EMC Measurement/Technical Report

on

Motorola Bluetooth PCMCIA Card BTPCM101

Report Reference: 4-F0003a/00

7 Layers AG
Borsigstr. 11
40880 Ratingen
Germany

Table of Contents

0 Summary

0.1 Technical Report Summary

Type of Authorization

Certification for an Intentional Radiator (Frequency Hopping Spread Spectrum)

Applicable FCC Rules:

Prepared in accordance with the requirements of FCC Rules and Regulations as listed in 47 CFR Ch.1 Parts 0 to 19 (10-1-98 Edition). The following subparts are applicable to the results in this test report.

Part 2, Subpart J - Equipment Authorization Procedures, Certification Sections

Part 15, Subpart C - Intentional Radiators

- § 15.201 Equipment authorization requirement
- § 15.203 Antenna requirements
- § 15.207 Conducted limits
- § 15.209 Radiated emission limits; general requirements
- § 15.247 Operation within the bands 902-928 MHz, 2400-2483,5 MHZ and 5725-5850 MHz

Note:
The tests were selected and performed with reference to the FCC Public Notice DA 00-705, released March 30, 2000

Summary Test Results:

The chapter §15.207 is not applicable for this device.
It has no connection to the public AC mains.

The EUT complied with all the applicable FCC rules as listed above.

0.2 Measurement Summary

FCC Part 15, Subpart C § 15.247 (a) (1) (ii)

Occupied Bandwidth

The measurement was performed according to ANSI C63.4 1992

OP-Mode	Setup	Port	Final Result
op-mode 1	setup 1	Antenna Port	passed
op-mode 2	setup 1	Antenna Port	passed
op-mode 3	setup 1	Antenna Port	passed

FCC Part 15, Subpart C § 15.247 (b) (1)

Peak Power Output

The measurement was performed according to FCC §15.31 10-1-1998

OP-Mode	Setup	Port	Final Result
op-mode 1	setup 1	Antenna Port	passed
op-mode 2	setup 1	Antenna Port	passed
op-mode 3	setup 1	Antenna Port	passed

FCC Part 15, Subpart C § 15.247 (c)

Spurious RF Conducted Emissions

The measurement was performed according to FCC §15.31 10-1-1998

OP-Mode	Setup	Port	Final Result
op-mode 1	setup 1	Antenna Port	passed
op-mode 2	setup 1	Antenna Port	passed
op-mode 3	setup 1	Antenna Port	passed

FCC Part 15, Subpart C § 15.247 (c), §15.35 (b), § 15.209

Spurious Radiated Emissions

The measurement was performed according to ANSI C63.4 1992

OP-Mode	Setup	Port	Final Result
op-mode 1	setup 2	enclosure	passed
op-mode 2	setup 2	enclosure	passed
op-mode 3	setup 2	enclosure	passed

Responsible for Accreditation Scope: _____ Responsible for Test Report: _____

1. Administrative Data

1.1 Testing Laboratory

Company Name:	7 Layers AG
Address:	Borsigstr. 11 40880 Ratingen Germany

This facility has been fully described in a report submitted to the FCC and accepted in a letter dated February 07, 2000 under the registration number 96716 .

The test facility is also accredited by the following accreditation organisation:

- Deutscher Akkreditierungs Rat DAR-Registration no. TTI-P-G 178/99-1

- Regulierungsbehörde für Telekommunikation und Post (Reg TP)

Responsible for Accreditation Scope: Dipl.-Ing Bernhard Retka
Dipl.-Ing Arndt Stöcker

1.2 Project Data

Project Leader:	Marco Kullik
Receipt of EUT:	25.04.00
Date of Test(s):	25.04. - 12.05.00
Date of Report:	17.05.00
No. of Pages in Annex:	10

1.3 Applicant Data

Company Name:	Digianswer A/S
Address:	Skalhuse 5 DK-9240 Nibe Denmark
Contact Person:	Tom Ringtved

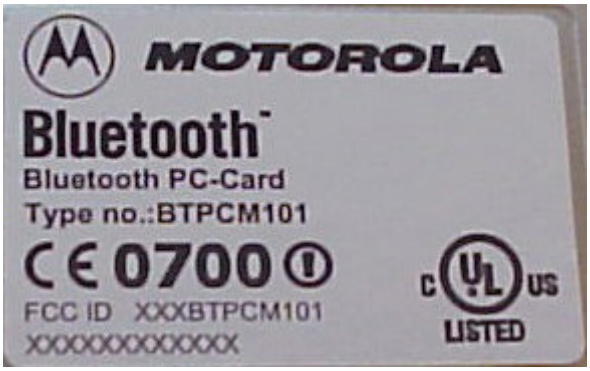
1.4 Manufacturer Data

Company Name:	Eloqtec Network Corporation
Address:	Lohja Plants - Gunnarlankatu P.O.Box 47 FIN-08101 Lohja Finland
Contact Person:	Teemu Melin

2.0 Product Labeling

2.1 FCC ID Label:

All devices authorized under the certification procedures are required todisplay an identification label showing the FCC identifier (FCC ID) under which they are authorized.



2.2 Location of Label on the EUT:

The label shall be located in a conspiciuous place on the device consistent with the requirements of section 15.19 of FCC CFR 47.

For this device it will be the topside.

3. Testobject Data

3.1 General EUT Description

Equipment under Test:	Motorola Bluetooth PCMCIA Card
Type Designation:	BTPCM101
Kind of Device: (optional)	
Voltage Type:	DC
Voltage level:	5,0 V

General product description

Bluetooth is a short-range radio link intended to be a cable replacement between portable and/or fixed electronic devices.

Bluetooth operates in the unlicensed ISM Band at 2.4 GHz. In the US a band of 83.5 MHz width is available. In this band, 79 RF channels spaced 1MHz apart a defined. The channel is represented by a pseudo-random hopping sequence through the 79 channels. The channel is devided into time slots, with a nominal slot length of 625µs, where each slot corresponds to different RF hop frequencies. The nominal hop rate is 1600 hops/s. All frequencies are equally used. The average time of occupancy is 0.3797 s within a 30 second period.
The symbol rate on the channel is 1 Ms/s.
The maximum output power, including antenna gain, is 23 dBm.

The EUT provides the following ports:

Ports
Antenna Port
Enclosure

The main components of EUT are listed and described in Chapter 2.2

3.2 EUT Main components:
Type, S/N, Short Descriptions etc. used in this Test Report

Short Description	Equipment under Test	Type Designation	Serial No.	HW Status	SW Status	Date of Receipt
EUT A	Bluetooth PCMCIA Card	BTPCM101	00003A	DIG8044240	PC Card Firmware - release 1.00	25.04.00
This EUT was equipped with a temporary antenna port.						
EUT B	Bluetooth PCMCIA Card	BTPCM101	00003E	DIG8044240	PC Card Firmware - release 1.00	25.04.00
This EUT is equipped witht two integral antennas. One patch antenna and one PCB antenna. The PCB antenna has a maximum gain of 2.52 dBi and the patch antenna has a maximum gain of 2.17 dBi. Only one antenna can be active at the same time. The antennas are not detachable.						

NOTE: The short descrption is used to simplify the identification of the EUT in this test report

3.3 Ancillary Equipment

For the purposes of this test report,: ancillary equipment is defined as equipment which is used in conjunction with the EUT to provide additional operational and control features to the EUT. It is necessary to configure the system in a typical fashion, as a customer would normally use it.

Short Description	Equipment under Test	Type Designation	HW Status	SW Status	Serial No.	FCC Id
AE 1	Laptop	IBM 2626	-	-	55-3211P 99/09	-
AE 2	Laptop	HP Omnibook XE2	-	-	TW95004702	-

3.4 EUT Setups

This chapter describes the combination of EUT's and ancillary equipment used for testing.

Setup No.	Combination of EUTs	Description
setup 1	EUT A + AE 2	For all conducted measurements
setup 2	EUT B + AE 1	For all radiated measurements

3.5 Operating Modes

This chapter describes the operating modes of the EUT's used for testing in this test report.

Op. Mode	Description of Operating Modes	Remarks
op-mode 1	Transmitting DH1 packets at 2401 MHz (Channel B)	without hopping
op-mode 2	Transmitting DH1 packets at 2441 MHz (Channel M)	without hopping
op-mode 3	Transmitting DH1 packets at 2480 MHz (Channel T)	without hopping

4. Measurement Results

4. 1 Occupied Bandwidth

Standard FCC Part 15, Subpart C 10-1-98

The test was performed according to: ANSI C63.4 1992

4. 1 .1 Test Description

The test set-up was made in accordance to the general provisions of ANSI C63.4-1992.

The Equipment Under Test (EUT) was setup in a shielded room to perform the occupied bandwidth measurements.

The reference level is the level of the highest amplitude signal observed from the transmitter at either the fundamental frequency or first-order modulation products in all typical modes of operation, including the unmodulated carrier, even if atypical.

The results recorded were measured with the modulation which produce the worst-case (widest) occupied bandwidth.

The resolution bandwidth for measuring the reference level and the occupied bandwidth was 10 kHz.

The reference level of the spectrum analyser was set equal to the reference level of the EUT.

4. 1 .2 Test Limits

FCC Part 15, Subpart C, §15.247 (a) (1) (ii)
(1) Frequency hopping systems operating in the 2400 - 2483.5 MHz band should use at least 75 hopping frequencies.
(2) The average time of occupancy on any frequency should not be greater than 0.4 seconds within a 30 second period.
(3) The maximum 20 dB bandwidth of the hopping channel is 1MHz.

4. 1 .3 Test Protocol

Temperature: 28,5 °C
Air Pressure: 1014hPa
Humidity: 39 %

Op. Mode	Setup	Port	Test Parameter
op-mode 1	setup 1	Antenna Port	

20 dB Bandwidth MHz	Remarks
0,84971	

Remark:

Temperature: 28,5 °C
Air Pressure: 1014 hPa
Humidity: 39 %

Op. Mode	Setup	Port	Test Parameter
op-mode 2	setup 1	Antenna Port	

20 dB Bandwidth MHz	Remarks
0,84168	

Remark:

Temperature: 28,5 °C
Air Pressure: 1014 hPa
Humidity: 39 %

Op. Mode	Setup	Port	Test Parameter
op-mode 3	setup 1	Antenna Port	

20 dB Bandwidth MHz	Remarks
0,72144	

Remark:

4.1 .3 Test result: Occupied Bandwidth

FCC Part 15, Subpart C	Op. Mode	Setup	Port	Result
	op-mode 1	setup 1	Antenna Port	**passed**
	op-mode 2	setup 1	Antenna Port	**passed**
	op-mode 3	setup 1	Antenna Port	**passed**

4.2 Peak Power Output

Standard FCC Part 15, Subpart C 10-1-98

The test was performed according to: FCC §15.31 10-1-1998

4.2.1 Test Description

The Equipment Under Test (EUT) was set up in a shielded room to perform the output power measurements.

The results recorded were measured with the modulation which produces the worst-case (highest) output power.

The resolution bandwidth for measuring the output power was 3 MHz.

The reference level of the spectrum analyser was set equal to the output power of the EUT.

The EUT was connected to the spectrum analyzer via a short coax cable (Type: Rosenberger RTK 161, 1m, SMA connectors), with a known loss.

4.2.2 Test Limits

FCC Part 15, Subpart C, §15.247 (b) (1)
(1) For frequency hopping systems operating in the band 2400 - 2483,5 MHz or 5725 - 5850 MHz and for all direct sequence systems: 1 Watt

Used conversion factor: Limit (dBm) = 10 log (Limit (W)/1mW)

==> Maximum Output Power: 30 dBm

4.2.3 Test Protocol

Temperature: 28,5 °C
Air Pressure: 1014 hPa
Humidity: 39 %

Op. Mode	Setup	Port	Test Parameter
op-mode 1	setup 1	Antenna Port	

Output Power dBm	Remarks
16,36	

Remark:

Temperature: 28,5 °C
Air Pressure: 1014 hPa
Humidity: 39 %

Op. Mode	Setup	Port	Test Parameter
op-mode 2	setup 1	Antenna Port	

Output Power dBm	Remarks
15,85	

Remark:

Temperature: 28,5 °C
Air Pressure: 1014 hPa
Humidity: 39 %

Op. Mode	Setup	Port	Test Parameter
op-mode 3	setup 1	Antenna Port	

Output Power dBm	Remarks
15,85	

Remark:

4.2 .3 Test result: Peak Power Output

FCC Part 15, Subpart C	Op. Mode	Setup	Port	Result
	op-mode 1	setup 1	Antenna Port	**passed**
	op-mode 2	setup 1	Antenna Port	**passed**
	op-mode 3	setup 1	Antenna Port	**passed**

4.3 Spurious RF Conducted Emissions

Standard FCC Part 15, Subpart C 10-1-98

The test was performed according to: FCC §15.31 10-1-1998

4. 3 .1 Test Description

The Equipment Under Test (EUT) was set up in a shielded room to perform the output power measurements

The EUT was connected to spectrum analyzer via a short coax cable (Type: Rosenberger RTK 161, 1m, SMA connectors), with a known loss.

Analyser settings:
- Detector: Peak-Maxhold
- Frequency range: 30 – 25000 MHz
- Resolution Bandwidth (RBW): 100 kHz
- Video Bandwidth (VBW): 100 kHz
- Sweep Time: Coupled

The reference level of the spectrum analyser was set equal to the reference level of the EUT.

4. 3 .2 Test Limits

FCC Part 15, Subpart C, §15.247(c)
(1) All harmonics/spurs must be at least 20dB below the highest emission level within the authorized band as measured with a 100kHz RBW, based on either RF conducted or radiated measurement.

4. 3 .3 Test Protocol

Temperature: 28,5 °C
Air Pressure: 1014 hPa
Humidity: 39 %

Op. Mode	Setup	Port	Test Parameter
op-mode 1	setup 1	Antenna Port	

Frequency MHz	Measured Value dBm	Correction Factor dB	Corrected Value	Reference Value dB	Limit dBm	Delta to Limit dB
4783,80	-47,40	1,30	-46,10	16,50	-3,50	-95,40

Remark: No other Spurious Emission found above noise level

Temperature: 28,5 °C
Air Pressure: 1014 hPA
Humidity: 39 %

Op. Mode	Setup	Port	Test Parameter
op-mode 2	setup 1	Antenna Port	

Frequency MHz	Measured Value dBm	Correction Factor dB	Corrected Value	Reference Value dB	Limit dBm	Delta to Limit dB
4883,80	-46,70	1,30	-45,40	15,60	-4,40	41,00

Remark: No other Spurious Emission found above noise level

Temperature: 28,5 °C
Air Pressure: 1014 hPa
Humidity: 39 %

Op. Mode	Setup	Port	Test Parameter
op-mode 3	setup 1	Antenna Port	

Frequency MHz	Measured Value dBm	Correction Factor dB	Corrected Value	Reference Value dB	Limit dBm	Delta to Limit dB
4933,90	-36,70	1,30	-35,40	15,90	-4,10	31,30

Remark: No other Spurious Emission found above noise level

4.3 .3 Test result: Spurious RF Conducted Emissions

FCC Part 15, Subpart C	Op. Mode	Setup	Port	Result
	op-mode 1	setup 1	Antenna Port	**passed**
	op-mode 2	setup 1	Antenna Port	**passed**
	op-mode 3	setup 1	Antenna Port	**passed**

4.4 Spurious Radiated Emissions

Standard FCC Part 15, Subpart C 10-1-98

The test was performed according to: ANSI C63.4 1992

4. 4 .1 Test Description

The test set-up was made in accordance to the general provisions of ANSI C63.4-1992.

The Equipment Under Test (EUT) was set up on a non-conductive table 1.0 x 2.0 m in the semi-anechoic chamber. The test was performed at an EUT to receiving antenna distance of 3m.
The radiated emissions measurements was made in a typical installation configuration.

The measurement procedure consists of four steps. It is implemented into EMI test software ES-K1 from R&S.

Step 1: Preliminary scan
Preliminary test to identify the highest amplitudes relative to the limit.
Settings for step 1:
- Detector: Peak-Maxhold
- Frequency range: 30 – 1000 MHz
- Frequency steps: 60 kHz
- IF–Bandwidth: 120 kHz
- Measuring time / Frequency step: 100 µs
- Turntable angle range: –180 to 180 °
- Turntable stepsize: 90°
- Height variation range: 1 – 3m
- Height variation stepsize: 2m
- Polarisation: Horizontal + Vertical

Intention of this step is, to determine the radiated EMI-profile of the EUT. With this data, the test system performs (to reduce the number of final measurements) a data reduction with the following parameters:

- Offset for acceptance analysis: Limit line – 10 dB
- Maximum number of final measurements: 12

Step 2:
With the frequencies determined in step 1, an additional measurement with the following settings will be performed. Intention of this step is, to find out the approximate turntable angle and antenna height for each frequency.

Settings for step 2:
- Detector: Peak – Maxhold
- Measured frequencies: in step 1 determined frequencies
- IF – Bandwidth: 120 kHz
- Measuring time: 100ms
- Turntable angle range: –180 to 180 °
- Turntable stepsize: 45°
- Height variation range: 1 – 5m
- Height variation stepsize: 0,5m
- Polarisation: horizontal + vertical

After this step the EMI test system has determined the following values for each frequency (of step 1):
- Frequency
- Azimuth value (of turntable)
- Antenna height

The last two values have now the following accuracy:
- Azimuth value (of turntable): 45°
- Antenna height: 0,5m

Step 3:
In this step the accuracy of the turntable azimuth and antenna height will be improved. This is necessary to find out the maximum value of every frequency.

For each frequency the turntable azimuth and antenna height, which was determined in step 3, will be adjusted.
The turntable azimuth will be slowly varied by +/- 22,5° around this value. During this action the value of emission is continuously measured. The turntable azimuth at the highest emission will be recorded and adjusted. In this position the antenna height is also slowly varied by +/- 25 cm around the antenna height determined in step 3. During this action the value of emission is also continuously measured. The antenna height of the highest emission will also be recorded and adjusted.

Settings for step 3:
- Detector: Peak – Maxhold
- Measured frequencies: in step 1 determined frequencies
- IF – Bandwidth: 120 kHz
- Measuring time: 100ms
- Turntable angle range: –22,5° to + 22,5 ° around the value determined in step 2
- Height variation range: -0,25m to + 0,25m around the value determined in step 2

Step 4:
With the settings determined in step 3, the final measurement will be performed:
EMI receiver settings for step 4:
- Detector: Quasi-Peak(< 1GHz)
- Measured frequencies: in step 1 determined frequencies
- IF – Bandwidth: 120 kHz
- Measuring time: 1s

The following modfications apply to the measurement procedure for the frequency range
above 1 GHz:
The measurement distance was reduced to 1m. The results were extrapolated by the extrapolation factor of 20 dB/decade (invers linear-distance for field strength measurements, invers linear-distance squared for the power reference level measurements). Due to the fact that in this frequency range a double ridged wave guided horn antenna (up to 18 Ghz) and a horn antenna (18-25 GHz) are used, the steps 2-4 are omitted. Step 1 was performed with one height of the receiving antenna only.
Detector: Peak, Average
RBW = VBW = 1 MHz, above 7 GHz 100 kHz

After the measurement a plot will be generated which contains a diagram with the results of the preliminary scan and a chart with the frequencies and values of the results of the final measurement.

4. 4 .2 Test Limits

FCC Part 15, Subpart C, §15.247(c)
(2) A radiated emission test applies to harmonic/spurs that fall in the restricted bands as listed in § 15.205(a). The maximum permitted QP (< 1GHz) and average (> 1GHz) field strength is listed in § 15.209(a).
(3)
FCC Part 15, Subpart C, §15.209, Radiated Emission Limits

Frequency Range (MHz):	Class B Limit (dBµV/m)
30 – 88	40,0
88 – 216	43,5
216 – 960	46,0
above 960	54,0

§15.35(b)
..., there is also a limit on the radio frequency emissions, as measured using instrumentation with a peak detector function, corresponding to 20 dB above the maximum permitted average limit....

Used conversion factor: Limit (dBµV/m) = 20 log (Limit (µV/m)/1µV/m)

4. 4 .3 Test Protocol

Temperature: 27,5 °C
Air Pressure: 1014 hPa
Humidity: 39 %

Op. Mode	Setup	Port	Test Parameter
op-mode 1	setup 2	enclosure	

Polarisation	Frequency MHz	Corrected Value dBµV/m			Limit QP/AV dBµV/m	Limit Peak dBµV/m	Delta to AV/QP Limit/dB	Delta to Peak Limit dB
		QP	Peak	AV				
Horizontal	608,00	45,20			46,00		0,80	
Horizontal	1201,00		45,00	40,40	54,00	74,00	13,60	29,00
Horizontal	3870,50		53,00	44,50	54,00	74,00	9,50	21,00
Horizontal	4804,00		56,00	47,90	54,00	74,00	6,10	18,00
Vertical	1146,50		43,70	35,20	54,00	74,00	18,80	30,30

Remark: No other Spurious Emission found above noise level

Temperature: 28,5 °C
Air Pressure: 1014 hPa
Humidity: 39 %

Op. Mode	Setup	Port	Test Parameter
op-mode 2	setup 2	enclosure	

Polarisation	Frequency MHz	Corrected Value dBµV/m			Limit QP/AV dBµV/m	Limit Peak dBµV/m	Delta to AV/QP Limit/dB	Delta to Peak Limit dB
		QP	Peak	AV				
Horizontal	204,00	38,00			46,00		8,00	
Horizontal	608,00	44,80			46,00		1,20	
Horizontal	1240,00		50,50	48,60	54,00	74,00	5,40	23,50
Horizontal	3270,00		53,50	49,20	54,00	74,00	4,80	20,50
Horizontal	3870,00		51,90	43,00	54,00	74,00	11,00	22,10

Remark: No other Spurious Emission found above noise level

Temperature: 28,5 °C
Air Pressure: 1014 hPa
Humidity: 39 %

Op. Mode	Setup	Port	Test Parameter
op-mode 3	setup 2	enclosure	

Polarisation	Frequency MHz	Corrected Value dBµV/m			Limit QP/AV dBµV/m	Limit Peak dBµV/m	Delta to AV/QP Limit/dB	Delta to Peak Limit dB
		QP	Peak	AV				
Horizontal	608,00	44,60			46,00		1,40	
Horizontal	1220,00		52,90	40,40	54,00	74,00	13,60	21,10
Horizontal	3870,00		53,00	44,90	54,00	74,00	9,10	21,00
Horizontal	4880,00		52,70	46,20	54,00	74,00	7,80	21,30
Horizontal	7320,00		50,10	42,70	54,00	74,00	11,30	23,90
Vertical	3660,00		53,30	42,90	54,00	74,00	11,10	20,70

Remark: No other Spurious Emission found above noise level

4.4 .3 Test result: Spurious Radiated Emissions

FCC Part 15, Subpart C	Op. Mode	Setup	Port	Result
	op-mode 1	setup 2	enclosure	**passed**
	op-mode 2	setup 2	enclosure	**passed**
	op-mode 3	setup 2	enclosure	**passed**

5. Testequipment

EMI Test System

Equipment	Type	Serial No.	Manufacturer	Cal due
EMI Analyzer	ESI 26	830482/004	Rohde & Schwarz	29.06.2000
Signal Generator	SMR 20	846834/008	Rohde & Schwarz	26.07.2002
Comparison Noise Emitter	CNE III	99/016	York	04.05.2001

EMI Radiated Auxiliary Equipment

Equipment	Type	Serial No.	Manufacturer	Cal due
High Pass Filter	4HC1600/12750-1.	9942011	Trilithic	02.11.2000
Loop Antenna	HFH2-Z2	829324/006	Rohde & Schwarz	16.06.2001
Cable "ESI to Horn Antenna"	RTK 081	W18.04+3599/001	Rosenberger	15.06.2000
Double-ridged horn	HF 906	357357/002	Rohde & Schwarz	18.05.2001
Double-ridged horn	HF 906	357357/001	Rohde & Schwarz	18.05.2001
Broadband Amplifier 45MHz-27GHz	JS4-00102600-42-5	619368	Miteq	
Log.-per. Antenna	HL 562 Ultralog	830547/003	Rohde & Schwarz	04.10.2001
High Pass Filter	5HC2700/12750-1.	9942012	Trilithic	02.11.2000
Pyramidal Horn Antenna 26,5 GHz	Model 3160-09	9910-1184	EMCO	22.08.2001
Cable "ESI to EMI Antenna"	RTK081+Aircell7	W18.01+W38.01a	Huber+Suhner	15.06.2000
Biconical dipole	VUBA 9117	9117108	Schwarzbeck	03.06.2001

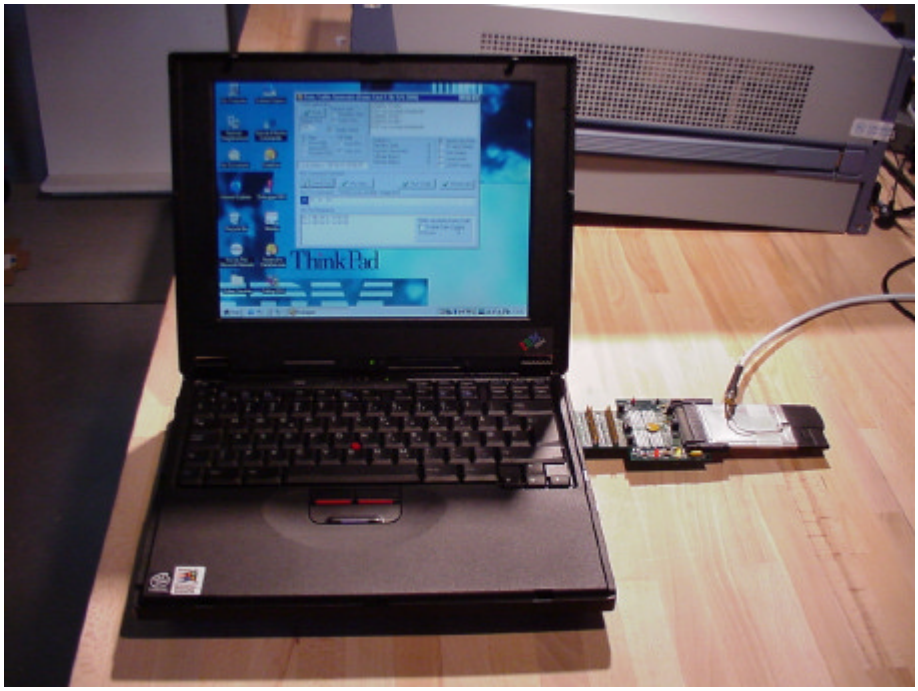
EMI Conducted Auxiliary Equipment

Equipment	Type	Serial No.	Manufacturer	Cal due
Two-Line V-Network	ESH 3-Z5	828304/029	Rohde & Schwarz	22.06.2000
Cable "LISN to ESI"	RG214	W18.03+W48.03	Huber+Suhner	15.06.2000
Two-Line V-Network	ESH 3-Z5	829996/002	Rohde & Schwarz	22.06.2000

Auxiliary Test Equipment

Equipment	Type	Serial No.	Manufacturer	Cal due
Digital Multimeter 02	Voltcraft M-3860M	IJ095955	Conrad	03.06.2000
Digital Oscilloscope	TDS 784C	B021311	Tektronix	26.05.2000
Digital Multimeter 01	Voltcraft M-3860M	IJ096055	Conrad	03.06.2000
Fibre optic link Transceiver	FO RS232 Link	182-018	Pontis	
Notch Filter ultra stable	WRCA800/960-6EE	24	Wainwright	
Broadband Resist. Power Divider SMA	1515 / 93459	LN673	Weinschel	
Broadband Resist. Power Divider N	1506A / 93459	LM390	Weinschel	
Signal Generator	SMIQ 03B	832492/061	Rohde & Schwarz	09.11.2000
I/Q Modulation Generator	AMIQ-B1	832085/018	Rohde & Schwarz	27.10.2000
Temperature Chamber	VT 4002	58566002150010	Vötsch	
Fibre optic link Satellite	FO RS232 Link	181-018	Pontis	

4. Photo Report

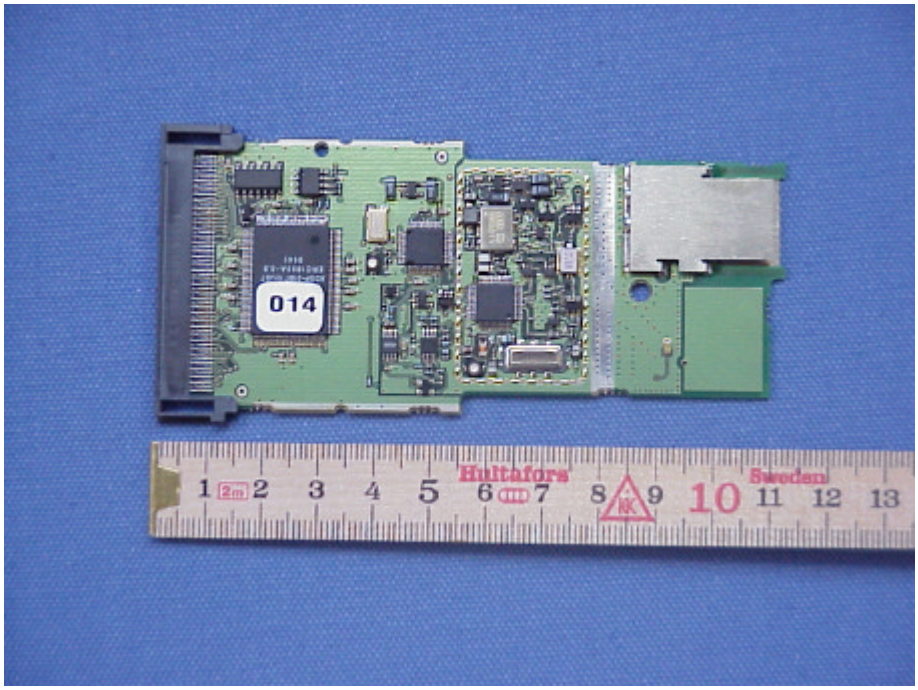


Picture 1 : RF Conducted Test set-up

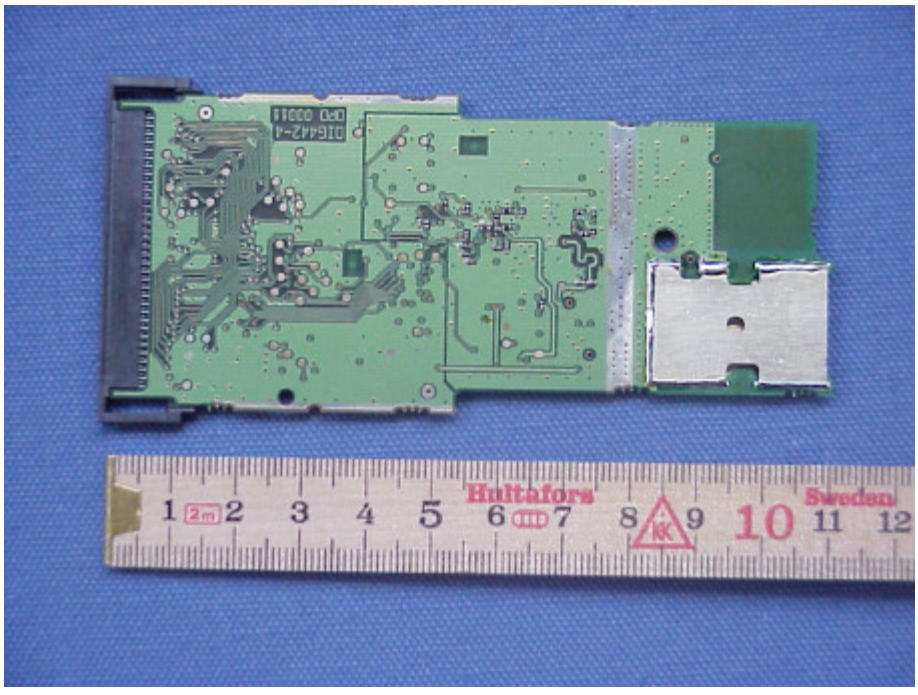
Picture 2 : RF Radiated Test set-up

Picture 3 : RF Radiated Test set-up (Detail view)

Picture 4 : PCMCIA Card Frontside

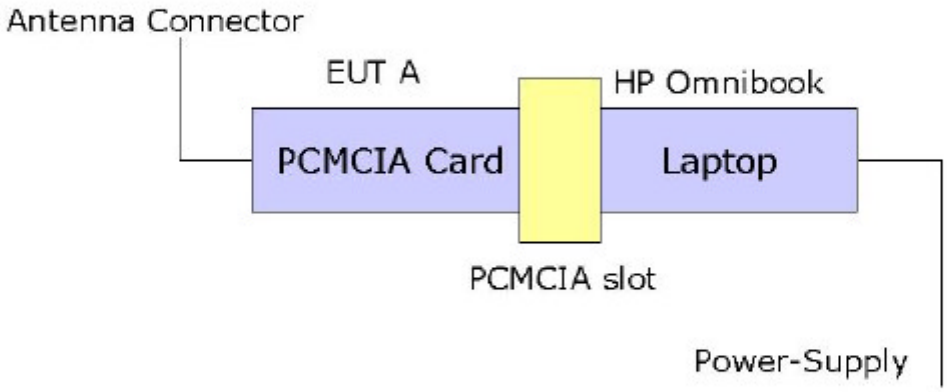


Picture 5 : PCMCIA Card Enclosure removed (PCB Frontside)

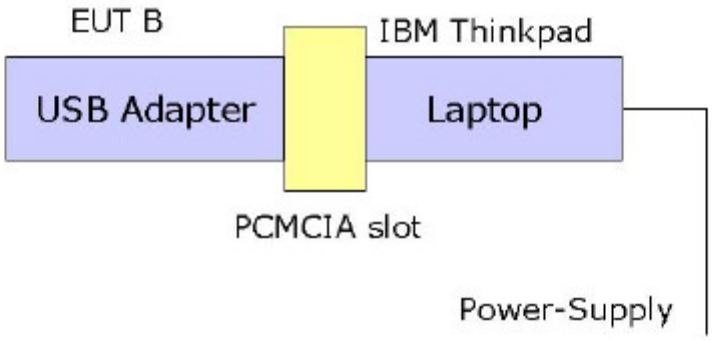


Picture 6 : PCMCIA Card Enclosure removed (PCB Rearside)

7. Setup Drawings



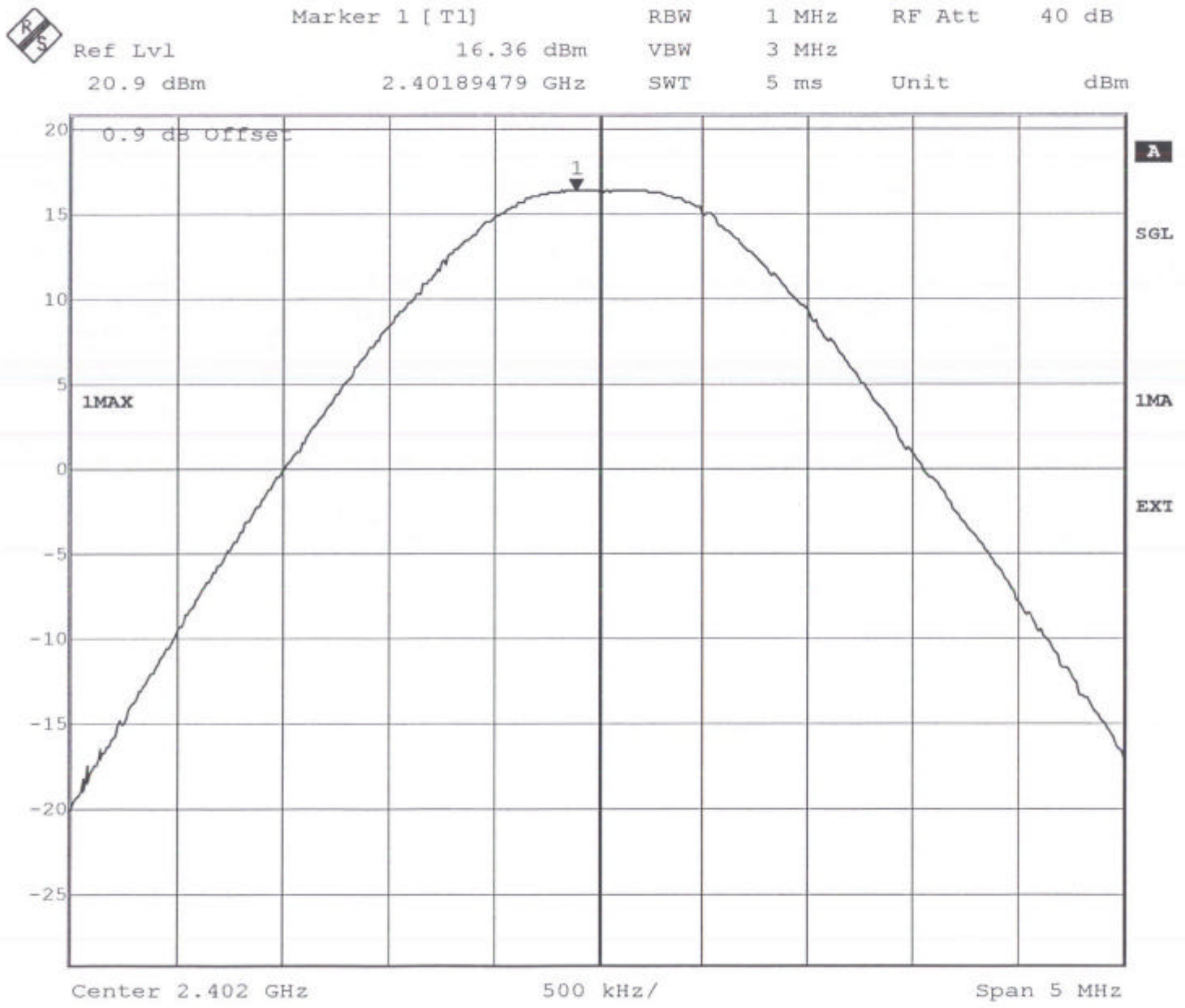
Drawin 1 : Setup 1 (Conducted Measurements)



Drawin 2 : Setup 2 (Radiated Measurements)

8. Annex

Measurement plots

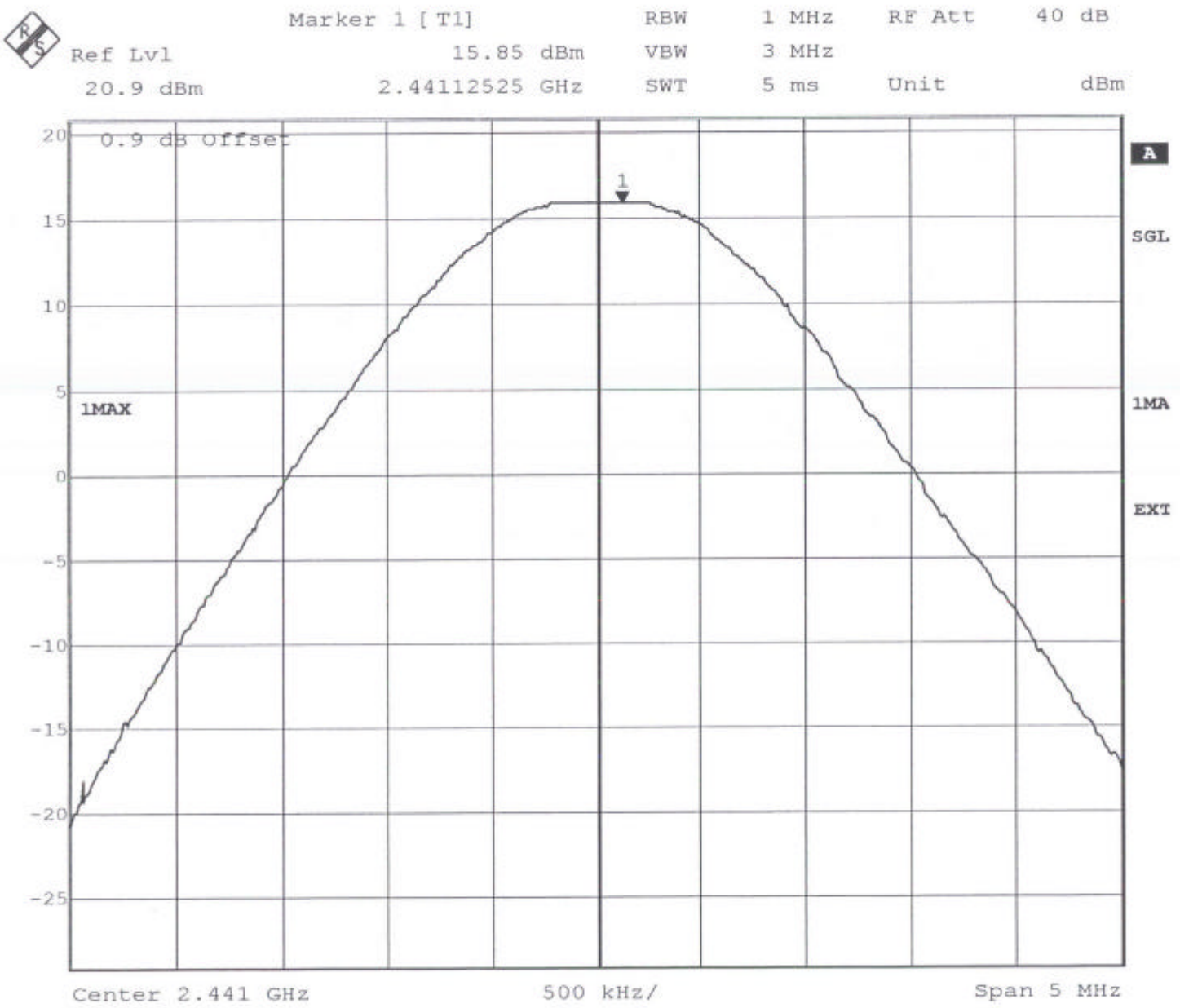


Output Power

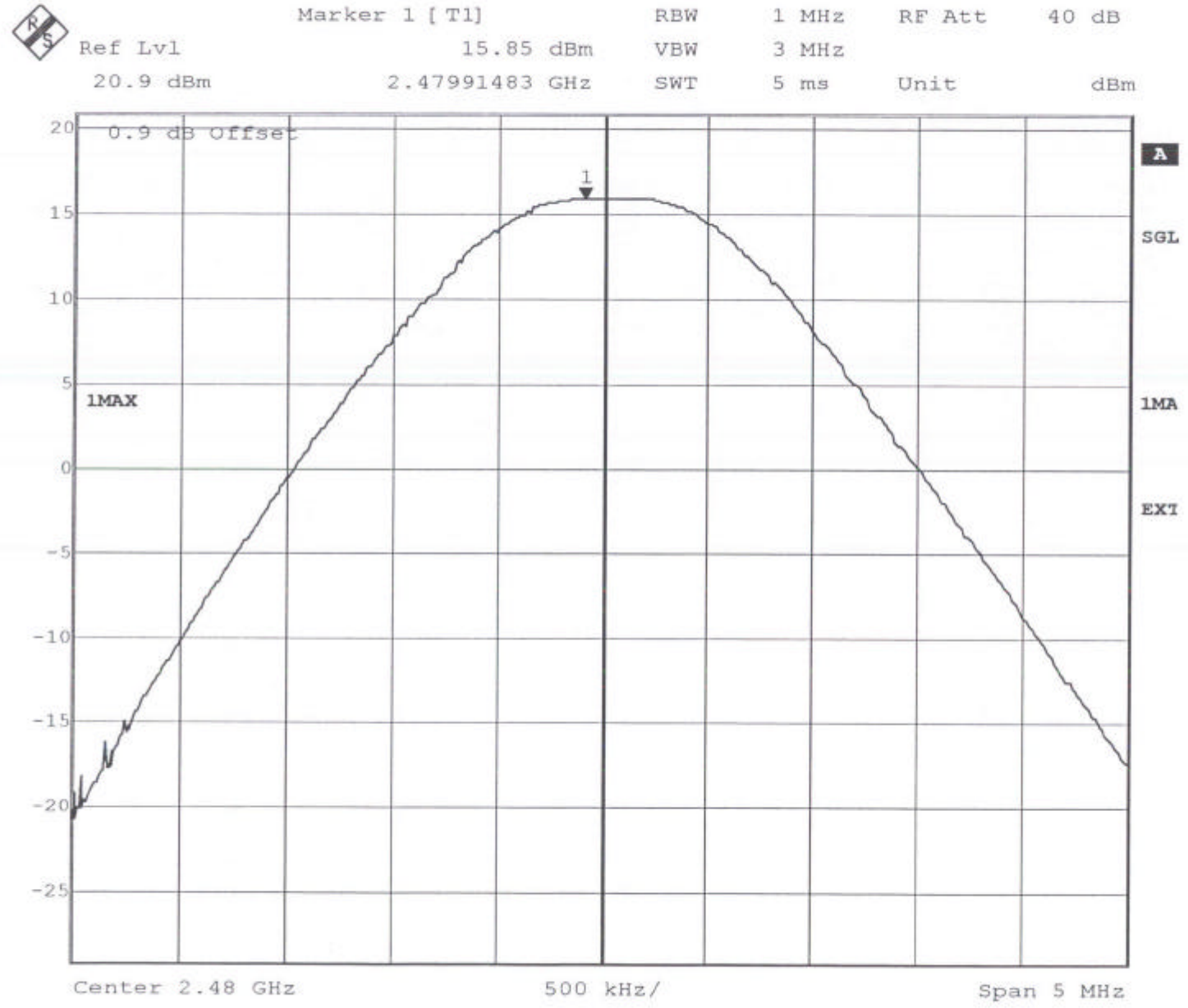
Op-Mode ↑

Set-Up ↑

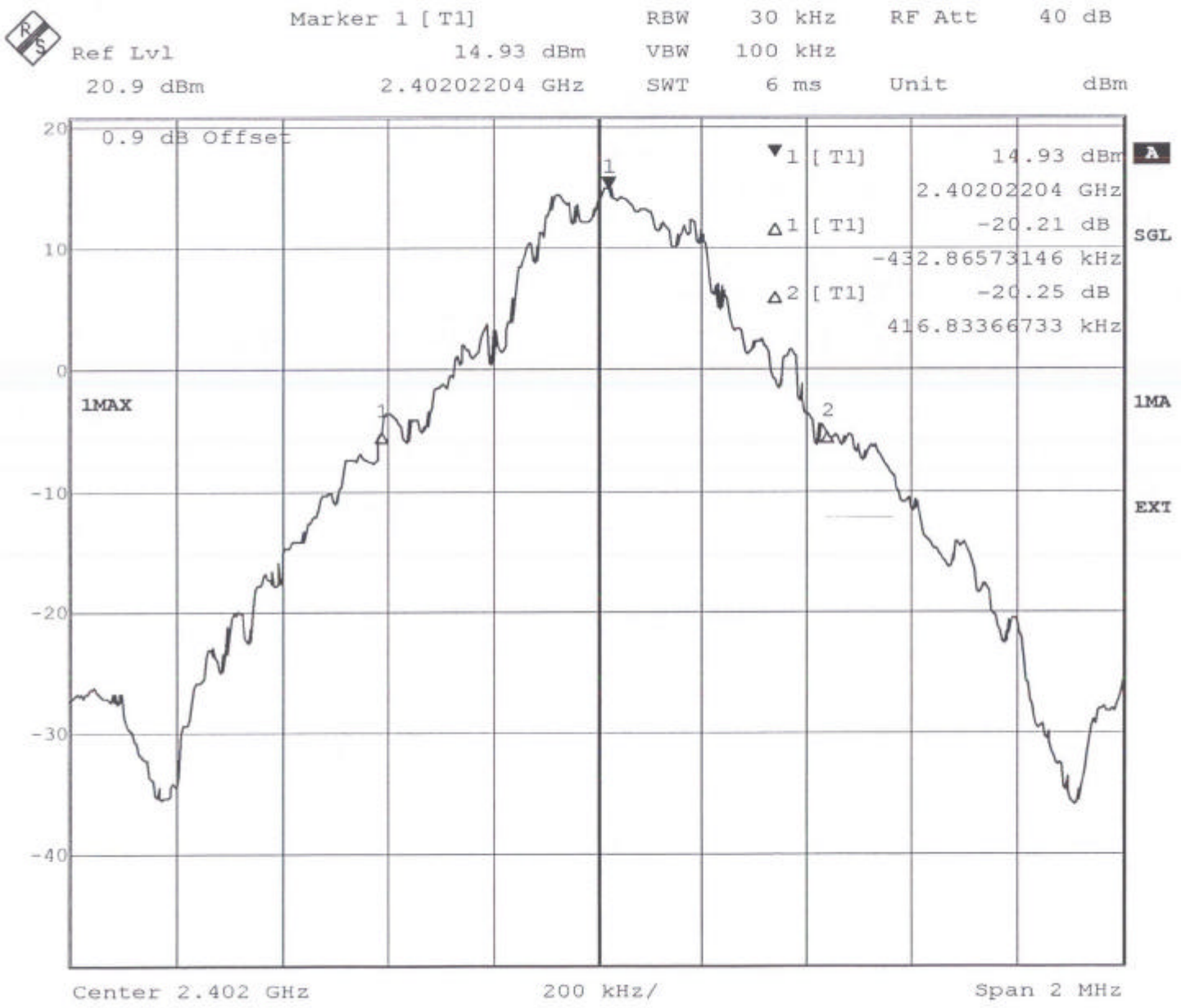
Output Power
Op-Mode 2
Set-Up 1



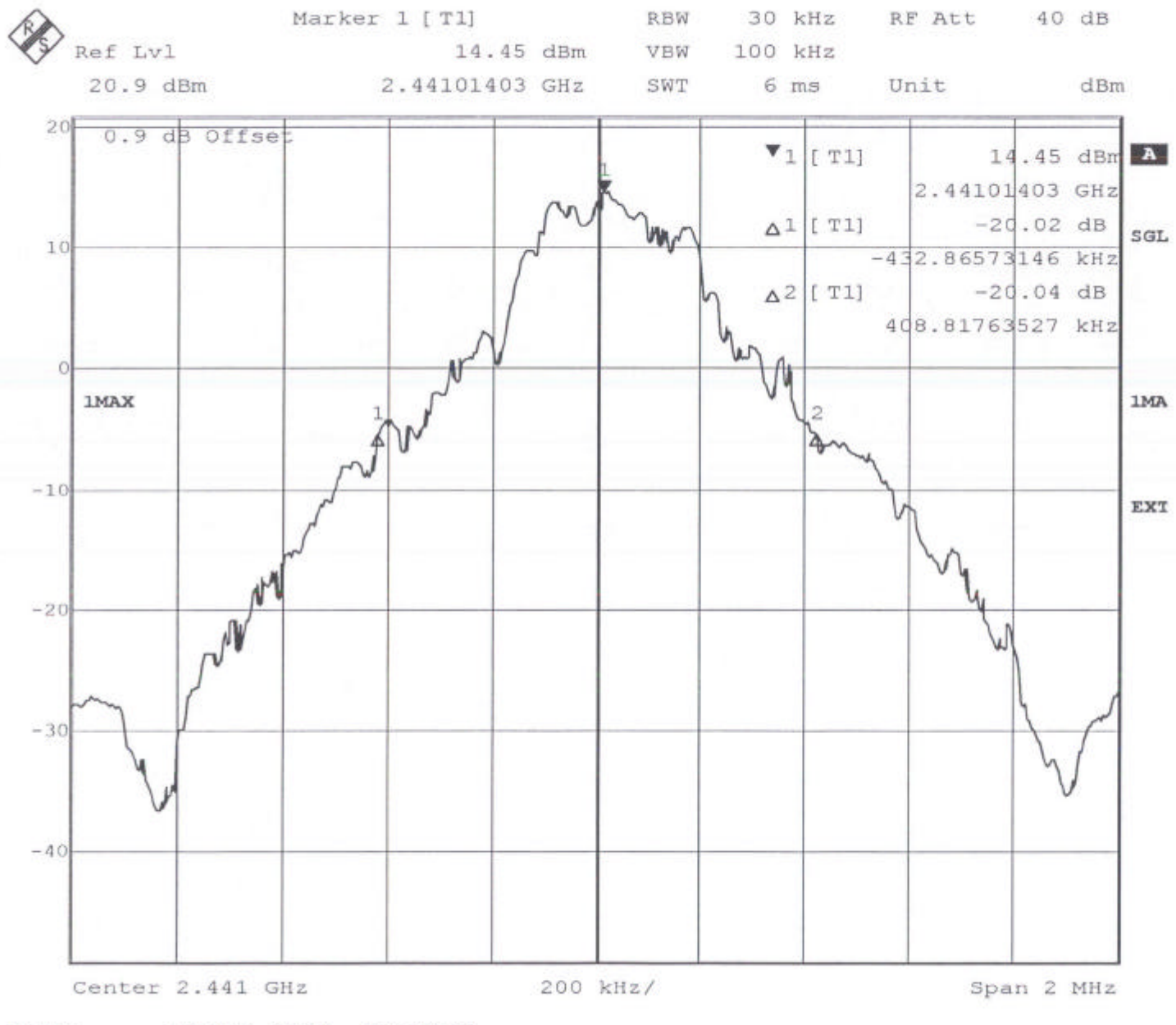
Output Power
Op - Mode 3
Setup 1

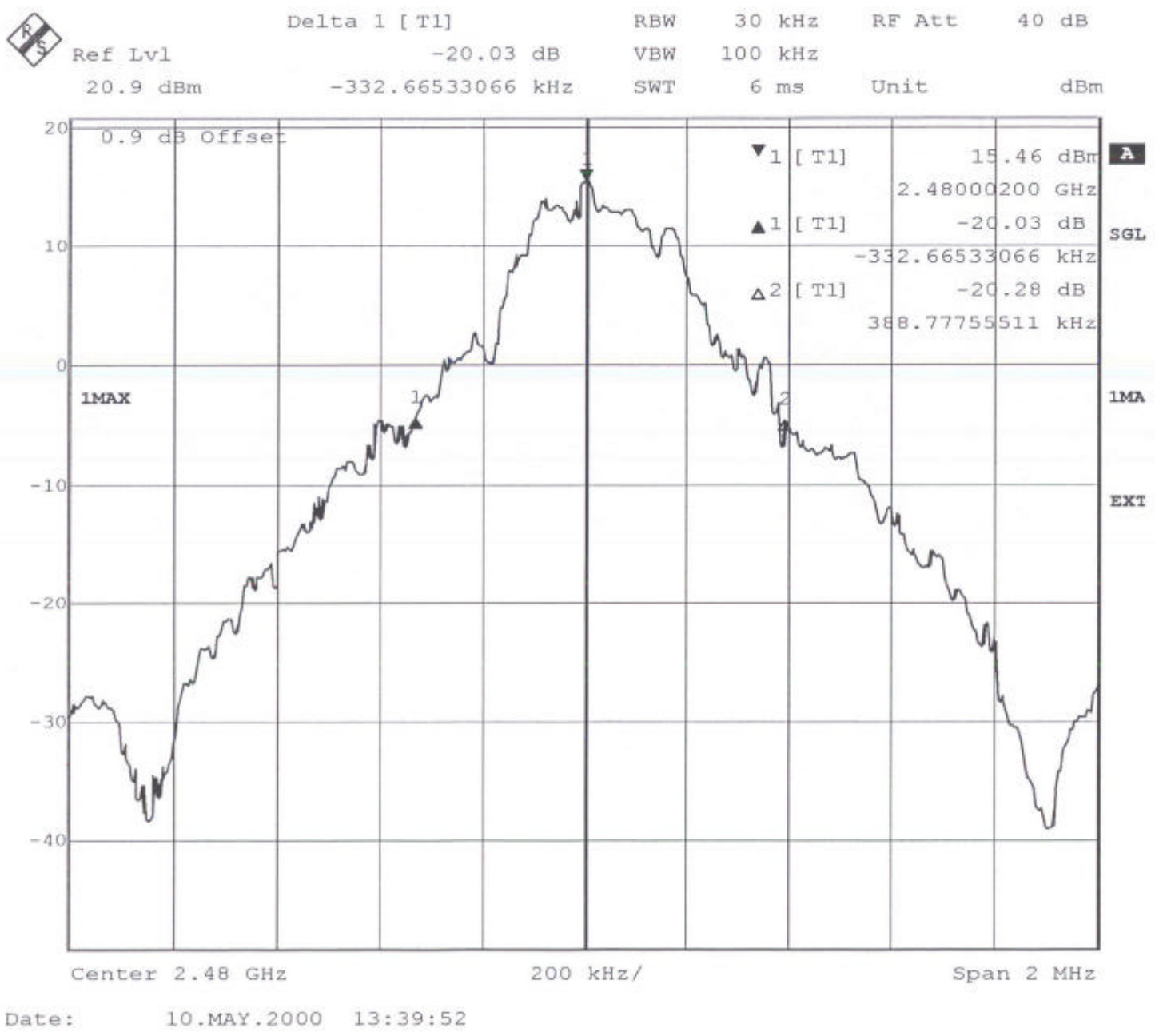


20 dB Bandwidth
Op-Mode 1
Set-up 1



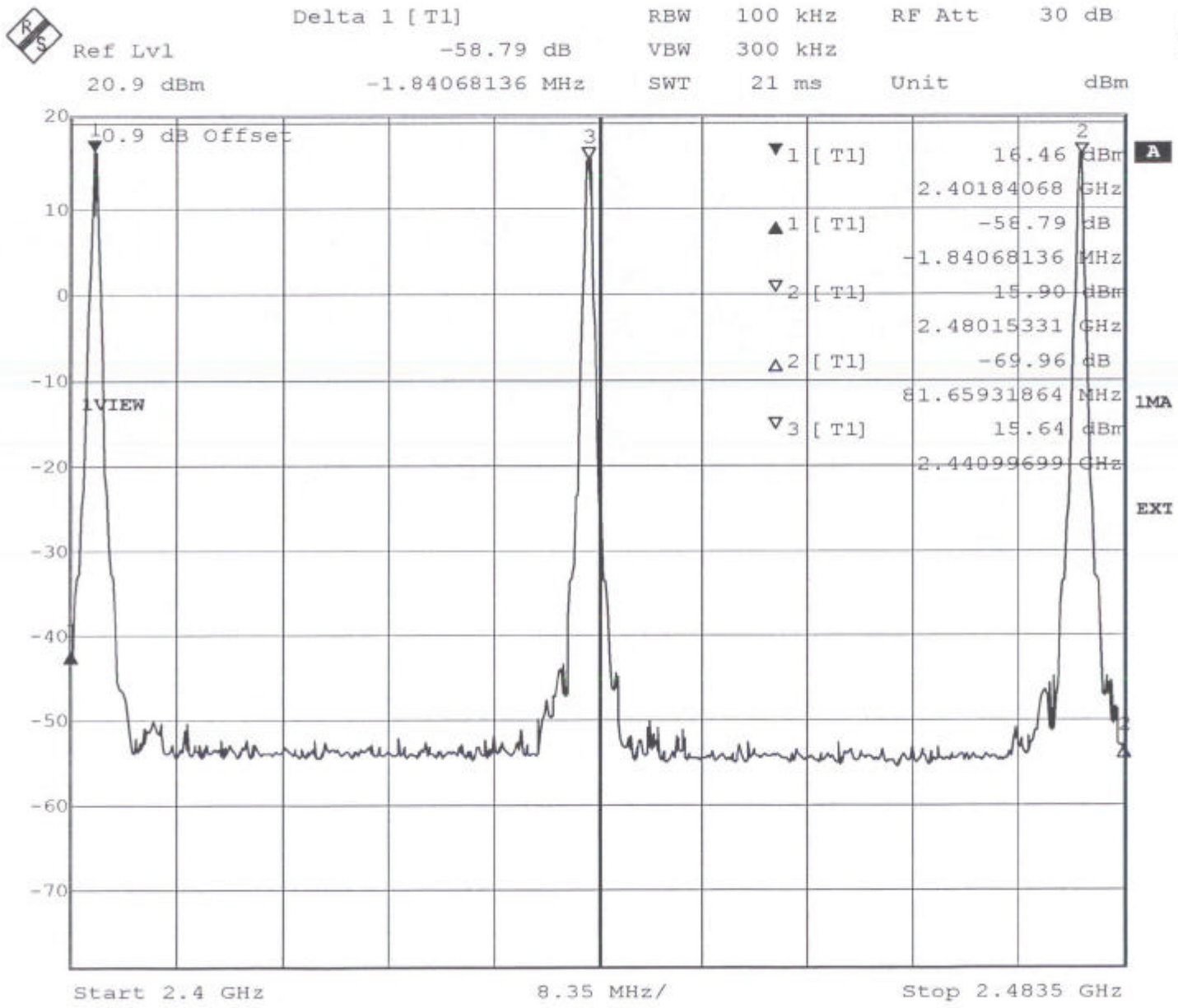
20 dB Bandwidth
Op-Mode 2
Set-up 1



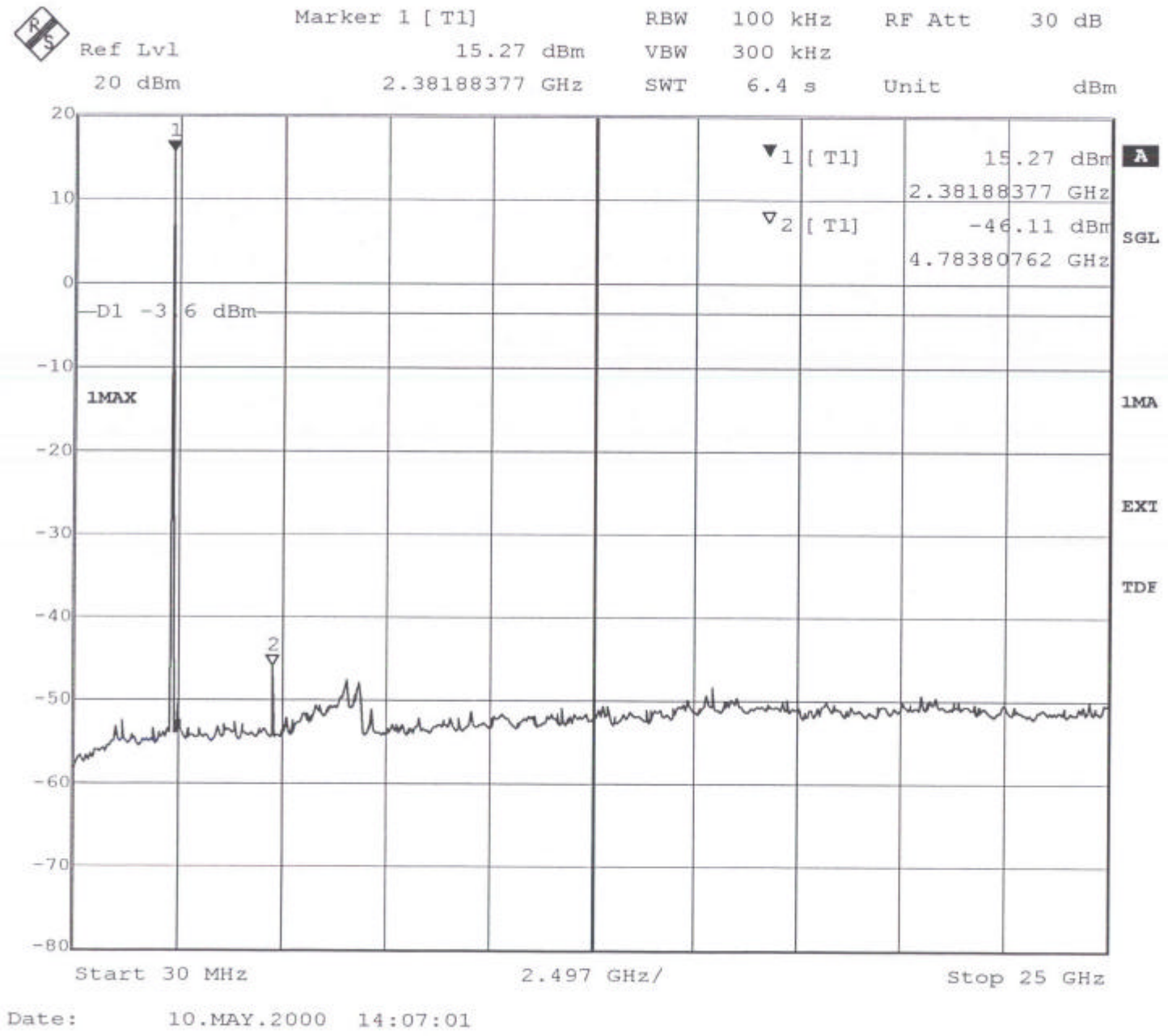


20 dB Bandwidth
Op-Mode 3
Set-up 1

6



Spurious RF Conducted
Reference Level
Band-Edge Compliance

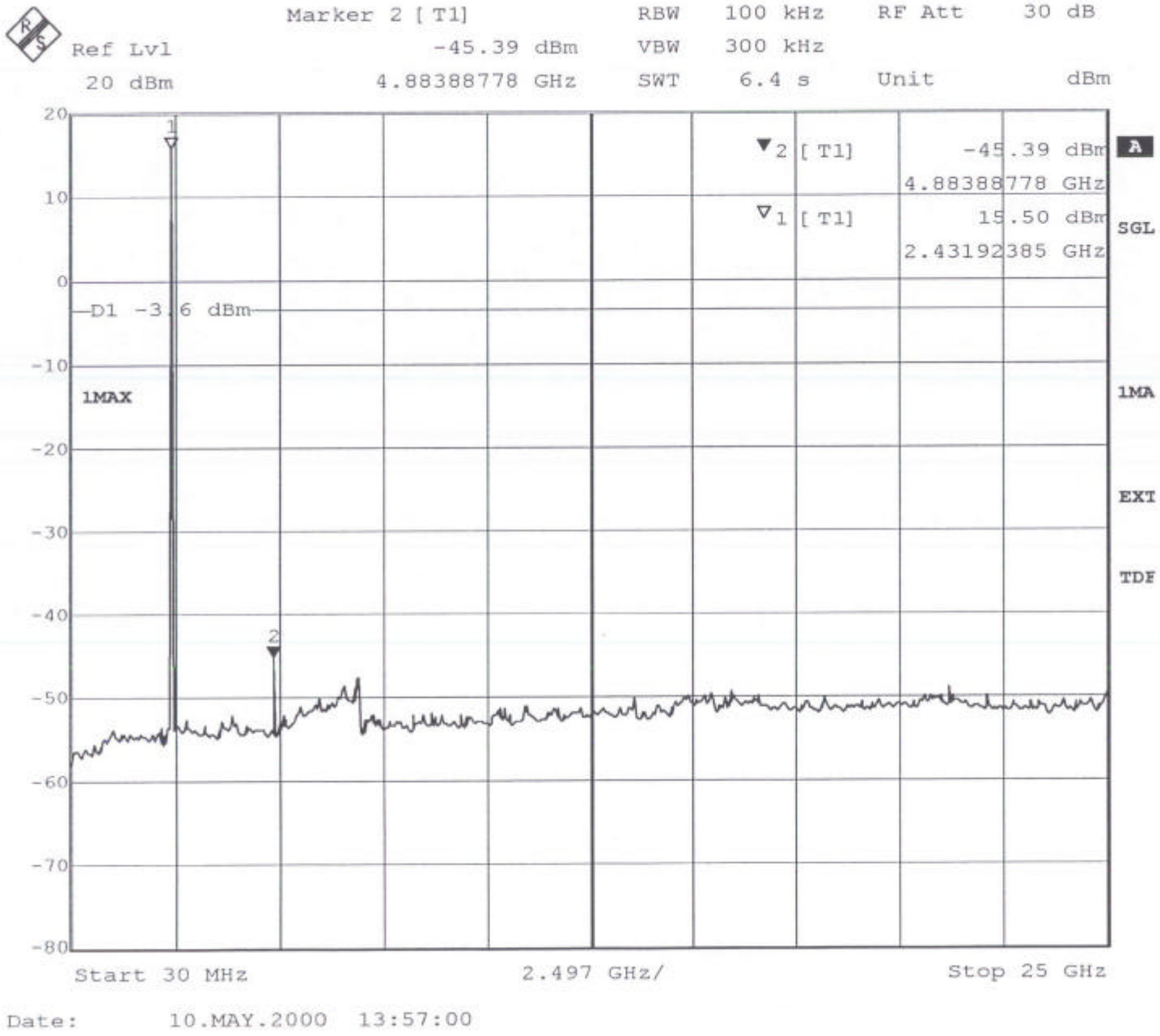


Spurious RF Conducted
Op-Mode 1
Set-up 1

Spurious RF Conducted

Op-Mode 2

Set-up 1



Spurious RF Conducted
Op-Mode 3
Set-up 1