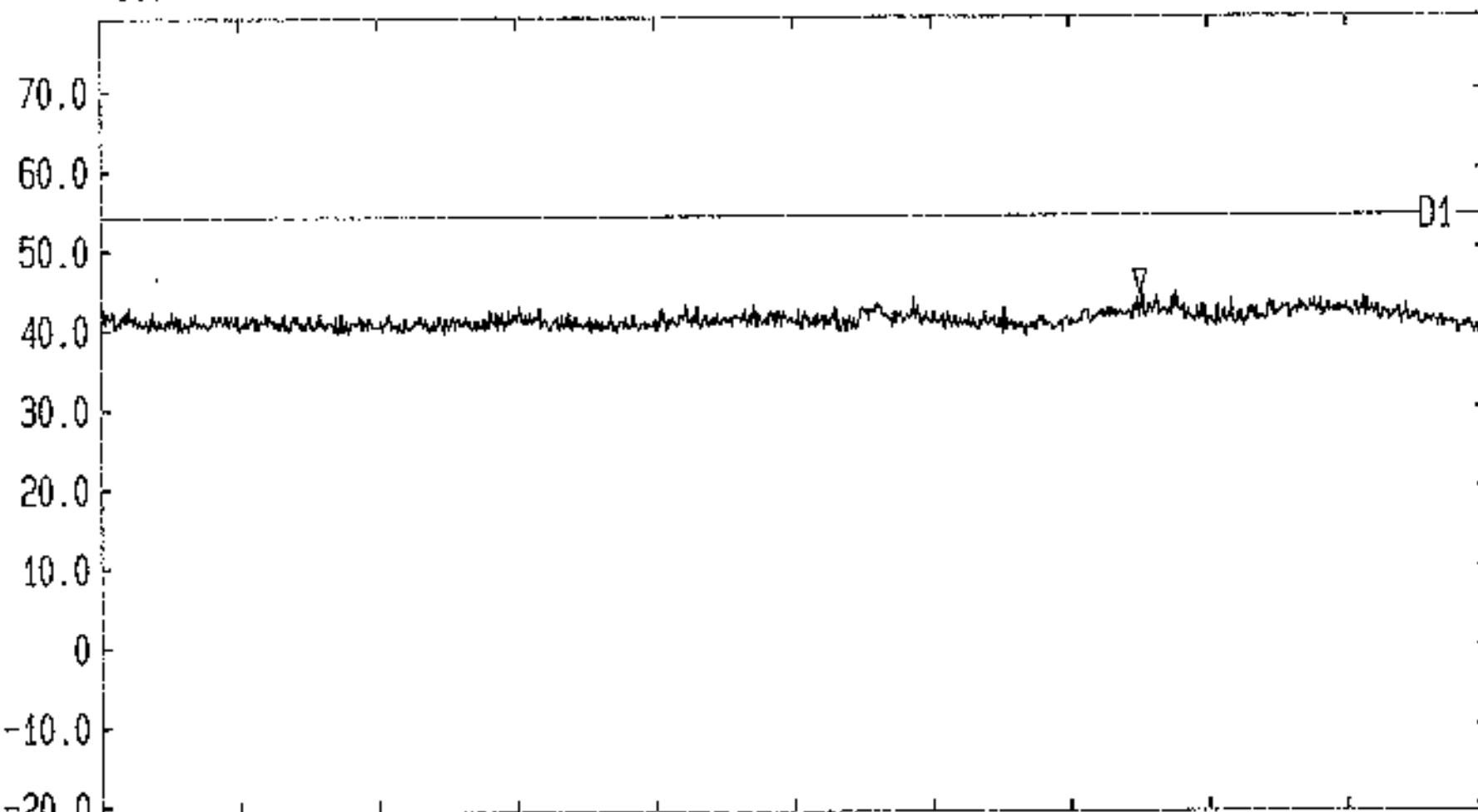
LVLOFF
Date 30.Apr.'01 Time 10:45:21
Ref.Lvl Marker 41.52 dBx CF.Stp 100.000 MHz RF.Att 0 dB
79.00 dBx 4.7388 GHz Unit [dB μ V/m]



Start 4 GHz Span 1 GHz Center 4.5 GHz Sweep 20 ms Stop 5 GHz

Spurious Radiated Emissions Tested For Red-M By RFI Ltd. OpCond: Tx Top Channel.
FCC Part 15.209 ENG: ND EUT: Palm V Clip-on GPH/42145/RE05

LVLOFF
Date 30.Apr.'01 Time 10:48:01
Ref.Lvl Marker 44.19 dB* CF.Stp 100.000 MHz RF.Att 0 dB
79.00 dBx 5.7522 GHz Unit [dB μ V/m]



Start 5 GHz Span 1 GHz Center 5.5 GHz Sweep 20 ms Stop 6 GHz

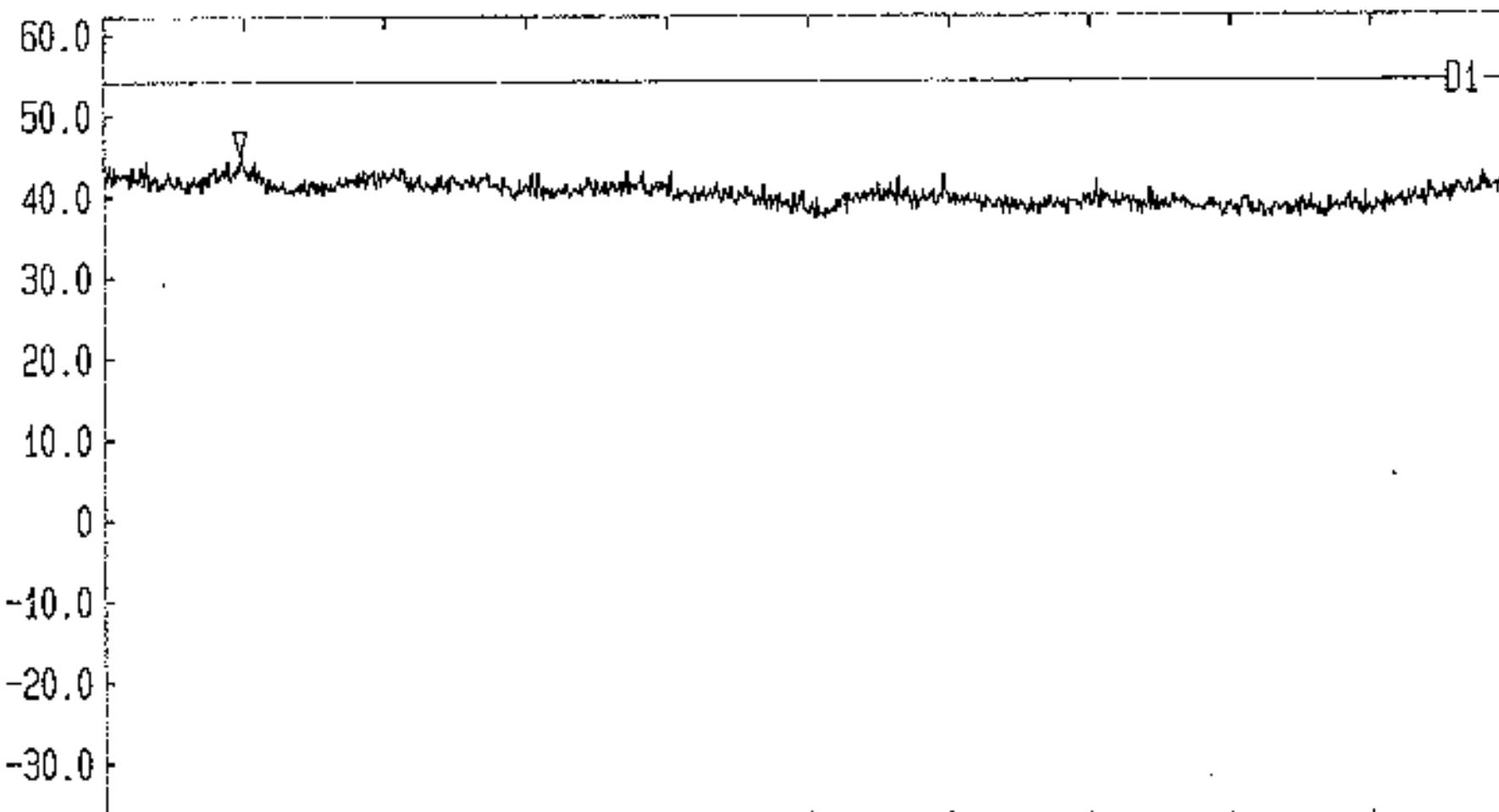
Spurious Radiated Emissions Tested For Red-M By RFI Ltd. OpCond: Tx Top Channel:
FCC Part 15.209 ENG: ND EUT: Palm V Clip-on GPH/42145/RE06

LVL0FF

Date 30.Apr.'01 Time 14:06:43

Res.Bw 1.0 MHz [3dB] Vid.Bw 1 MHz

Ref.Lvl Marker 44.97 dB* CF.Stp 200.000 MHz RF.Att 0 dB
62.00 dB* 6.1955 GHz Unit [dB μ V/m]



Start
6 GHz

Span
2 GHz

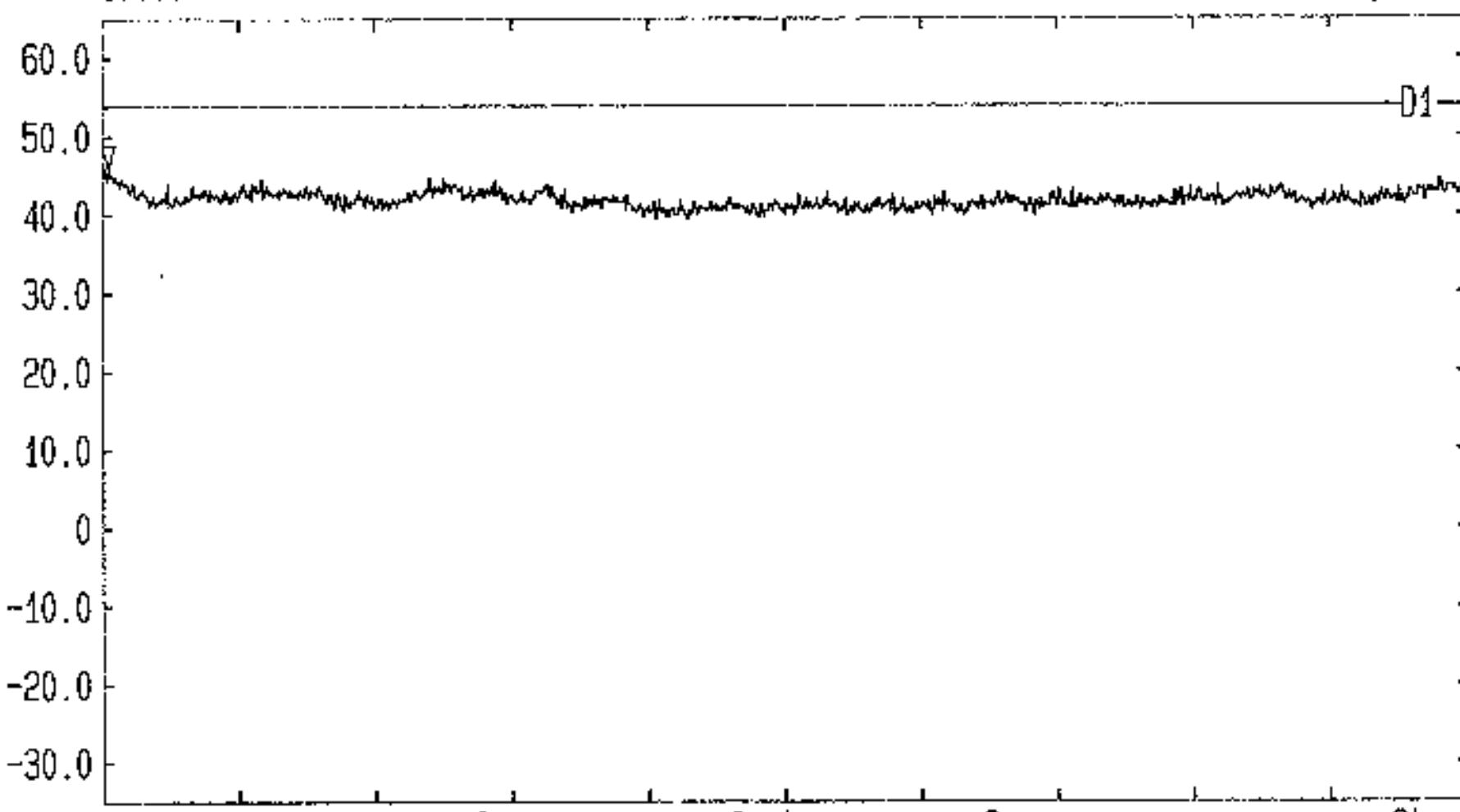
Center
7 GHz

Sweep
20 ms

Stop
8 GHz

Spurious Radiated Emissions Tested For Red-M By RFI Ltd. OpCond: Tx Top Channel
FCC Part 15.209 ENG: ND EUT: Palm V Clip-on GPH/42145/RE010

LVLOFF
Date 30.Apr.'01 Time 11:27:46
Ref.Lvl Marker 45.99 dBx CF.Stp 450.000 MHz RF.Att 0 dB
65.00 dBx 8.0200 GHz Unit [dB μ V/m]



Spurious Radiated Emissions Tested For Red-M By RFI Ltd. OpCond: Tx Top Channel
FCC Part 15.209 ENG:ND EUT: Palm V Clip-on GPH/42145/RE014

LVL0FF

Date 30.Apr.'01 Time 11:54:02

Res.Bw

1.0 MHz [3dB]

Vid.Bw

1 MHz

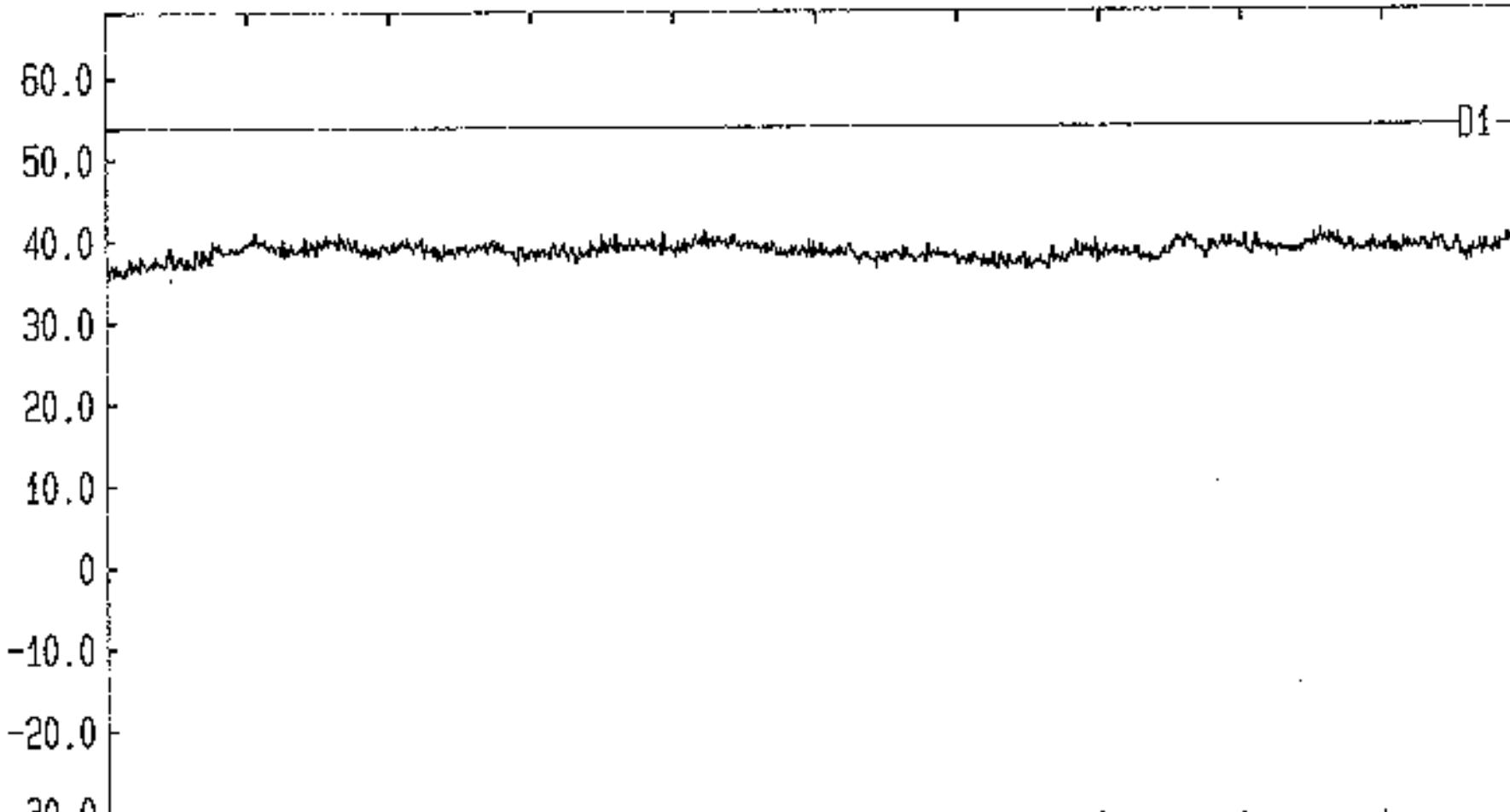
Ref.Lv1 Marker 41.49 dB*
68.00 dB* 17.9816 GHz

CF.Stp

550.000 MHz

RF.Att

0 dB
[dB μ V/m]



Start

12.5 GHz

Span

5.5 GHz

Center

15.25 GHz

Sweep

40 ms

Stop

18 GHz

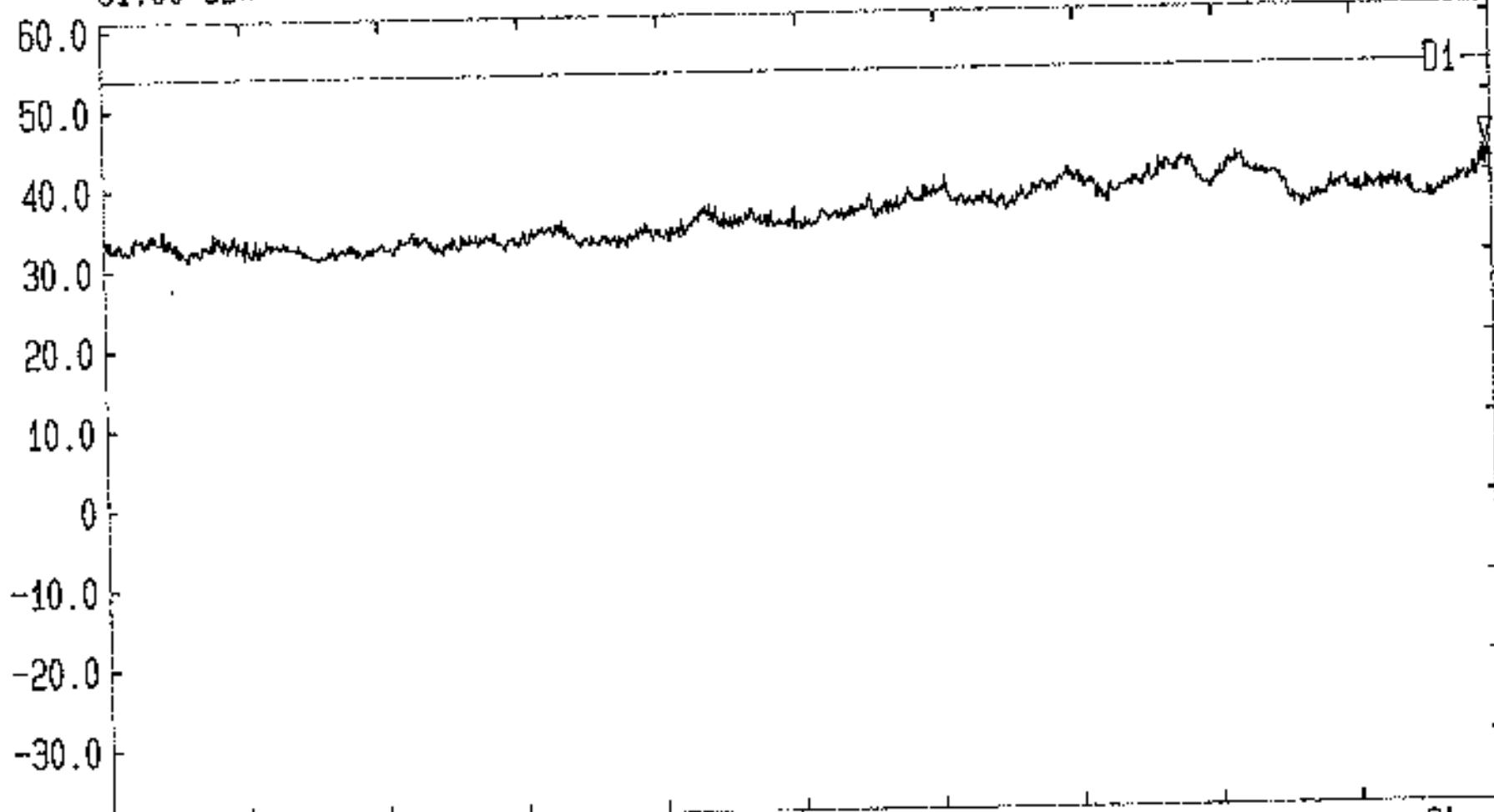
Spurious Radiated Emissions Tested For Red-M By RFI Ltd. OpCond: Top Channel 1
FCC Part 15.209 ENG: ND EUT: Palm V Clip-on GPH/42145/RE018

LVLOFF

Date 30.Apr.'01 Time 12:21:04

Ref.Lvl Marker 43.15 dB*
61.00 dB* 26.4811 GHz

Res.Bw 1.0 MHz [3dB] Vid.Bw 1 MHz
CF.Stp 850.000 MHz RF.Att 0 dB
Unit [dB μ V/m]



Start
18 GHz

Span
8.5 GHz

Center
22.25 GHz

Sweep
40 ms

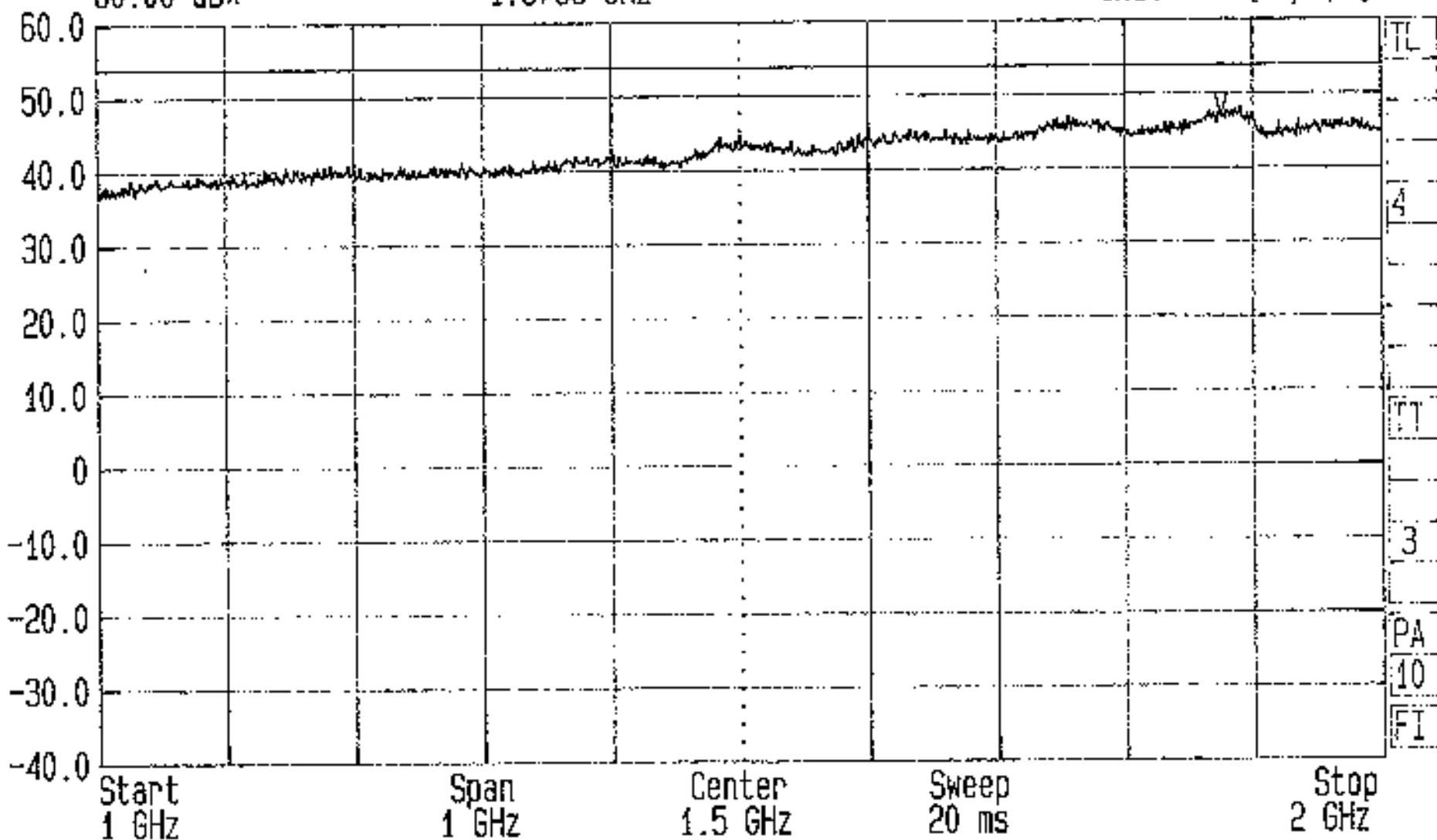
Stop
26.5 GHz

Spurious Radiated Emissions Tested For Red-M By RFI Ltd. OpCond: Top Channel
FCC Part 15.209 ENG: ND EUT: Palm V Clip-on GPH/42145/RE022



Date 02.May.'01 Time 14:41:17
Ref.Lvl Marker 47.16 dB*
60.00 dB* 1.8766 GHz

Res.Bw TG.Lvl 1 MHz [imp] Vid.Bw 1 MHz
CF.Stp off off RF.Att Unit 0 dB
[dB μ V/m]

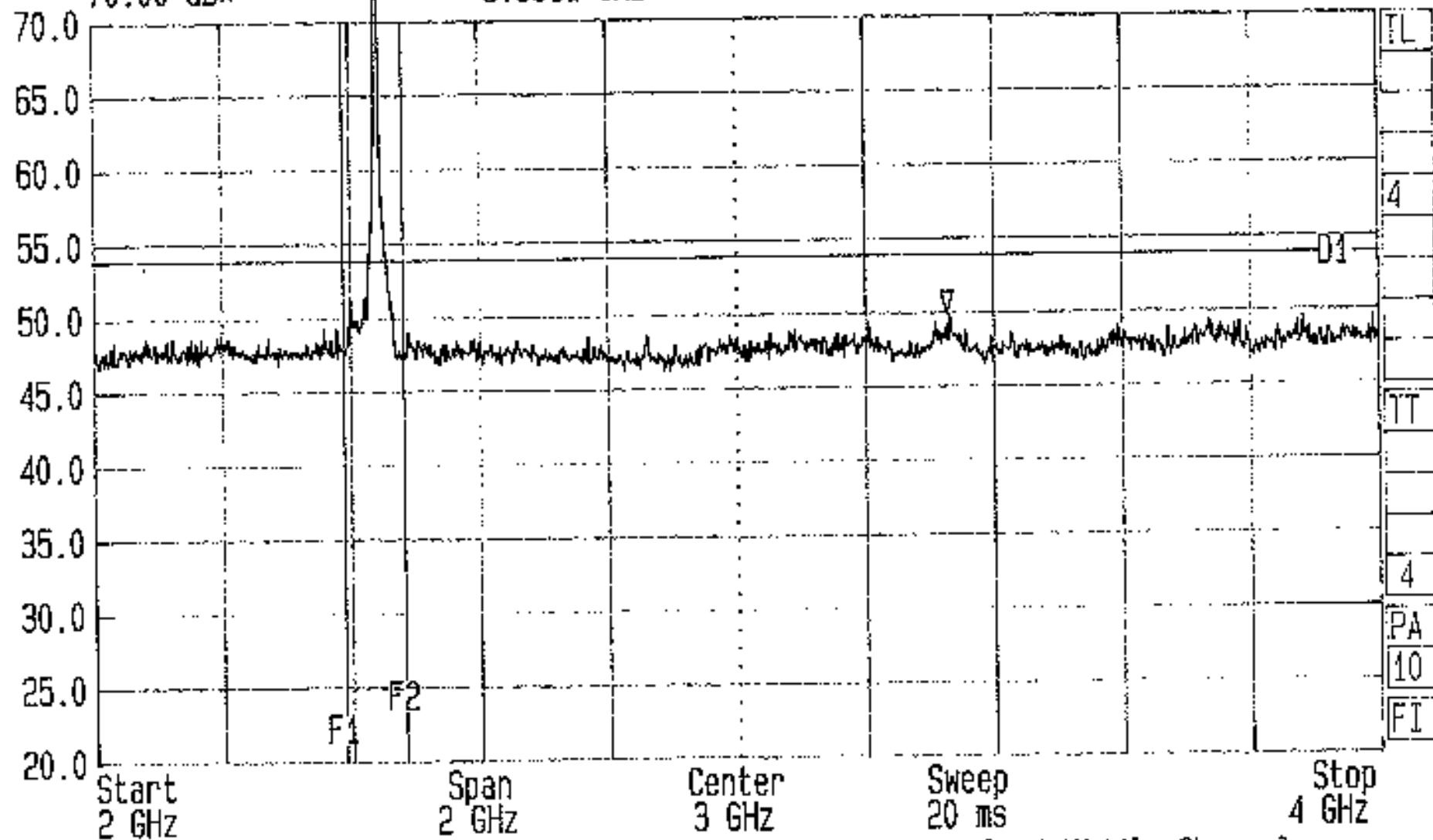


Spurious Radiated Emissisons Test For Red-M by RFI Ltd. Op-Cond Center Channel
FCC Part 15.209 ENG: ND/JXK EUT: Palm V Clip-on GPH/42145/RE026



Date 02.May.'01 Time 15:55:23
Ref.Lvl Marker 49.96 dB*
70.00 dB*

Res.Bw 1 MHz [imp] Vid.Bw 1 MHz
TG.Lvl off RF.Att 0 dB
CF.Stp 200.000 MHz Unit [dB μ V/m]



Spurious Radiated Emissions Test For Red-M by RFI Ltd. Op-Cond Middle Channel
FCC Part 15.209 ENG:ND/JXK EUT: Palm V Clip-on GPH/42145/RE032

LVLOFF

Res.Bw 1.0 MHz [3dB] Vid.Bw 1 MHz

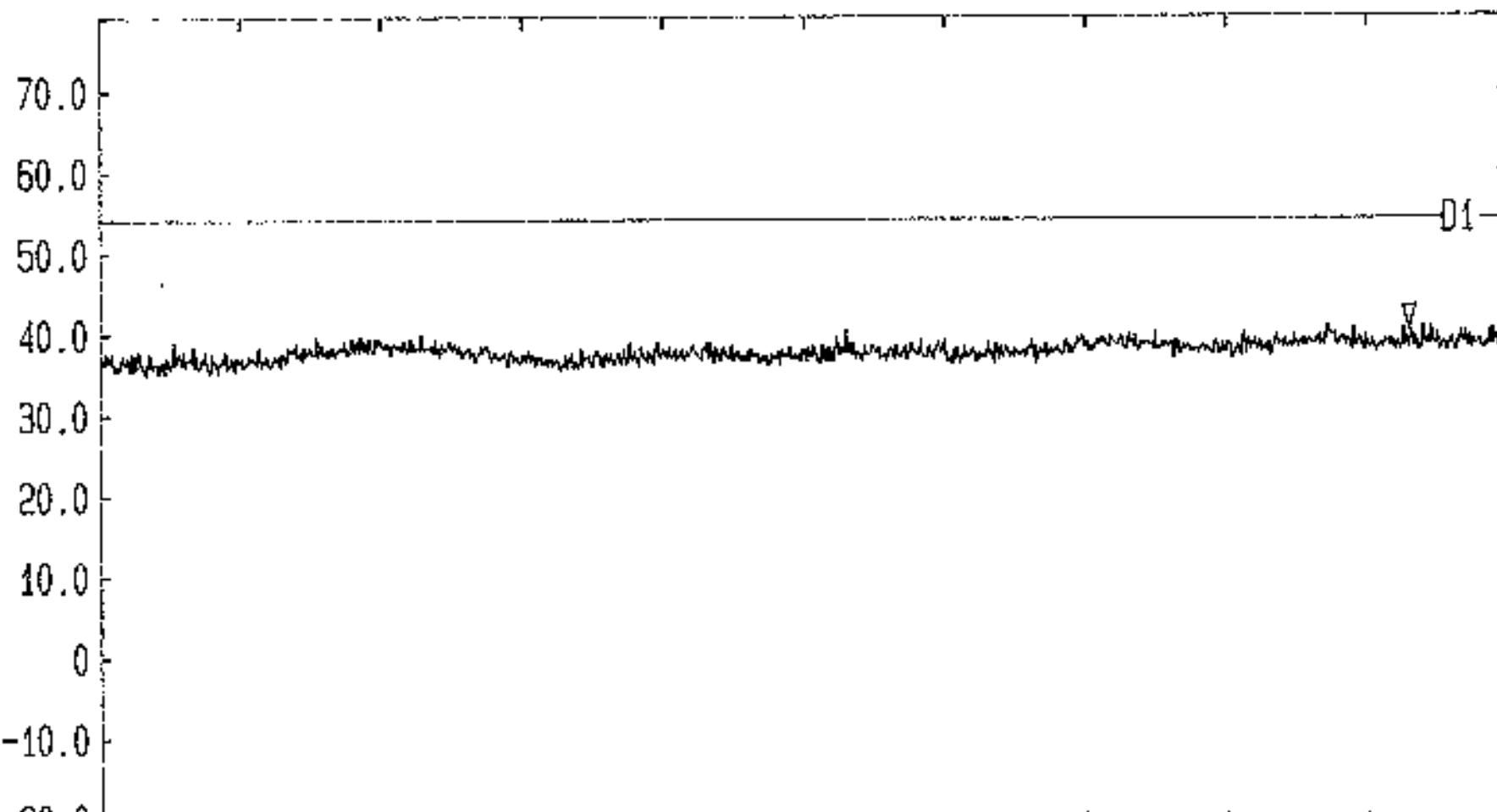
Date 30.Apr.'01 Time 10:34:48

RF.Att 0 dB

Ref.Lvl Marker 40.31 dB* 4.9311 GHz

CF.Stp 100.000 MHz [dB μ V/m]

79.00 dB*



Start
4 GHz

Span
1 GHz

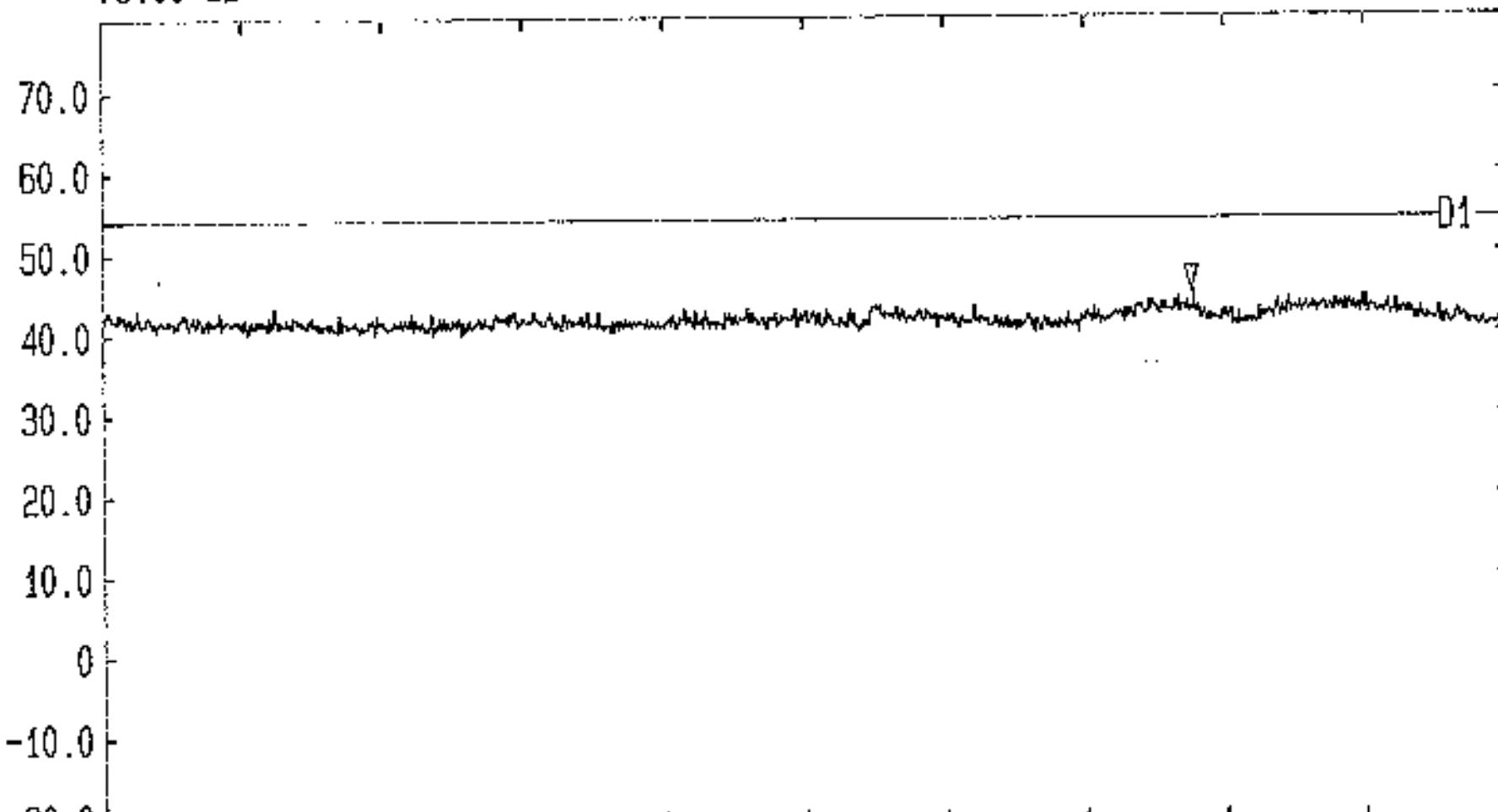
Center
4.5 GHz

Sweep
20 ms

Stop
5 GHz

Spurious Radiated Emissions Tested For Red-M By RFI Ltd. OpCond: Tx Middle Channel.
FCC Part 15.209 ENG:ND EUT: Palm V Clip-on GPH/42145/RE03

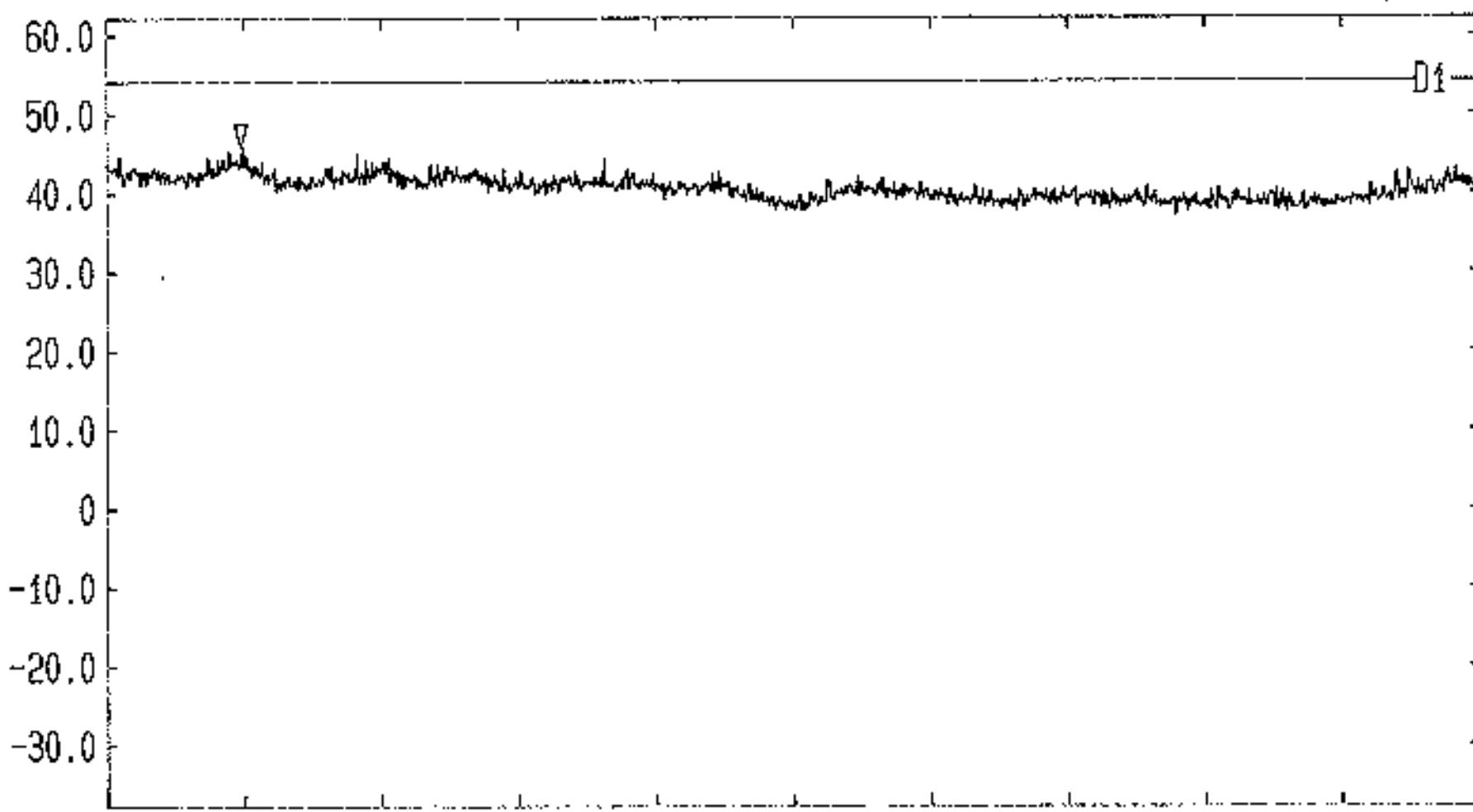
LVLOFF
Date 30.Apr.'01 Time 10:39:32
Ref.Lvl Marker 44.88 dB* CF.Stp 100.000 MHz RF.Att 0 dB
79.00 dB* 5.7777 GHz Unit [dB μ V/m]



Start Span Center Sweep Stop
5 GHz 1 GHz 5.5 GHz 20 ms 6 GHz

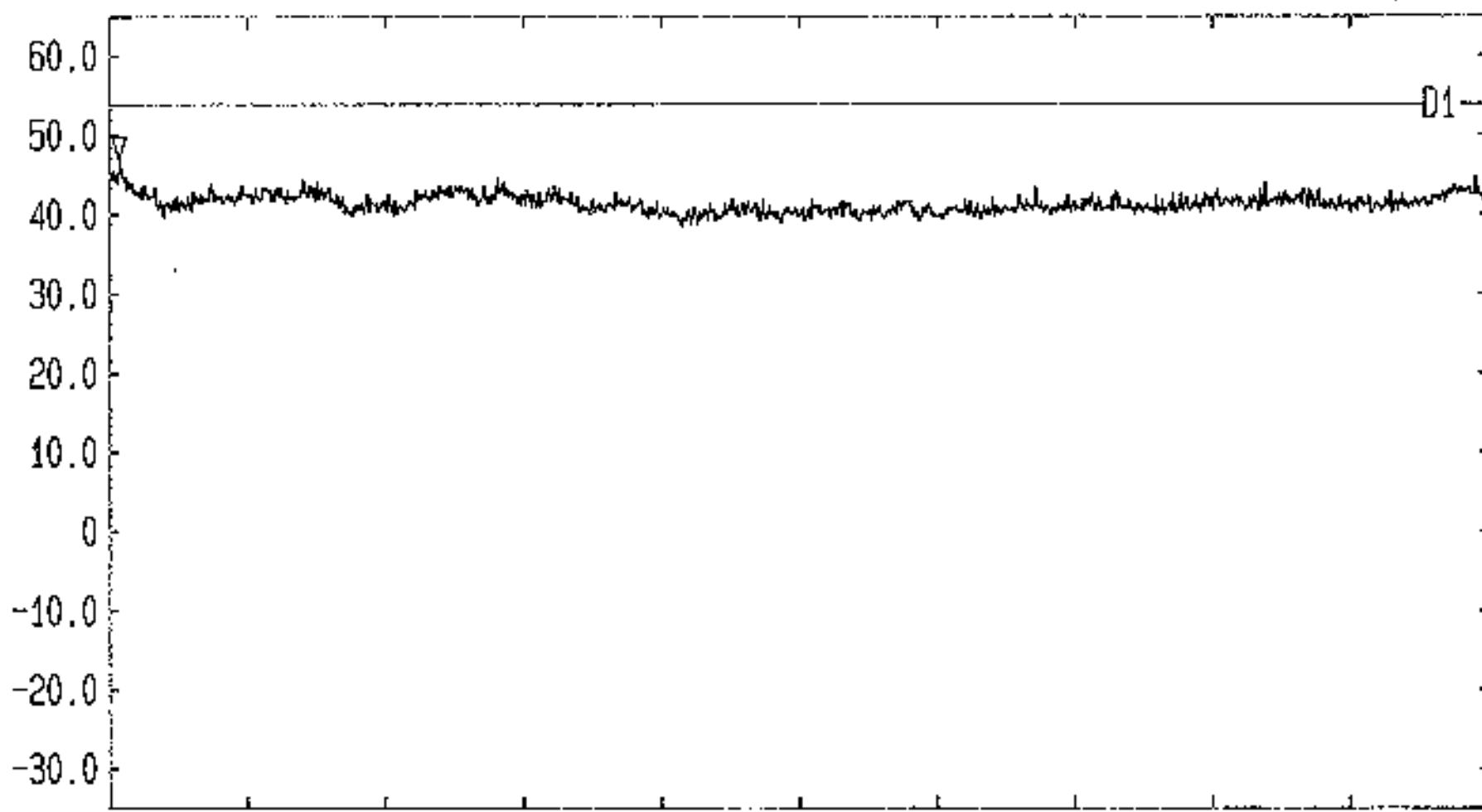
Spurious Radiated Emissions Tested For Red-M By RFI Ltd. OpCond: Tx Middle Channel.
FCC Part 15.209 ENG: ND EUT: Palm V Clip-on GPH/42145/RE04

LVLOFF
Date 30.Apr.'01 Time 11:09:59
Ref.Lvl Marker 45.65 dBx CF.Stp 200.000 MHz RF.Att 0 dB
62.00 dBx 6.1977 GHz Unit [dB μ V/m]



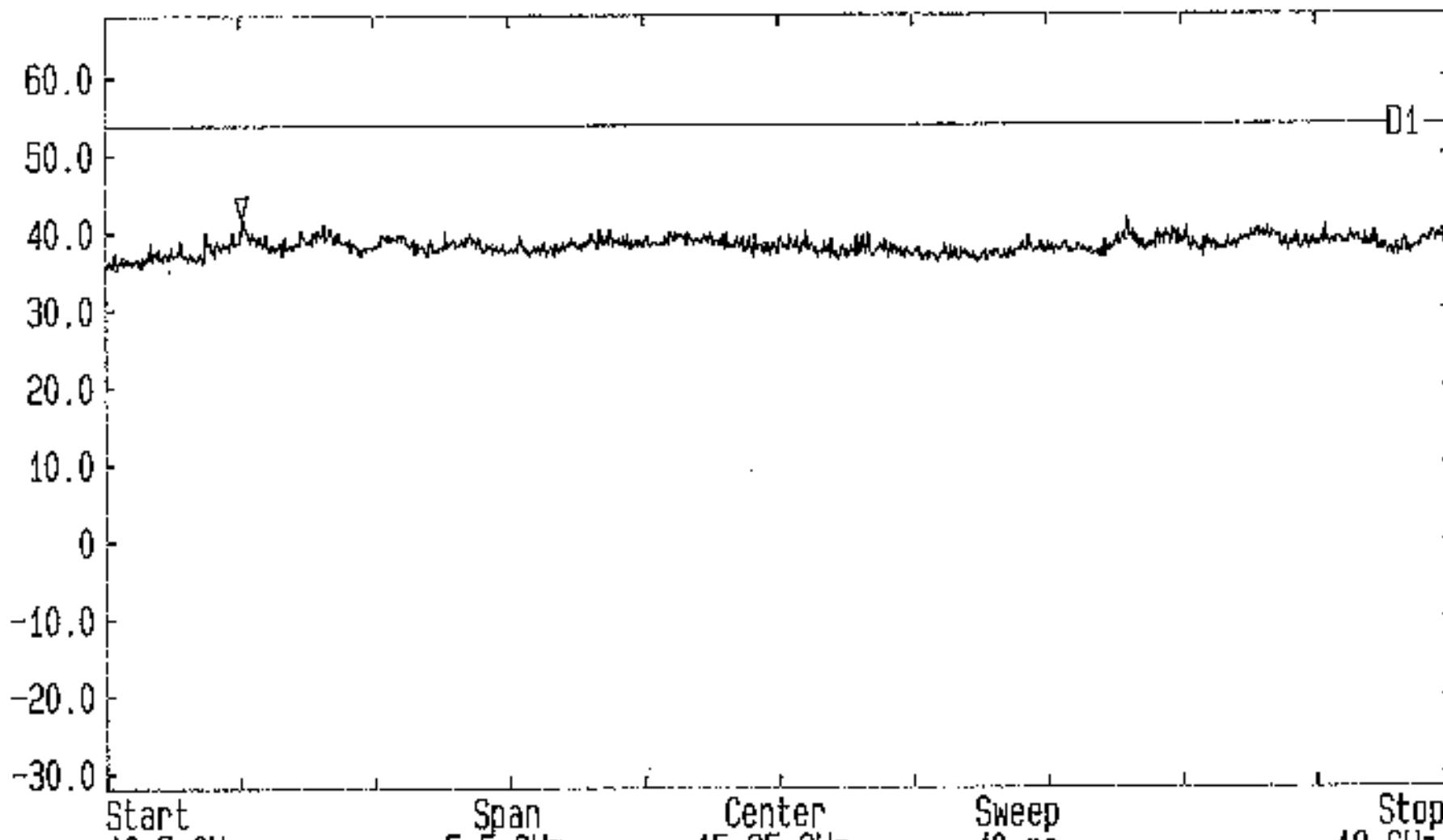
Spurious Radiated Emissions Tested For Red-M By RFI Ltd. OpCond: Tx Middle Channel
FCC Part 15.209 ENG: ND EUT: Palm V Clip-on GPH/42145/RE009

LVLOFF
Date 30.Apr.'01 Time 11:21:03
Ref.Lvl Marker 46.82 dB* CF.Stp 450.000 MHz RF.Att 0 dB
65.00 dB* 8.0300 GHz Unit [dB μ V/m]



Spurious Radiated Emissions Tested For Red-M By RFI Ltd. OpCond: Tx Middle Channel
FCC Part 15.209 ENG: ND EUT: Palm V Clip-on GPH/42145/RE013

LVLOFF
Date 30.Apr.'01 Time 11:49:35
Ref.Lvl Marker 41.77 dB* CF.Stp 550.000 MHz RF.Att 0 dB
68.00 dB* 13.0622 GHz Unit [dBuV/m]

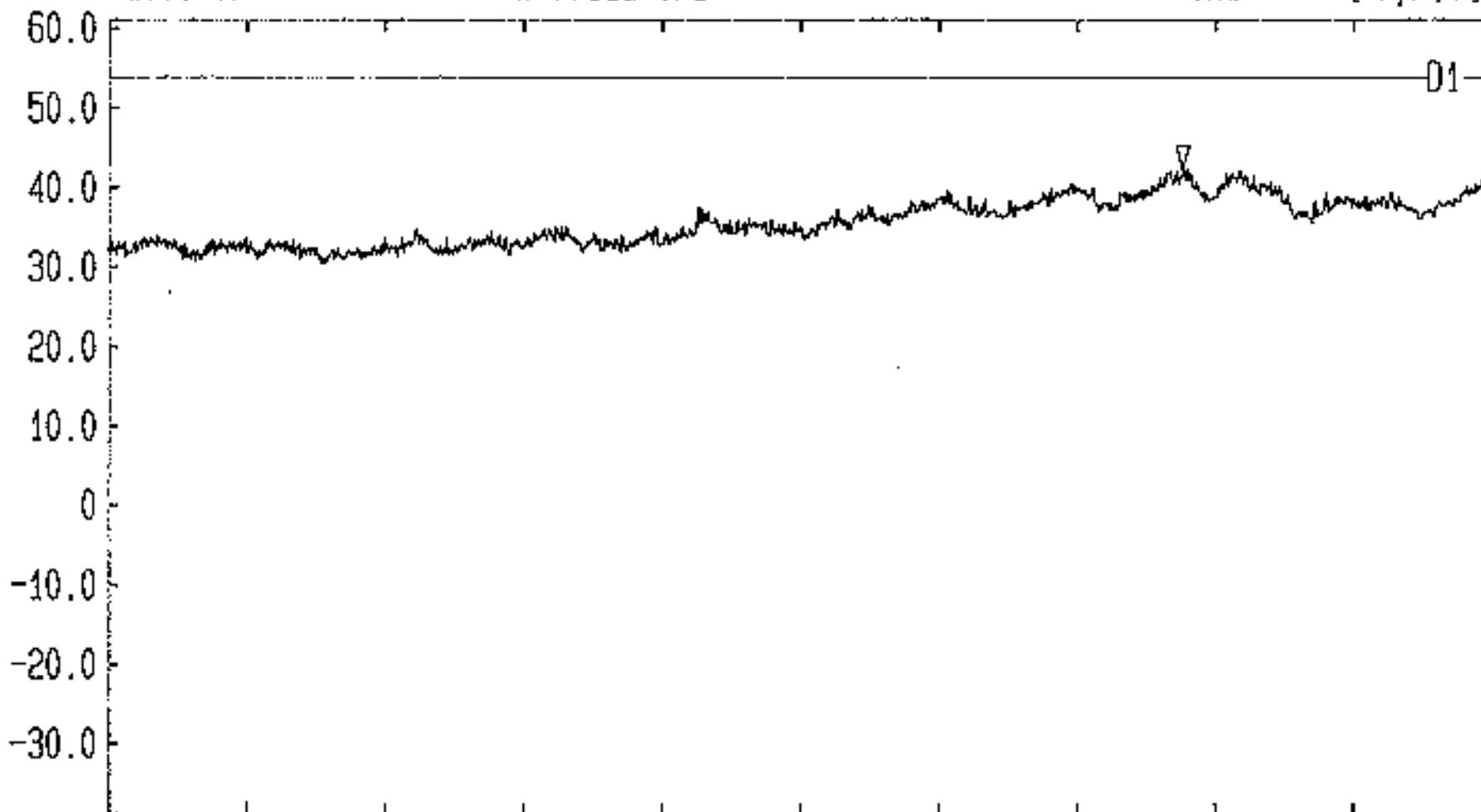


Spurious Radiated Emissions Tested For Red-M By RFI Ltd. OpCond: Middle Channel
FCC Part 15.209 ENG: ND EUT: Palm V Clip-on GPH/42145/RE017

LVL0FF

Date 30.Apr.'01 Time 12:16:59
Ref.Lvl Marker 42.34 dBx
61.00 dB* 24.6111 GHz

Res.Bw 1.0 MHz [3dB] Vid.Bw 1 MHz
CF.Stp 850.000 MHz RF.Att 0 dB
Unit [dB μ V/m]



Start 18 GHz Span 8.5 GHz Center 22.25 GHz Sweep 40 ms Stop 26.5 GHz

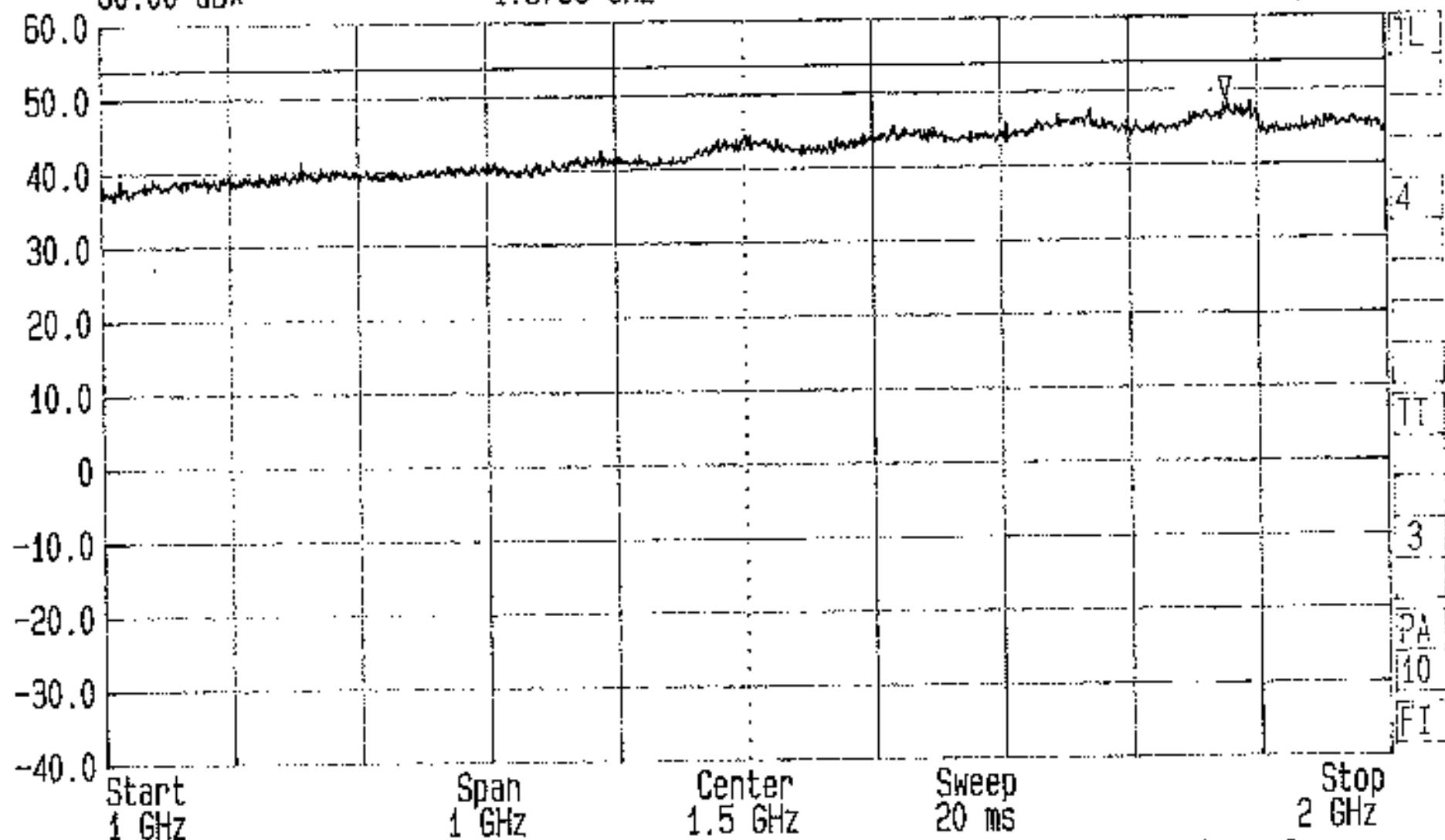
Spurious Radiated Emissions Tested For Red-M By RFI Ltd. OpCond: Middle Channel
FCC Part 15.209 ENG: ND EUT: Palm V Clip-on GPH/42145/RE021



Date 02.May.'01 Time 14:32:07

Ref.Lvl Marker 48.65 dB*
60.00 dBx 1.8766 GHz

Res.Bw 1 MHz [imp] Vid.Bw 1 MHz
TG.Lvl off RF.Att 0 dB
CF.Stp 100.000 MHz Unit [dB μ V/m]

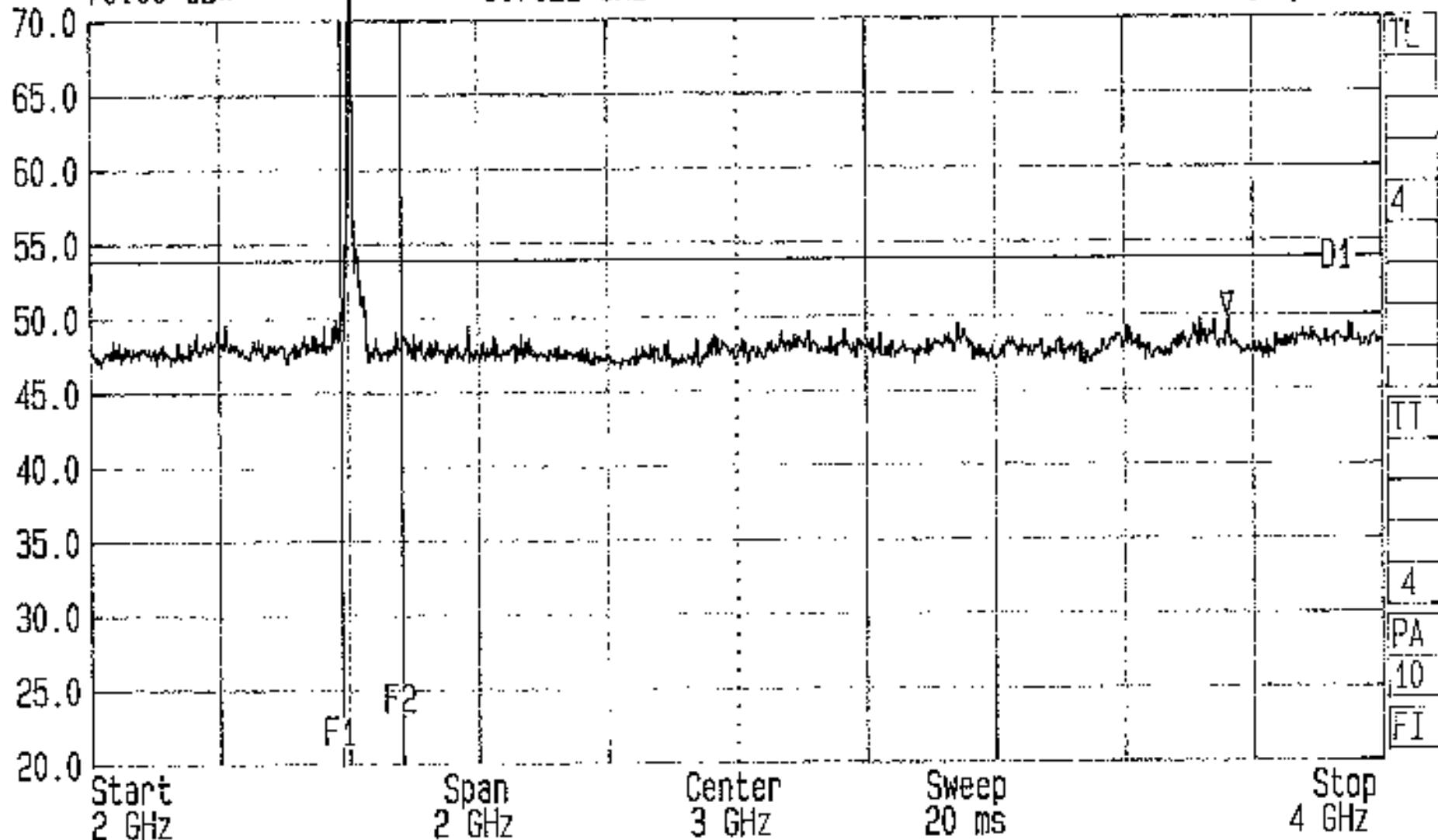


Spurious Radiated Emissions Test For Red-M by RFI Ltd. Op-Cond Bottom Channel
FCC Part 15.209 ENG: ND/JXK EUT: Palm V Clip-on GPH/42145/RE025



Date 02.May.'01 Time 16:04:22
Ref.Lvl Marker 49.87 dB*
70.00 dB* 3.7622 GHz

Res.Bw 1 MHz [imp] Vid.Bw 1 MHz
TG.Lvl off RF.Att 0 dB
CF.Stp 200.000 MHz Unit [dB μ V/m]



Start
2 GHz

Span
2 GHz

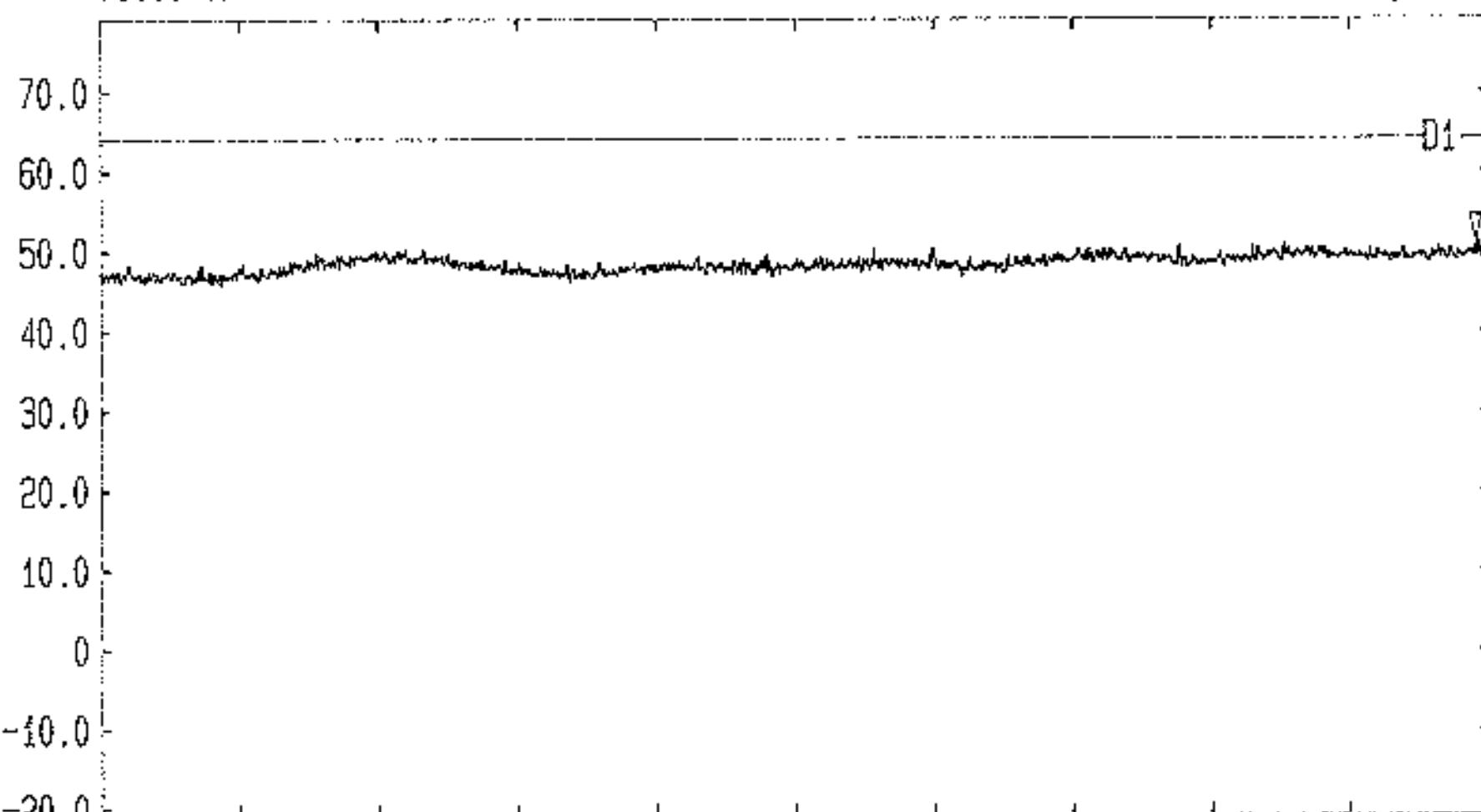
Center
3 GHz

Sweep
20 ms

Stop
4 GHz

Spurious Radiated Emissions Test For Red-M by RFI Ltd. Op-Cond Bottom Channel
FCC Part 15.209 ENG: ND/JXK EUT: Palm V Clip-on GPH/42145/RE033

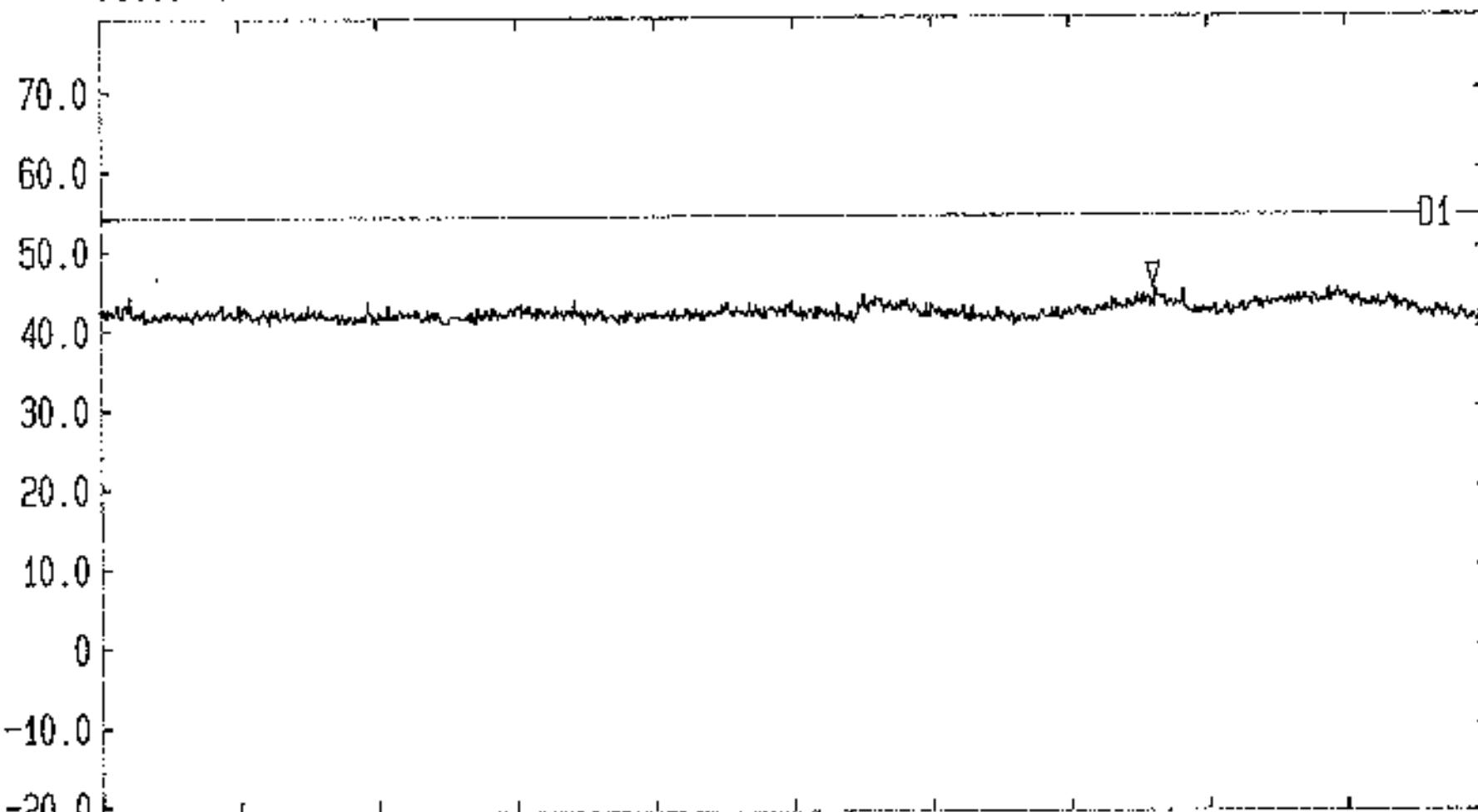
LVLOFF
Date 30.Apr.'01 Time 10:21:04
Ref.Lvl Marker 51.25 dB* CF.Stg 100.000 MHz RF.Att 0 dB
79.00 dB* 4.9922 GHz Unit [dB μ V/m]



Start Span Center Sweep Stop
4 GHz 1 GHz 4.5 GHz 20 ms 5 GHz

Spurious Radiated Emissions Tested For Red-X By RFI Ltd. OpCond: Tx Bottom Channel.
FCC Part 15.209 ENG: ND EUT: Palm V Clip-on GPR/42145/RE01

LVLOFF
Date 30.Apr.'01 Time 10:30:40
Ref.Lvl Marker 44.88 dB* CF.Stp 100.000 MHz RF.Att 0 dB
79.00 dB* 5.7622 GHz Unit [dB μ V/m]



Start Span Center Sweep Stop
5 GHz 1 GHz 5.5 GHz 20 ms 6 GHz

Spurious Radiated Emissions Tested For Red-M By RFI Ltd. OpCond: Tx Bottom Channel.
FCC Part 15.209 ENG: ND EUT: Palm V Clip-on GPH/42145/RE02

LVLOFF

Date 30.Apr.'01 Time 11:13:17

Ref.Lvl Marker 45.78 dB*
62.00 dBx 6.1888 GHz

Res.Bw

1.0 MHz [3dB]

Vid.Bw

1 MHz

CF.Stp

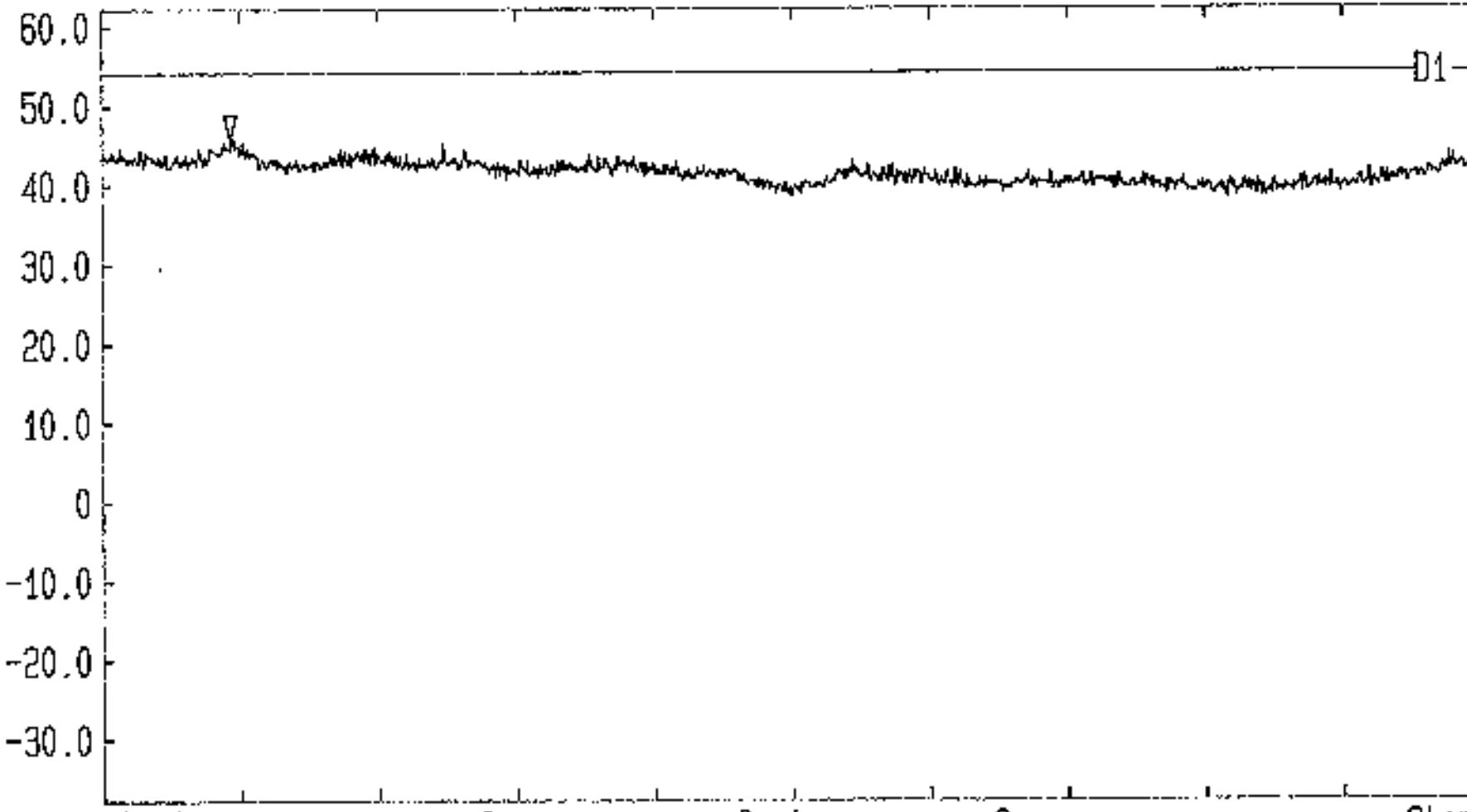
200.000 MHz

RF.Att

0 dB

Unit

[dB μ V/m]



Start
6 GHz

Span
2 GHz

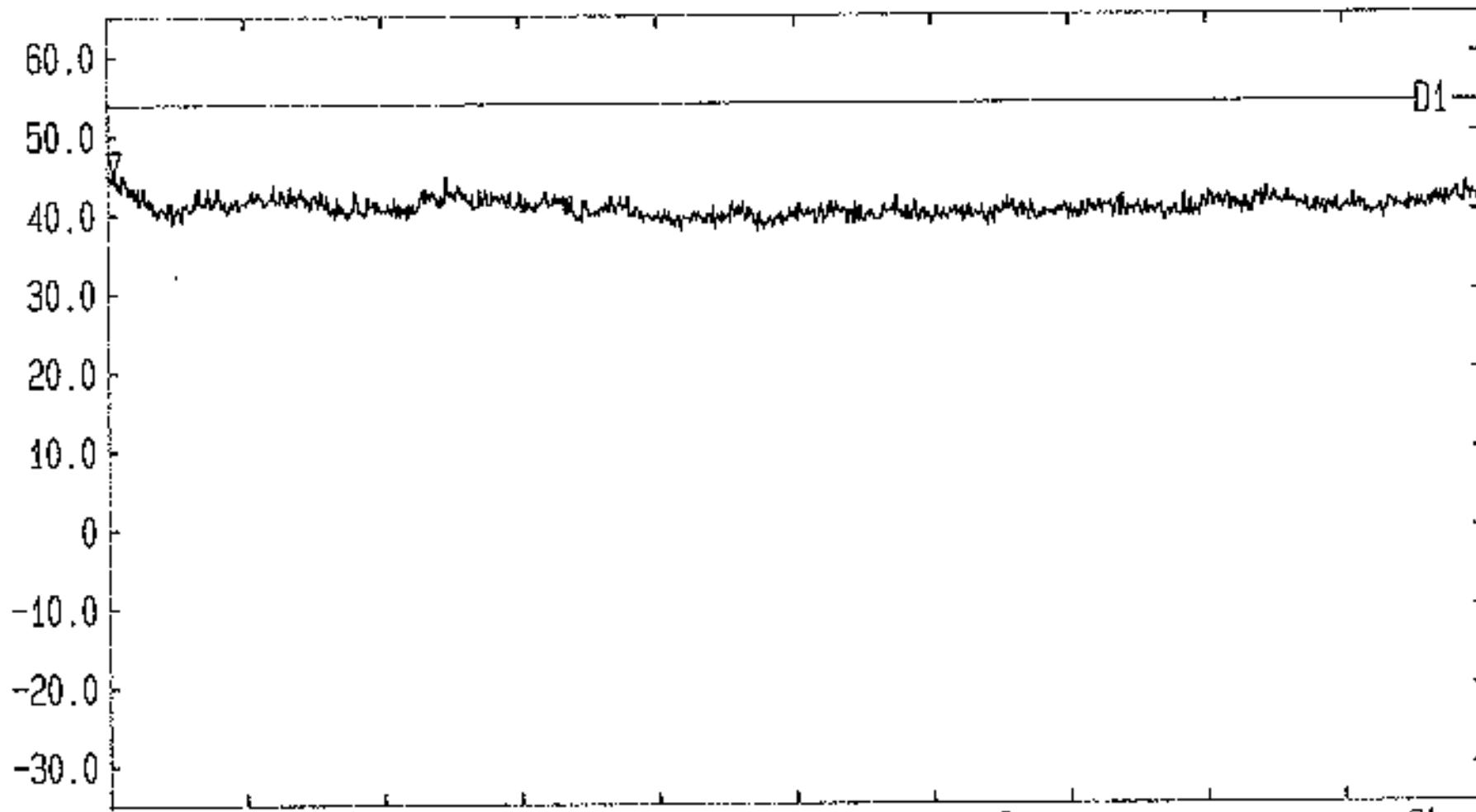
Center
7 GHz

Sweep
20 ms

Stop
8 GHz

Spurious Radiated Emissions Tested For Red-M By RFI Ltd. OpCond: Tx Bottom Channel
FCC Part 15.209 ENG: ND EUT: Palm V Clip-on GPH/42145/RE008

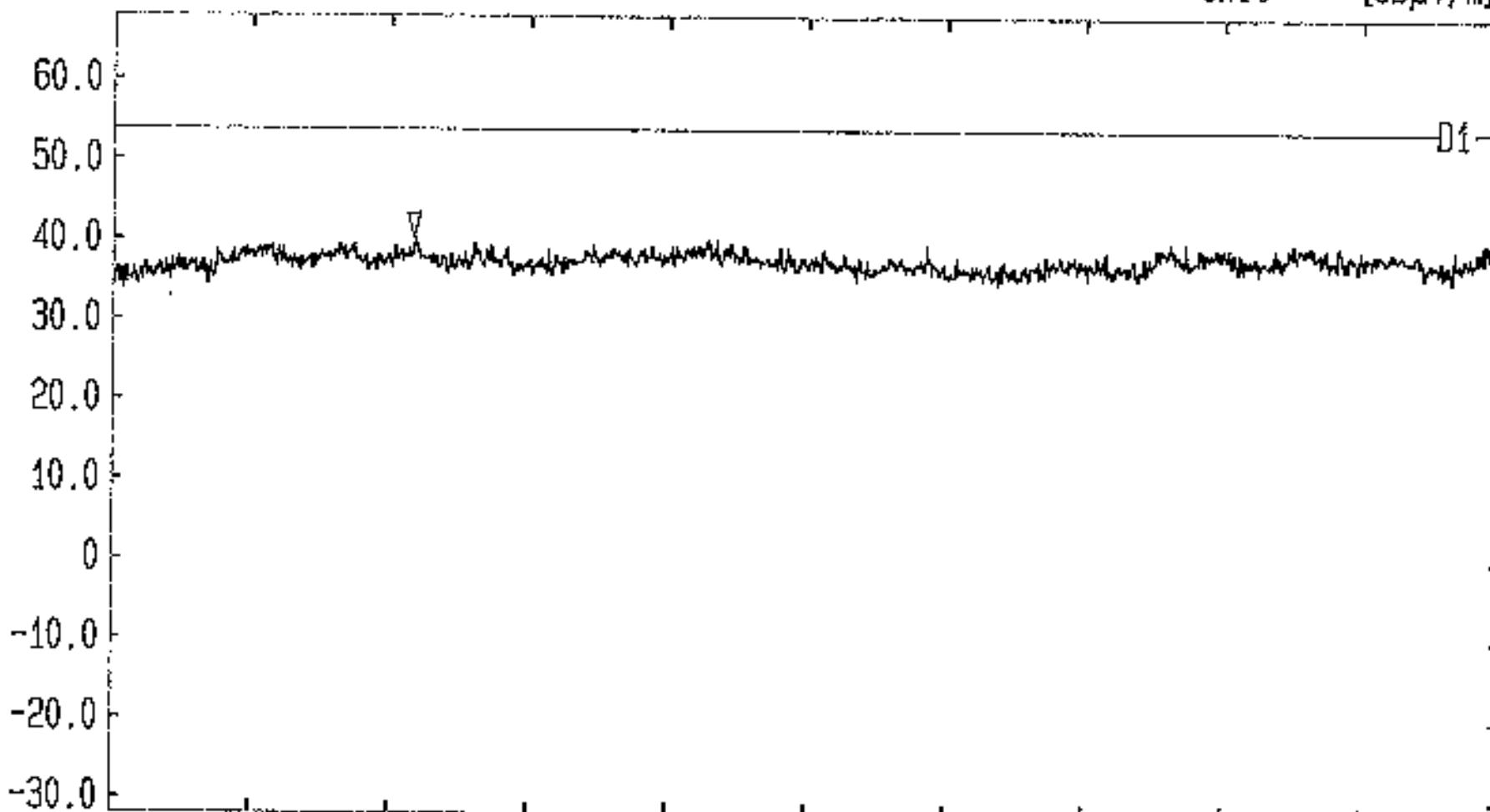
LVLOFF
Date 30.Apr.'01 Time 11:46:11
Ref.Lv1 Marker 45.27 dB* CF.Stp 450.000 MHz RF.Att 0 dB
65.00 dB* 8.0200 GHz Unit [dB μ V/m]



Start Span Center Sweep Stop
8 GHz 4.5 GHz 10.25 GHz 20 ms 12.5 GHz

Spurious Radiated Emissions Tested For Red-M By RFI Ltd. OpCond: Tx Bottom Channel
FCC Part 15.209 ENG: ND EUT: Palm V Clip-on GPH/42145/RE012

LVL OFF
Date 30.Apr.'01 Time 11:45:55
Ref.Lvl Marker 40.30 dB* CF,Stp 550.000 MHz RF.Att 0 dB
68.00 dB* 13.6977 GHz Unit [dB μ V/m]



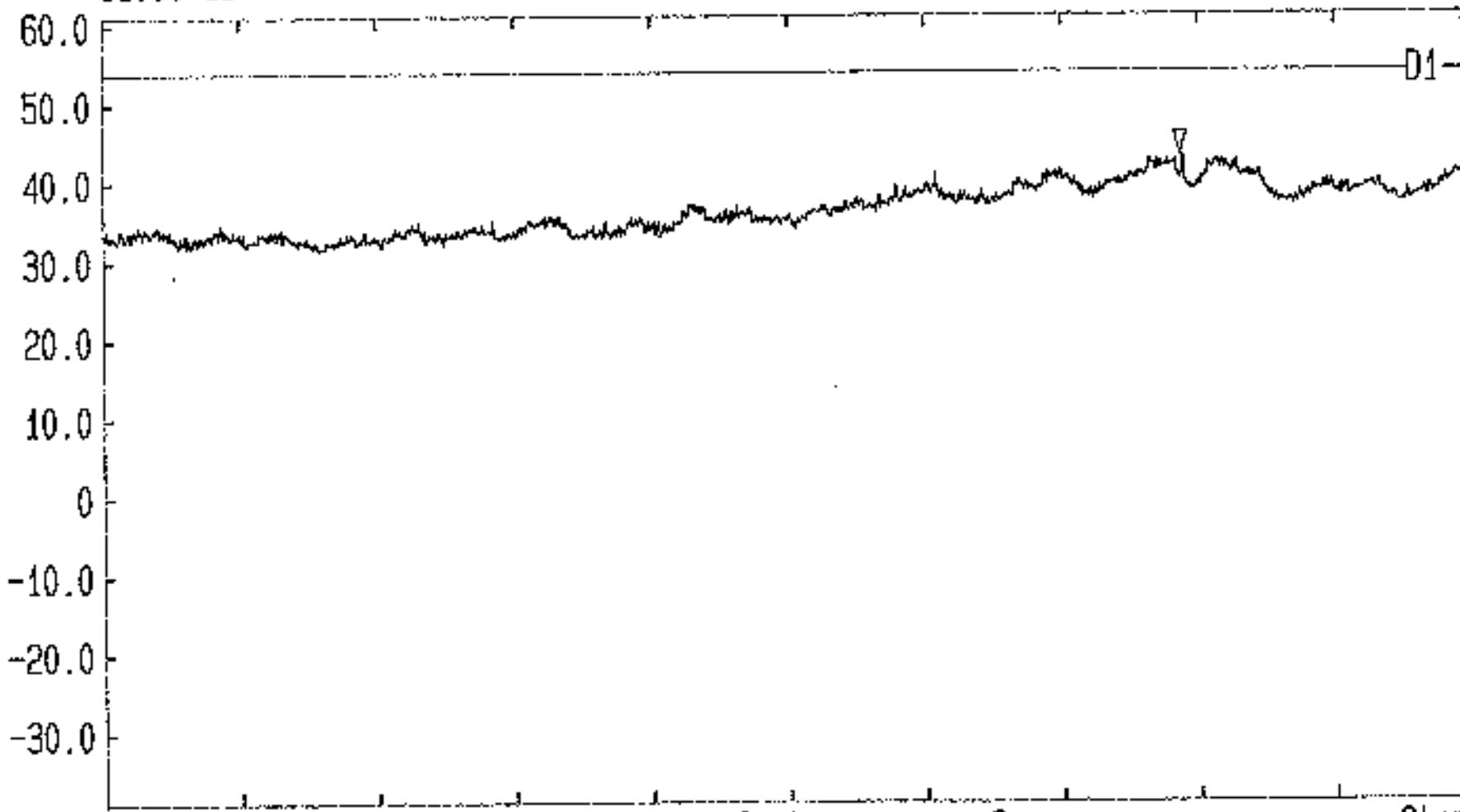
Start 12.5 GHz Span 5.5 GHz Center 15.25 GHz Sweep 40 ms Stop 18 GHz
Spurious Radiated Emissions Tested For Red-M By RFI Ltd. OpCond: Bottom Channel
FCC Part 15.209 ENG: ND EUT: Palm V Clip-on GPH/42145/RE016

LVLOFF

Res.Bw 1.0 MHz [3dB] Vid.Bw 1 MHz

Date 30.Apr.'01 Time 12:13:49

Ref.Lvl Marker 43.00 dB* 24.7055 GHz

CF.Stp 850.000 MHz RF.Att 0 dB
61.00 dB* Unit [dB μ V/m]

Start	Span	Center	Sweep	Stop
18 GHz	8.5 GHz	22.25 GHz	40 ms	26.5 GHz

Spurious Radiated Emissions Tested For Red-M By RFI Ltd. OpCond: Bottom Channel
FCC Part 15.209 ENG: ND EUT: Palm V Clip-on GPH/42145/RE020



Date 02.May.'01 Time 14:52:49

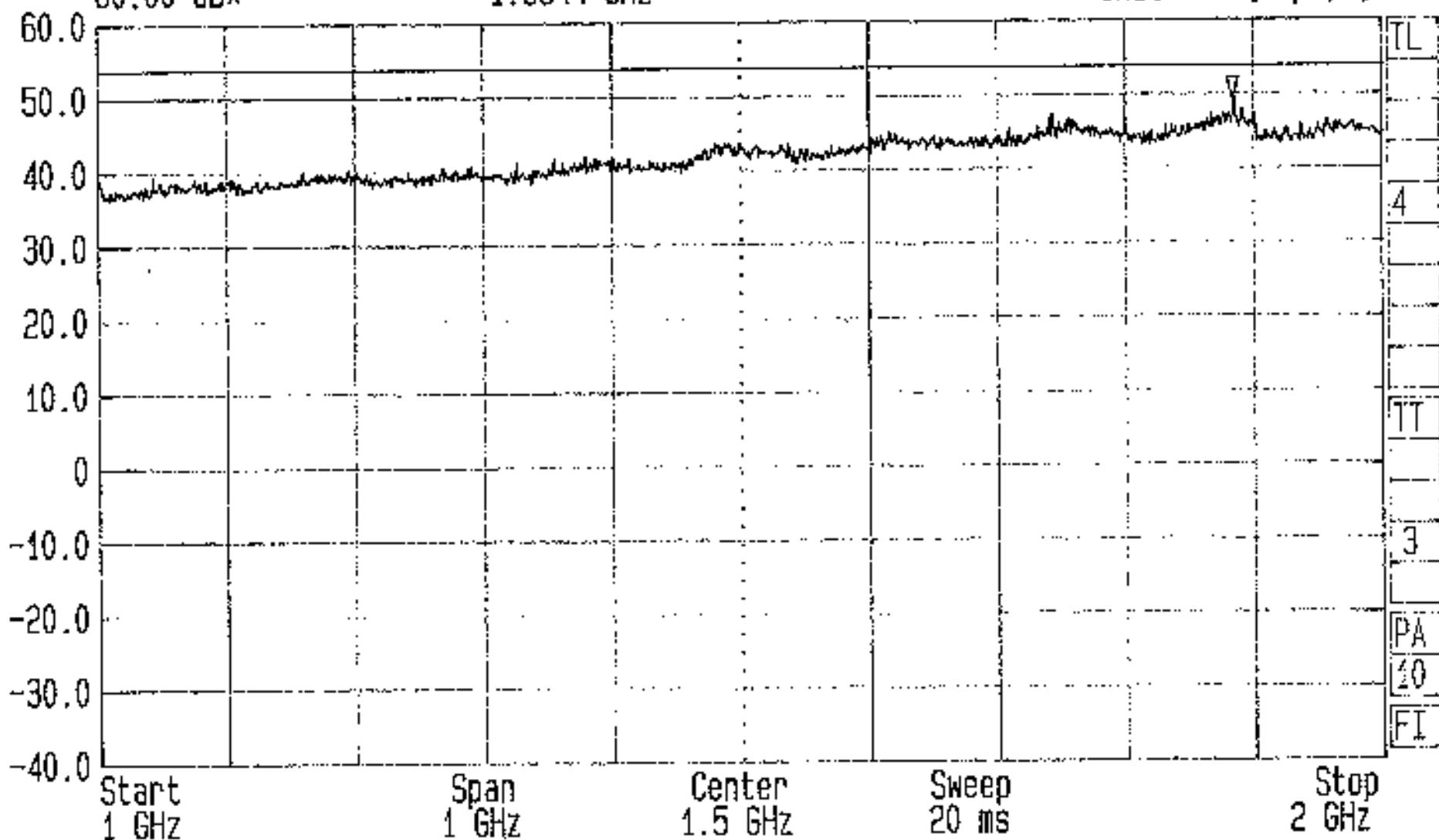
Ref.Lvl Marker 49.44 dB*
60.00 dBx 1.8844 GHz

Res.Bw
TG.Lvl
CF.Stp

1 MHz [imp] off
100.000 MHz

Vid.Bw
RF.Att
Unit

1 MHz
0 dB
[dB μ V/m]



Spurious Radiated Emissions Test For Red-M by RFI Ltd. Op-Cond Rx Mode

FCC Part 15.109 ENG: ND/JXK

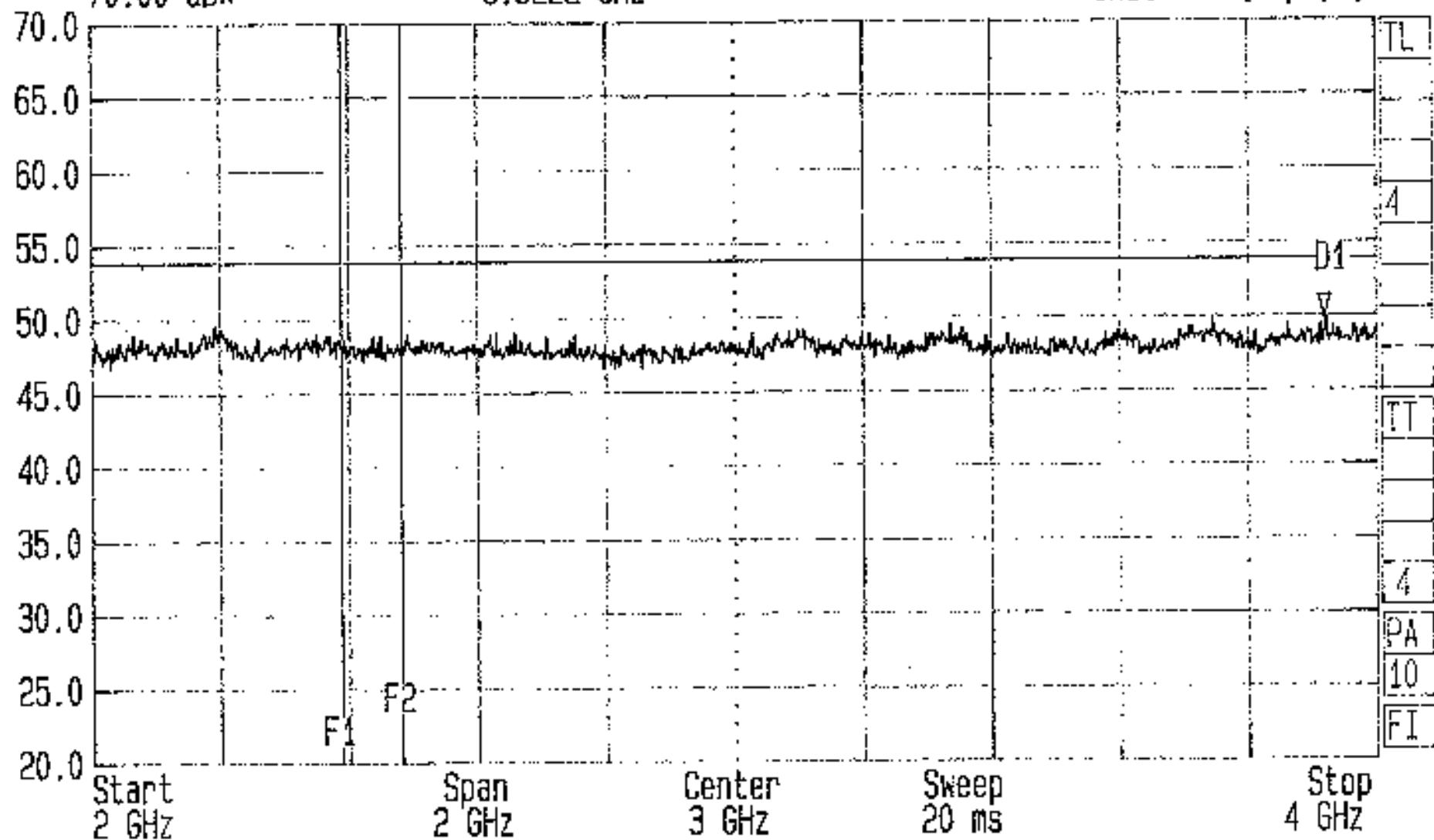
EUT: Palm V Clip-on

GPH/42145/RE028



Date 02.May.'01 Time 16:18:21
Ref.Lvl Marker 49.88 dB*
70.00 dB* 3.9222 GHz

Res.Bw TG.Lvl 1 MHz [imp] Vid.Bw 1 MHz
CF.Stp off off RF.Att 0 dB
Unit [dB μ V/m]



Spurious Radiated Emissions Test For Red-M by RFI Ltd. Op-Cond Rx Mode
FCC Part 15.109 ENG: ND/JXK EUT: Palm V Clip-on GPH/42145/RE035

LVLOFF

Res.Bw

1.0 MHz [3dB]

Vid.Bw

1 MHz

Date 30.Apr.'01 Time 10:52:17

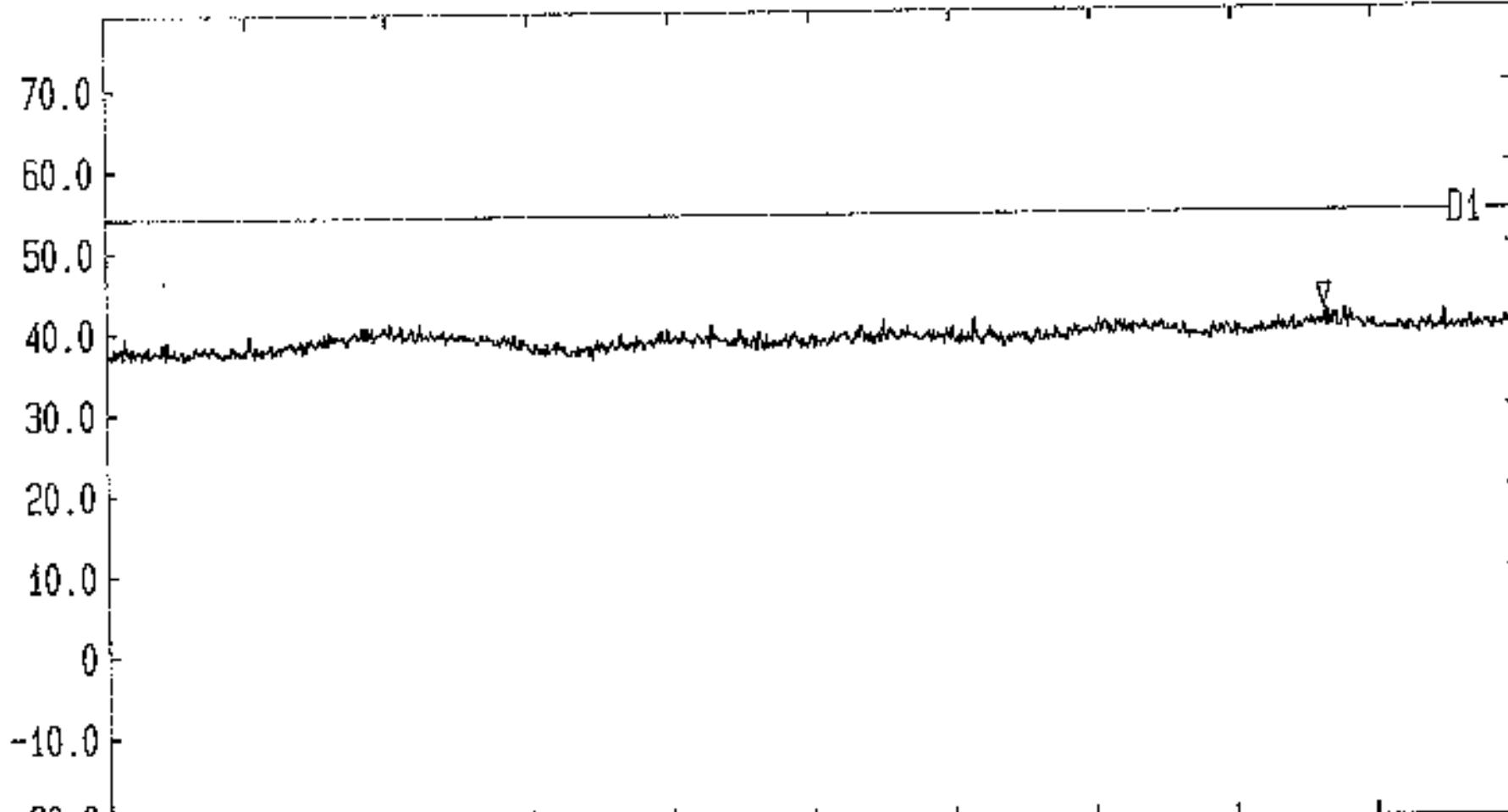
Ref.Lvl Marker 41.83 dB*
79.00 dB* 4.8655 GHz

CF.Stp

100.000 MHz

RF.Att

0 dB
[dB μ V/m]



Start
4 GHz

Span
1 GHz

Center
4.5 GHz

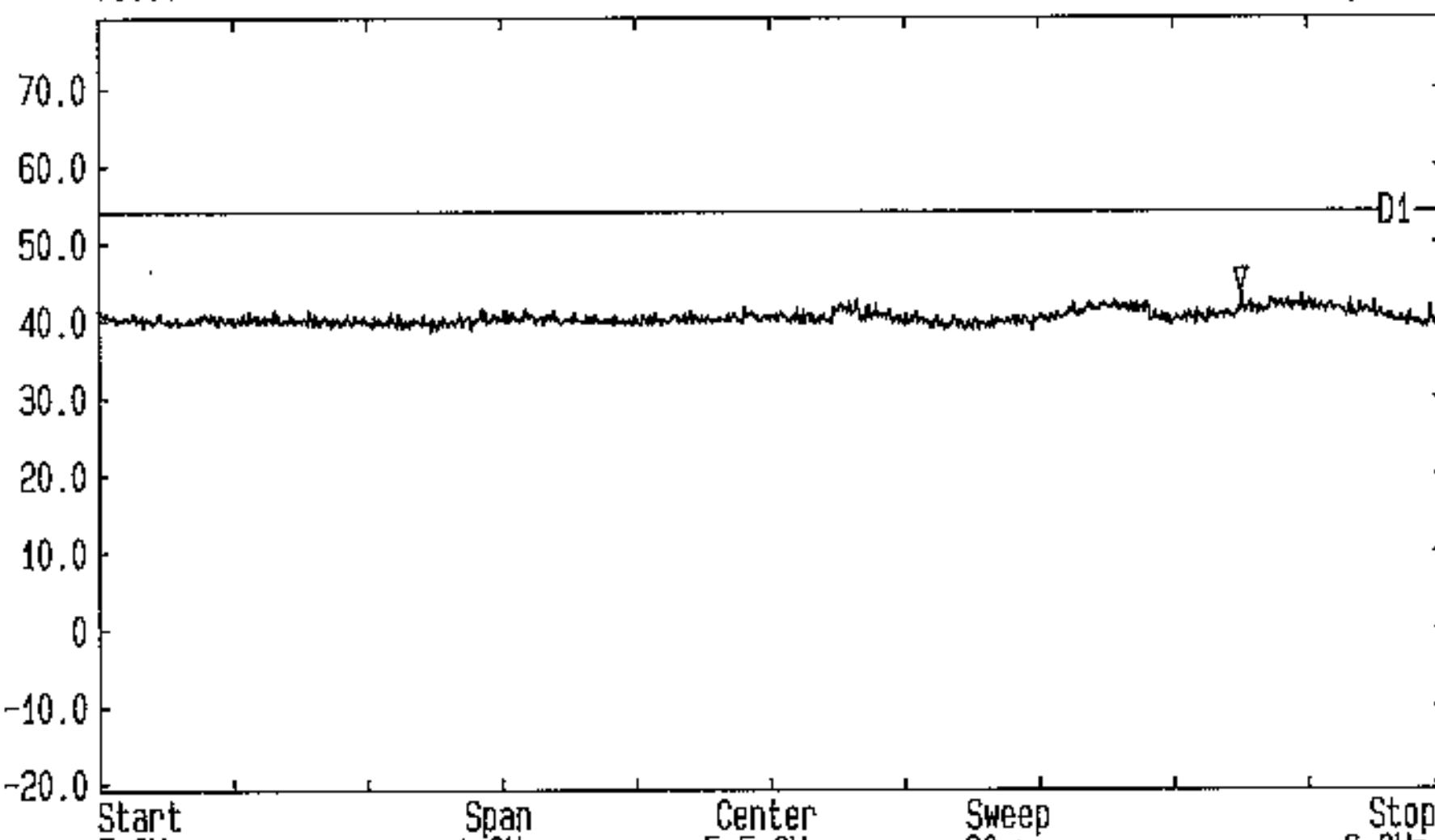
Sweep
20 ms

Stop
5 GHz

Spurious Radiated Emissions Tested For Red-M By RFI Ltd. OpCond: Rx Channel:
FCC Part 15.209 ENG: ND EUT: Palm V Clip-on GPH/42145/RE07

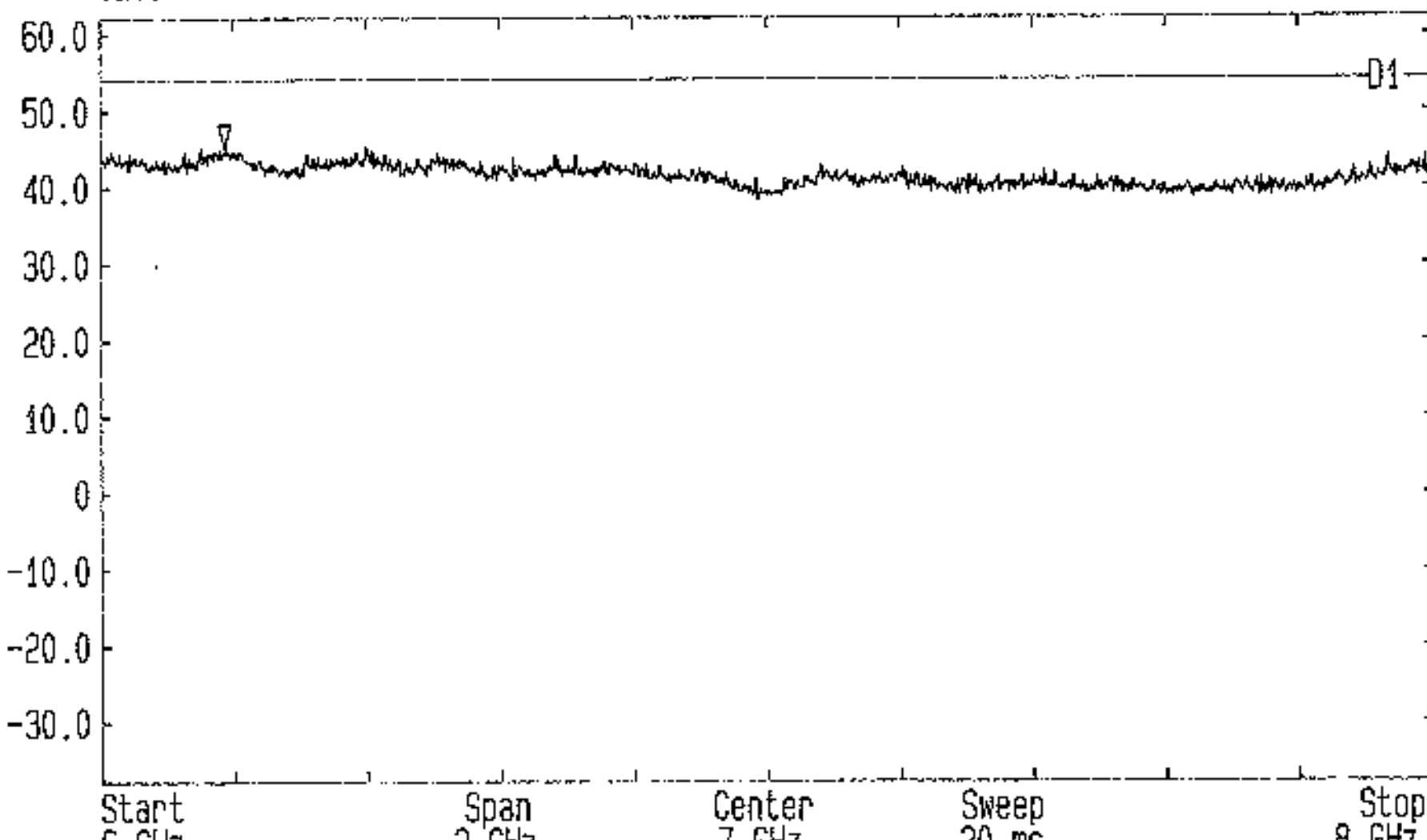
LVLOFF
Date 30.Apr.'01 Time 10:54:27
Ref.Lvl Marker 43.58 dB*
79.00 dB* 5.8511 GHz

Res.Bw 1.0 MHz [3dB] Vid.Bw 1 MHz
CF.Stp 100.000 MHz RF.Att 0 dB
Unit [dB μ V/m]



Spurious Radiated Emissions Tested For RED-M By RFI Ltd. OpCond: Rx Channel:
FCC Part 15.109 ENG: N0 EUT: Palm V Clip-On CPH/42145/RE08

LVLOFF
Date 30.Apr.'01 Time 10:57:32
Ref.Lvl Marker 45.30 dB* CF.Stp 200.000 MHz RF.Att 0 dB
62.00 dB* 6.1888 GHz Unit [dB μ V/m]



Spurious Radiated Emissions Tested For Red-M By RFI Ltd. OpCond: Rx Mode

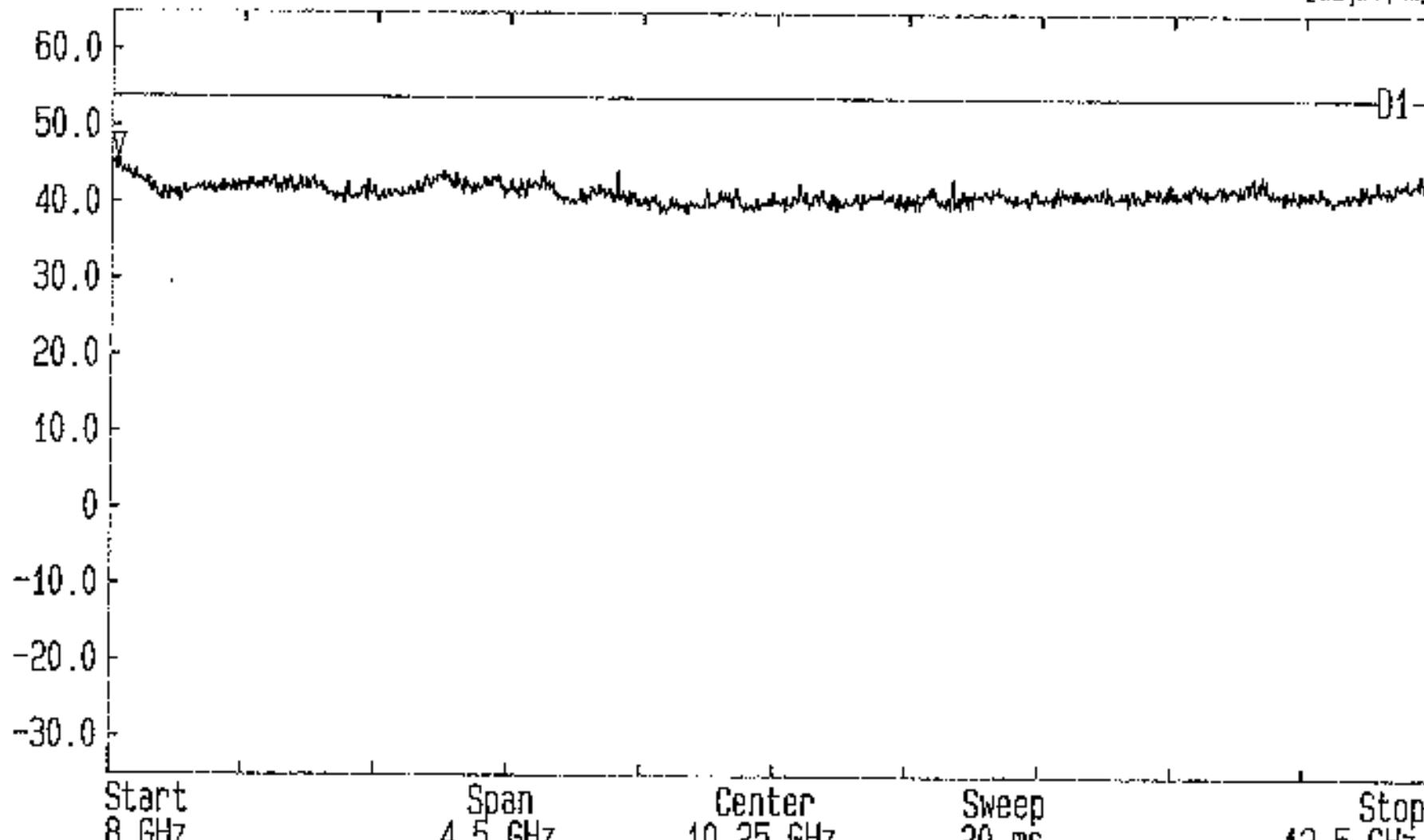
FCC Part 15.109

ENG: ND

EUT: Palm V Clip-on

GPH/42145/RE011

LVL0FF
Date 30.Apr.'01 Time 11:30:21
Ref.Lvl Marker 46.09 dB* CF.Stp 450.000 MHz RF.Att 0 dB
65.00 dB* B.0200 GHz Unit [dB μ V/m]

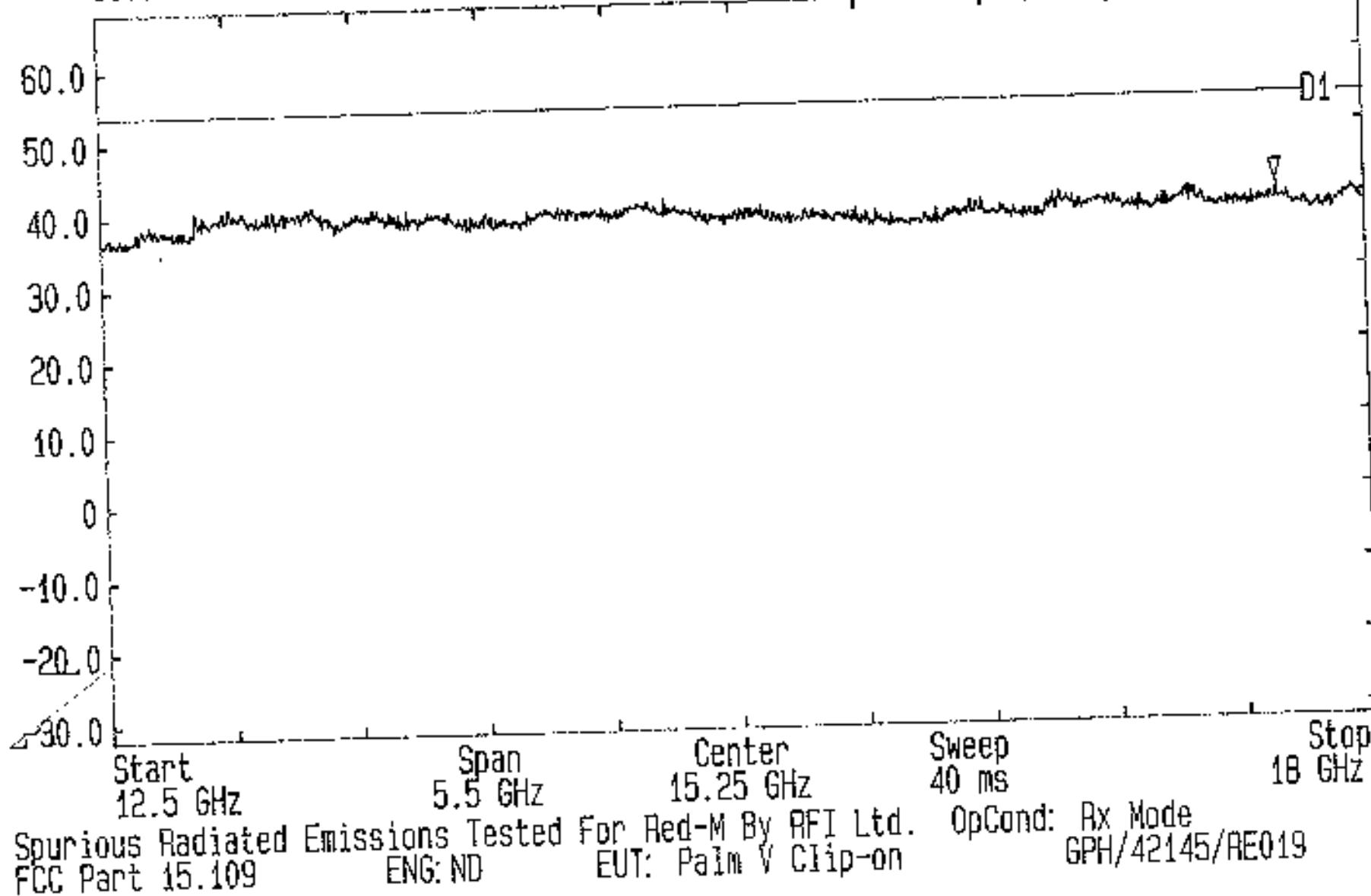


Spurious Radiated Emissions Tested For Red-M By RFI Ltd. OpCond: Rx Mode
FCC Part 15.109 ENG: ND EUT: Palm V Clip-on GPH/42145/RE015

LVLOFF

Date 30.Apr.'01 Time 11:59:41
Ref.Lvl Marker 41.39 dB*
68.00 dB* 17.6211 GHz

Res.Bw 1.0 MHz [3dB] Vid.Bw 1 MHz
CF.Stp 550.000 MHz RF.Att 0 dB
Unit [dB μ V/m]



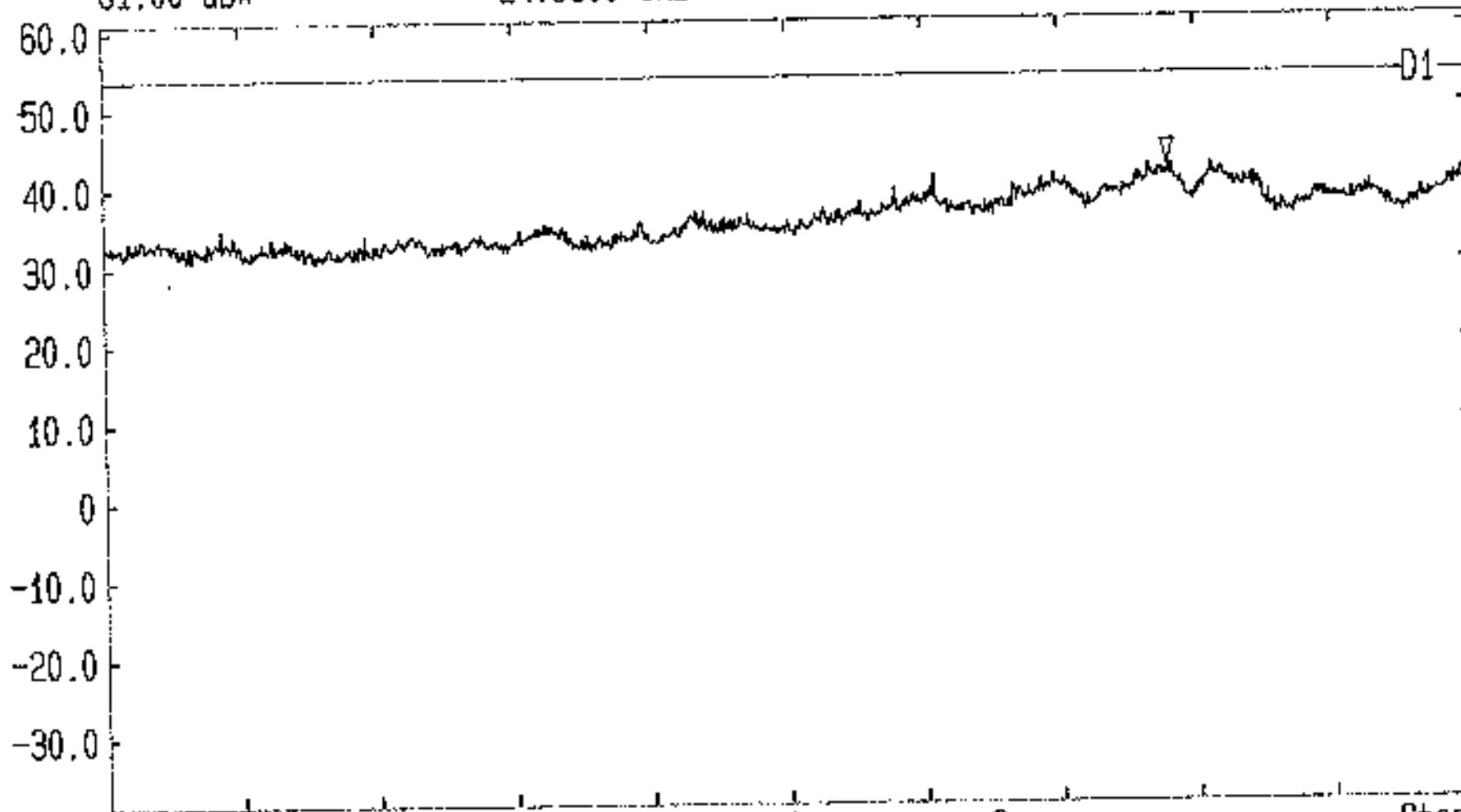
LVLOFF

Res.Bw 1.0 MHz [3dB] Vid.Bw 1 MHz

Date 30.Apr.'01 Time 12:08:16

Ref.Lvl Marker 42.34 dB* 24.6300 GHz

CF.Stp 850.000 MHz RF.Att 0 dB
61.00 dB* Unit [dB μ V/m]



Spurious Radiated Emissions Tested For Red-M By RFI Ltd. OpCond: Rx Mode

FCC Part 15.109

ENG: ND

EUT: Palm V Clip-on

GPH/42145/RE023



Date 02.May.'01 Time 15:04:00

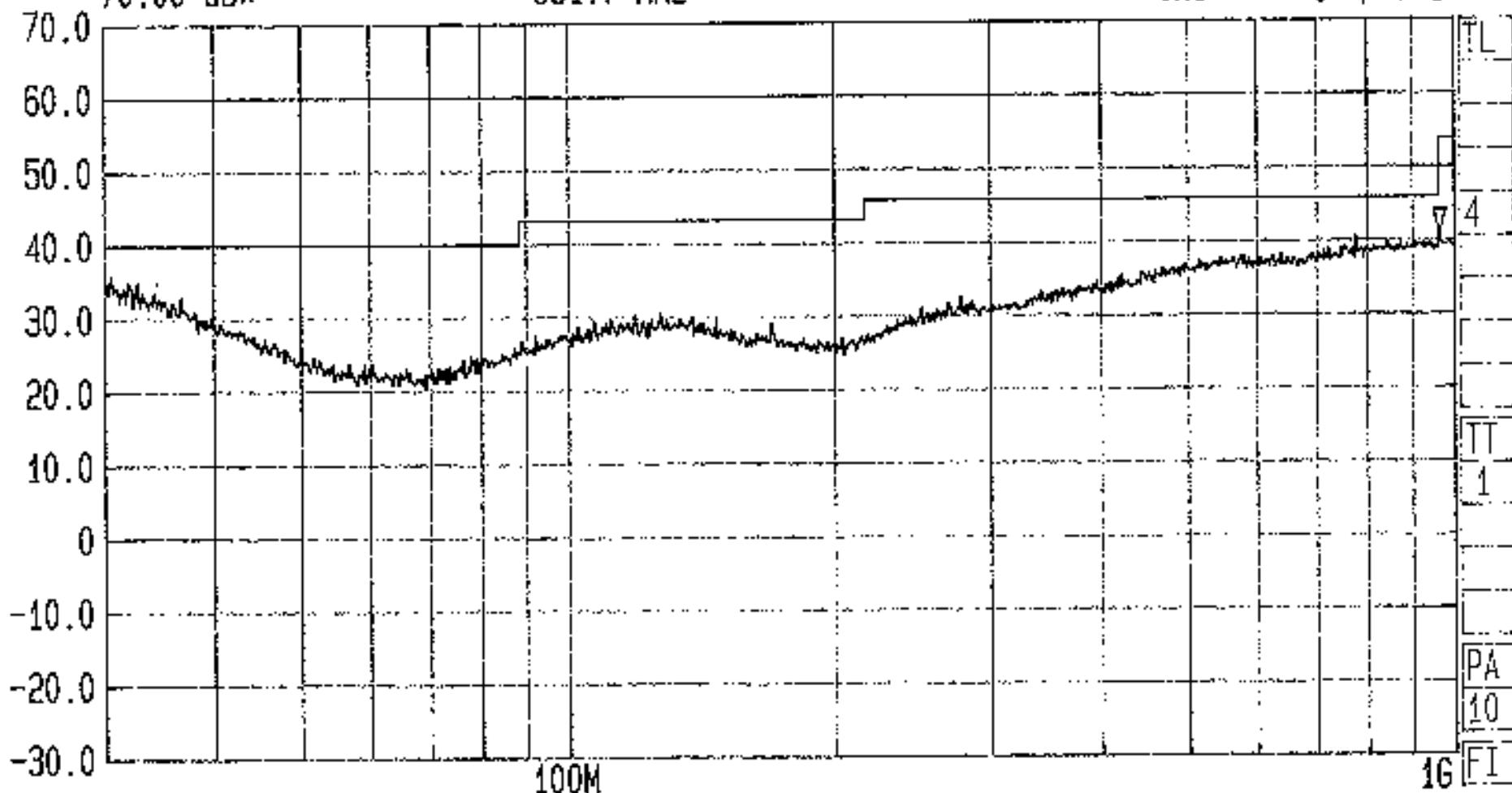
Ref.Lvl Marker 41.13 dB*
70.00 dB* 961.7 MHz

Res.BW
TG.Lvl
CF.Stp

100 kHz [imp]
off
97.000 MHz

Vid.Bw
RF.Att
Unit

100 kHz
0 dB
[dB μ V/m]



Start
30 MHz

Span
970 MHz

Center
173.2 MHz

Sweep
540 ms

Stop
1 GHz

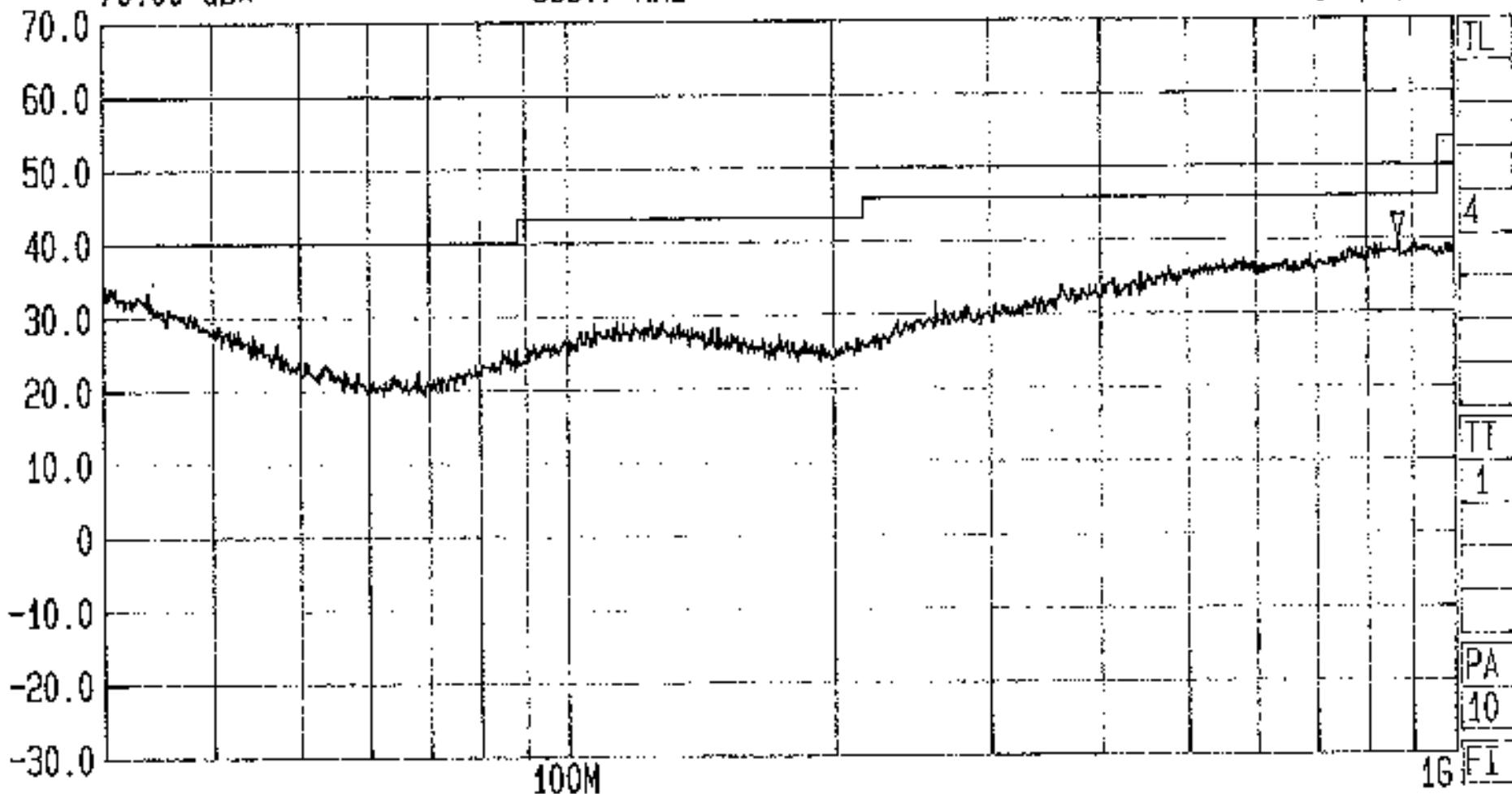
Spurious Radiated Emissions Test For Red-M by RFI Ltd. Op-Cond Rx Mode
FCC Part 15.109 ENG:ND/JXK EUT:Palm V Clip-on

GPH/42145/RE029



Date 02.May.'01 Time 15:24:33
Ref.Lvl Marker 40.04 dB*
70.00 dB* 865.7 MHz

Res.Bw 100 kHz [imp] Vid.Bw 100 kHz
TG.Lvl off RF.Att 0 dB
CF.Stp 97.000 MHz Unit [dB μ V/m]



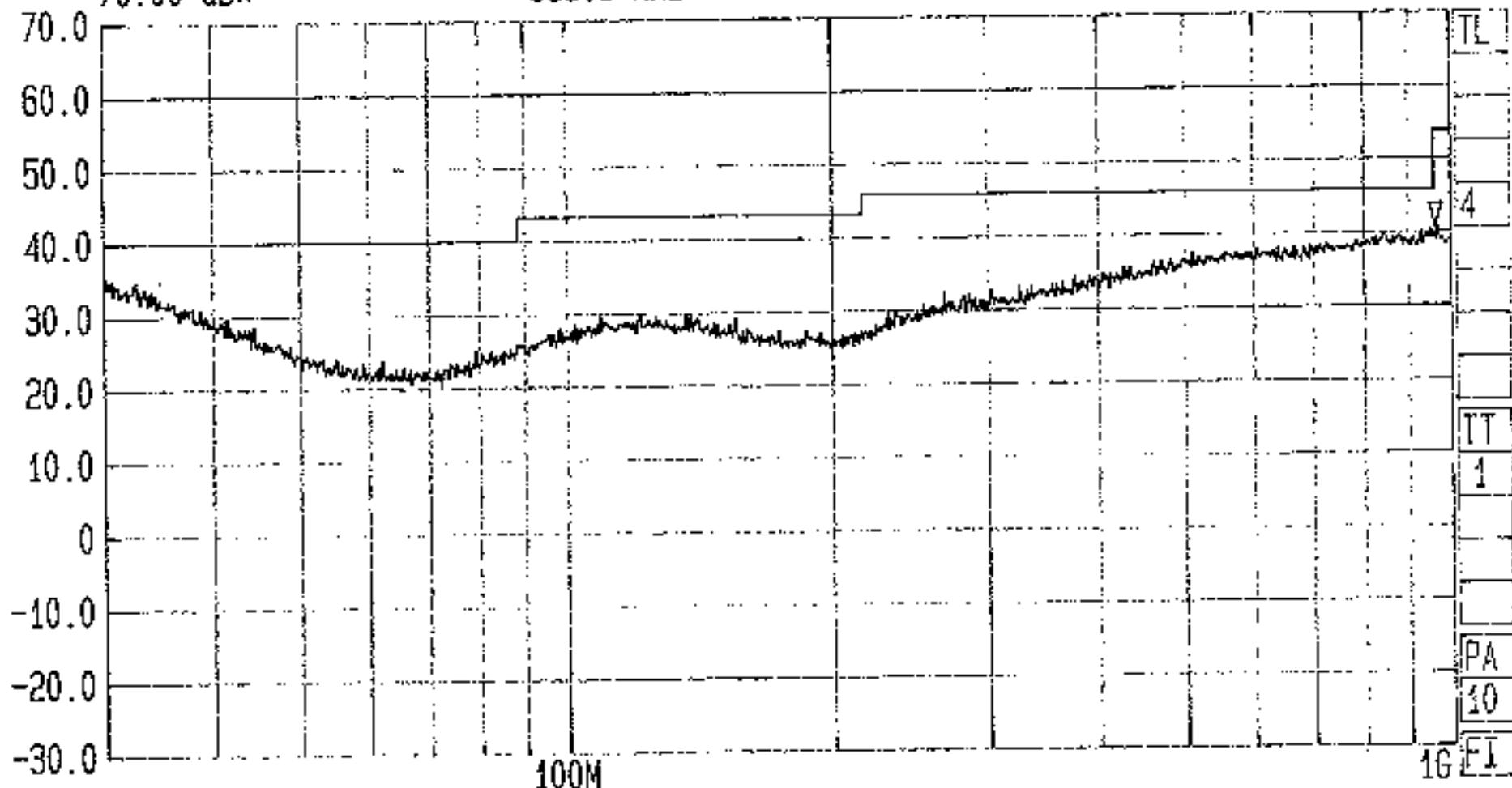
Start 30 MHz Span 970 MHz Center 173.2 MHz Sweep 540 ms Stop 1 GHz

Spurious Radiated Emissions Test For Red-M by RFI Ltd. Op-Cond Top Channel
FCC Part 15.209 ENG: ND/JXK EUT: Palm V Clip-on. GPH/42145/RE039



Date 02.May.'01 Time 15:41:20
Ref.Lvl Marker 40.88 dB*
70.00 dB*

Res.Bw 100 kHz [imp] Vid.Bw 100 kHz
TG.Lvl off RF.Att 0 dB
CF.Stp 97.000 MHz Unit [dB μ V/m]



Start
30 MHz

Span
970 MHz

Center
173.2 MHz

Sweep
100 ms

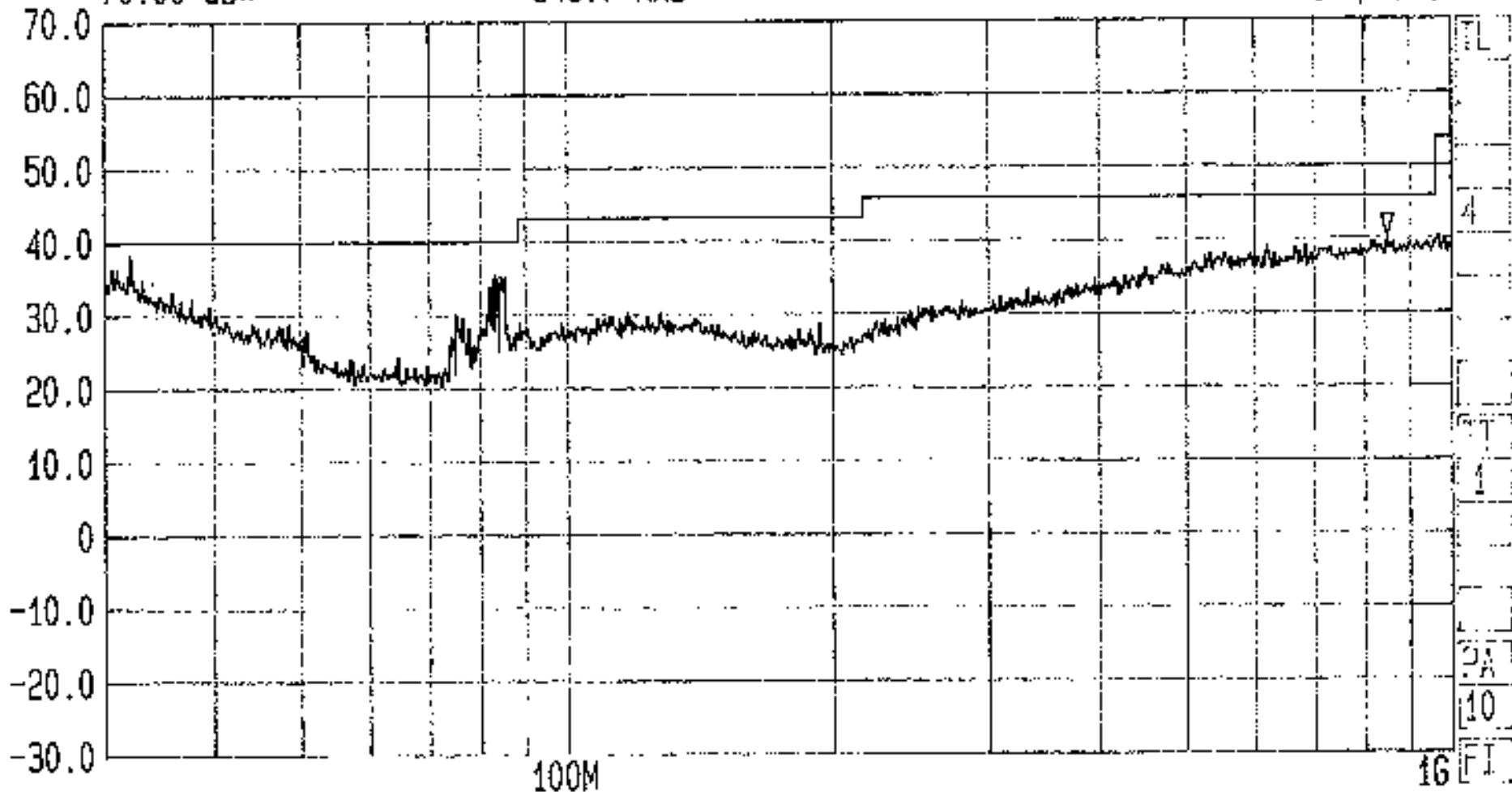
Stop
1 GHz

Spurious Radiated Emissions Test For Red-M by RFI Ltd. Op-Cond Middle Channel
FCC Part 15.209 ENG: ND/JXK EUT: Palm V Clip-on GPH/42145/RE031



Date 02.May.'01 Time 14:02:38
Ref.Lvl Marker 40.24 dB*
70.00 dB* 845.7 MHz

Res.Bw TG.Lvl 100 kHz [imp] Vid.Bw 100 kHz
CF.Stp off off RF.Att Unit 0 dB
[dB μ V/m]



Start
30 MHz

Span
970 MHz

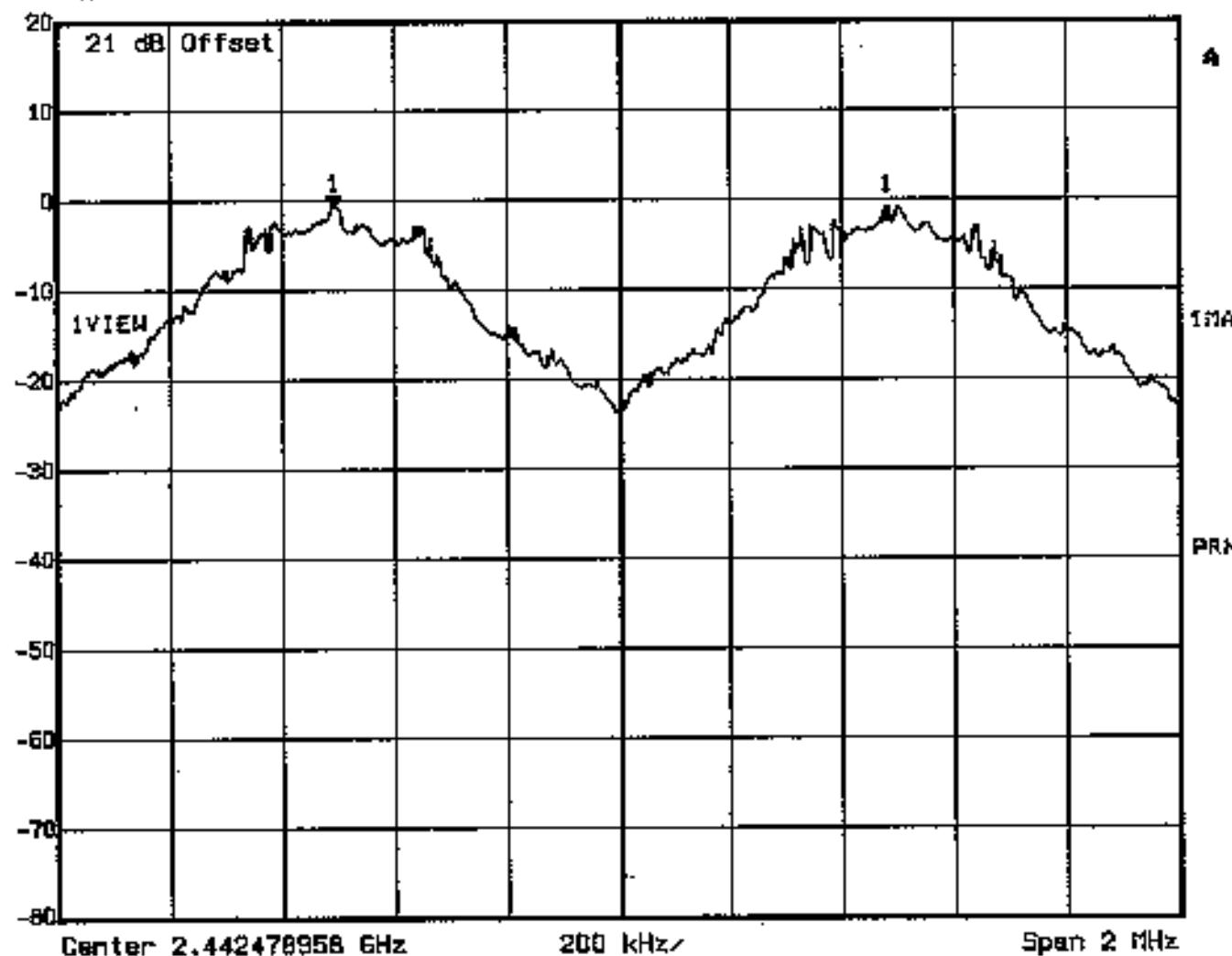
Center
173.2 MHz

Sweep
100 ms

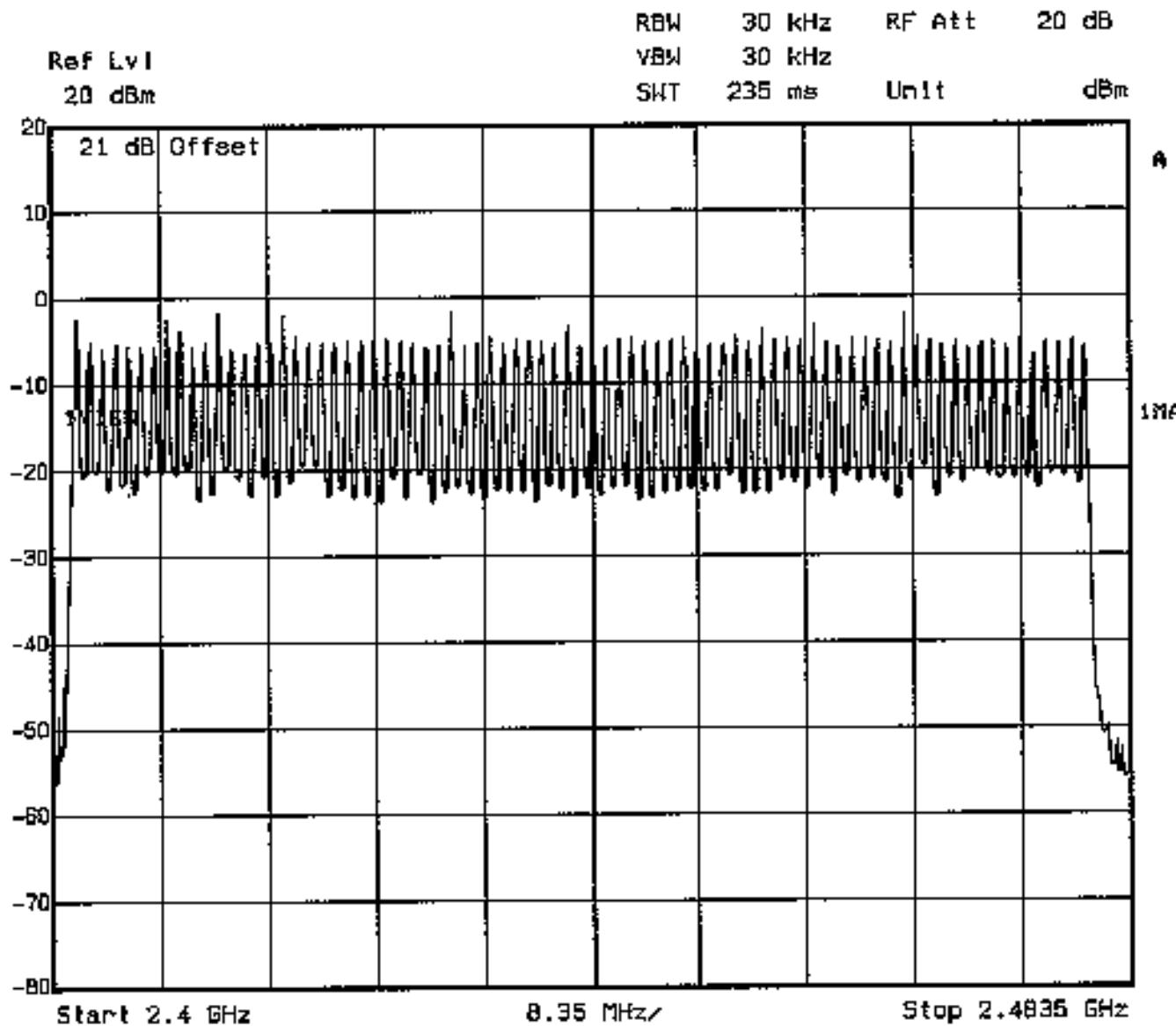
Stop
1 GHz

Spurious Radiated Emissions Test For Red-M by RFI Ltd. Op-Cond Bottom Channel
FCC Part 15.209 ENG: ND/JXK EUT: Palm V Clip-on GPH/42145/RE024

Delta τ (Ts) -0.43 dB
Ref Lvl 987.97595190 kHz
20 dBm RBW 50 kHz
VBW 60 kHz
SWT 5 ms RF Att 20 dB
Unit dBm



Title: Carrier Frequency Separation FCC Part 15.247(a)(1)
Comment A: Tested For RED-M by RFI Ltd EUT:Palm V Clip-on ENG:ND
OpCond: Hopping All Channels SPH/42145/01
Date: 20.APR.2001 9:54:55

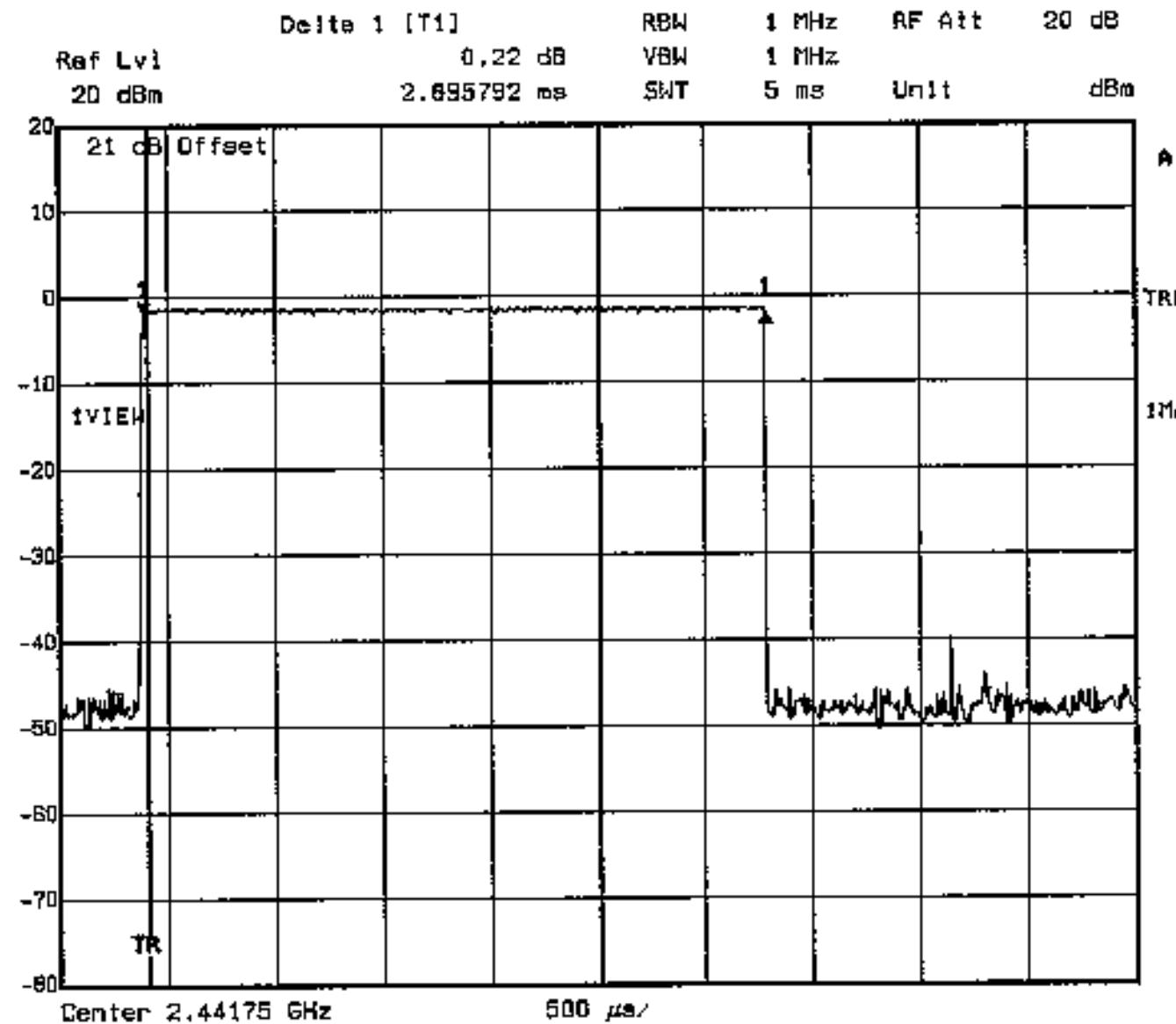


Title: Number Of Hopping Frequencies FCC Part 15.247(a)(1)(ii)

Comment A: Tested For RED-M by RFI Ltd EUT:Palm V Clip-on ENG:ND

OpCond: Hopping All Channels GPM/42145/02

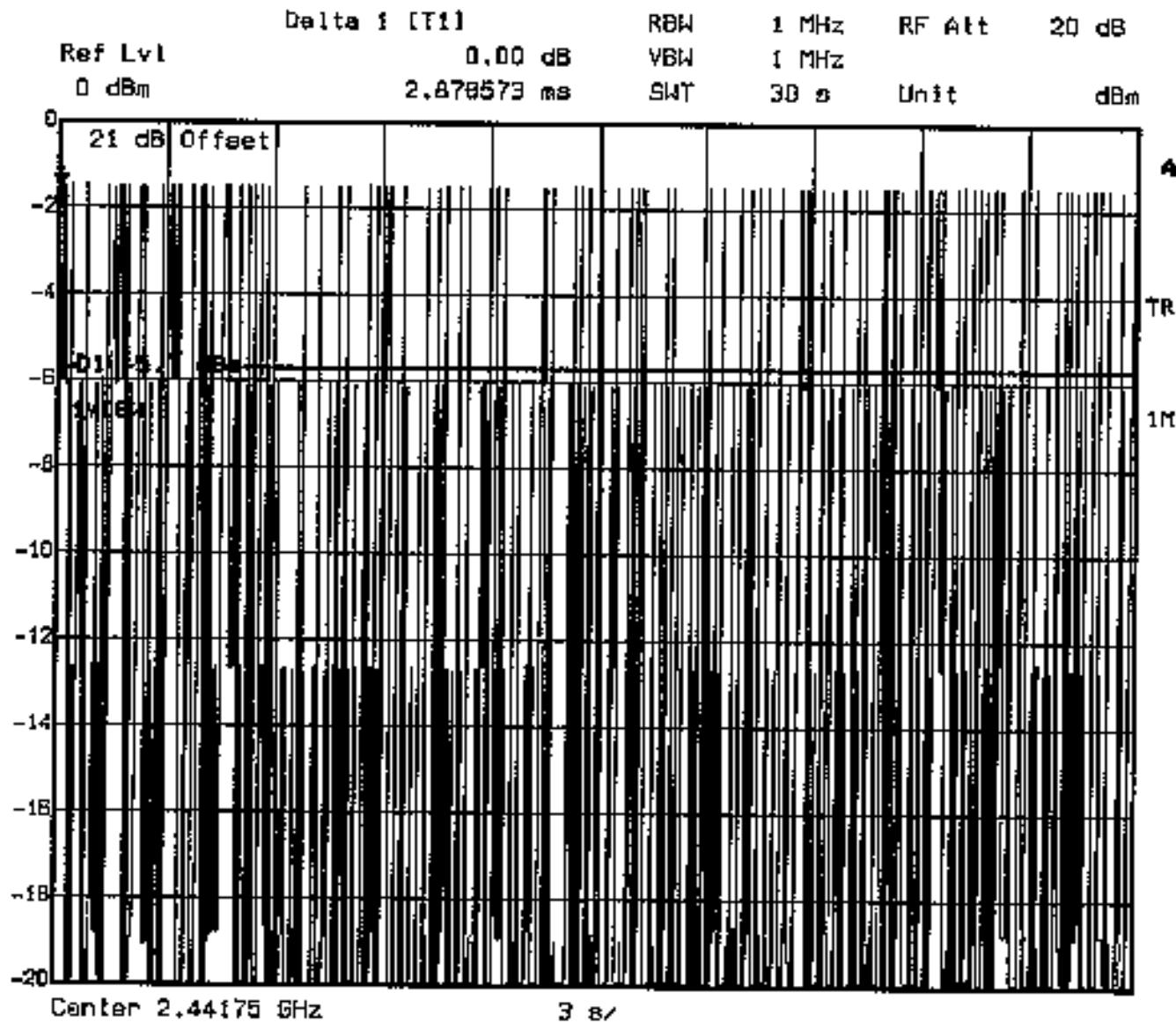
Date: 20.APR.2001 10:12:55



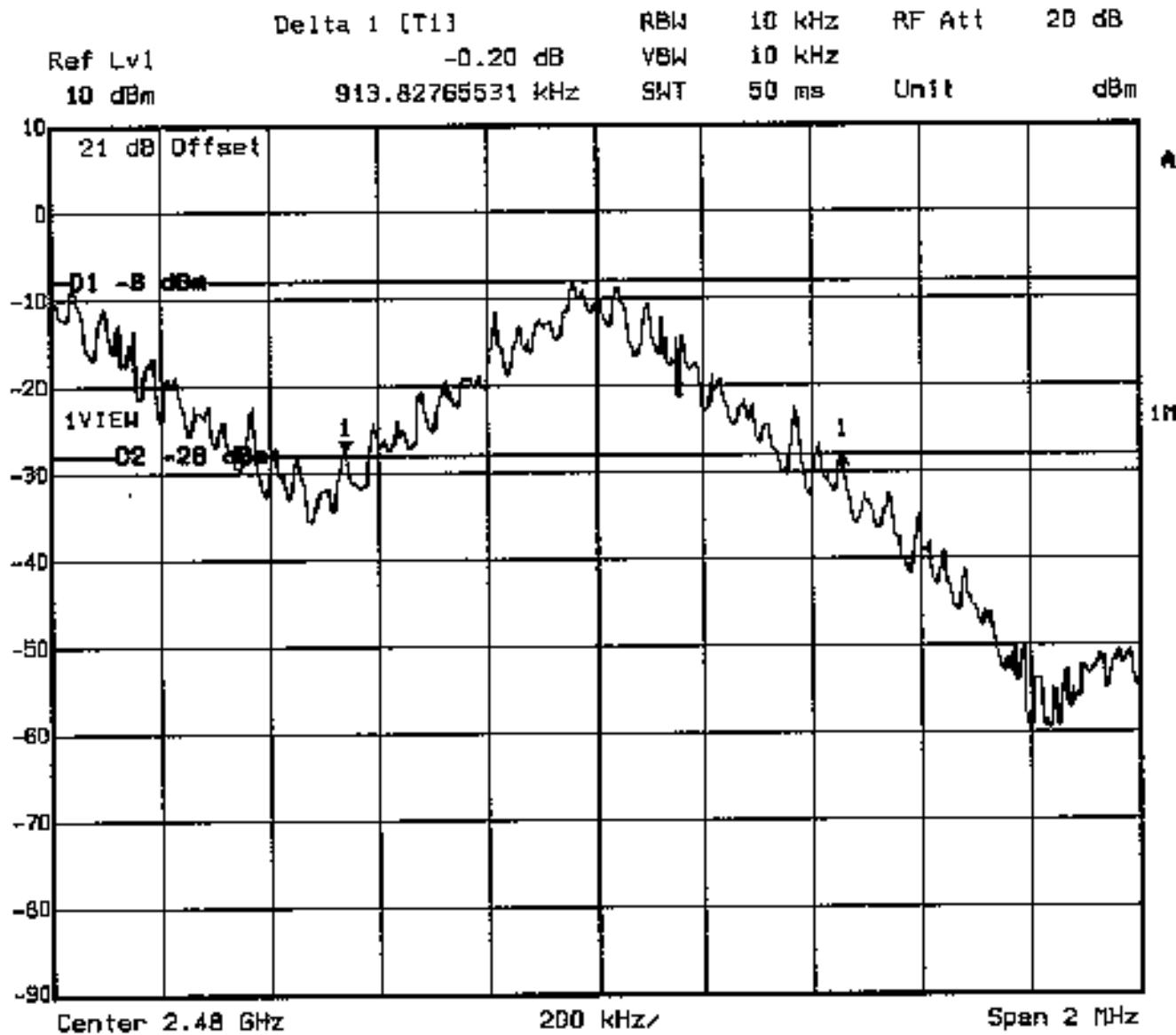
Title: Time Of Occupancy (Dwell Time) FCC Part 15.247(a)(1)(ii)

Comment A: Tested For RED-M by RFI Ltd EUT:Palm V Clip-on ENG:ND
OpCond: Hopping All Channels GPH/42145/03

Date: 20/APR/2001 10:30:51

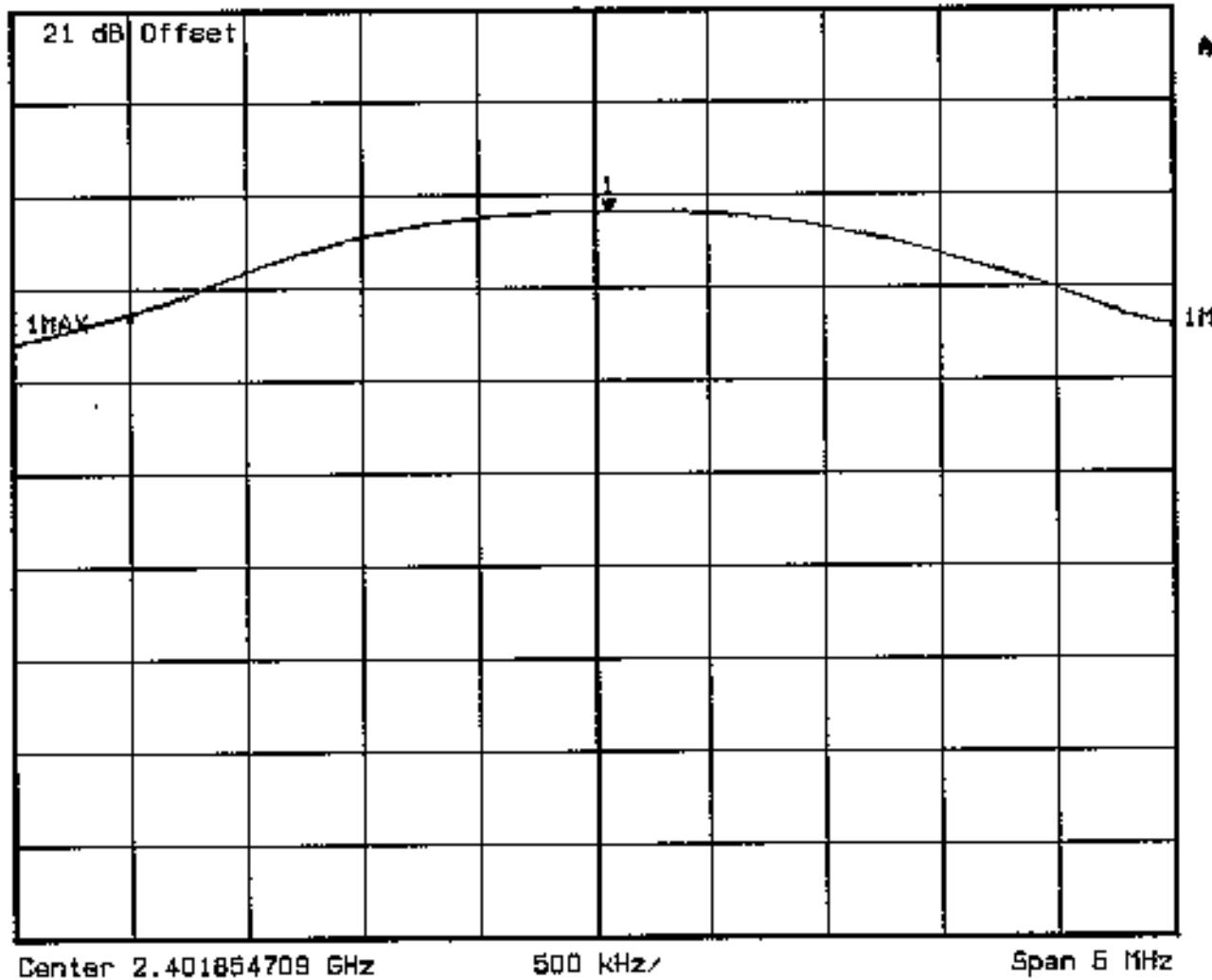


Title: Time Of Occupancy (Dwell Time) FCC Part 15.247(a)(1)(ii)
 Comment A: Tested For RED-M by RFI Ltd EUT:Palm V Clip-on ENG:ND
 OpCond: Hopping All Channels GPH/42145/04
 Date: 20.APR.2001 11:04:06



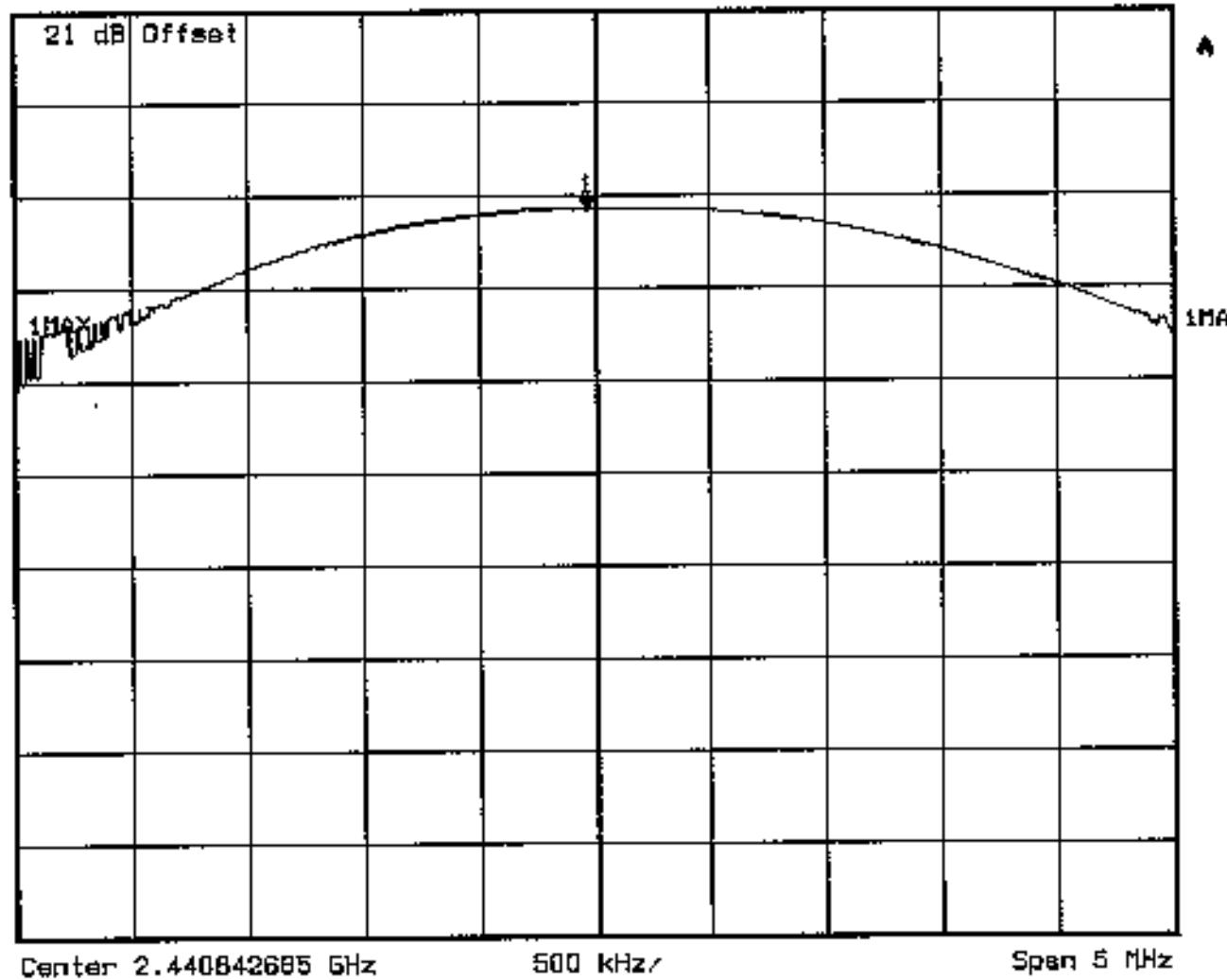
Title: 20 dB Bandwidth FCC Part 15.247(a)(1)(ii)
Comment A: Tested For RED-M by RFI Ltd EUT:Palm V Clip-on ENG:ND
OpCond: Hopping All Channels SPP/42145/05
Date: 20/APR/2001 11:18:58

Marker 1 [T1] RBW 2 MHz RF Att 20 dB
Ref Lvl 657.957 μ W VBW 2 MHz
100 mW 2.40182986 GHz SWT 5 ms Unit W



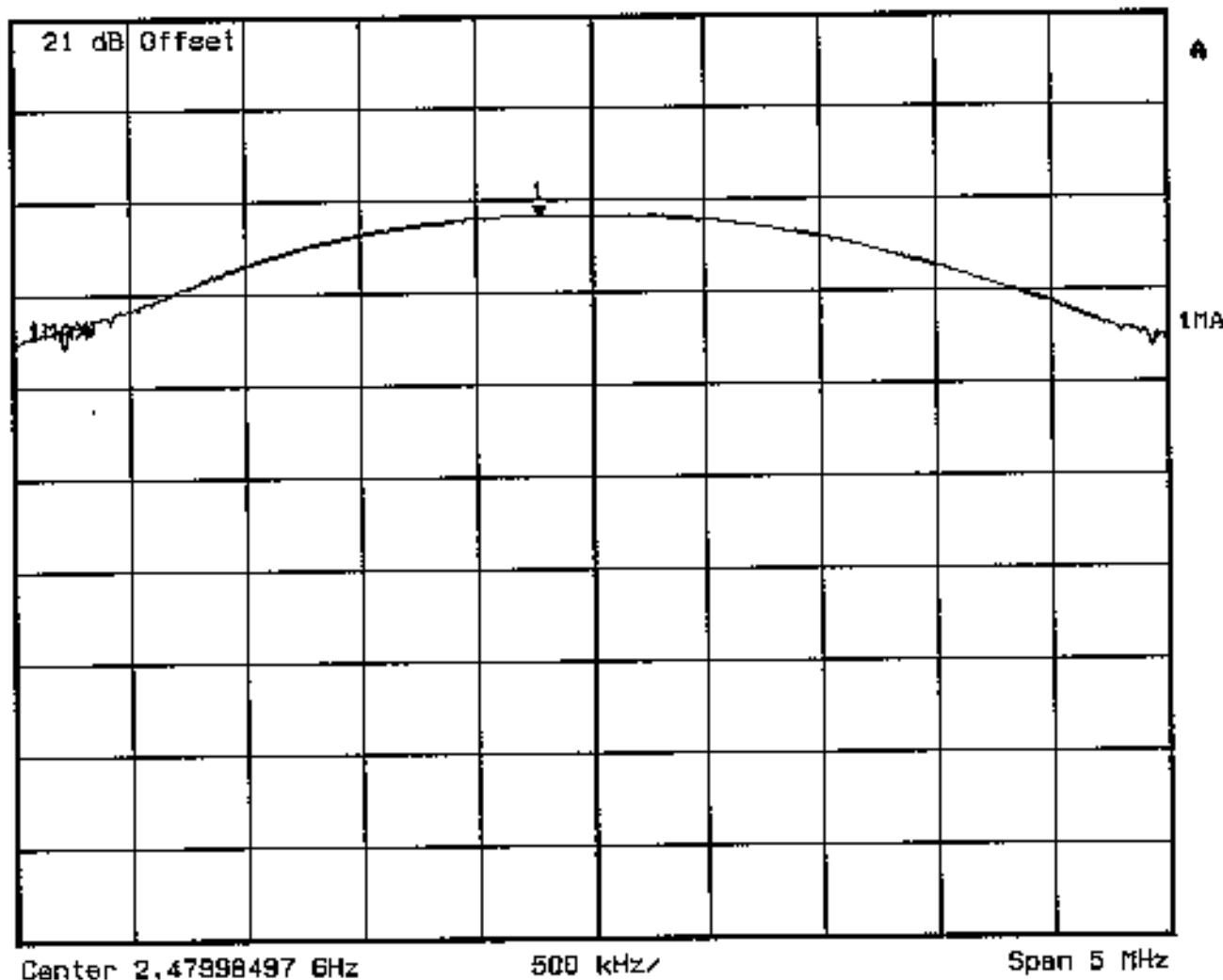
Title: Peak Output Power FCC Part 15.247(b)
Comment At: Tested For RED-M by RFI Ltd EUT:Palm V Clip-on ENG:ND
OpCond: Bottom Channel GPH/42145/06
Date: 20.APR.2001 11:31:13

Marker 1 [T1] RBW 2 MHz RF Att 20 dB
Ref Lvl 703.526 μ W VBW 2 MHz
100 mW 2.44081764 GHz SWT 5 ms Unit W



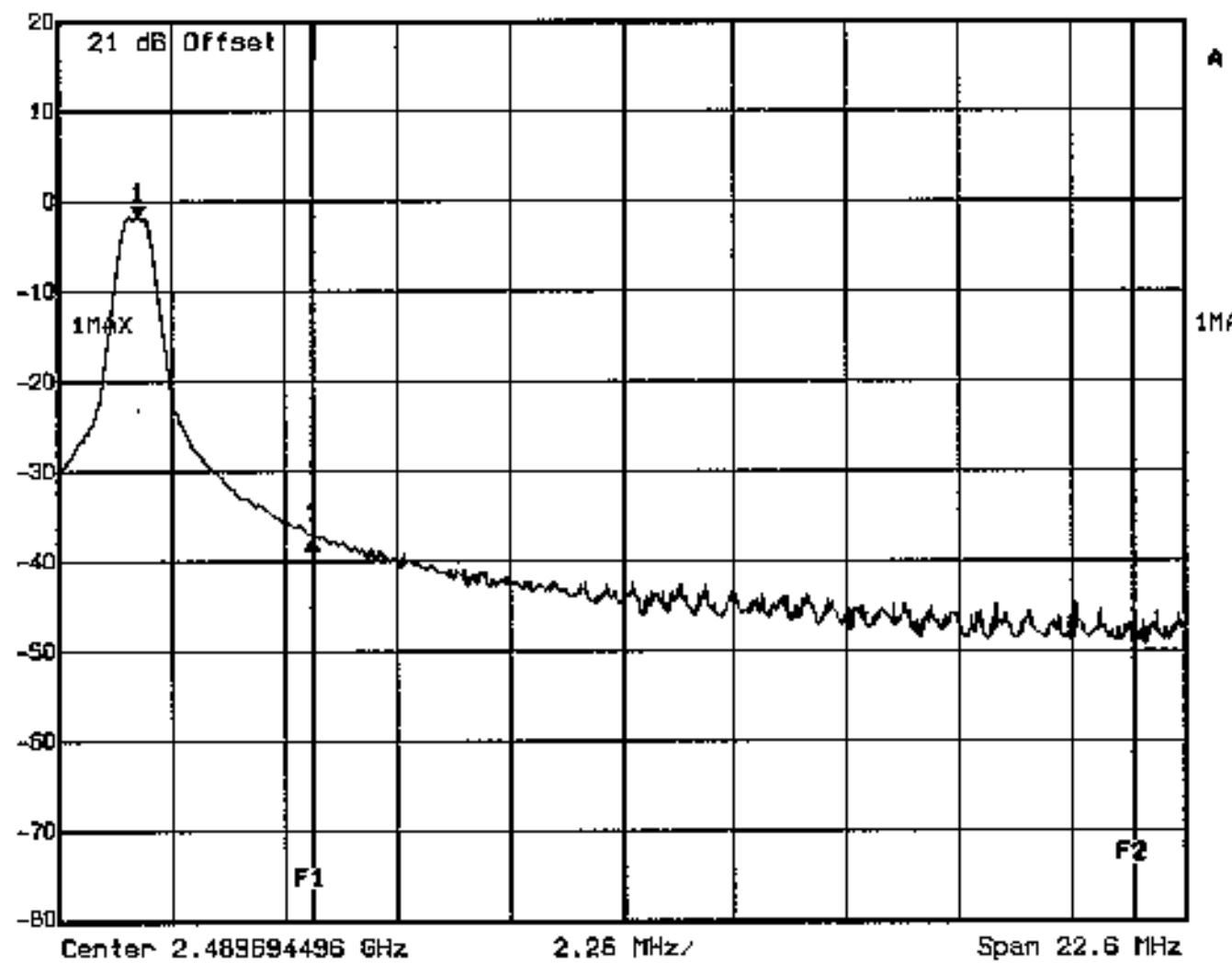
Title: Peak Output Power FCC Part 15.247(b)
Comment A: Tested For RED-M by RFI Ltd EUT:Palm V Clip-on ENG:ND
OpCond: Middle Channel1 GPH/42145/07
Date: 20.APR.2001 11:41:39

Marker 1 (T1) 667.957 μ W 2 MHz RF Att 20 dB
Ref Lvl 100 mW 2.47976954 GHz VBW 2 MHz Unit W
SWT 5 ms

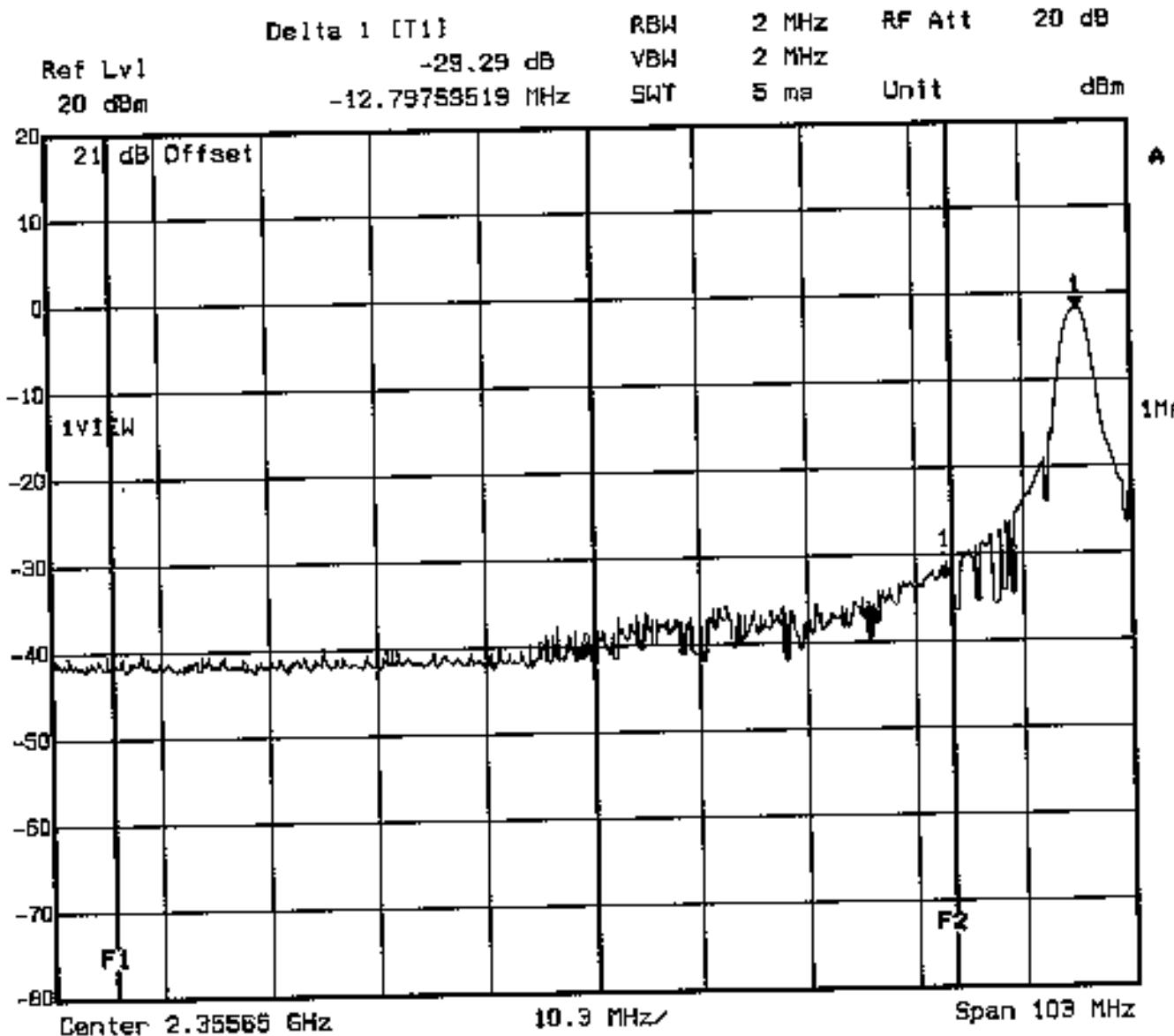


Title: Peak Output Power FCC Part 15.247(b)
Comment A: Tested For RED-M by RFI Ltd EUT: Palm V Clip-on ENG:ND
OpCond: Top Channel GPH/42145/08
Date: 20.APR.2001 11:52:16

Delta 1 [T1] -36.52 dB
Ref Lv] 20 dBm 3.48737475 MHz RBW 300 kHz RF Att 20 dB
20 dBm SWT 5 ms Unit dBm



Title: Band Edge Compliance FCC Part 15.247(c)
Comment A: Tested For RED-M by RFI Ltd EUT:Palm V Clip-on ENG:ND
OpCond: Top Channel F1/F2 Show Restricted Band SPH/42146/09
Date: 20.APR.2001 12:07:48



Title: Band Edge Compliance FCC Part 15.247(c)
 Comment A: Tested For RED-M by RFI Ltd EUT:Palm V Clip-on ENG:ND
 OpCond: Bottom Channel F1/F2 Show Restricted Band GPH/42145/10
 Date: 20.APR.2001 12:21:34

RADIO FREQUENCY INVESTIGATION LTD.

EMC Department

Test Of: Red-M (Communications) Ltd.

Bluetooth Clip-On For Palm Vx (code no. 0400-001)

To: F.C.C. Part 15 Subpart C: 1998 (Intentional Radiators) Section 15.247

TEST REPORT

S.No: RFI/EMCB1/RP42145B

Page 51 of 52

Issue Date: 05 June 2001

Appendix 5. Photographs of EUT

This appendix contains the following photographs:

Photo Reference Number	Title
PHT/42145JD02/001	Rear view of conducted emissions.
PHT/42145JD02/002	Side view of conducted emissions.
PHT/42145JD02/003	Front view of radiated emissions.
PHT/42145JD02/004	Rear view of radiated emissions.

These pages are not included in the total number of pages for this report.

RADIO FREQUENCY INVESTIGATION LTD.

EMC Department

Test Of: **Red-M (Communications) Ltd.**

Bluetooth Clip-On For Palm Vx (code no. 0400-001)

To: **F.C.C. Part 15 Subpart C: 1998 (Intentional Radiators) Section 15.247**

TEST REPORT

S.No: RFI/EMCB1/RP42145B

Page 52 of 52

Issue Date: 05 June 2001

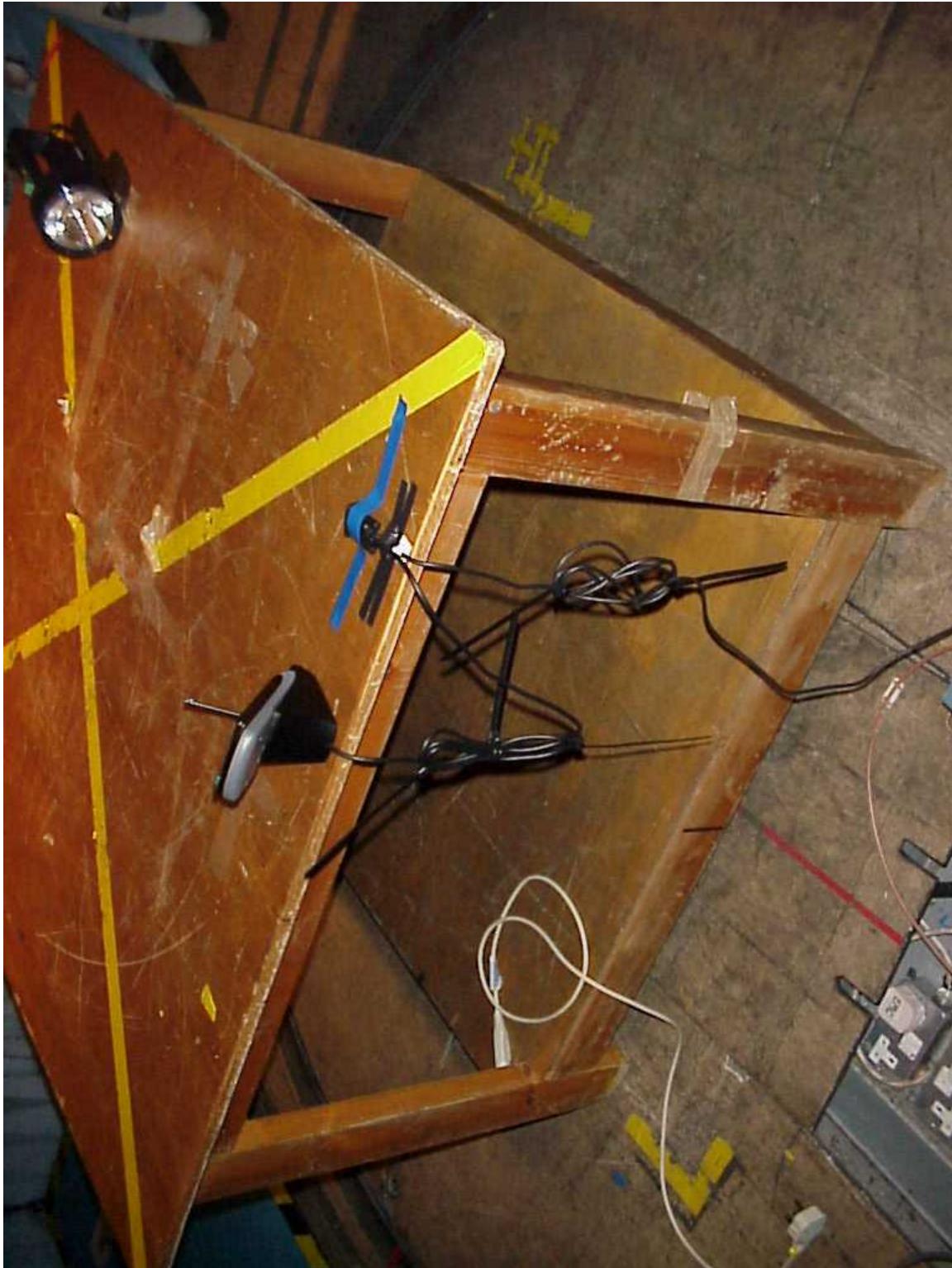
This page has been left intentionally blank.

Test Of: Red-M (Communications) Ltd.

Bluetooth Clip-On For Palm Vx (code no. 0400-001)

To: F.C.C. Part 15 Subpart C: 1998 (Intentional Radiators) Section 15.247

PHT/42145JD02/001 Rear view of conducted emissions.

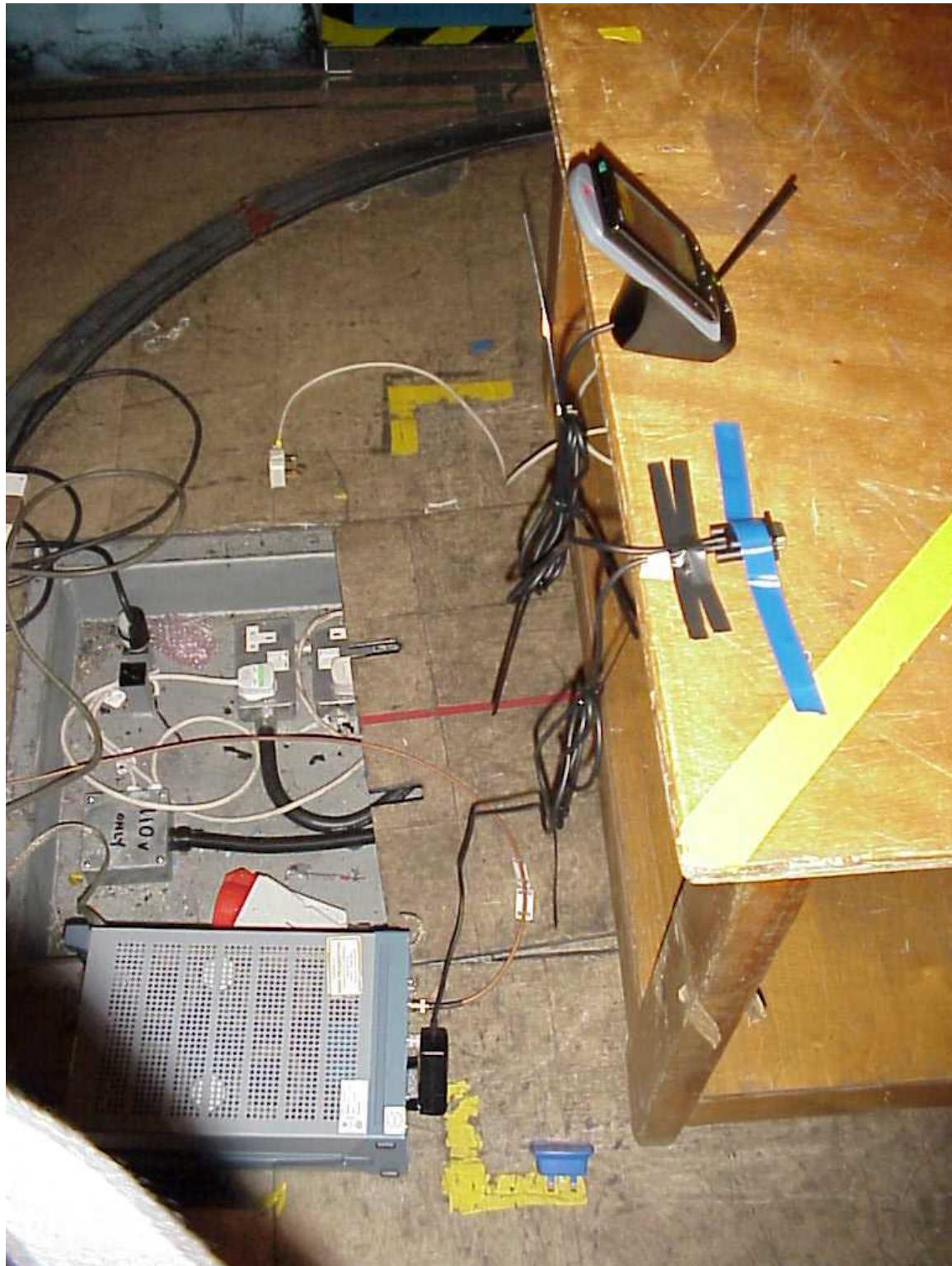


Test Of: Red-M (Communications) Ltd.

Bluetooth Clip-On For Palm Vx (code no. 0400-001)

To: F.C.C. Part 15 Subpart C: 1998 (Intentional Radiators) Section 15.247

PHT/42145JD02/002 Side view of conducted emissions.



Test Of: Red-M (Communications) Ltd.

Bluetooth Clip-On For Palm Vx (code no. 0400-001)

To: F.C.C. Part 15 Subpart C: 1998 (Intentional Radiators) Section 15.247

PHT/42145JD02/003 Front view of radiated emissions.



Test Of: Red-M (Communications) Ltd.

Bluetooth Clip-On For Palm Vx (code no. 0400-001)

To: F.C.C. Part 15 Subpart C: 1998 (Intentional Radiators) Section 15.247

PHT/42145JD02/004 Rear view of radiated emissions.

