FCC PART 15, SUBPART B and C
TEST REPORT

for

POCKETPRO USB WIRELESS

MODEL: 2933-UW

Prepared for

TROY GROUP, INC.
2331 SOUTH PULLMAN STREET
SANTA ANA, CALIFORNIA 92705

Prepared by:_____

MICHAEL CHRISTENSEN

Approved by:_____

KYLE FUJIMOTO

COMPATIBLE ELECTRONICS INC.
114 OLINDA DRIVE
BREA, CALIFORNIA 92823
(714) 579-0500

DATE: DECEMBER 18, 2003

	REPORT BODY	APPENDICES					TOTAL
		A	***B***	***C***	***D***	***E***	
PAGES	20	2	2	2	18	44	**88**

This report shall not be reproduced except in full, without the written approval of Compatible Electronics.

TABLE OF CONTENTS

Section / Title	PAGE
GENERAL REPORT SUMMARY	***4***
SUMMARY OF TEST RESULTS	***5***
1. PURPOSE	**6**
2. ADMINISTRATIVE DATA	**7**
2.1 Location of Testing	7
2.2 Traceability Statement	7
2.3 Cognizant Personnel	7
2.4 Date Test Sample was Received	7
2.5 Disposition of the Test Sample	7
2.6 Abbreviations and Acronyms	7
3. APPLICABLE DOCUMENTS	**8**
4. DESCRIPTION OF TEST CONFIGURATION	**9**
4.1 Description of Test Configuration - EMI	9
4.1.1 Cable Construction and Termination	10
5. LISTS OF EUT, ACCESSORIES AND TEST EQUIPMENT	**11**
5.1 EUT and Accessory List	11
5.2 EMI Test Equipment for Brea Facility	12
6. TEST SITE DESCRIPTION	**13**
6.1 Test Facility Description	13
6.2 EUT Mounting, Bonding and Grounding	13
7. CHARACTERISTICS OF THE TRANSMITTER	**14**
7.1 Antenna Gain	14
8. TEST PROCEDURES	**15**
8.1 RF Emissions	15
8.1.1 Conducted Emissions Test	15
8.1.2 Radiated Emissions (Spurious and Harmonics) Test	16
8.2 6 dB Bandwidth	18
8.3 Peak Output Power	18
8.4 RF Antenna Conducted Test	18
8.5 Spectral Density Output	19
8.6 RF Band Edges	19
9. CONCLUSIONS	**20**

LIST OF APPENDICES

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

LIST OF FIGURES

FIGURE	TITLE
1	Conducted Emissions Test Setup
2	Plot Map and Layout of 3 Meter Radiated Site
3	Plot Map and Layout of 10 Meter Radiated Site

GENERAL REPORT SUMMARY

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

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

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

Device Tested:	PocketPro USB Wireless Model: 2933-UW S/N: 6
Product Description:	See Expository Statement.
Modifications:	The EUT was not modified during the testing.
Manufacturer:	Troy Group, Inc. 2331 South Pullman Street Santa Ana, California 92705
Test Dates:	September 29 and 30 and October 2, 2003.
Test Specifications:	EMI requirements Limits: EN 55022: 1998 **Class B**; CFR Title 47, Part 15, Subpart B; and Subpart C, sections 15.205, 15.207, 15.209, and 15.247
Test Procedure:	ANSI C63.4: 2001
Test Deviations:	The test procedure was not deviated from during the testing.

SUMMARY OF TEST RESULTS

TEST	DESCRIPTION	RESULTS
1	Conducted RF Emissions, 150 kHz – 30 MHz	Complies with the **Class B** limits of EN 55022: 1998; and the limits of CFR Title 47, Part 15, Subpart C, section 15.207
2	Spurious Radiated RF Emissions, 30 MHz – 1000 MHz	Complies with the **Class B** limits of EN 55022: 1998; and the limits of CFR Title 47, Part 15, Subpart B
3	Spurious Radiated RF Emissions, 10 kHz - 25000 MHz	Complies with the **Class B** limits of CFR Title 47, Part 15, Subpart B; and CFR Title 47, Part 15, Subpart C, section 15.247(c)
4	Fundamental and Emissions produced by the intentional radiator in non-restricted bands, 10 kHz – 40 GHz	Complies with the relevant requirements of CFR Title 47, Part 15, Subpart C, section 15.247(c)
5	Emissions produced by the intentional radiator in restricted bands, 10 kHz – 40 GHz	Complies with the relevant requirements of CFR Title 47, Part 15, Subpart C, section 15.205, 15.209(a), and section 15.247 (c)
6	6 dB Bandwidth	Complies with the relevant requirements of CFR Title 47, Part 15, Subpart C, section 15.247(a)(2)
7	Peak Power Output	Complies with the relevant requirements of CFR Title 47, Part 15, Subpart C, section 15.247(b)(3)
8	RF Conducted Antenna Test	Complies with the relevant requirements of CFR Title 47, Part 15, Subpart C, section 15.247(c)
9	Peak Power Spectral Density Conducted from the Intentional Radiator to the Antenna	Complies with the relevant requirements of CFR Title 47, Part 15, Subpart C, section 15.247 (d)

1. PURPOSE

This document is a qualification test report based on the Electromagnetic Interference (EMI) tests performed on the PocketPro USB Wireless Model: 2933-UW. The EMI measurements were performed according to the measurement procedure described in ANSI C63.4: 2001. The tests were performed in order to determine whether the electromagnetic emissions from the equipment under test, referred to as EUT hereafter, are within the specification limits defined by CFR Title 47, Part 15, Subpart B; and Subpart C, sections 15.205, 15.207, 15.209, and 15.247.

Note: For the unintentional radiator portion of the test for radiated emissions from 30 MHz to 1000 MHz, the EUT was within the **Class B** specification limits defined by C.I.S.P.R. Publication 22 for Information Technology Equipment. Under paragraph G of section 15.109 of the Code of Federal Regulations Title 47, Part 15 of the FCC rules, FCC accepts the international standards set forth in C.I.S.P.R. Publication 22.

2. ADMINISTRATIVE DATA

2.1 Location of Testing

The EMI tests of the testing described herein were performed at the test facility of Compatible Electronics at 114 Olinda Drive, Brea, California 92823.

2.2 Traceability Statement

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

2.3 Cognizant Personnel

Troy Group, Inc.

Ronald Tozaki Senior Hardware Engineer

Compatible Electronics, Inc.

Kyle Fujimoto Test Engineer
Michael Christensen Sr. Test Engineer

2.4 Date Test Sample was Received

The test sample was received on August 13, 2003.

2.5 Disposition of the Test Sample

The sample was returned to Troy Group, Inc. on December 18, 2003.

2.6 Abbreviations and Acronyms

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

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

3. APPLICABLE DOCUMENTS

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

SPEC	TITLE
FCC Title 47, Part 15 Subpart C	FCC Rules - Radio frequency devices (including digital devices) – Intentional Radiators
ANSI C63.4 2001	Methods of measurement of radio-noise emissions from low-voltage electrical and electronic equipment in the range of 9 kHz to 40 GHz
FCC Title 47, Part 15 Subpart B	FCC Rules - Radio frequency devices (including digital devices) – Unintentional Radiators
EN 55022: 1998	Information technology equipment – Radio disturbance characteristics – Limits and methods of measurement
CISPR 22: 1997	Information technology equipment – Radio disturbance characteristics – Limits and methods of measurement

4. DESCRIPTION OF TEST CONFIGURATION

4.1 Description of Test Configuration - EMI

Setup and operation of the equipment under test.

Specifics of the EUT and Peripherals Tested

The EUT was connected to the laptop, printer and AC Adapter via its Ethernet, USB and power ports, respectively. The laptop was also connected to the AC Adapter via its power port. The laptop was placed 50 feet away from the test site.

Operation of the EUT during the testing

For the intentional radiator portion of the test - The EUT used a program that locked one channel at a time so that the low and high channels could be tested.

For the unintentional radiator and conducted emission portion of the test - The laptop was sent a command to the EUT to print "H" characters on a continuous basis. The EUT then sent this data via USB to the printer. The printer then printed a full page of "H" characters. The EUT was also sending information back to the laptop.

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

4.1.1 Cable Construction and Termination

Intentional Radiator Mode

Cable 1 This is a 50 foot unshielded cable connecting the EUT to the laptop. It has an RJ-45 connector at each end.

Cable 2 This is a 6 foot unshielded cable connecting the EUT to the AC adapter. It has a 1/8 inch power connector at the EUT end and is hard wired into the AC Adapter.

Cable 3 This is a 4 meter braid shielded cable connecting the EUT to the printer. It has a USB connector at both ends. The cable was bundled to a length of 1 meter.

5. LISTS OF EUT, ACCESSORIES AND TEST EQUIPMENT

5.1 EUT and Accessory List

EQUIPMENT	MANUFACTURER	MODEL NUMBER	SERIAL NUMBER	FCC ID
POCKETPRO USB WIRELESS (EUT)	TROY GROUP, INC.	2933-UW	6	PTY-2933-UW
LAPTOP	DELL	PPM	N/A	DoC
AC ADPATER FOR LAPTOP	DELL	ADP-70EB	N/A	N/A
ACCESS POINT	N/A	CI-1500H	N/A	M4Y-325H2
PRINTER	LEXMARK	OPTRA E312	1037888	DoC
AC ADAPTER FOR EUT (115 VAC)	POTRANS ELECTRICAL	UP00531050	N/A	N/A

5.2 EMI Test Equipment for Brea Facility

EQUIPMENT TYPE	MANU-FACTURER	MODEL NUMBER	SERIAL NUMBER	CAL. DATE	CAL. DUE DATE
Radiated Emissions Manual Test – Radiated	Compatible Electronics	N/A	N/A	N/A	N/A
Conducted Emissions Test Program	Compatible Electronics	N/A	N/A	N/A	N/A
Spectrum Analyzer – Main Section	Hewlett Packard	8566B	2727A04757	Nov. 12, 2002	Nov. 12, 2003
Spectrum Analyzer – Display Section	Hewlett Packard	85662A	2648A15455	Nov. 12, 2002	Nov. 12, 2003
Spectrum Analyzer – Quasi-Peak Adapter	Hewlett Packard	85650A	3303A01688	Nov. 12, 2002	Nov. 12, 2003
Preamplifier	Com Power	PA-102	1017	Jan. 2, 2003	Jan. 2, 2004
Biconical Antenna	Com Power	AB-900	15227	April 21, 2003	April 21, 2004
Log Periodic Antenna	Com Power	AL-100	16089	Oct. 4, 2002	Oct. 4, 2003
Computer	Hewlett Packard	D5251A 888	US74458128	N/A	N/A
Monitor	Hewlett Packard	D5258A	DK74889705	N/A	N/A
Loop Antenna	Com-Power	AL-130	17070	June 19, 2002	June 19, 2004
Horn Antenna	Antenna Research	DRG-118/A	1053	Jan. 13, 2002	Jan. 13, 2004
Microwave Preamplifier	Com-Power	PA-122	25196	Jan. 10, 2003	Jan. 10, 2004
EMI Receiver	Rohde & Schwarz	ESIB40	100172	July 22, 2003	July 22, 2004
Microwave Preamplifier	Com-Power	PA-840	711013	Mar. 6, 2002	Mar. 6, 2004
Horn Antenna	Com-Power	AH826	0071957	Nov. 3, 2001	Nov. 3, 2003

6. TEST SITE DESCRIPTION

6.1 Test Facility Description

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

6.2 EUT Mounting, Bonding and Grounding

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

The EUT was not grounded.

7. CHARACTERISTICS OF THE TRANSMITTER

7.1 Antenna Gain

The 802.11 b antenna has a gain of 1.5 dBi.

8. TEST PROCEDURES

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

8.1 RF Emissions

8.1.1 Conducted Emissions Test

The spectrum analyzer was used as a measuring meter. The data was collected with the spectrum analyzer in the peak detect mode with the "Max Hold" feature activated. The quasi-peak was used only where indicated in the data sheets. A 10 dB attenuation pad was used for the protection of the spectrum analyzer input stage, and the offset was adjusted accordingly to read the actual data measured. The LISN output was measured using the spectrum analyzer. The output of the second LISN was terminated by a 50 ohm termination. The effective measurement bandwidth used for this test was 9 kHz.

Please see section 6.2 of this report for mounting, bonding and grounding of the EUT. The EUT was powered through the LISN, which was bonded to the ground plane. The LISN power was filtered and the filter was bonded to the ground plane. The EUT was set up with the minimum distances from any conductive surfaces as specified in ANSI C63.4: 2001. The excess power cord was wrapped in a figure eight pattern to form a bundle not exceeding 0.4 meters in length.

The conducted emissions from the EUT were maximized for operating mode as well as cable placement. The final data was collected under program control by the Compatible Electronics conducted emissions software in several overlapping sweeps by running the spectrum analyzer at a minimum scan rate of 10 seconds per octave. The final qualification data is located in Appendix E.

Test Results:

The EUT complies with the **Class B** limits EN 55022: 1998 for conducted emissions; and the limits of CFR Title 47, Part 15, Subpart C, Section 15.207 for conducted emissions.

8.1.2 Radiated Emissions (Spurious and Harmonics) Test

The spectrum analyzer was used as a measuring meter along with the quasi-peak adapter. Amplifiers were used to increase the sensitivity of the instrument. The Com Power Preamplifier Model: PA-102 was used for frequencies from 30 MHz to 1 GHz, the Com-Power Microwave Preamplifier Model: PA-122 was used for frequencies from 1 GHz to 18 GHz, and the Com Power Microwave Preamplifier Model: PA-840 was used for frequencies from 18 GHz to 40 GHz. The spectrum analyzer was used in the peak detect mode with the "Max Hold" feature activated. In this mode, the spectrum analyzer records the highest measured reading over all the sweeps.

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

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

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

FREQUENCY RANGE	EFFECTIVE MEASUREMENT BANDWIDTH	TRANSDUCER
10 kHz to 150 kHz	200 Hz	Active Loop Antenna
150 kHz to 30 MHz	9 kHz	Active Loop Antenna
30 MHz to 300 MHz	120 kHz	Biconical Antenna
300 MHz to 1 GHz	120 kHz	Log Periodic Antenna
1 GHz to 25 GHz	1 MHz	Horn Antenna

The open field test site of Compatible Electronics, Inc. was used for radiated emission testing. This test site is set up according to ANSI C63.4: 1992. Please see section 6.2 of this report for mounting, bonding and grounding of the EUT. The turntable supporting the EUT is remote controlled using a motor. The turntable permits EUT rotation of 360 degrees in order to maximize emissions. Also, the antenna mast allows height variation of the antenna from 1 meter to 4 meters. Data was collected in the worst case (highest emission) configuration of the EUT by the Radiated Emission Manual Test software. At each reading, the EUT was rotated 360 degrees and the antenna height was varied from 1 to 4 meters (for E field radiated field strength). The gunsight method was used when measuring with the horn antenna in order to ensure accurate results.

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

The presence of ambient signals was verified by turning the EUT off. In case an ambient signal was detected, the measurement bandwidth was reduced temporarily and verification was made that an additional adjacent peak did not exist. This ensures that the ambient signal does not hide any emissions from the EUT. The EUT was tested at a 3 meter test distance and also at a 10 meter test distance between 30 MHz and 1000 MHz.

8.2 6 dB Bandwidth

The 6 dB bandwidth was measured using the EMI Receiver. The bandwidth was measured using a direct connection from the RF out on the EUT. The resolution bandwidth was 100 kHz and the video bandwidth was 300 kHz.

Test Results:

This test complies with the relevant requirements of CFR Title 47, Part 15, Subpart C section 15.247 (a)(2).

8.3 Peak Output Power

The Peak Output Power was taken using the power meter and power sensor. The EUT was directly connected to the power sensor, which was directly connected to the power meter. The Peak Output Power was then taken.

Test Results:

This test complies with the relevant requirements of CFR Title 47, Part 15, Subpart C section 15.247 (b)(3).

8.4 RF Antenna Conducted Test

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

Test Results:

This test complies with the relevant requirements of CFR Title 47, Part 15, Subpart C section 15.247 (c).

8.5 Spectral Density Output

The spectral density output was measured using the EMI Receiver. The spectral density output was measured using a direct connection from the RF out on the EUT into the input of the EMI Receiver. The resolution bandwidth was 3 kHz, and the video bandwidth was 10 kHz. The highest 4.5 MHz of the signal was used as the frequency span with the sweep rate being 1 second for every 3 kHz of span.

Test Results:

This test complies with the relevant requirements of CFR Title 47, Part 15, Subpart C section 15.247 (d).

8.6 RF Band Edges

The RF band edges were taken at the start of the restricted bands (2390 MHz and 2483.5 MHz). The readings taken were also averaged by the EMI Receiver. Data sheets are included in Appendix E, which compares the reading from the EMI Receiver to the spec limit.

Test Results:

The EUT complies with the relevant requirements of FCC Title 47, Part 15, Subpart C section 15.247 (c). The RF power at the restricted bands closest to the band edges at 2390 MHz and 2483.5 MHz meet the limits of section 15.209. Please see the data sheets located in Appendix E.

9. CONCLUSIONS

The PocketPro USB Wireless meets all of the specification limits defined in FCC Title 47, Part 15, Subpart B; and Subpart C, sections 15.205, 15.207, 15.209, and 15.247.

Note: For the unintentional radiator portion of the test for radiated emissions from 30 MHz to 1000 MHz, the EUT was within the **Class B** specification limits defined by C.I.S.P.R. Publication 22 for Information Technology Equipment. Under paragraph G of section 15.109 of the Code of Federal Regulations Title 47, Part 15 of the FCC rules, FCC accepts the international standards set forth in C.I.S.P.R. Publication 22.

APPENDIX A

LABORATORY RECOGNITIONS

LABORATORY RECOGNITIONS

Compatible Electronics has the following agency accreditations:

National Voluntary Laboratory Accreditation Program - Lab Code: 200528-0

Voluntary Control Council for Interference - Registration Numbers: R-983, C-1026, R-984 and C-1027

Bureau of Standards and Metrology Inspection - Reference Number: SL2-IN-E-1031

Conformity Assessment Body for the EMC Directive Under the US/EU MRA Appointed by NIST

Compatible Electronics is recognized or on file with the following agencies:

Federal Communications Commission

Industry Canada

Radio-Frequency Technologies (Competent Body)

APPENDIX B

MODIFICATIONS TO THE EUT

MODIFICATIONS TO THE EUT

The modifications listed below were made to the EUT to pass FCC Subpart B and Subpart C specifications.

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

No modifications were made to the EUT during the testing.

APPENDIX C

ADDITIONAL MODELS COVERED UNDER THIS REPORT

ADDITIONAL MODELS COVERED UNDER THIS REPORT

USED FOR THE PRIMARY TEST

PocketPro USB Wireless
Model: 2933-UW
S/N: 6

There were no additional models covered under this report.

APPENDIX D

DIAGRAMS, CHARTS, AND PHOTOS

FIGURE 1: CONDUCTED EMISSIONS TEST SETUP

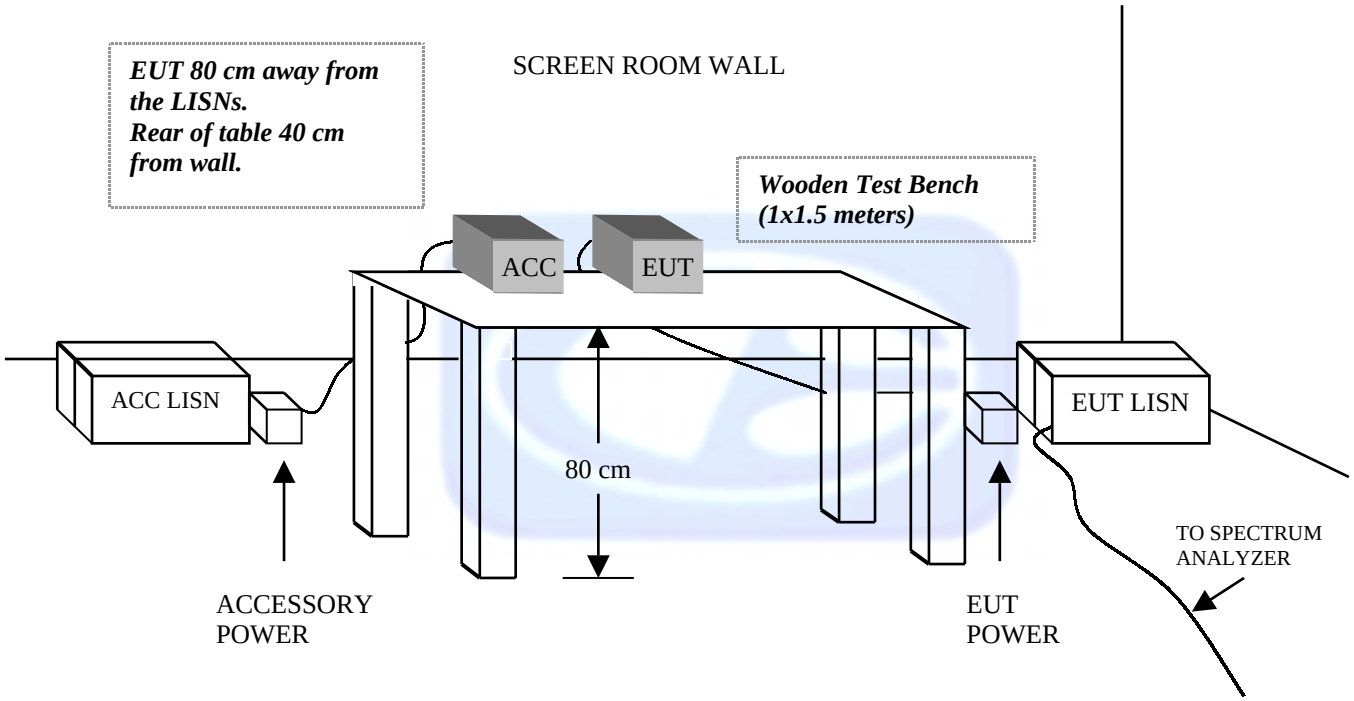
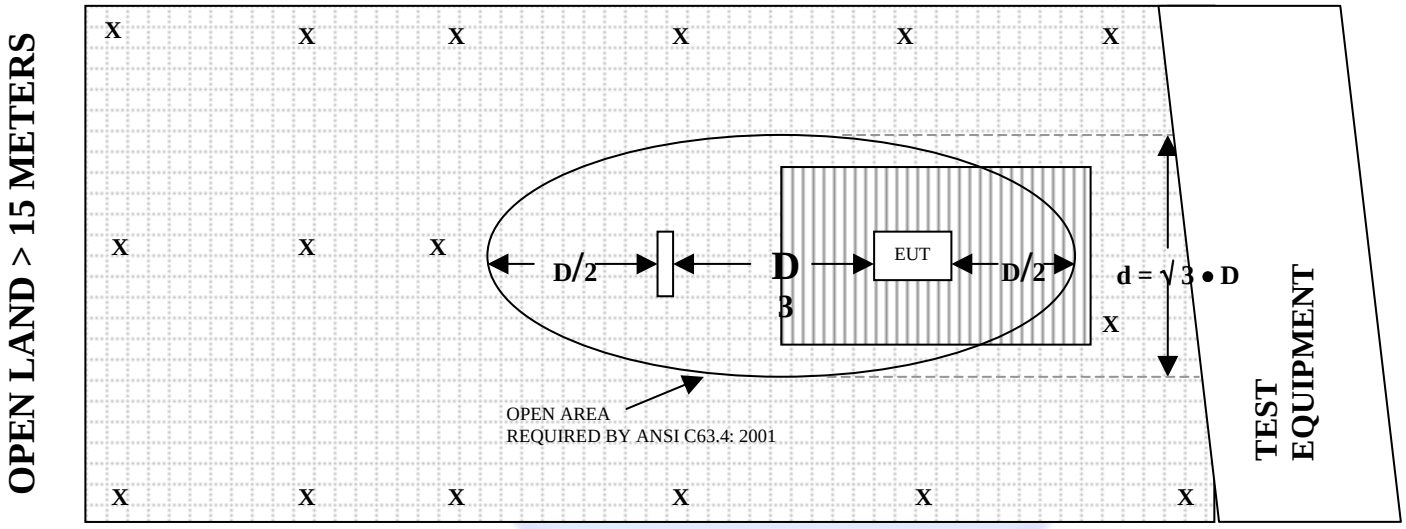


FIGURE 2: PLOT MAP AND LAYOUT OF 3 METER RADIATED SITE

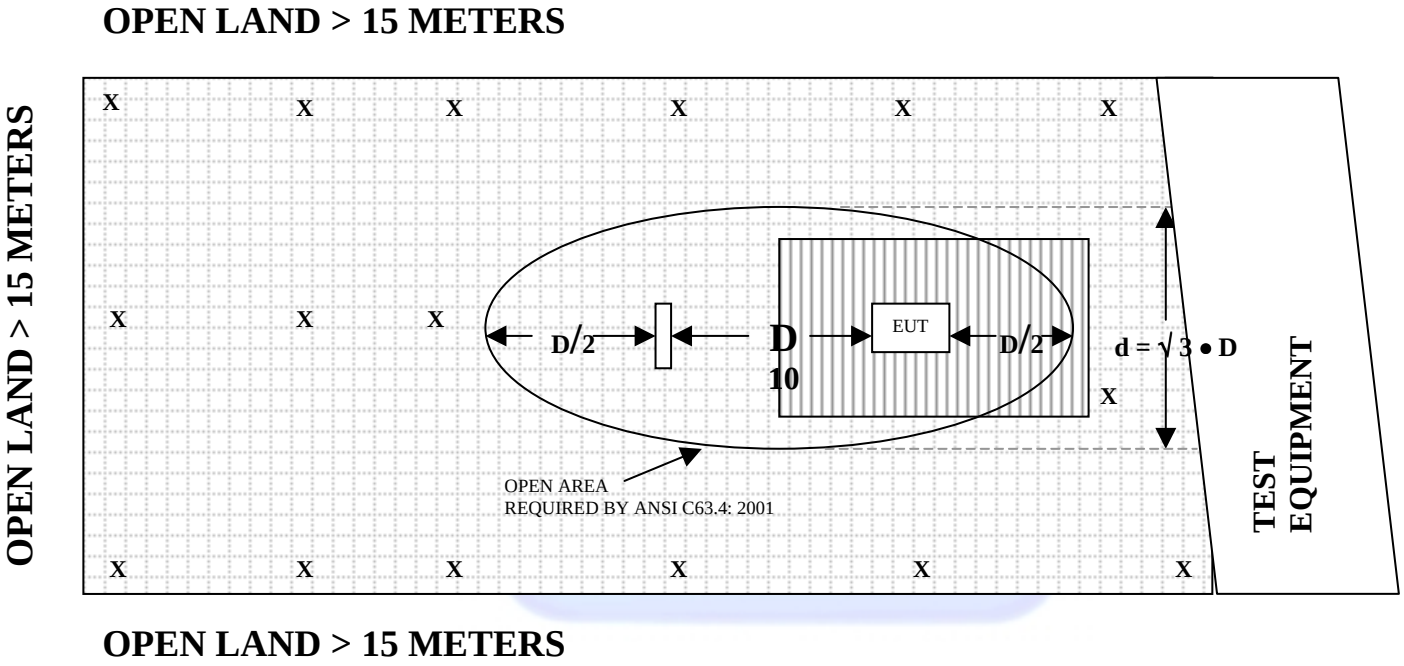
OPEN LAND > 15 METERS



OPEN LAND > 15 METERS

X = GROUND RODS	= GROUND SCREEN
D = TEST DISTANCE (meters)	= WOOD COVER

FIGURE 3: PLOT MAP AND LAYOUT OF 10 METER RADIATED SITE



FRONT VIEW

TROY GROUP, INC.
POCKETPRO USB WIRELESS
MODEL: 2933-UW
FCC SUBPART C - RADIATED EMISSIONS – 09-29-03

PHOTOGRAPH SHOWING THE EUT CONFIGURATION FOR MAXIMUM EMISSIONS

REAR VIEW

TROY GROUP, INC.
POCKETPRO USB WIRELESS
MODEL: 2933-UW
FCC SUBPART C - RADIATED EMISSIONS – 09-29-03

PHOTOGRAPH SHOWING THE EUT CONFIGURATION FOR MAXIMUM EMISSIONS

FRONT VIEW

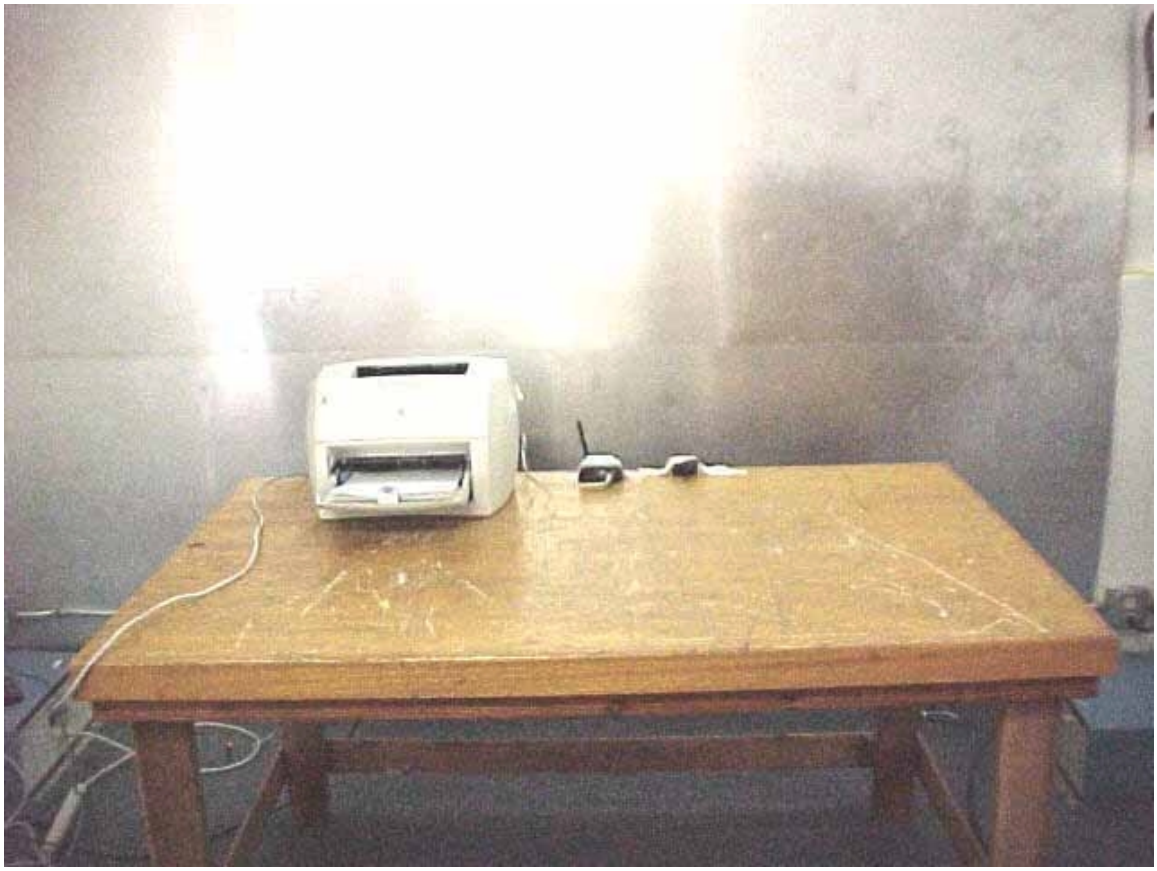
TROY GROUP, INC.
POCKETPRO USB WIRELESS
MODEL: 2933-UW
EN 55022 CLASS B - RADIATED EMISSIONS – 09-29-03

PHOTOGRAPH SHOWING THE EUT CONFIGURATION FOR MAXIMUM EMISSIONS

REAR VIEW

TROY GROUP, INC.
POCKETPRO USB WIRELESS
MODEL: 2933-UW
EN 55022 CLASS B - RADIATED EMISSIONS – 09-29-03

PHOTOGRAPH SHOWING THE EUT CONFIGURATION FOR MAXIMUM EMISSIONS



FRONT VIEW

TROY GROUP, INC.
POCKETPRO USB WIRELESS
MODEL: 2933-UW
FCC SUBPART B - CONDUCTED EMISSIONS – 09-30-03

PHOTOGRAPH SHOWING THE EUT CONFIGURATION FOR MAXIMUM EMISSIONS

REAR VIEW

TROY GROUP, INC.
POCKETPRO USB WIRELESS
MODEL: 2933-UW
FCC SUBPART B - CONDUCTED EMISSIONS – 09-30-03

PHOTOGRAPH SHOWING THE EUT CONFIGURATION FOR MAXIMUM EMISSIONS

COM-POWER AB-900

BICONICAL ANTENNA

S/N: 15227

CALIBRATION DATE: APRIL 21, 2003

FREQUENCY (MHz)	FACTOR (dB)	FREQUENCY (MHz)	FACTOR (dB)
30	11.50	120	13.50
35	10.60	125	12.40
40	10.30	140	12.50
45	11.00	150	11.10
50	11.30	160	11.70
60	9.70	175	15.10
70	7.40	180	15.80
80	6.20	200	17.00
90	7.60	250	15.60
100	10.40	300	19.50

COM-POWER AL-100

LOG PERIODIC ANTENNA

S/N: 16089

CALIBRATION DATE: OCTOBER 4, 2002

FREQUENCY (MHz)	FACTOR (dB)	FREQUENCY (MHz)	FACTOR (dB)
300	13.10	700	17.70
350	14.40	750	19.60
400	14.30	800	20.50
450	15.70	850	21.20
500	16.60	900	21.20
550	16.60	950	22.50
600	17.30	1000	24.60
650	18.80		

COM-POWER PA-102

PREAMPLIFIER

S/N: 1017

CALIBRATION DATE: JANUARY 2, 2003

FREQUENCY (MHz)	FACTOR (dB)	FREQUENCY (MHz)	FACTOR (dB)
30	38.4	300	38.3
40	38.4	350	38.3
50	38.3	400	38.3
60	38.4	450	37.9
70	38.4	500	38.1
80	38.4	550	38.2
90	38.4	600	38.1
100	38.3	650	37.9
125	38.4	700	37.9
150	38.4	750	37.7
175	38.2	800	37.4
200	38.4	850	37.6
225	38.2	900	37.4
250	38.3	950	36.7
275	38.5	1000	37.0

COM-POWER PA-122

MICROWAVE PREAMPLIFIER

S/N: 25195

CALIBRATION DATE: AUGUST 19, 2003

FREQUENCY (GHz)	FACTOR (dB)	FREQUENCY (GHz)	FACTOR (dB)
1.0	30.8	6.0	33.3
1.1	30.9	6.5	32.7
1.2	30.9	7.0	31.8
1.3	30.4	7.5	31.6
1.4	30.7	8.0	30.3
1.5	31.0	8.5	29.0
1.6	31.2	9.0	29.0
1.7	30.3	9.5	29.5
1.8	28.9	10.0	30.9
1.9	31.2	11.0	30.2
2.0	30.9	12.0	28.7
2.5	30.4	13.0	30.3
3.0	31.7	14.0	28.7
3.5	32.6	15.0	29.5
4.0	32.6	16.0	31.1
4.5	32.2	17.0	30.1
5.0	31.1	18.0	28.6
5.5	30.6		

ANTENNA RESEARCH DRG-118/A

HORN ANTENNA

S/N: 1053

CALIBRATION DATE: JANUARY 13, 2002

FREQUENCY (GHz)	FACTOR (dB)	FREQUENCY (GHz)	FACTOR (dB)
1.0	25.5	9.5	39.1
1.5	26.6	10.0	39.7
2.0	29.4	10.5	40.9
2.5	30.4	11.0	40.7
3.0	31.2	11.5	42.4
3.5	32.3	12.0	42.6
4.0	32.9	12.5	42.4
4.5	33.0	13.0	41.5
5.0	34.8	13.5	41.0
5.5	35.2	14.0	40.5
6.0	36.4	14.5	43.6
6.5	36.6	15.0	43.7
7.0	38.8	15.5	43.3
7.5	38.8	16.0	42.8
8.0	38.0	16.5	43.0
8.5	38.1	17.0	42.7
9.0	39.9	17.5	44.0
		18.0	41.8

COM-POWER AL-130

LOOP ANTENNA

S/N: 17070

CALIBRATION DATE: JUNE 19, 2002

FREQUENCY (MHz)	MAGNETIC (dB/m)	ELECTRIC (dB/m)
0.009	-40.4	11.1
0.01	-40.3	11.2
0.02	-41.2	10.3
0.05	-41.6	9.9
0.07	-41.4	10.1
0.1	-41.7	9.8
0.2	-44.0	7.5
0.3	-41.6	9.9
0.5	-41.3	10.2
0.7	-41.4	10.1
1	-40.9	10.6
2	-40.6	10.9
3	-40.5	11.0
4	-40.8	10.7
5	-40.2	11.3
10	-40.7	10.8
15	-41.4	10.1
20	-41.6	9.9
25	-41.7	9.8
30	-42.9	8.6

COM-POWER AH826

HORN ANTENNA

S/N: 0071957

CALIBRATION DATE: NOVEMBER 03, 2001

FREQUENCY (GHz)	FACTOR (dB)	FREQUENCY (GHz)	FACTOR (dB)
18.0	32.3	22.5	32.5
18.5	32.2	23.0	32.1
19.0	32.3	23.5	32.3
19.5	31.9	24.0	32.3
20.0	32.0	24.5	32.9
20.5	32.3	25.0	33.1
21.0	32.0	25.5	32.9
21.5	32.3	26.0	33.4
22.0	32.5	26.5	33.0

COM-POWER PA-840

MICROWAVE PREAMPLIFIER

S/N: 711013

CALIBRATION DATE: MARCH 06, 2002

FREQUENCY (GHz)	FACTOR (dB)	FREQUENCY (GHz)	FACTOR (dB)
18.0	26.4	30.0	27.6
19.0	25.4	31.0	27.3
20.0	24.5	32.0	26.9
21.0	23.9	33.0	26.7
22.0	24.0	34.0	27.0
23.0	24.4	35.0	25.9
24.0	25.2	36.0	25.5
25.0	26.1	37.0	26.2
26.0	26.6	38.0	25.6
27.0	27.2	39.0	23.4
28.0	27.4	40.0	24.3
29.0	27.5		

APPENDIX E

DATA SHEETS

RADIATED EMISSIONS

DATA SHEETS for the DIGITAL PORTION

Test Location : Compatible Electronics **Page** : 1/1
Customer : Troy Group, Inc. **Date** : 9/29/2003
Manufacturer : Troy Group, Inc. **Time** : 8:22:27
Eut name : PocketPro USB Wireless **Lab** : D
Model : 2933-UW **Test Distance** : 10.0 Meters
Serial # : 6
Specification : EN 55022 Class B
Distance correction factor (20 * log(test/spec) : 0.00
Test Mode : Clocks: 44.00 MHz, 66.00 MHz, 25.00 MHz, 12.00 MHz
Spurious Emissions - Digital Portion - 30 MHz to 1000 MHz
Vertical and Horizontal Polarization
Tested By: Kyle Fujimoto

Pol	Freq	Rdng	Cable loss	Ant factor	Amp gain	Cor'd rdg = R	Limit = L	Delta R-L
	MHz	dBuV	dB	dB	dB	dBuV	dBuV/m	dB
1V	53.460	42.90	1.81	10.71	38.34	17.09	30.00	-12.91
2V	80.500	41.70	2.20	6.27	38.40	11.77	30.00	-18.23
3V	120.035	48.20	2.56	13.49	38.38	25.87	30.00	-4.13
4V	120.035Qp	44.04	2.56	13.49	38.38	21.71	30.00	-8.29
5V	156.013	45.60	3.00	11.47	38.35	21.72	30.00	-8.28
6V	168.013	45.60	3.19	13.55	38.25	24.10	30.00	-5.90
7V	192.070	44.90	3.37	16.54	38.34	26.47	30.00	-3.53
8V	336.125	46.30	4.42	14.06	38.30	26.48	37.00	-10.52
9V	398.542	41.80	4.79	14.30	38.30	22.59	37.00	-14.41
10V	432.125	42.60	5.06	15.22	38.04	24.84	37.00	-12.16
11V	432.125	45.00	5.06	15.22	38.04	27.24	37.00	-9.76
12V	446.250	40.80	5.17	15.60	37.93	23.64	37.00	-13.36
13V	448.576	41.30	5.19	15.66	37.91	24.24	37.00	-12.76
14V	500.072	38.30	5.10	16.60	38.10	21.90	37.00	-15.10
15V	875.098	42.50	7.10	21.20	37.50	33.30	37.00	-3.70
16V	875.098Qp	38.95	7.10	21.20	37.50	29.75	37.00	-7.25

Test Location : Compatible Electronics **Page** : 1/1
Customer : Troy Group, Inc. **Date** : 9/29/2003
Manufacturer : Troy Group, Inc. **Time** : 9:23:23
Eut name : PocketPro USB Wireless **Lab** : D
Model : 2933-UW **Test Distance** : 10.0 Meters
Serial # : 6
Specification : EN 55022 Class B
Distance correction factor (20 * log(test/spec) : 0.00
Test Mode : Clocks: 44.00 MHz, 66.00 MHz, 25.00 MHz, 12.00 MHz
Spurious Emissions - Digital Portion - 30 MHz to 1000 MHz
Vertical and Horizontal Polarization
Tested By: Kyle Fujimoto

Pol	Freq	Rdng	Cable loss	Ant factor	Amp gain	Cor'd rdg = R	Limit = L	Delta R-L
	MHz	dBuV	dB	dB	dB	dBuV	dBuV/m	dB
1H	43.653	39.70	1.70	10.82	38.36	13.86	30.00	-16.14
2H	72.949	38.90	2.13	7.03	38.40	9.66	30.00	-20.34
3H	110.668	43.30	2.49	12.12	38.35	19.57	30.00	-10.43
4H	131.995	39.90	2.69	12.45	38.40	16.64	30.00	-13.36
5H	215.995	38.50	3.53	16.52	38.27	20.28	30.00	-9.72
6H	227.995	41.50	3.64	16.18	38.21	23.10	30.00	-6.90
7H	336.137	46.70	4.42	14.06	38.30	26.88	37.00	-10.12
8H	396.137	38.90	4.78	14.31	38.30	19.69	37.00	-17.31
9H	432.137	47.80	5.06	15.22	38.04	30.04	37.00	-6.96
10H	528.053	50.70	5.39	16.60	38.16	34.53	37.00	-2.47
11H	528.055Qp	49.68	5.39	16.60	38.16	33.51	37.00	-3.49
12H	550.067	46.30	5.60	16.60	38.20	30.30	37.00	-6.70
13H	572.067	47.70	5.83	16.92	38.15	32.29	37.00	-4.71
14H	594.085	43.70	6.04	17.22	38.11	28.85	37.00	-8.15
15H	638.085	43.30	6.33	18.45	37.95	30.14	37.00	-6.86
16H	660.065	45.80	6.42	18.57	37.90	32.89	37.00	-4.11
17H	792.065	47.30	6.90	20.36	37.45	37.11	37.00	0.11
18H	792.065Qp	43.76	6.90	20.36	37.45	33.57	37.00	-3.43
19H	814.057	42.80	6.93	20.70	37.46	32.97	37.00	-4.03
20H	858.057	40.90	7.03	21.20	37.57	31.57	37.00	-5.43
21H	875.133	41.70	7.10	21.20	37.50	32.50	37.00	-4.50
22H	880.034	44.20	7.12	21.20	37.48	35.04	37.00	-1.96
23H	880.035Qp	42.10	7.12	21.20	37.48	32.94	37.00	-4.06
24H	924.054	39.70	7.44	21.83	37.06	31.92	37.00	-5.08
25H	968.054	39.20	7.96	23.27	36.81	33.62	37.00	-3.38
26H	968.055Qp	38.34	7.96	23.27	36.81	32.76	37.00	-4.24

RADIATED EMISSIONS (FCC SECTION 15.205 AND 15.247)

COMPANY	**Troy Group, Inc.**	**DATE**	**9/29/03**	
EUT	**PocketPro USB Wireless**	**DUTY CYCLE**	**N/A**	**%**
MODEL	**2933-UW**	**PEAK TO AVG**	**N/A**	**dB**
S/N	**6**	**TEST DIST.**	**3**	**Meters**
TEST ENGINEER	**Kyle Fujimoto**	**LAB**	**B**	

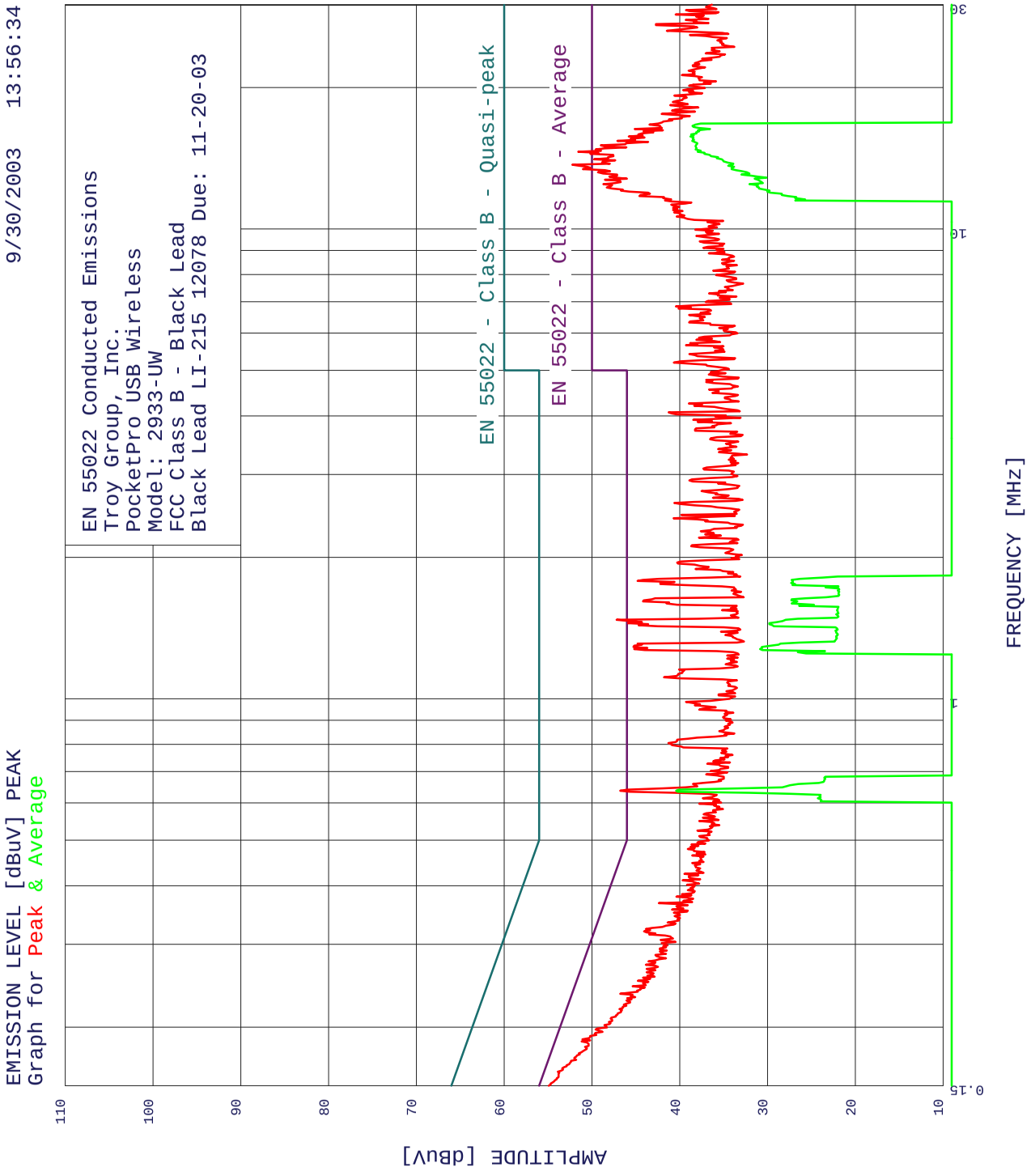
Frequency MHz	Peak Reading (dBuV)	Average (A) or Quasi-Peak (QP)	Antenna Polar. (V or H)	Antenna Height (meters)	EUT Azimuth (degrees)	EUT Axis (X,Y,Z)	EUT Tx Channel	Antenna Factor (dB)	Cable Loss (dB)	Amplifier Gain (dB)	Distance Factor (dB)	Mixer Factor (dB)	*Corrected Reading (dBuV/m)	Delta ** (dB)	Spec Limit (dBuV/m)	Comments
2037.8000	39.2	35.2 A	H	2.0	90			29.5	2.2	30.9	0.0	0.0	**36.0**	**-18.0**	**54.0**	**Digital Spurious**
4075.6000	44.1	A	H	2.0	90			33.1	3.6	32.5	0.0	0.0	**48.3**	**-5.7**	**54.0**	**Digital Spurious**
2037.8000	44.8	42.3 A	V	2.0	90			29.5	2.2	30.9	0.0	0.0	**43.1**	**-10.9**	**54.0**	**Digital Spurious**
4075.6000	47.0	45.3 A	V	2.0	90			33.1	3.6	32.5	0.0	0.0	**49.5**	**-4.5**	**54.0**	**Digital Spurious**
																No Harmnic Emissions
																Found in the Receive Mode

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

** DELTA = SPEC LIMIT - CORRECTED READING

CONDUCTED EMISSIONS

DATA SHEETS


9/30/2003 13:56:34
EN 55022 Conducted Emissions
Troy Group, Inc.
PocketPro USB Wireless
Model: 2933-UW
FCC Class B - Black Lead
Black Lead LI-215 12078 Due: 11-20-03
EN 55022 - Class B - Quasi-peak
EN 55022 - Class B - Average
EMISSION LEVEL [dBuV] PEAK
Graph for Peak & Average
AMPLITUDE [dBuV]
FREQUENCY [MHz]
110
100
90
80
70
60
50
40
30
20
10
0.15

EN 55022 Conducted Emissions page 1/1
Troy Group, Inc.
PocketPro USB Wireless 9/30/2003 13:56:34
Model: 2933-UW
FCC Class B - Black Lead
Black Lead LI-215 12078 Due: 11-20-03
TEST ENGINEER : Kyle Fujimoto

40 highest peaks above -50.00 dB of EN 55022 - Class B - Average limit line
Peak criteria : 2.00 dB, Curve : Peak

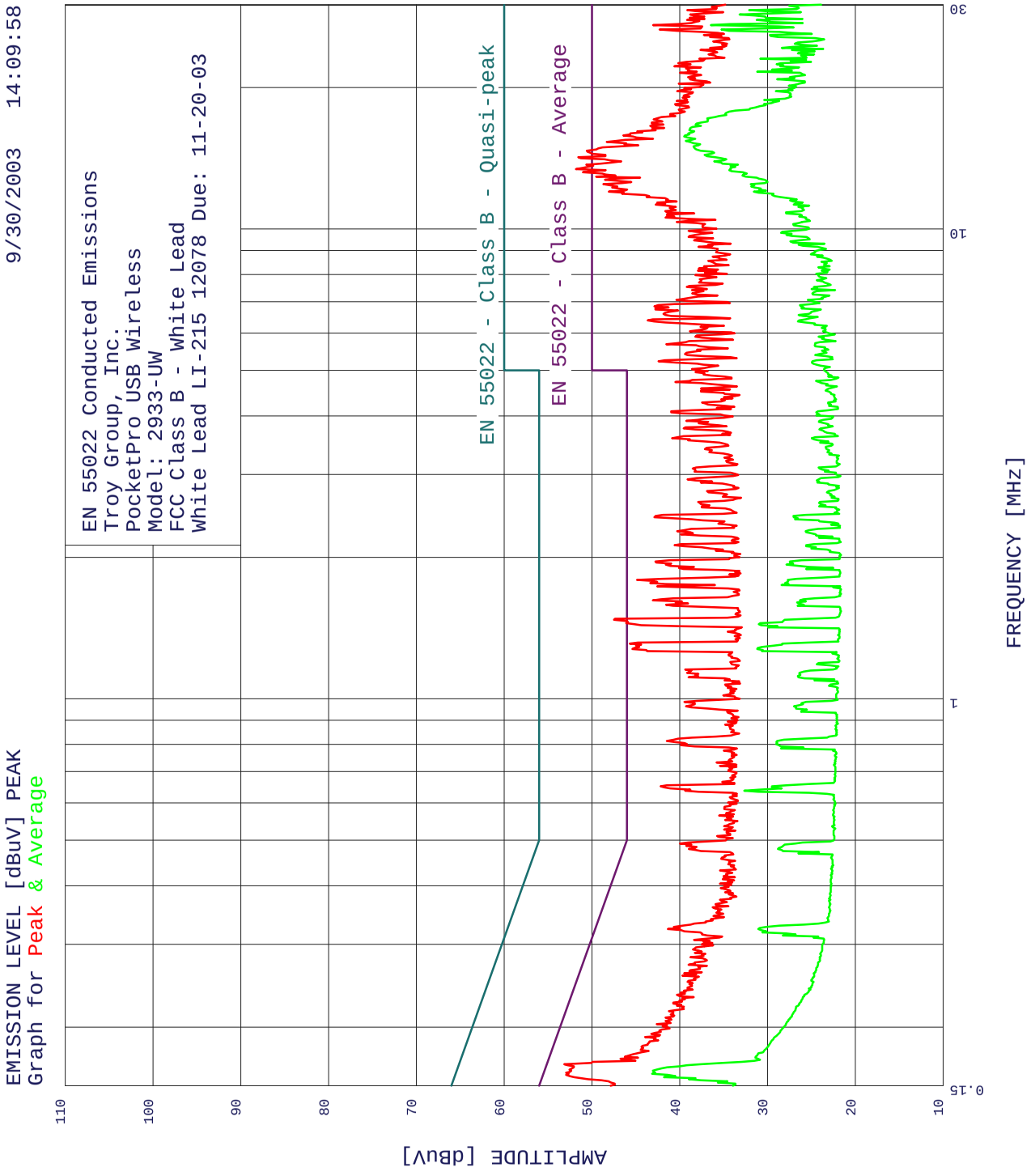
Peak#	Freq(MHz)	Amp(dBuV)	Limit(dB)	Delta(dB)
1	13.703	52.23	50.00	2.23**
2	14.603	51.56	50.00	1.56**
3	1.472	47.18	46.00	1.18**
4	0.637	46.77	46.00	0.77**
5	14.065	49.74	50.00	-0.26**
6	1.290	45.28	46.00	-0.72**
7	15.068	48.97	50.00	-1.03**
8	1.781	44.79	46.00	-1.21**
9	12.453	48.70	50.00	-1.30**
10	1.611	44.18	46.00	-1.82**
11	15.395	47.08	50.00	-2.92**
12	1.112	41.78	46.00	-4.22
13	0.805	41.27	46.00	-4.73
14	4.071	41.24	46.00	-4.76
15	16.315	45.11	50.00	-4.89**
16	2.423	40.70	46.00	-5.30
17	2.610	40.60	46.00	-5.40
18	0.320	44.06	49.71	-5.65
19	1.950	40.29	46.00	-5.71
20	2.462	39.80	46.00	-6.20
21	0.367	42.36	48.56	-6.20
22	0.984	39.27	46.00	-6.73
23	4.249	38.95	46.00	-7.05
24	2.916	38.91	46.00	-7.09
25	0.479	39.06	46.36	-7.30
26	2.111	38.69	46.00	-7.31
27	27.287	42.69	50.00	-7.31
28	3.924	38.44	46.00	-7.56
29	3.741	38.23	46.00	-7.77
30	17.573	42.05	50.00	-7.95
31	2.201	37.80	46.00	-8.20
32	0.598	37.77	46.00	-8.23
33	0.550	37.77	46.00	-8.23
34	2.274	37.60	46.00	-8.40
35	2.766	37.51	46.00	-8.49
36	26.422	41.46	50.00	-8.54
37	3.091	37.31	46.00	-8.69
38	18.336	41.07	50.00	-8.93
39	0.690	36.97	46.00	-9.03
40	4.774	36.96	46.00	-9.04

** Please See the Average Readings on the Next Page and on the Plot

EN 55022 Conducted Emissions
Troy Group, Inc. page 1/1
PocketPro USB Wireless 9/30/2003 13:56:34
Model: 2933-UW
FCC Class B - Black Lead
Black Lead LI-215 12078 Due: 11-20-03
TEST ENGINEER : Kyle Fujimoto

34 highest peaks above -50.00 dB of EN 55022 - Class B - Average limit line
Peak criteria : 0.10 dB, Curve : Average

Peak#	Freq(MHz)	Amp(dBuV)	Limit(dB)	Delta(dB)
1	0.637	40.39	46.00	-5.61
2	15.727	38.76	50.00	-11.24
3	15.893	38.68	50.00	-11.32
4	15.395	38.56	50.00	-11.44
5	16.582	38.53	50.00	-11.47
6	14.991	38.19	50.00	-11.81
7	14.758	38.19	50.00	-11.81
8	14.603	37.96	50.00	-12.04
9	16.226	37.93	50.00	-12.07
10	14.138	35.76	50.00	-14.24
11	1.276	30.83	46.00	-15.17
12	13.631	34.47	50.00	-15.53
13	13.414	34.08	50.00	-15.92
14	1.449	29.79	46.00	-16.21
15	13.061	32.96	50.00	-17.04
16	12.453	32.06	50.00	-17.94
17	12.791	31.45	50.00	-18.55
18	1.763	27.29	46.00	-18.71
19	1.620	27.28	46.00	-18.72
20	1.790	27.24	46.00	-18.76
21	1.594	27.23	46.00	-18.77
22	12.318	31.21	50.00	-18.79
23	1.745	27.15	46.00	-18.85
24	1.256	26.53	46.00	-19.47
25	1.577	26.38	46.00	-19.62
26	12.003	30.02	50.00	-19.98
27	0.614	24.26	46.00	-21.74
28	0.679	23.52	46.00	-22.48
29	1.726	23.38	46.00	-22.62
30	11.498	26.82	50.00	-23.18
31	1.397	22.25	46.00	-23.75
32	1.512	22.16	46.00	-23.84
33	1.544	22.08	46.00	-23.92
34	1.699	22.00	46.00	-24.00


9/30/2003 14:09:58
EN 55022 Conducted Emissions
Troy Group, Inc.
PocketPro USB Wireless
Model: 2933-UW
FCC Class B - White Lead
White Lead LI-215 12078 Due: 11-20-03
EN 55022 - Class B - Quasi-peak
EN 55022 - Class B - Average
EMISSION LEVEL [dBuV] PEAK
Graph for Peak & Average
AMPLITUDE [dBuV]
FREQUENCY [MHz]
110
100
90
80
70
60
50
40
30
20
10
30
10
1
0.15

EN 55022 Conducted Emissions
Troy Group, Inc. page 1/1
PocketPro USB Wireless 9/30/2003 14:09:58
Model: 2933-UW
FCC Class B - White Lead
White Lead LI-215 12078 Due: 11-20-03
TEST ENGINEER : Kyle Fujimoto

---

40 highest peaks above -50.00 dB of EN 55022 - Class B - Average limit line
Peak criteria : 2.00 dB, Curve : Peak

Peak#	Freq(MHz)	Amp(dBuV)	Limit(dB)	Delta(dB)
1	13.414	51.83	50.00	1.83**
2	14.215	51.56	50.00	1.56**
3	1.472	47.47	46.00	1.47**
4	13.197	51.02	50.00	1.02**
5	14.680	50.58	50.00	0.58**
6	1.311	45.67	46.00	-0.33**
7	12.926	49.51	50.00	-0.49**
8	1.790	44.86	46.00	-1.14**
9	12.453	48.69	50.00	-1.31**
10	12.724	48.50	50.00	-1.50**
11	15.312	48.30	50.00	-1.70**
12	12.003	48.07	50.00	-1.93**
13	0.167	53.15	55.11	-1.97**
14	1.620	43.05	46.00	-2.95**
15	2.436	42.89	46.00	-3.11**
16	1.960	42.77	46.00	-3.23**
17	1.735	42.56	46.00	-3.44**
18	15.810	46.42	50.00	-3.58**
19	0.651	42.16	46.00	-3.84**
20	1.586	41.55	46.00	-4.45**
21	0.814	41.46	46.00	-4.54**
22	4.092	40.95	46.00	-5.05**
23	3.585	40.83	46.00	-5.17**
24	2.123	40.57	46.00	-5.43**
25	4.722	40.48	46.00	-5.52**
26	2.274	40.28	46.00	-5.72**
27	0.492	39.95	46.14	-6.19**
28	6.390	43.64	50.00	-6.36**
29	3.761	39.54	46.00	-6.46**
30	0.984	39.46	46.00	-6.54**
31	1.154	39.36	46.00	-6.64**
32	3.903	39.25	46.00	-6.75**
33	2.932	39.11	46.00	-6.89**
34	27.143	43.01	50.00	-6.99**
35	6.845	42.86	50.00	-7.14**
36	11.263	42.74	50.00	-7.26**
37	3.091	38.51	46.00	-7.49**
38	5.224	42.40	50.00	-7.60**
39	26.566	42.28	50.00	-7.72**
40	2.624	37.89	46.00	-8.11**

** Please See the Average Readings on the Next Page and on the Plot

EN 55022 Conducted Emissions
Troy Group, Inc. page 1/1
PocketPro USB Wireless 9/30/2003 14:09:58
Model: 2933-UW
FCC Class B - White Lead
White Lead LI-215 12078 Due: 11-20-03
TEST ENGINEER : Kyle Fujimoto

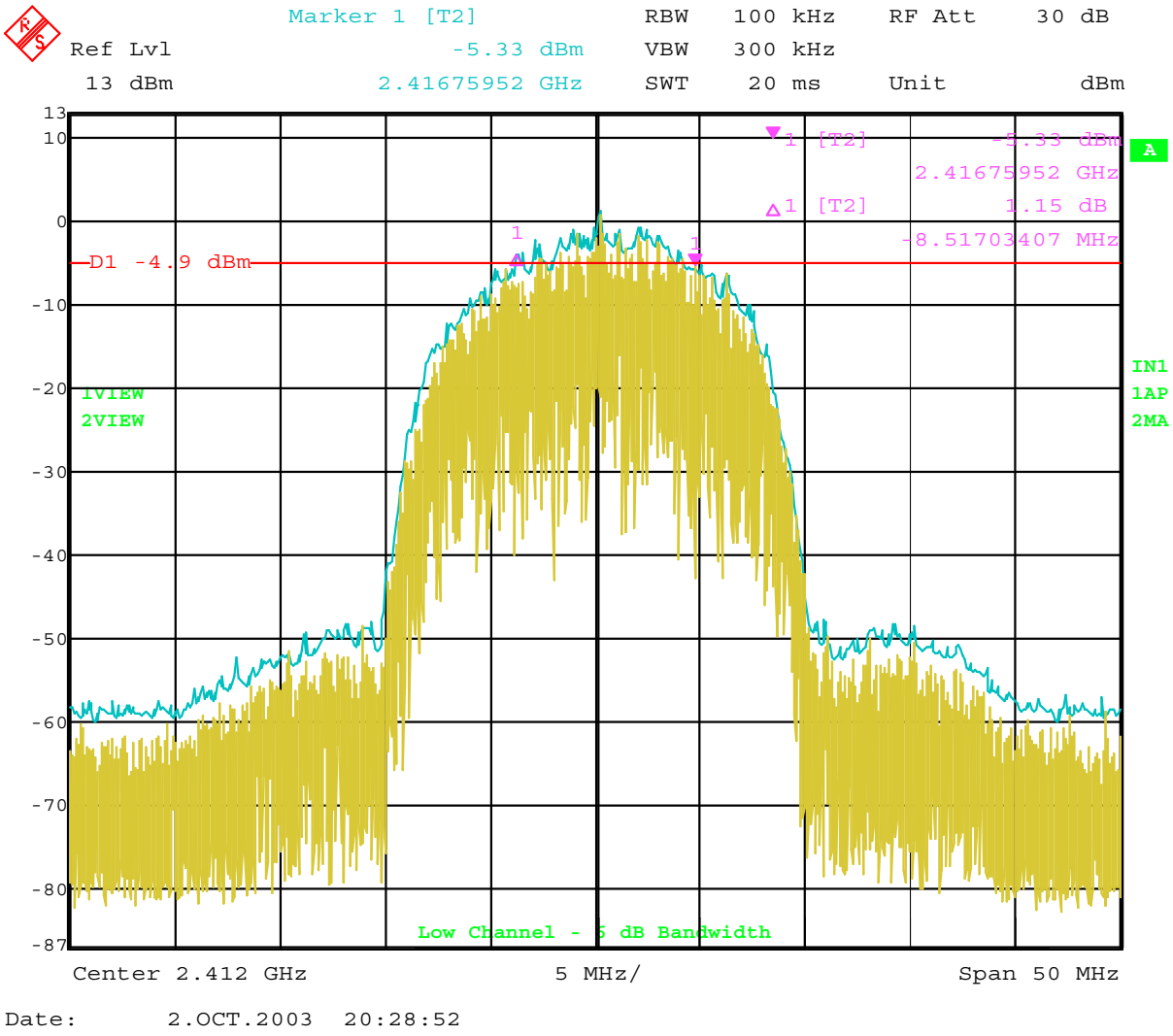
---

40 highest peaks above -50.00 dB of EN 55022 - Class B - Average limit line
Peak criteria : 0.10 dB, Curve : Average

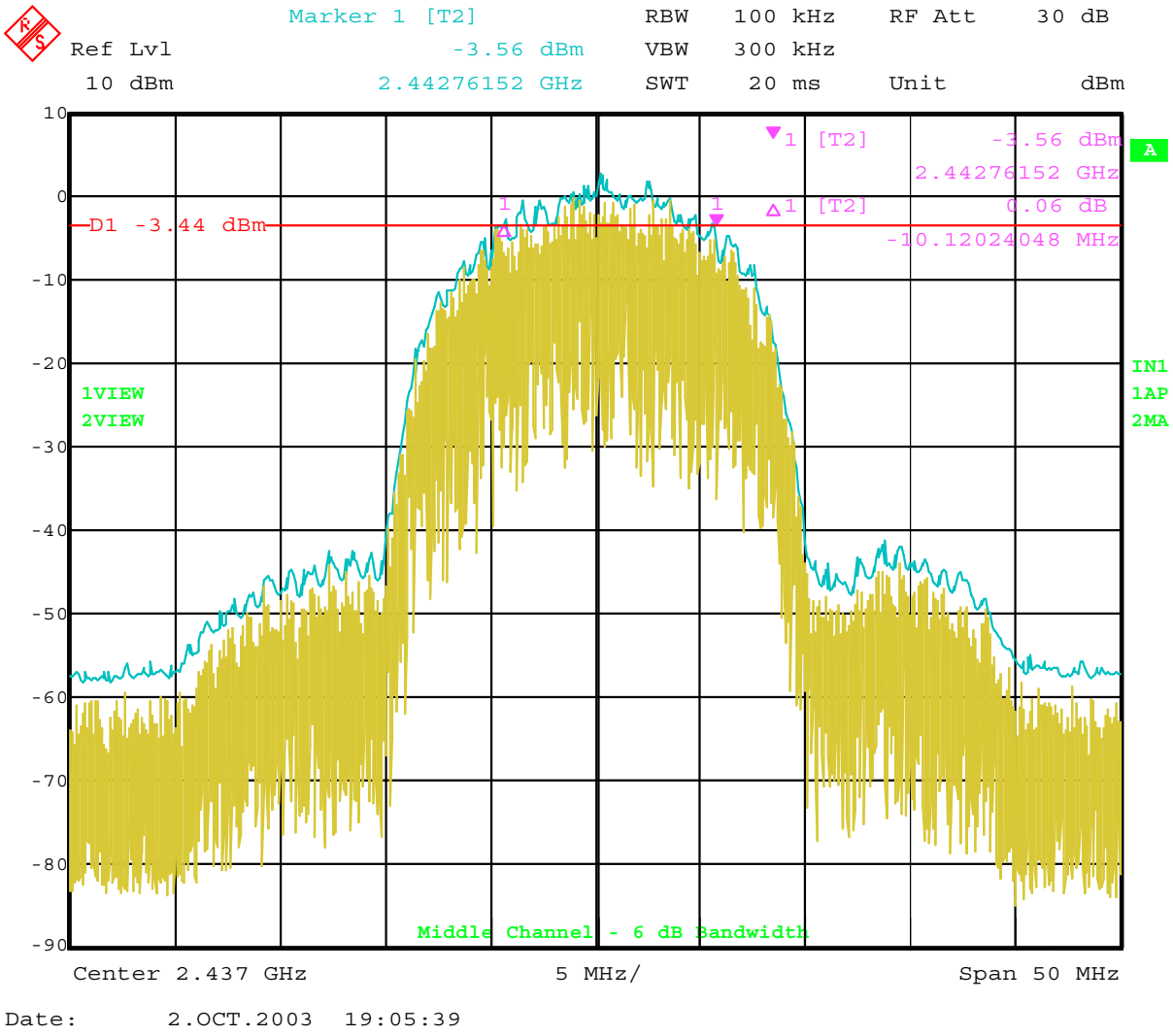
Peak#	Freq(MHz)	Amp(dBuV)	Limit(dB)	Delta(dB)
1	15.727	39.50	50.00	-10.50
2	15.395	39.29	50.00	-10.71
3	15.976	39.01	50.00	-10.99
4	16.226	38.91	50.00	-11.09
5	14.991	38.42	50.00	-11.58
6	16.671	38.19	50.00	-11.81
7	0.162	43.06	55.38	-12.32
8	0.159	43.13	55.51	-12.38
9	14.370	37.16	50.00	-12.84
10	0.637	32.65	46.00	-13.35
11	27.143	36.43	50.00	-13.57
12	0.157	41.79	55.64	-13.85
13	13.920	36.07	50.00	-13.93
14	26.566	35.24	50.00	-14.76
15	1.276	31.16	46.00	-14.84
16	1.441	31.00	46.00	-15.00
17	17.573	34.82	50.00	-15.18
18	1.262	30.63	46.00	-15.37
19	13.341	34.36	50.00	-15.64
20	13.631	34.19	50.00	-15.81
21	1.419	29.92	46.00	-16.08
22	0.648	29.49	46.00	-16.51
23	0.155	38.94	55.73	-16.79
24	28.615	33.16	50.00	-16.84
25	0.801	29.00	46.00	-17.00
26	0.809	28.99	46.00	-17.01
27	12.994	32.85	50.00	-17.15
28	0.783	28.46	46.00	-17.54
29	0.479	28.81	46.36	-17.55
30	1.745	28.38	46.00	-17.62
31	29.233	32.09	50.00	-17.91
32	1.763	27.99	46.00	-18.01
33	12.453	31.92	50.00	-18.08
34	12.318	31.85	50.00	-18.15
35	1.929	27.83	46.00	-18.17
36	12.003	31.54	50.00	-18.46
37	1.960	27.46	46.00	-18.54
38	0.324	31.05	49.62	-18.56
39	27.864	31.22	50.00	-18.78
40	21.607	31.15	50.00	-18.85

-6 dB BANDWIDTH

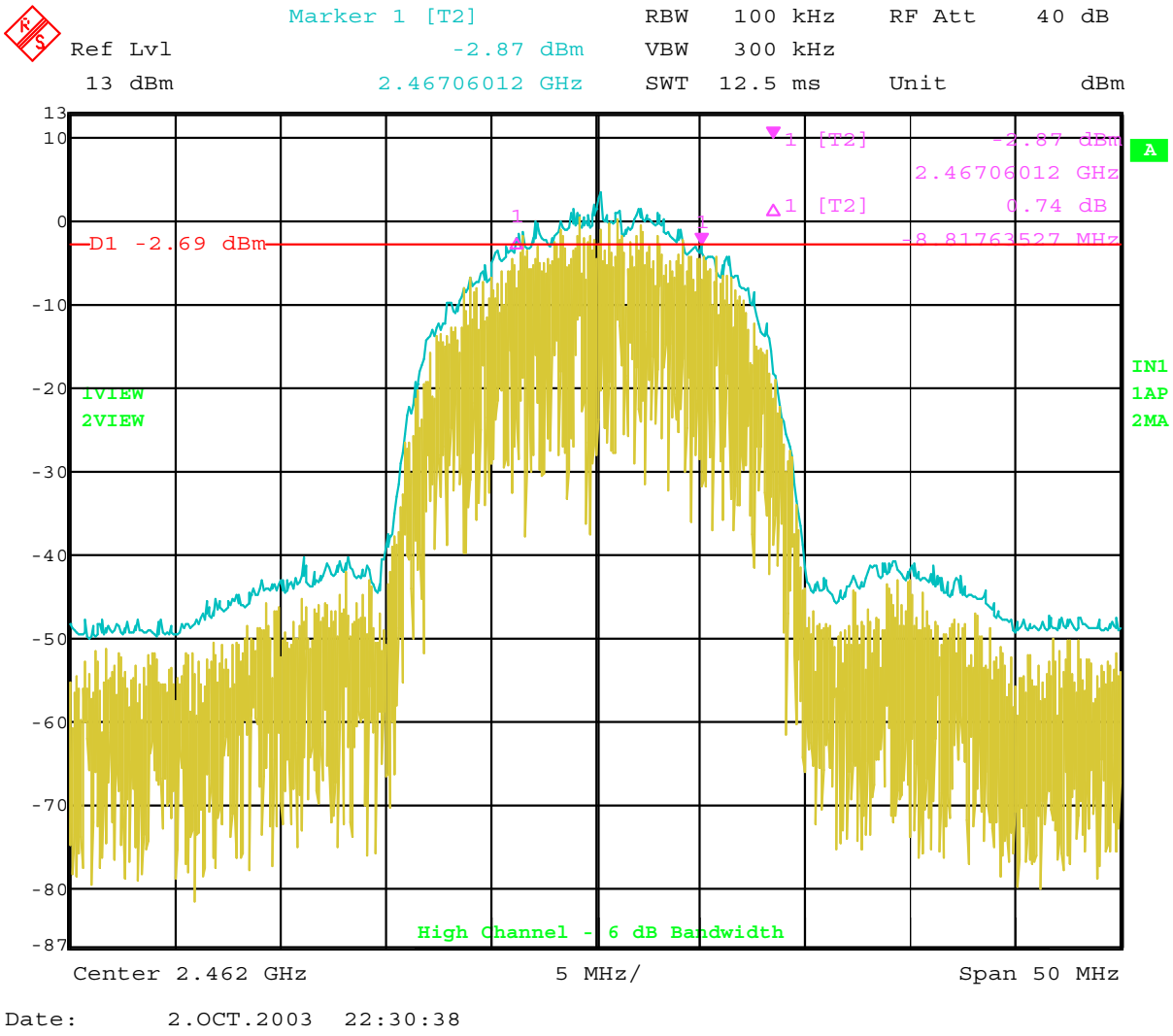
DATA SHEETS



-6 dB Bandwidth – Low Channel



-6 dB Bandwidth – Middle Channel



-6 dB Bandwidth – High Channel

PEAK POWER OUTPUT

DATA SHEETS

PEAK OUTPUT POWER

Troy Group, Inc.

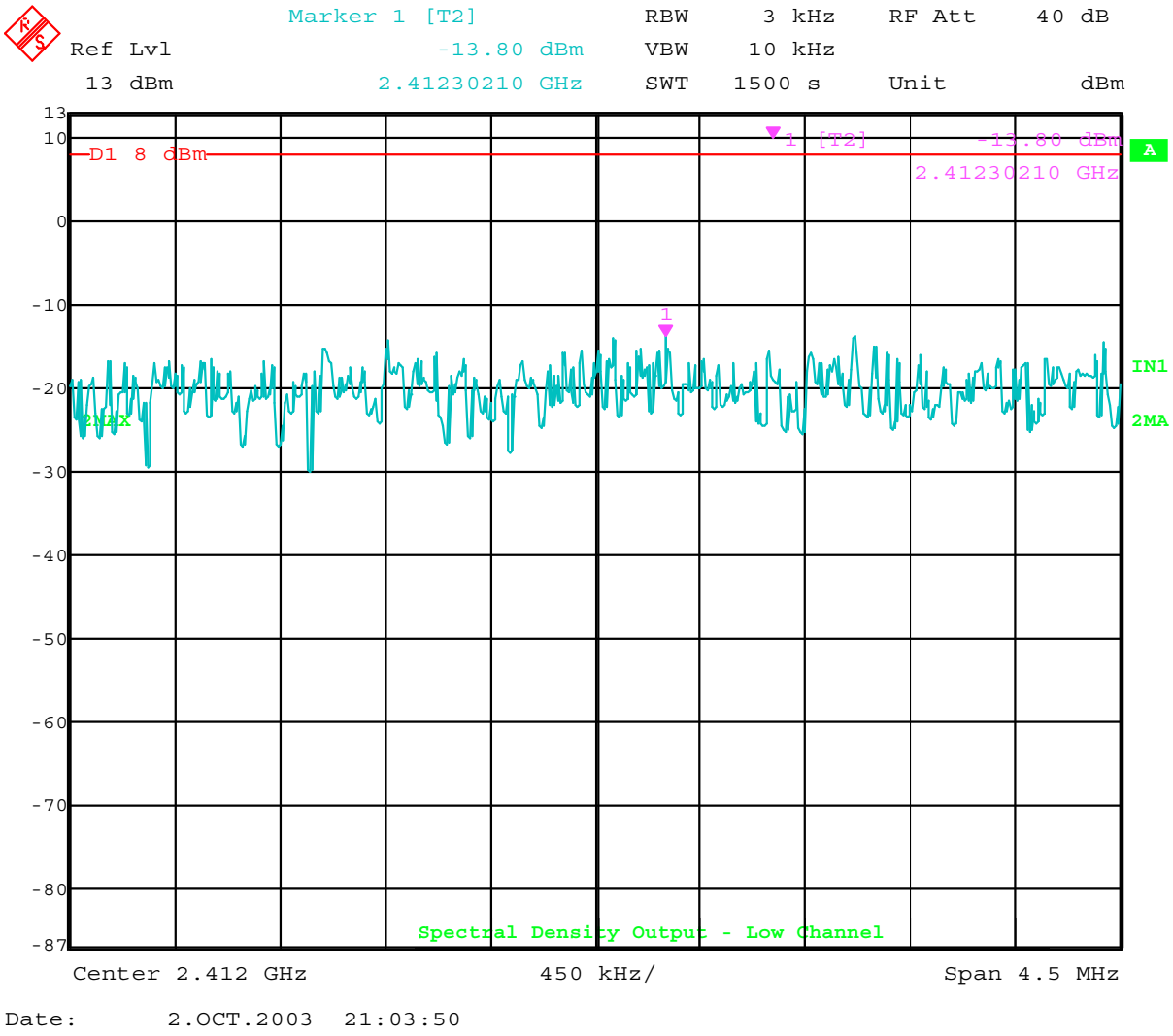
PocketPro USB Wireless

MODEL: 2933-UW

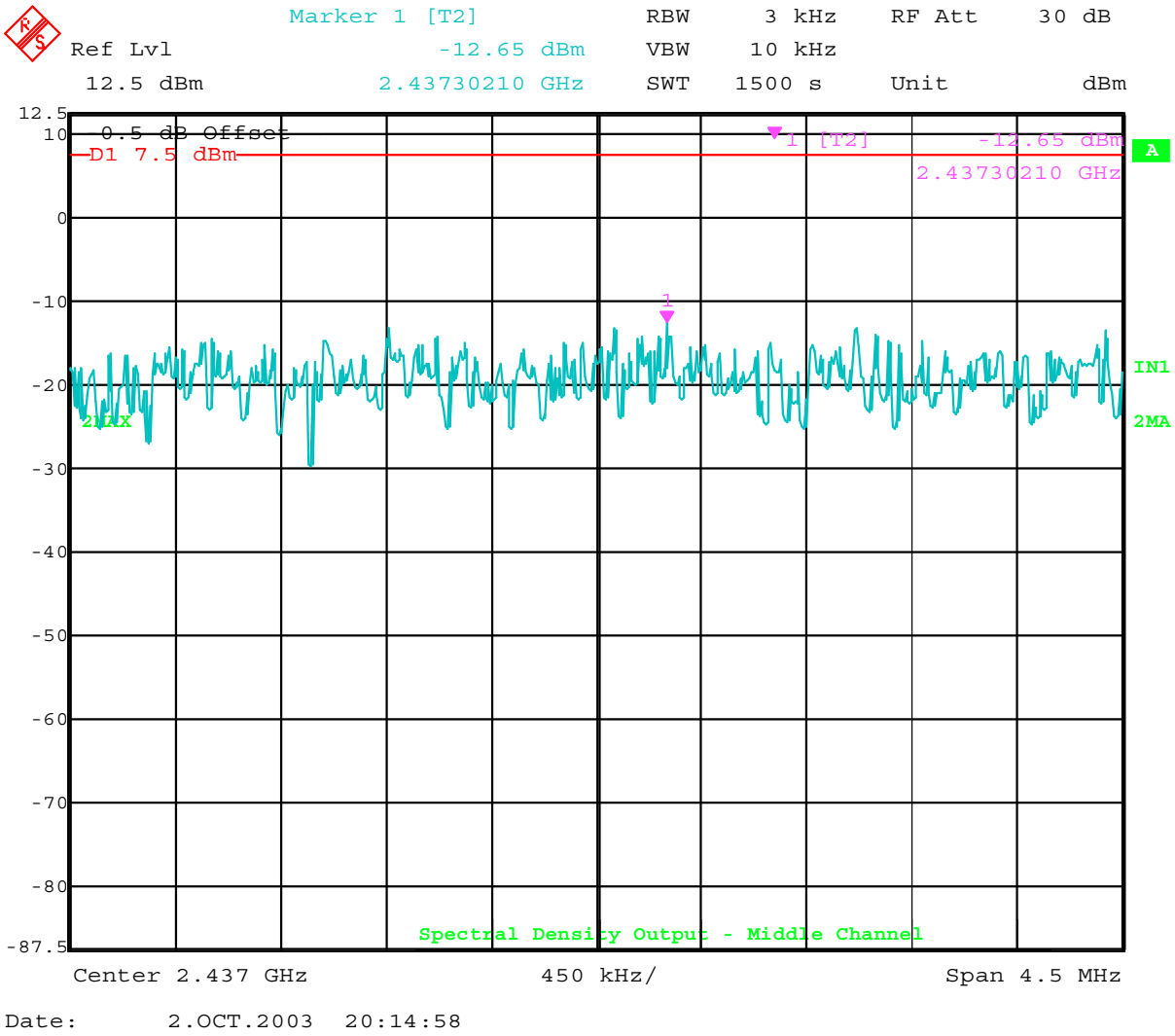
CHANNEL	PEAK POWER OUTPUT (dBm)
1 (2412 MHz)	13.00 dBm
6 (2437 MHz)	13.93 dBm
11 (2462 MHz)	15.14 dBm

PEAK POWER SPECTRAL DENSITY

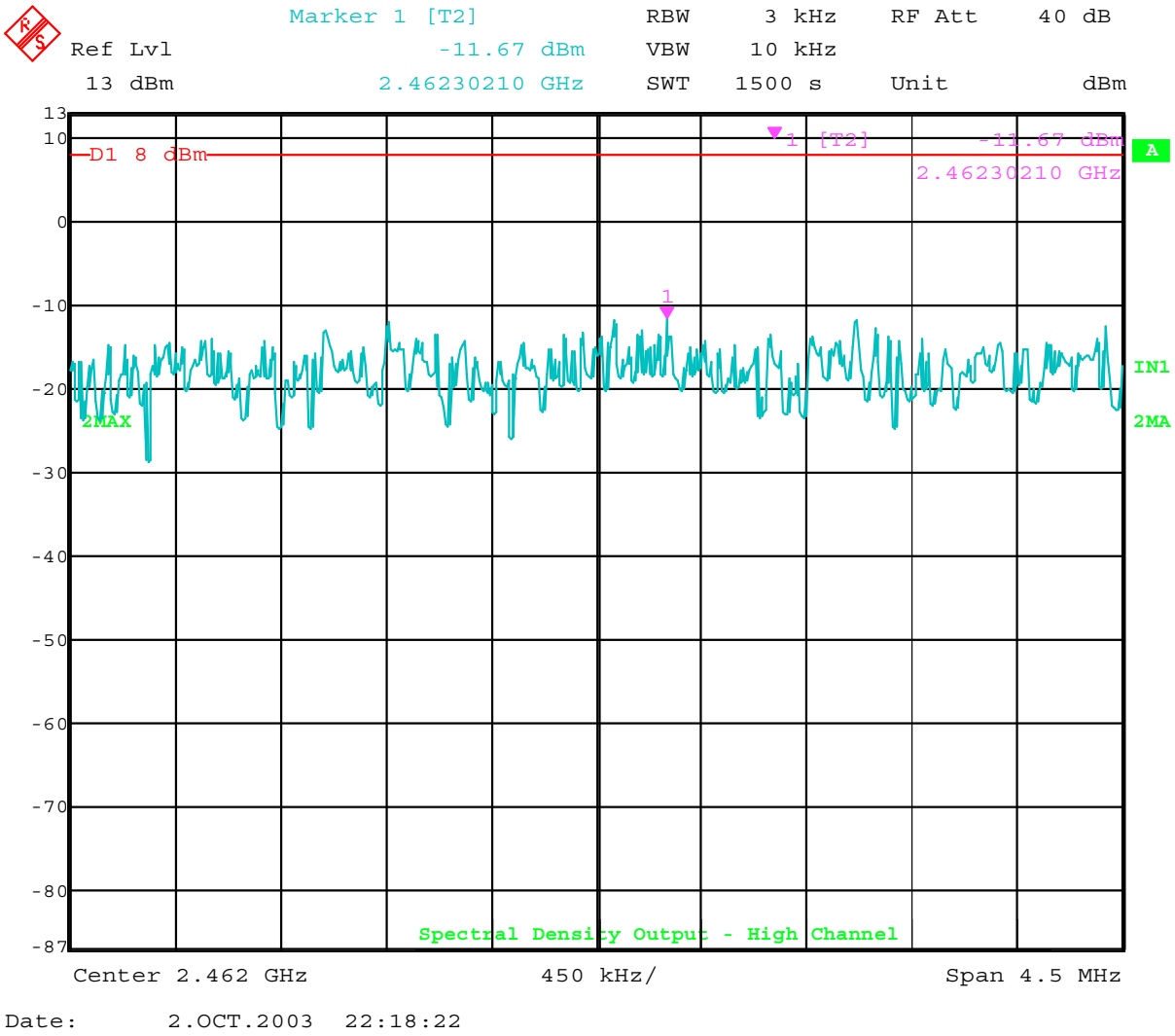
DATA SHEETS



Spectral Density Output – Low Channel



Spectral Density Output – Middle Channel



Spectral Density Output – High Channel

RADIATED EMISSIONS

DATA SHEETS for the TRANSMITTER PORTION

RADIATED EMISSIONS (FCC SECTION 15.205 AND 15.247)

COMPANY	**Troy Group, Inc.**	**DATE**	**9/29/03**	
EUT	**PocketPro USB Wireless**	**DUTY CYCLE**	**N/A**	**%**
MODEL	**2933-UW**	**PEAK TO AVG**	**N/A**	**dB**
S/N	**6**	**TEST DIST.**	**3**	**Meters**
TEST ENGINEER	**Kyle Fujimoto**	**LAB**	**B**	

Frequency MHz	Peak Reading (dBuV)	Average (A) or Quasi-Peak (QP)	Antenna Polar. (V or H)	Antenna Height (meters)	EUT Azimuth (degrees)	EUT Axis (X,Y,Z)	EUT Tx Channel	Antenna Factor (dB)	Cable Loss (dB)	Amplifier Gain (dB)	Distance Factor (dB)	Mixer Factor (dB)	*Corrected Reading (dBuV/m)	Delta ** (dB)	Spec Limit (dBuV/m)	Comments
2412.0000	67.9	A	H	1.0	90		LOW	30.2	2.5	0.0	0.0	0.0	**100.7**			
2412.0000	78.4	A	V	2.0	90		LOW	30.2	2.5	0.0	0.0	0.0	**111.1**			
2437.0000	66.1	A	H	1.0	270		MID	30.3	2.5	0.0	0.0	0.0	**98.9**			
2437.0000	77.9	A	V	1.0	0		MID	30.3	2.5	0.0	0.0	0.0	**110.7**			
2462.0000	67.8	A	H	2.0	0		HIGH	30.3	2.6	0.0	0.0	0.0	**100.7**			
2462.0000	79.9	A	V	2.0	90		HIGH	30.3	2.6	0.0	0.0	0.0	**112.8**			

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

** DELTA = SPEC LIMIT - CORRECTED READING

RADIATED EMISSIONS (FCC SECTION 15.205 AND 15.247)

COMPANY	**Troy Group, Inc.**	**DATE**	**9/29/03**	
EUT	**PocketPro USB Wireless**	**DUTY CYCLE**	**N/A**	**%**
MODEL	**2933-UW**	**PEAK TO AVG**	**N/A**	**dB**
S/N	**6**	**TEST DIST.**	**3**	**Meters**
TEST ENGINEER	**Kyle Fujimoto**	**LAB**	**B**	

Frequency MHz	Peak Reading (dBuV)	Average (A) or Quasi-Peak (QP)	Antenna Polar. (V or H)	Antenna Height (meters)	EUT Azimuth (degrees)	EUT Axis (X,Y,Z)	EUT Tx Channel	Antenna Factor (dB)	Cable Loss (dB)	Amplifier Gain (dB)	Distance Factor (dB)	Mixer Factor (dB)	*Corrected Reading (dBuV/m)	Delta ** (dB)	Spec Limit (dBuV/m)	Comments
4824.0000	42.0	32.0 A	H	1.0	90	Y	LOW	34.2	3.8	29.8	0.0	0.0	**40.2**	**-13.8**	**54.0**	
4824.0000	40.6	31.9 A	V	1.0	90	Y	LOW	34.2	3.8	29.8	0.0	0.0	**40.1**	**-13.9**	**54.0**	
4874.0000	41.5	27.2 A	H	1.0	90	Y	MID	34.3	3.8	31.4	0.0	0.0	**34.0**	**-20.0**	**54.0**	
4874.0000	41.4	29.9 A	V	2.0	90	Y	MID	34.3	3.8	31.4	0.0	0.0	**36.7**	**-17.3**	**54.0**	
4924.0000	37.2	27.8 A	H	1.5	0	Y	HIGH	34.5	3.8	31.3	0.0	0.0	**34.9**	**-19.1**	**54.0**	
4924.0000	37.8	30.0 A	V	2.0	0	Y	HIGH	34.5	3.8	31.3	0.0	0.0	**37.1**	**-16.9**	**54.0**	

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

** DELTA = SPEC LIMIT - CORRECTED READING

RADIATED EMISSIONS (FCC SECTION 15.205 AND 15.247)

COMPANY	**Troy Group, Inc.**	**DATE**	**9/29/03**
EUT	**PocketPro USB Wireless**	**DUTY CYCLE**	**N/A %**
MODEL	**2933-UW**	**PEAK TO AVG**	**N/A dB**
S/N	**6**	**TEST DIST.**	**3 Meters**
TEST ENGINEER	**Kyle Fujimoto**	**LAB**	**B**

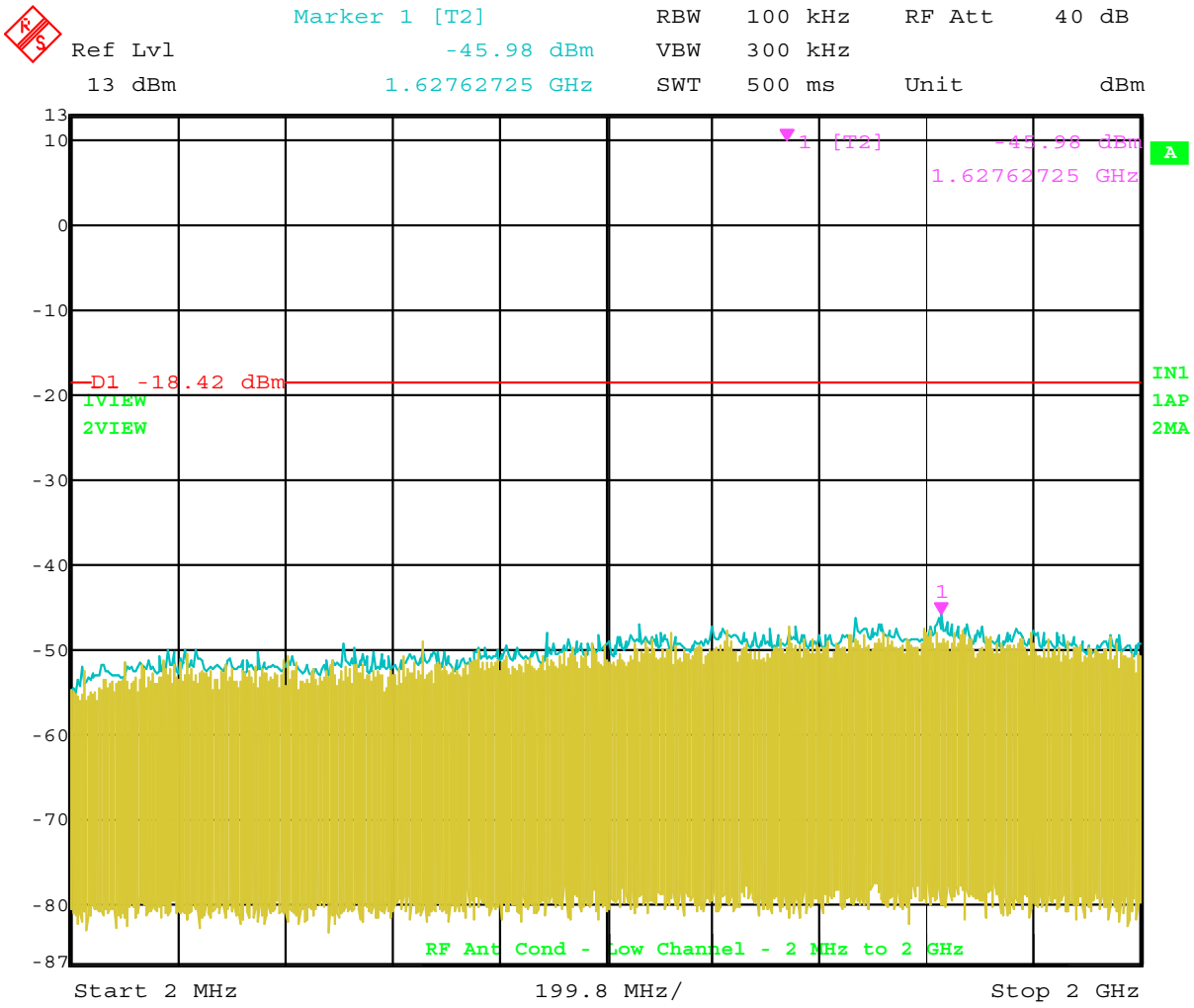
Frequency MHz	Peak Reading (dBuV)	Average (A) or Quasi-Peak (QP)	Antenna Polar. (V or H)	Antenna Height (meters)	EUT Azimuth (degrees)	EUT Axis (X,Y,Z)	EUT Tx Channel	Antenna Factor (dB)	Cable Loss (dB)	Amplifier Gain (dB)	Distance Factor (dB)	Mixer Factor (dB)	*Corrected Reading (dBuV/m)	Delta ** (dB)	Spec Limit (dBuV/m)	Comments
7236.0000	43.1	33.5 A	H	1.5	90	Y	LOW	38.8	4.8	31.7	0.0	0.0	**45.4**	**-8.6**	**54.0**	**No Harmonics**
																Nor Emissions Found
																After the 3rd Harmonic
7236.0000	41.4	33.0 A	V	2.0	90	Y	LOW	38.8	4.8	31.7	0.0	0.0	**44.9**	**-9.1**	**54.0**	
7311.0000	39.0	26.8 A	H	1.5	90	Y	MID	38.8	4.9	31.7	0.0	0.0	**38.8**	**-15.2**	**54.0**	
7311.0000	39.1	26.9 A	V	1.5	90	Y	MID	38.8	4.9	31.7	0.0	0.0	**38.9**	**-15.1**	**54.0**	
7386.0000	35.9	26.4 A	H	1.5	0	Y	HIGH	38.8	4.9	31.6	0.0	0.0	**38.4**	**-15.6**	**54.0**	
7386.0000	33.5	26.2 A	V	1.5	0	Y	HIGH	38.8	4.9	31.6	0.0	0.0	**38.2**	**-15.8**	**54.0**	

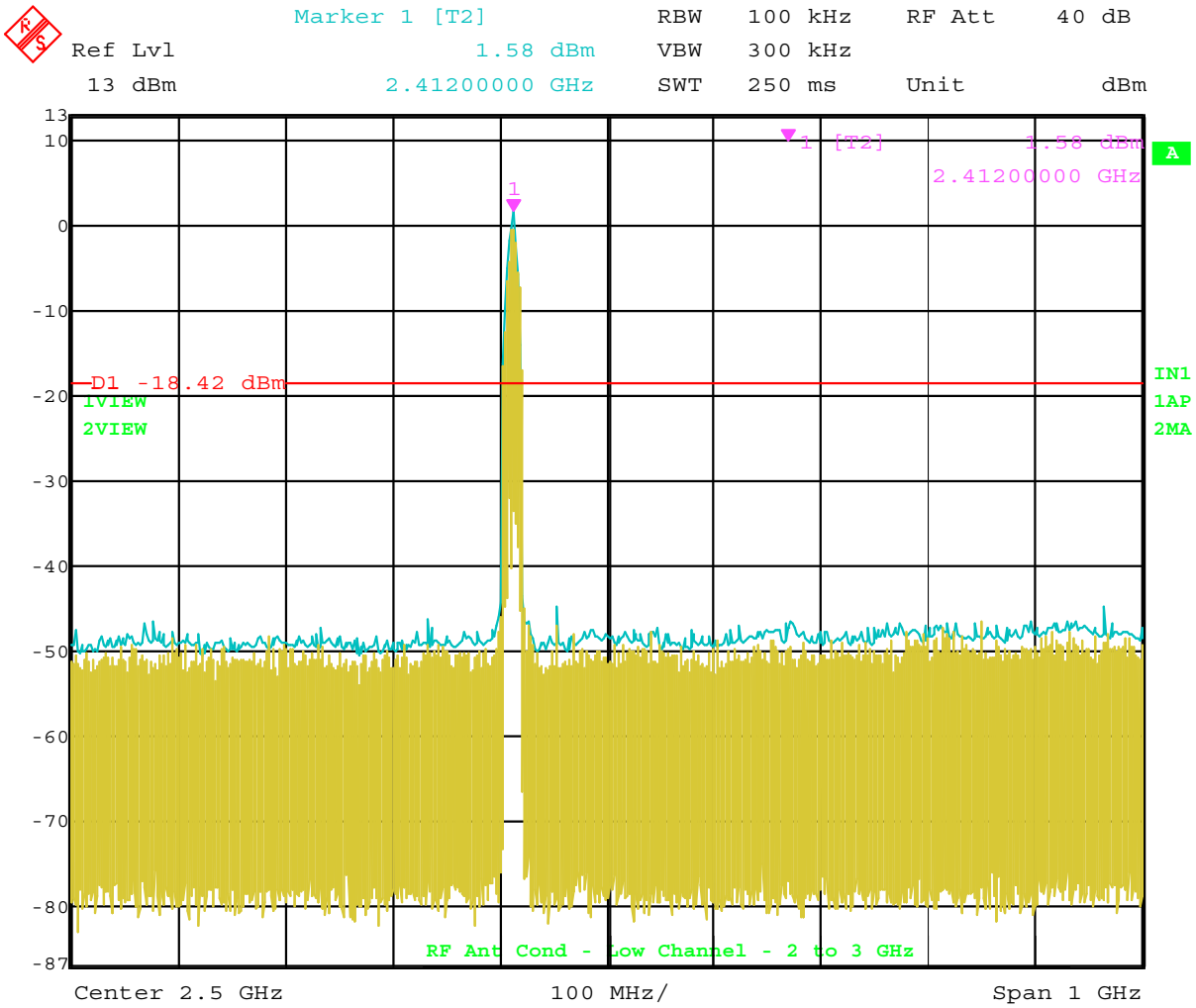
* CORRECTED READING = METER READING + ANTENNA FACTOR + CABLE LOSS - AMPLIFIER GAIN

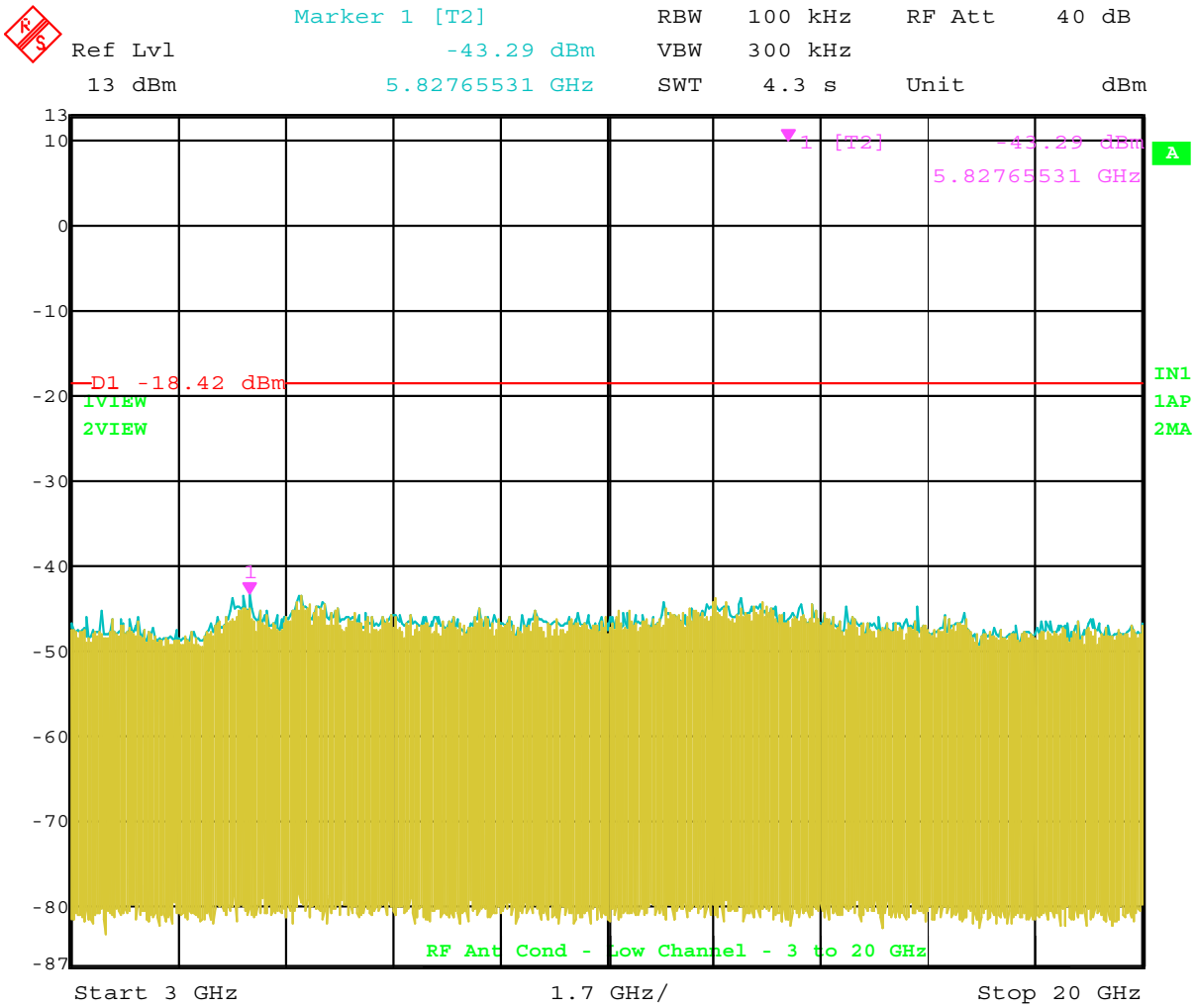
** DELTA = SPEC LIMIT - CORRECTED READING

RF ANTENNA CONDUCTED

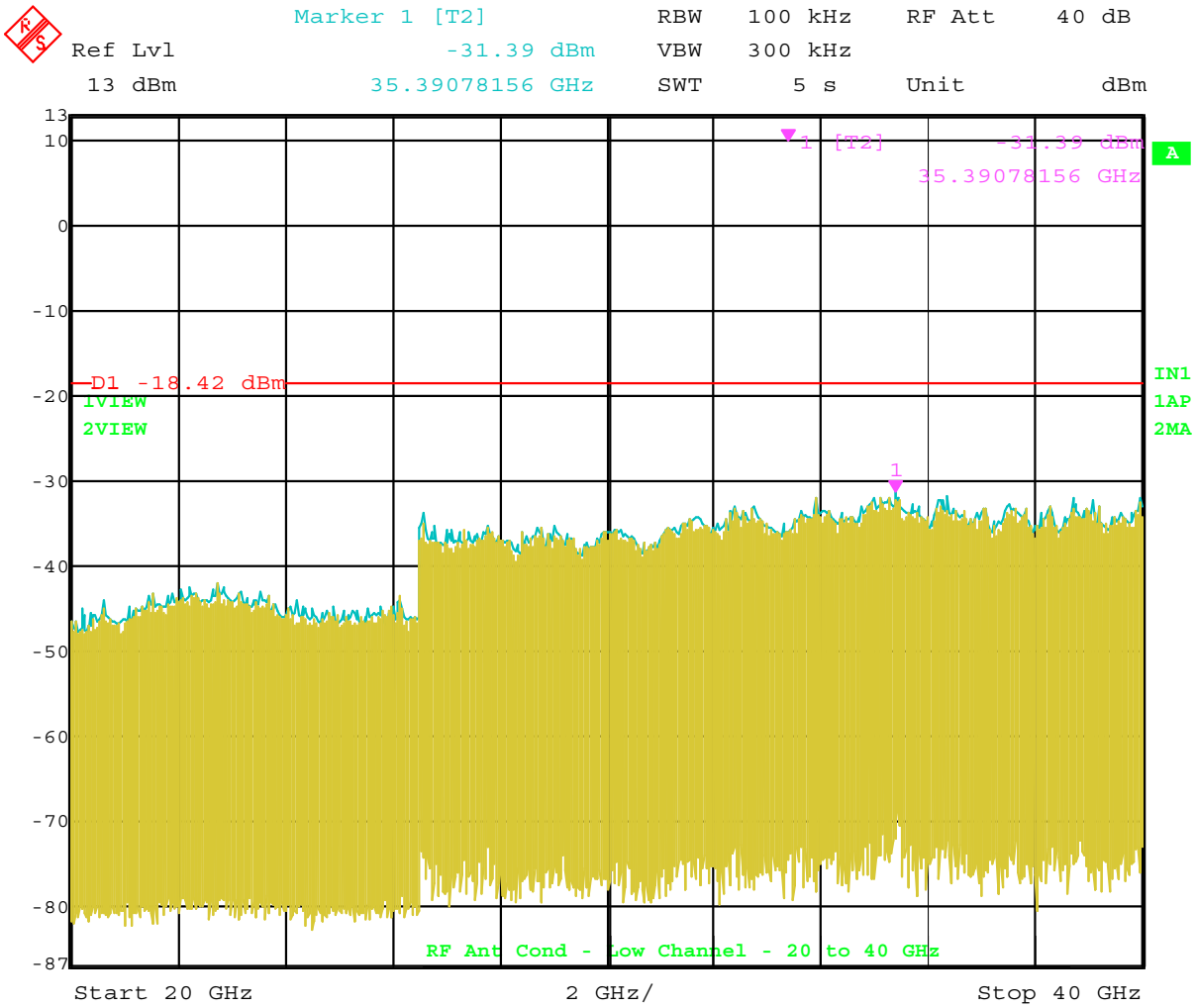
DATA SHEETS


Marker 1 [T2]
-45.98 dBm
1.62762725 GHz
RBW 100 kHz
VBW 300 kHz
SWT 500 ms
RF Att 40 dB
Unit dBm
Ref Lvl
13 dBm
1 [T2] -45.98 dBm
1.62762725 GHz
D1 -18.42 dBm
1VIEW
2VIEW
IN1
1AP
2MA
A
RF Ant Cond - Low Channel - 2 MHz to 2 GHz
Start 2 MHz
199.8 MHz/
Stop 2 GHz
Date: 2.OCT.2003 20:33:47

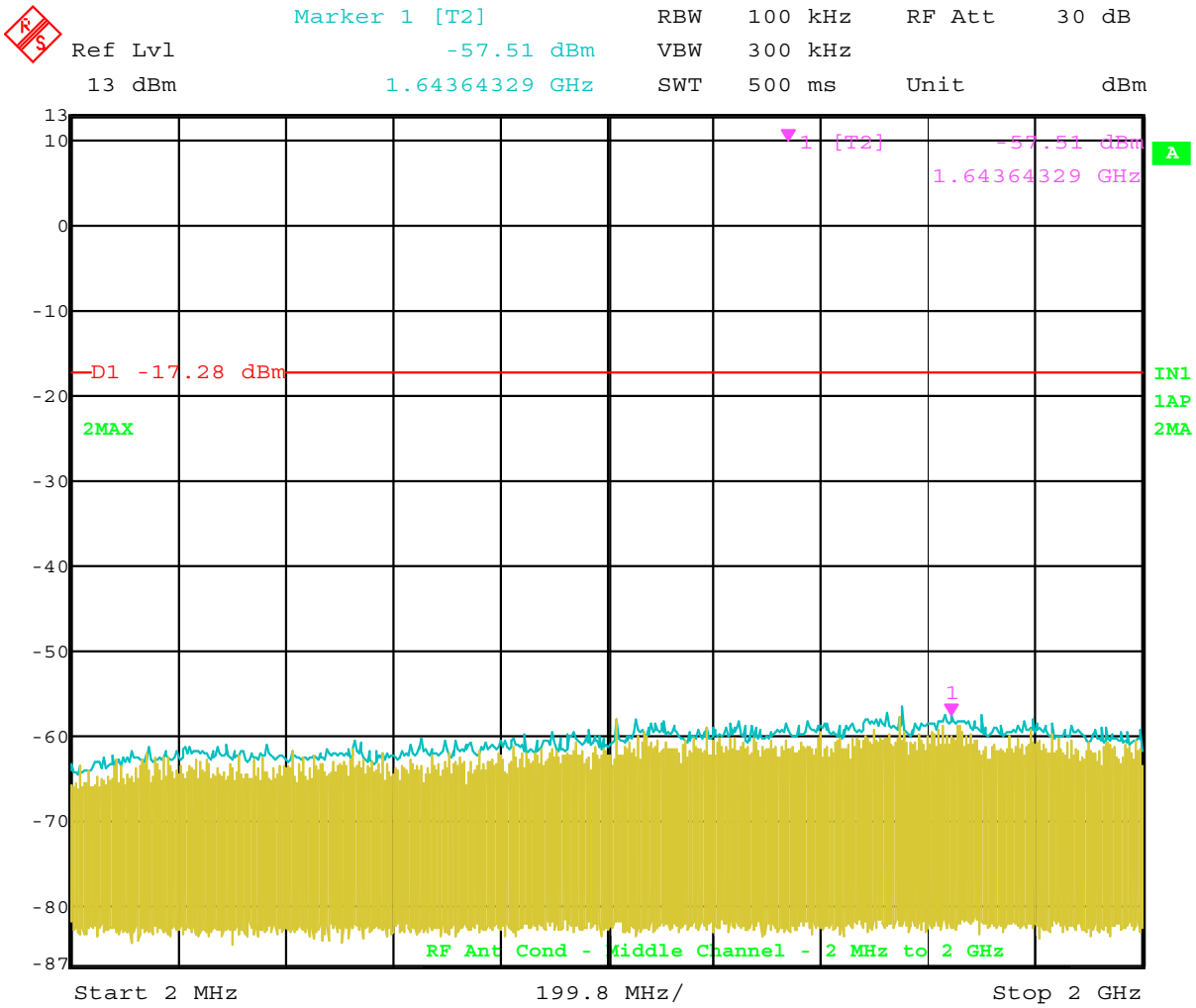

Marker 1 [T2]
1.58 dBm
2.41200000 GHz
RBW 100 kHz
VBW 300 kHz
SWT 250 ms
RF Att 40 dB
Unit dBm
Ref Lvl
13 dBm
1 [T2] 1.58 dBm
2.41200000 GHz
A
D1 -18.42 dBm
IN1
1AP
2MA
1VIEW
2VIEW
RF Ant Cond - Low Channel - 2 to 3 GHz
Center 2.5 GHz
100 MHz/
Span 1 GHz
Date: 2.OCT.2003 20:33:06



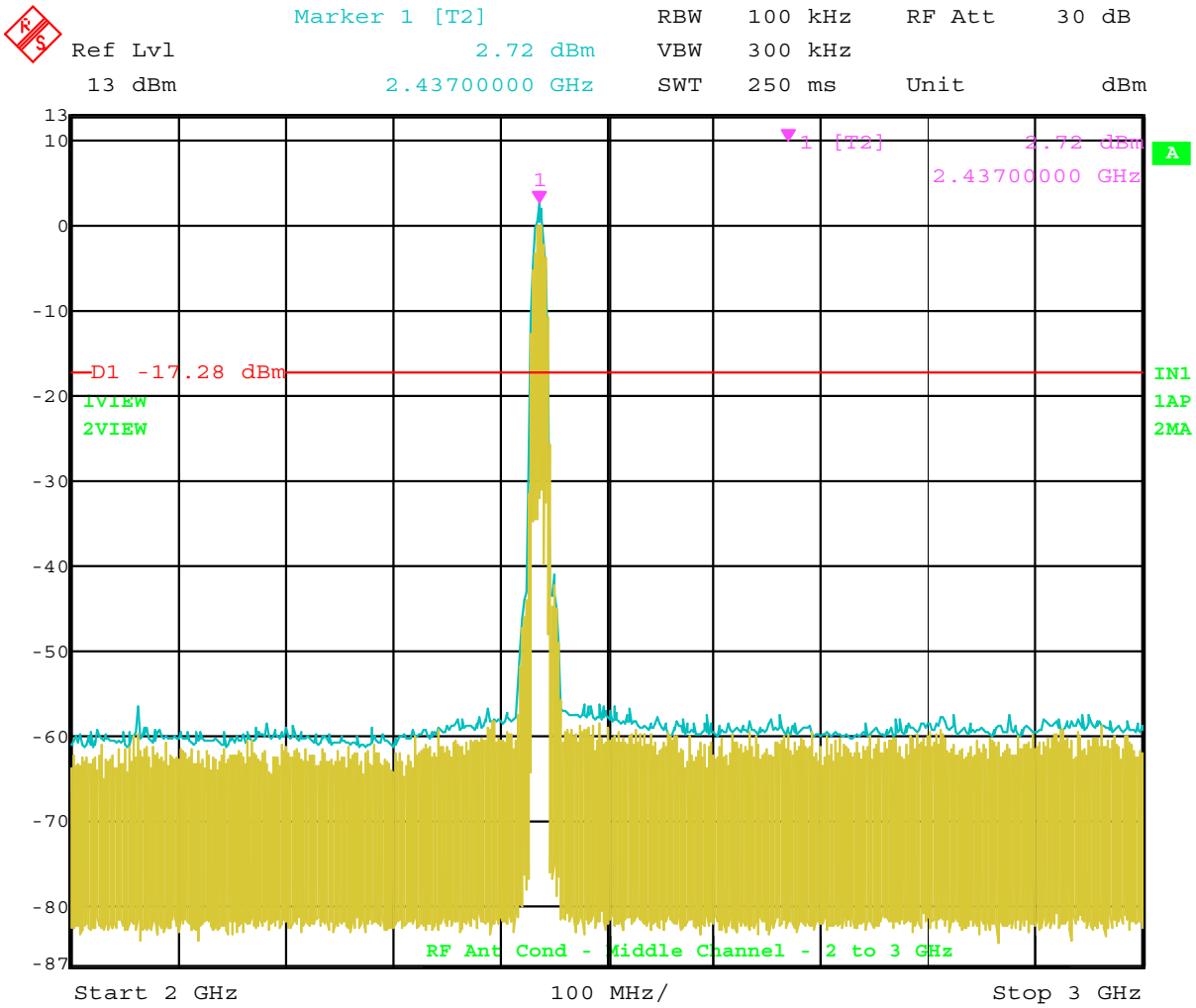
Date: 2.OCT.2003 20:34:45



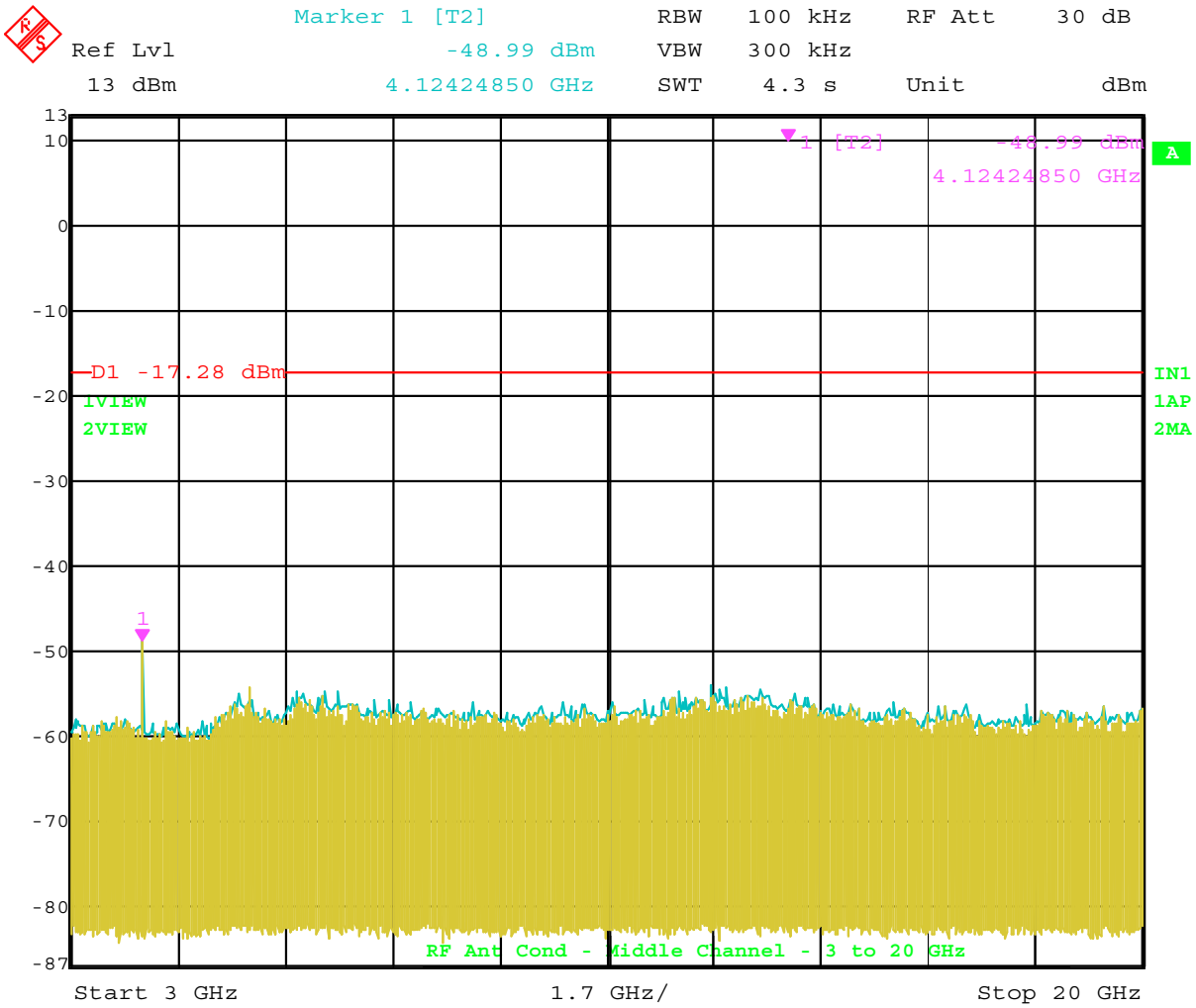
Date: 2.OCT.2003 20:35:38

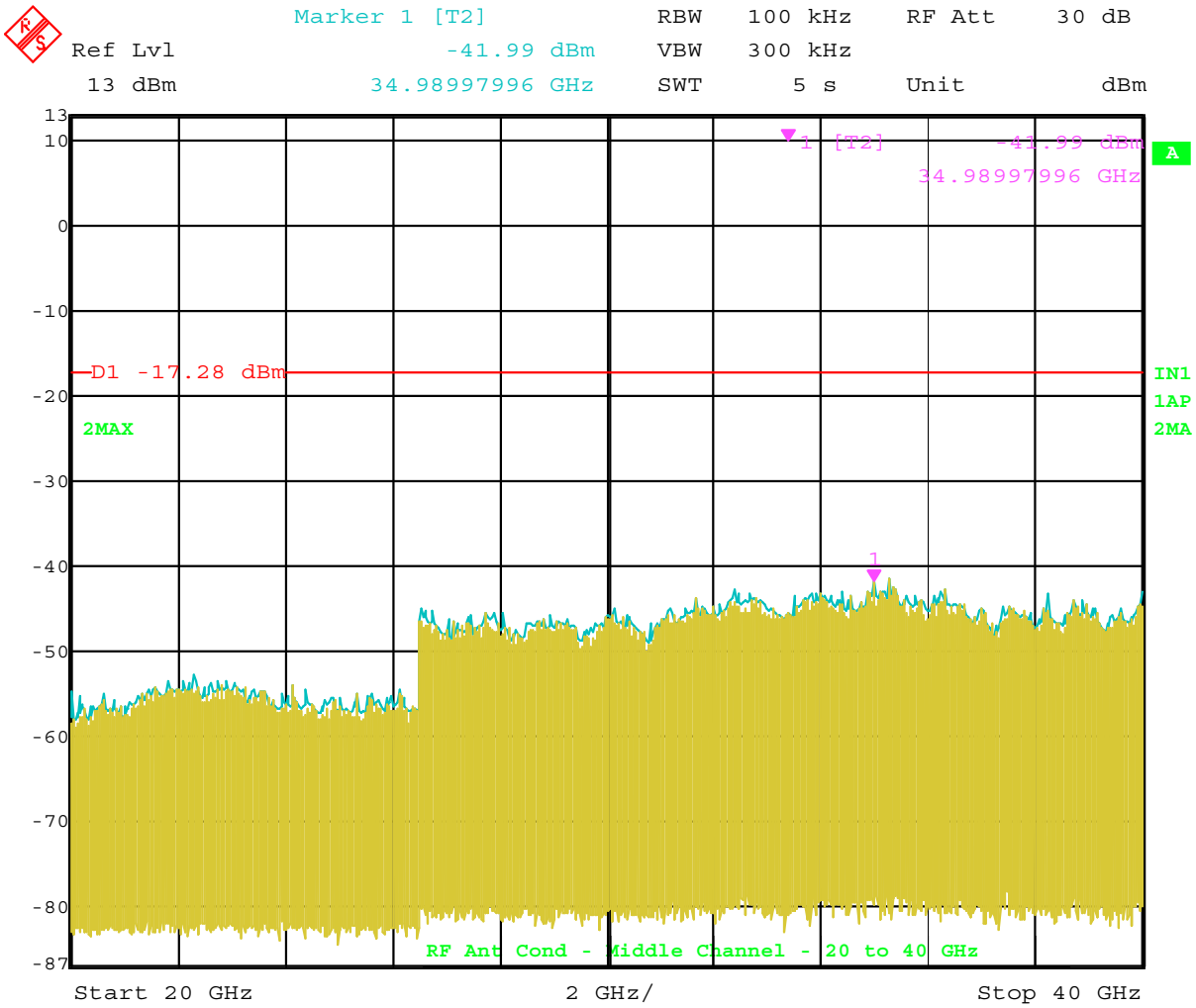


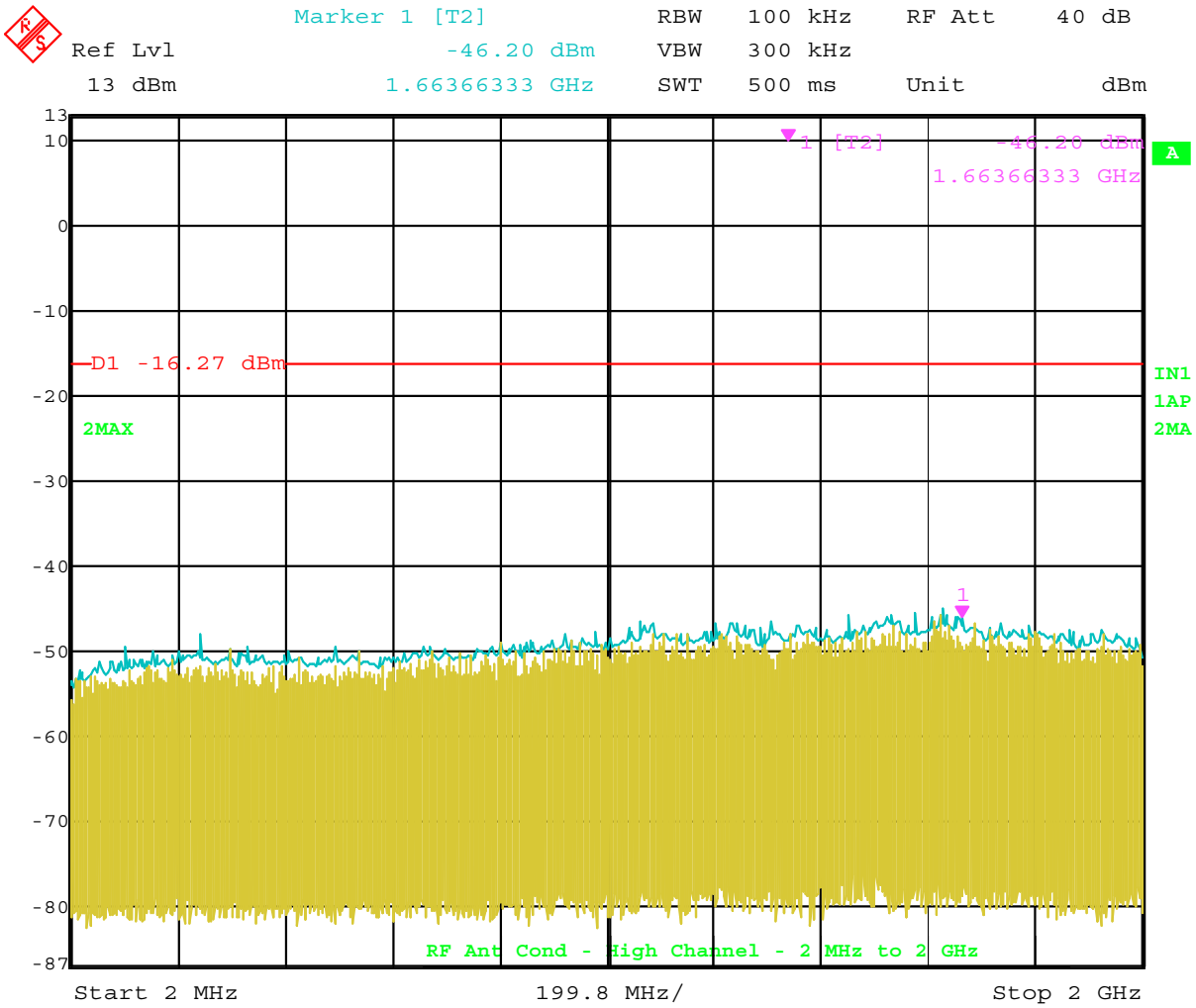
Date: 2.OCT.2003 19:39:19



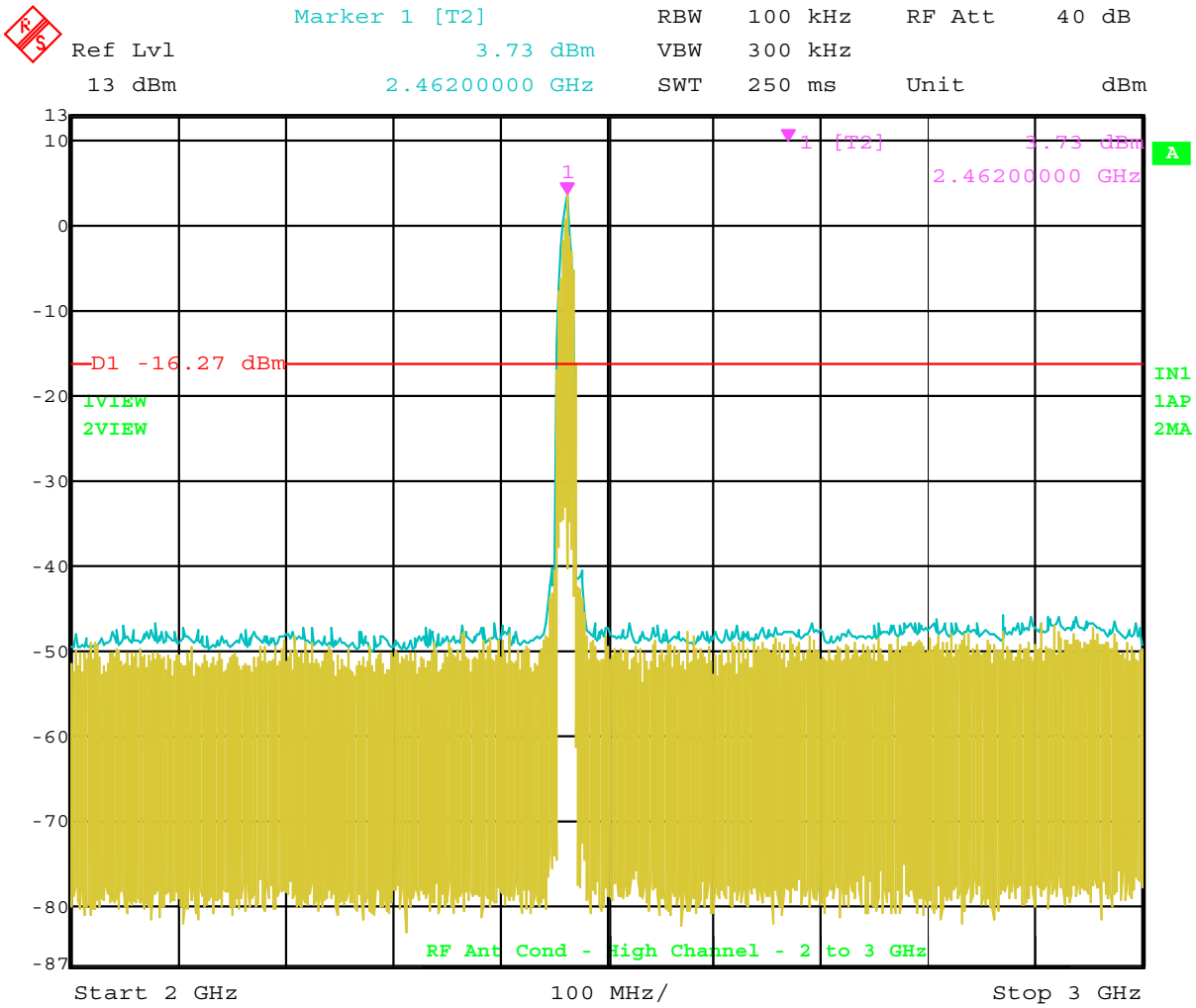
Date: 2.OCT.2003 19:38:35

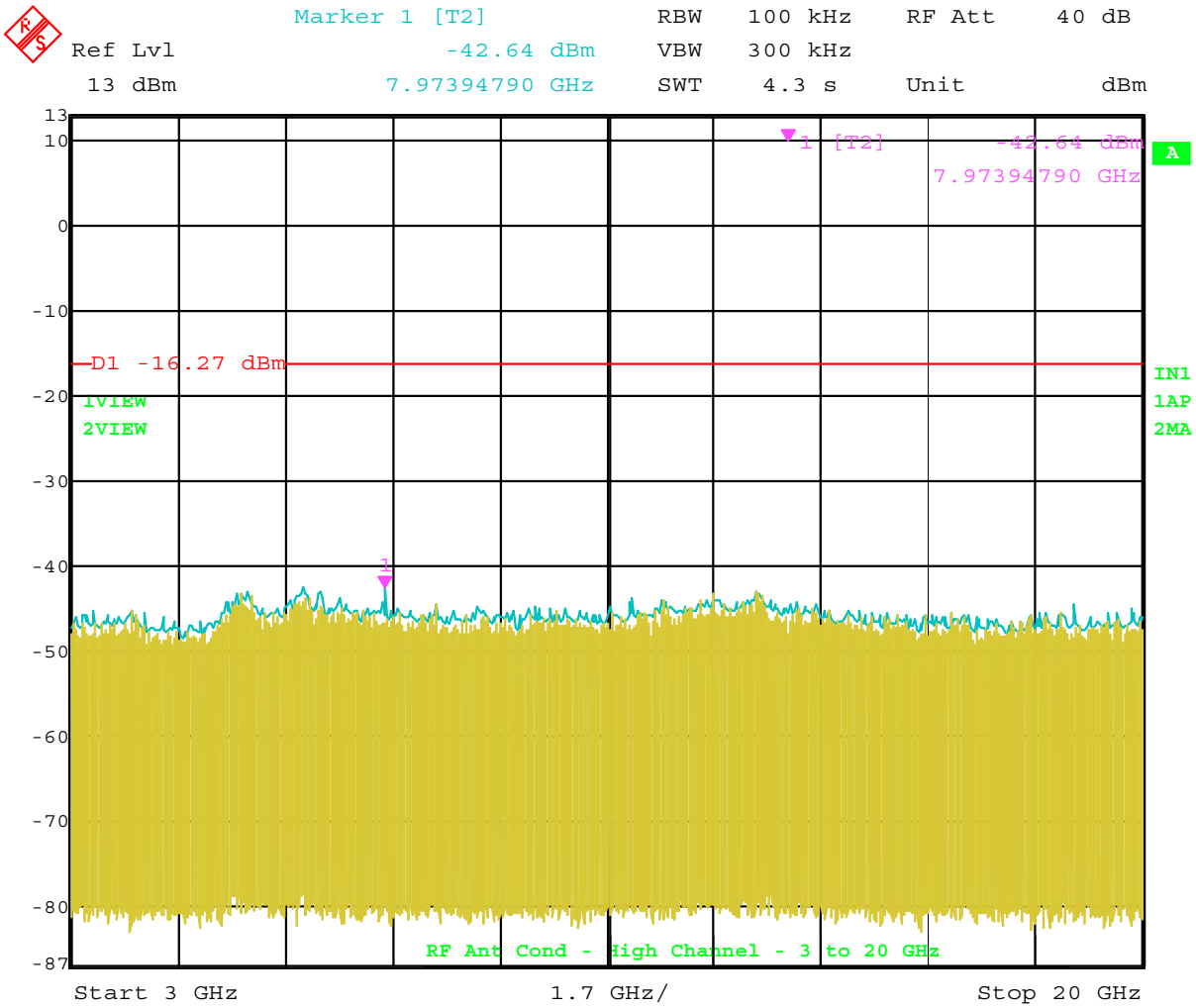

Marker 1 [T2]
-48.99 dBm
4.12424850 GHz
RBW 100 kHz
VBW 300 kHz
SWT 4.3 s
RF Att 30 dB
Unit dBm
Ref Lvl
13 dBm
1 [T2] -48.99 dBm
4.12424850 GHz
A
D1 -17.28 dBm
IN1
1AP
2MA
1VIEW
2VIEW
RF Ant Cond - Middle Channel - 3 to 20 GHz
Start 3 GHz
1.7 GHz/
Stop 20 GHz
Date: 2.OCT.2003 19:43:03

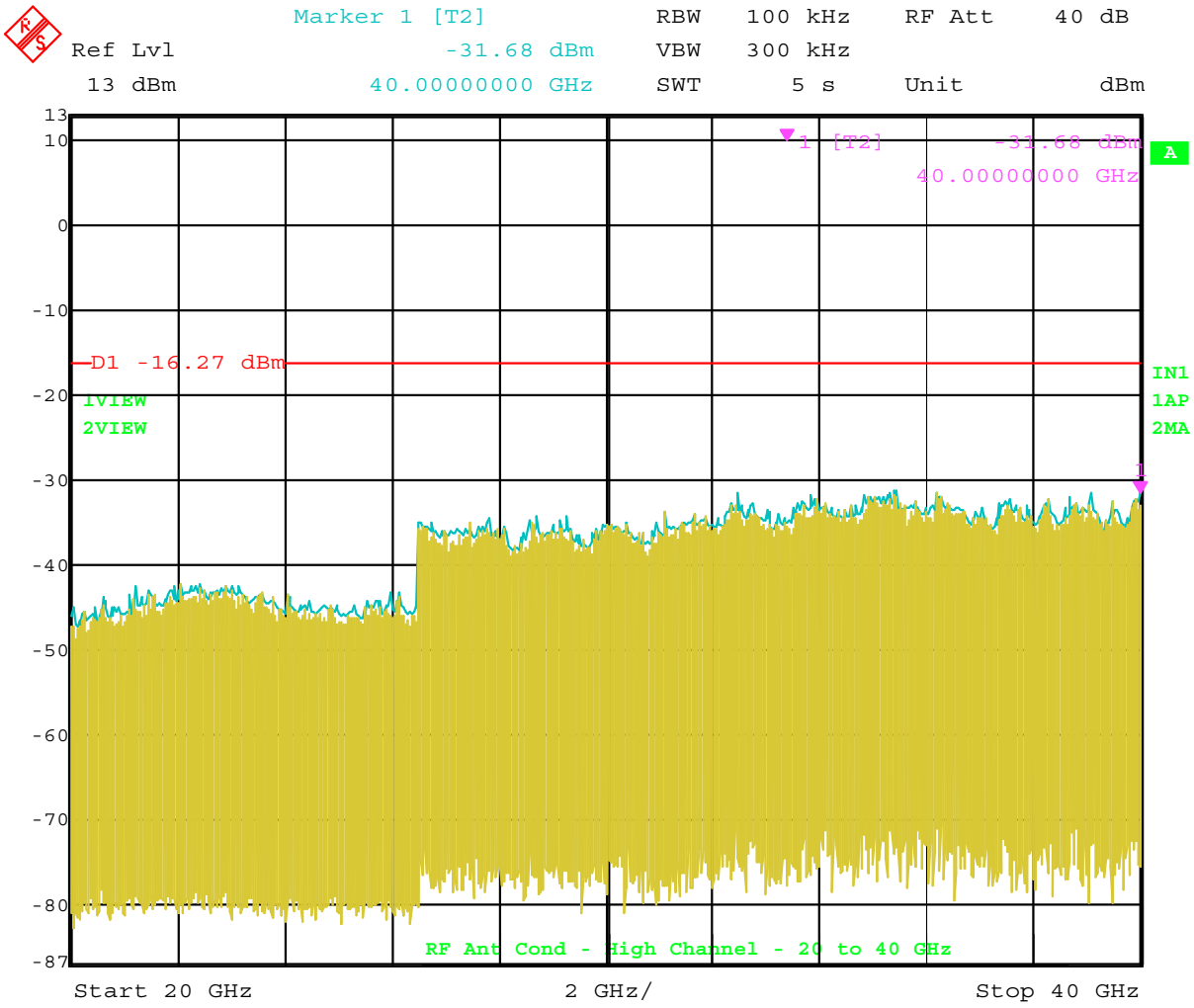

Marker 1 [T2]
-41.99 dBm
34.98997996 GHz
RBW 100 kHz
VBW 300 kHz
SWT 5 s
RF Att 30 dB
Unit dBm
Ref Lvl
13 dBm
1 [T2] -41.99 dBm
34.98997996 GHz
A
D1 -17.28 dBm
IN1
1AP
2MA
2MAX
RF Ant Cond - Middle Channel - 20 to 40 GHz
Start 20 GHz
2 GHz/
Stop 40 GHz
Date: 2.OCT.2003 19:42:05



Date: 2.OCT.2003 22:33:24


Marker 1 [T2]
3.73 dBm
2.46200000 GHz
RBW 100 kHz
VBW 300 kHz
SWT 250 ms
RF Att 40 dB
Unit dBm
Ref Lvl
13 dBm
1 [T2] 3.73 dBm
2.46200000 GHz
A
D1 -16.27 dBm
IN1
1AP
2MA
1VIEW
2VIEW
RF Ant Cond - High Channel - 2 to 3 GHz
Start 2 GHz
100 MHz/
Stop 3 GHz
Date: 2.OCT.2003 22:32:51

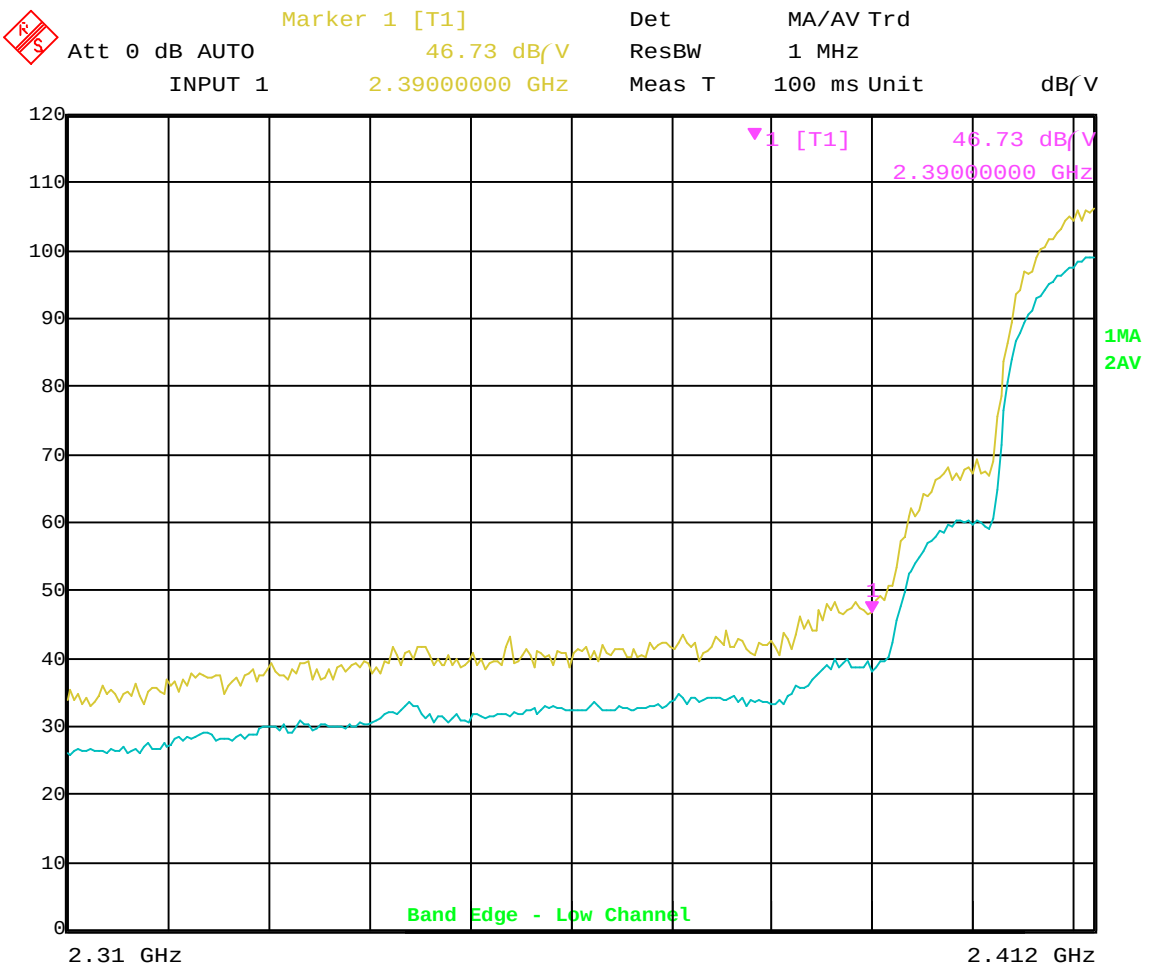

Marker 1 [T2]
-42.64 dBm
7.97394790 GHz
RBW 100 kHz
VBW 300 kHz
SWT 4.3 s
RF Att 40 dB
Unit dBm
Ref Lvl
13 dBm
1 [T2] -42.64 dBm
7.97394790 GHz
A
D1 -16.27 dBm
IN1
1AP
2MA
1VIEW
2VIEW
RF Ant Cond - High Channel - 3 to 20 GHz
Start 3 GHz
1.7 GHz/
Stop 20 GHz
Date: 2.OCT.2003 22:34:31



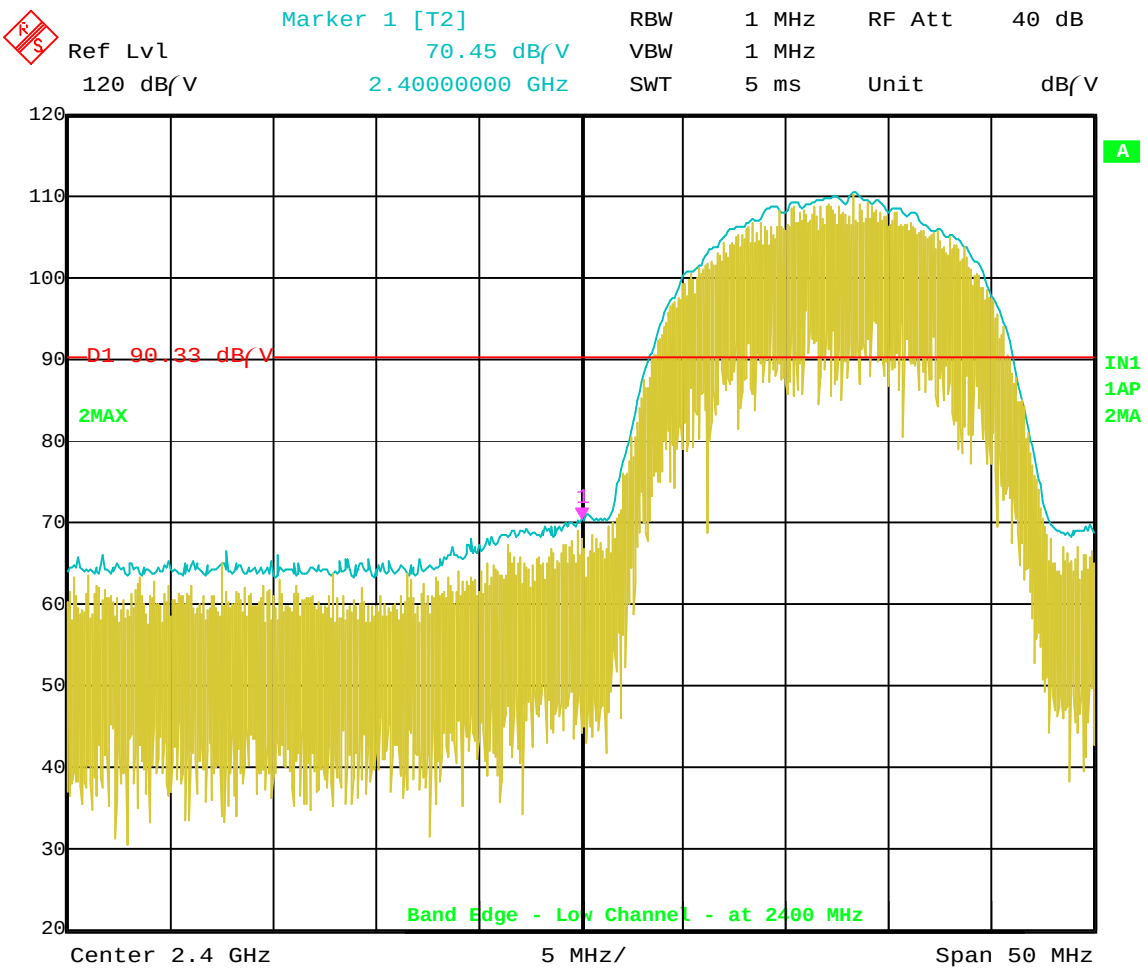
Date: 2.OCT.2003 22:37:34

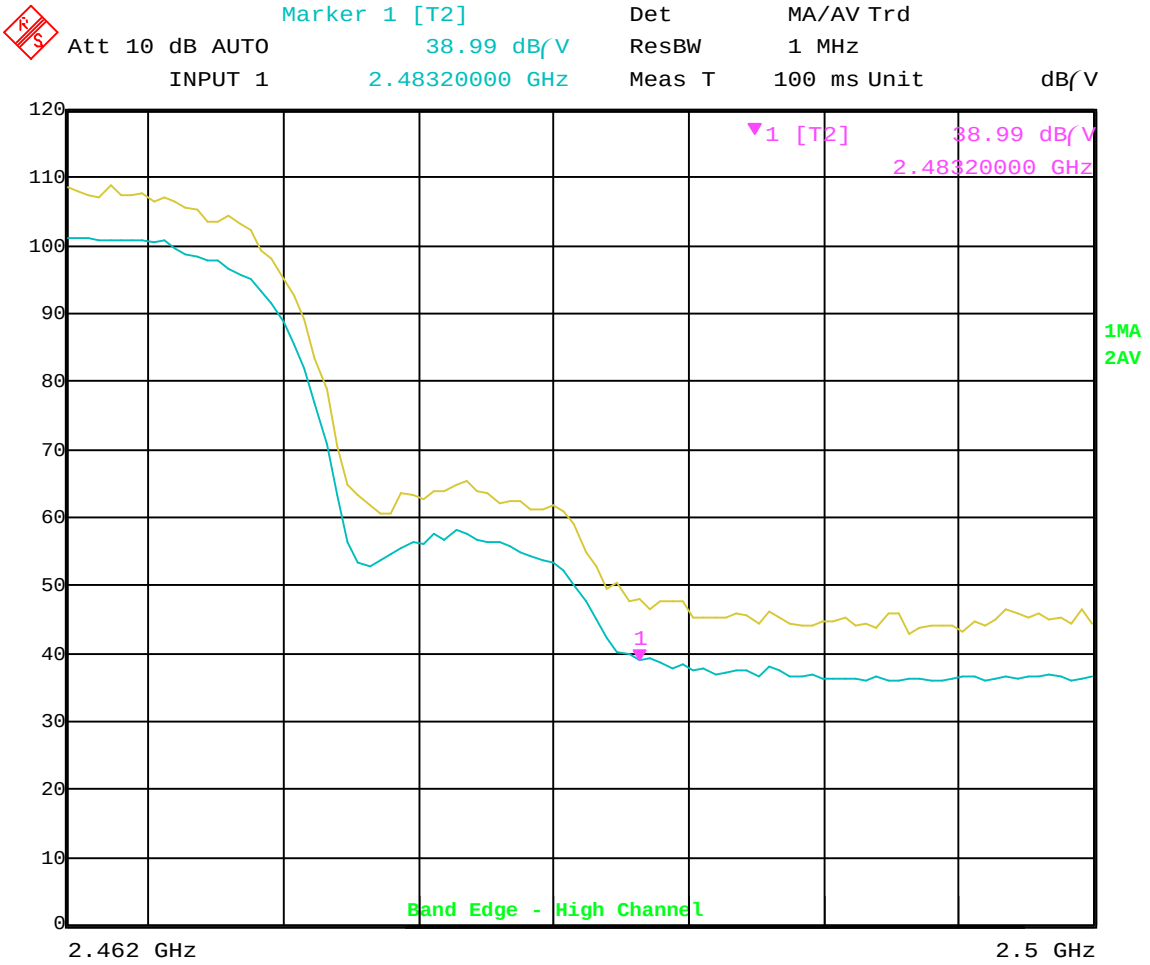
BAND EDGE

DATA SHEETS



Date: 29.SEP.2003 22:46:34


Marker 1 [T2]
RBW 1 MHz
RF Att 40 dB
Ref Lvl
70.45 dBµV
VBW 1 MHz
120 dBµV
2.40000000 GHz
SWT 5 ms
Unit dBµV
D1 90.33 dBµV
2MAX
A
IN1
1AP
2MA
Band Edge - Low Channel - at 2400 MHz
Center 2.4 GHz
5 MHz/
Span 50 MHz
Date: 30.SEP.2003 17:40:53



Date: 29.SEP.2003 21:04:12

RADIATED EMISSIONS (FCC SECTION 15.205 AND 15.247)

COMPANY	**Troy Group, Inc.**	**DATE**	**9/29/03**	
EUT	**PocketPro USB Wireless**	**DUTY CYCLE**	**N/A**	**%**
MODEL	**2933-UW**	**PEAK TO AVG**	**N/A**	**dB**
S/N	**6**	**TEST DIST.**	**3**	**Meters**
TEST ENGINEER	**Kyle Fujimoto**	**LAB**	**B**	

Frequency MHz	Peak Reading (dBuV)	Average (A) or Quasi-Peak (QP)	Antenna Polar. (V or H)	Antenna Height (meters)	EUT Azimuth (degrees)	EUT Axis (X,Y,Z)	EUT Tx Channel	Antenna Factor (dB)	Cable Loss (dB)	Amplifier Gain (dB)	Distance Factor (dB)	Mixer Factor (dB)	*Corrected Reading (dBuV/m)	Delta ** (dB)	Spec Limit (dBuV/m)	Comments
2390.0000	41.0	30.0 A	H	1.5	0	Y	LOW	30.2	2.5	30.5	0.0	0.0	**32.2**	**-21.8**	**54.0**	**Band Edge - Low Channel**
2390.0000	46.7	39.4 A	V	1.5	0	Y	LOW	30.2	2.5	30.5	0.0	0.0	**41.6**	**-12.4**	**54.0**	**Band Edge - Low Channel**
2483.5000	41.5	31.8 A	H	2.0	180	Y	HIGH	30.4	2.6	30.4	0.0	0.0	**34.4**	**-19.6**	**54.0**	**Band Edge - High Channel**
2483.5000	47.7	39.0 A	V	1.0	90	Y	HIGH	30.4	2.6	30.4	0.0	0.0	**41.6**	**-12.4**	**54.0**	**Band Edge - High Channel**
																Vertical is worst case
																Please also see the plots
																on the previous pages
																for Vertical Polarizaition.

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

** DELTA = SPEC LIMIT - CORRECTED READING