FCC PART 15, SUBPART B and C
TEST REPORT

for

ETHERBRIDGE

MODEL: ETHBG

Prepared for

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

Prepared by:_____

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DATE: AUGUST 26, 2003

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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:	EtherBridge Model: ETHBG S/N: BVH205008-02083
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:	August 15, 19, 21, 22, 25, and 26, 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 C, section 15.209
3	Spurious Radiated RF Emissions, 10 kHz – 30 MHz and 1000 MHz – 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 EtherBridge Model: ETHBG. 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 the following locations:

1) 114 Olinda Drive, Brea, California 92823
2) 19121 El Toro Road, Silverado, California 92676

2.2 Traceability Statement

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

2.3 Cognizant Personnel

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 15, 2003.

2.5 Disposition of the Test Sample

The sample has been returned to Troy Group, Inc. on September 16, 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

For the intentional radiator portion of the test – The EUT was connected to the laptop and AC Adapter via its Ethernet 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.

For the unintentional radiator portion of the test – The EUT was connected to the printer server and AC Adapter via its Ethernet and power ports, respectively. The print server was also connected to an AC Adapter and directly connected to the printer.

A wireless network setup was placed 50 feet away from the test site. It consisted of a laptop, Ethernet hub, and access point. The laptop was connected to the Ethernet hub via its Ethernet port. The access point was connected to the Ethernet Hub via its Ethernet port. The laptop, Ethernet hub, and access point all had AC Adapters connected to their respective power ports.

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 programmed to send a command to the printer to print "H" characters on a continuous basis. This command went to the access point via the Ethernet hub. The access point transmitted this command via 802.11b technology. The EUT received the 802.11b signal and sent this command via Ethernet to the print server connected on 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 6 foot unshielded cable connecting the laptop to the AC Adapter. It has a 1/8 inch power connector at the laptop end and is hard wired into the AC Adapter.

Unintentional Radiator Mode

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

Cable 2 This is a 2 meter unshielded cable connecting the Ethernet hub to the laptop. It has an RJ-45 connector at each end.

Cable 3 This is a 6 foot unshielded cable connecting the Ethernet hub to the AC Adapter. It has a 1/8 inch power connector at the Ethernet hub end and is hard wired into the AC Adapter.

Cable 4 This is a 2 meter unshielded cable connecting the Ethernet hub to the access point. It has an RJ-45 connector at each end.

Cable 5 This is a 6 foot unshielded cable connecting the access point to the AC Adapter. It has a 1/8 inch power connector at the access point end and is hard wired into the AC Adapter.

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

Cable 7 This is a 50 foot unshielded cable connecting the print server to the EUT. It has an RJ-45 connector at each end.

Cable 8 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

5. LISTS OF EUT, ACCESSORIES AND TEST EQUIPMENT

5.1 EUT and Accessory List

EQUIPMENT	MANUFACTURER	MODEL NUMBER	SERIAL NUMBER	FCC ID
ETHERBRIDGE (EUT)	TROY GROUP, INC.	ETHBG	BVH2050098-02083	PTY-ETHBG
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
AC ADAPTER FOR ACCESS POINT	N/A	SCP48-121000	N/A	N/A
ETHERNET HUB	NETGEAR	FS 108	N/A	N/A
AC ADAPTER FOR HUB	NETGEAR	PWR-002-004	N/A	N/A
PRINT SERVER	TROY GROUP, INC.	XCD PPS100-8S	0044859	N/A
AC ADAPTER FOR PRINT SERVER	POTRANS ELECTRICAL CORPORATION	UP01011050	N/A	N/A
PRINTER	LEXMARK	OPTRA E312	1037888	N/A
AC ADAPTER FOR EUT (115 VAC)	UNIFIVE	U2110-0520	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-100	1548	Sept. 19, 2002	Sept. 19, 2003
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

5.3 EMI Test Equipment for Silverado 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	2637A03816	Jan. 8, 2003	Jan. 8, 2004
Spectrum Analyzer – Display Section	Hewlett Packard	85662A	2648A13730	Jan. 8, 2003	Jan. 8, 2004
Spectrum Analyzer – Quasi-Peak Adapter	Hewlett Packard	85650A	2430A00530	Jan. 8, 2003	Jan. 8, 2004
Preamplifier	Com Power	PA-103	1541	Jan. 13, 2003	Jan. 13, 2004
Biconical Antenna	Com Power	AB-900	14022	Mar. 21, 2003	Mar. 21, 2004
Log Periodic Antenna	Com Power	AL-100	16016	Nov. 16, 2002	Nov. 16, 2003
Computer	Hewlett Packard	Pavilion 4530	US91925466	N.C.R.	N/A
Printer	Hewlett Packard	DeskJet 697C	US9341D07G	N.C.R.	N/A
LISN	Com-Power	LI-215	12072	Jan. 30, 2003	Jan. 30, 2004
LISN	Com-Power	LI-215	12073	Jan. 30, 2003	Jan. 30, 2004
Transient Limiter	Com-Power	Hz-560	N/A	Mar. 19, 2003	Mar. 19, 2004

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 2 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 EtherBridge 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

EtherBridge
Model: ETHBG
S/N: BVH205008-02083

There were no additional models covered under this report.

APPENDIX D

DIAGRAMS, CHARTS, AND PHOTOS

FIGURE 1: CONDUCTED EMISSIONS TEST SETUP

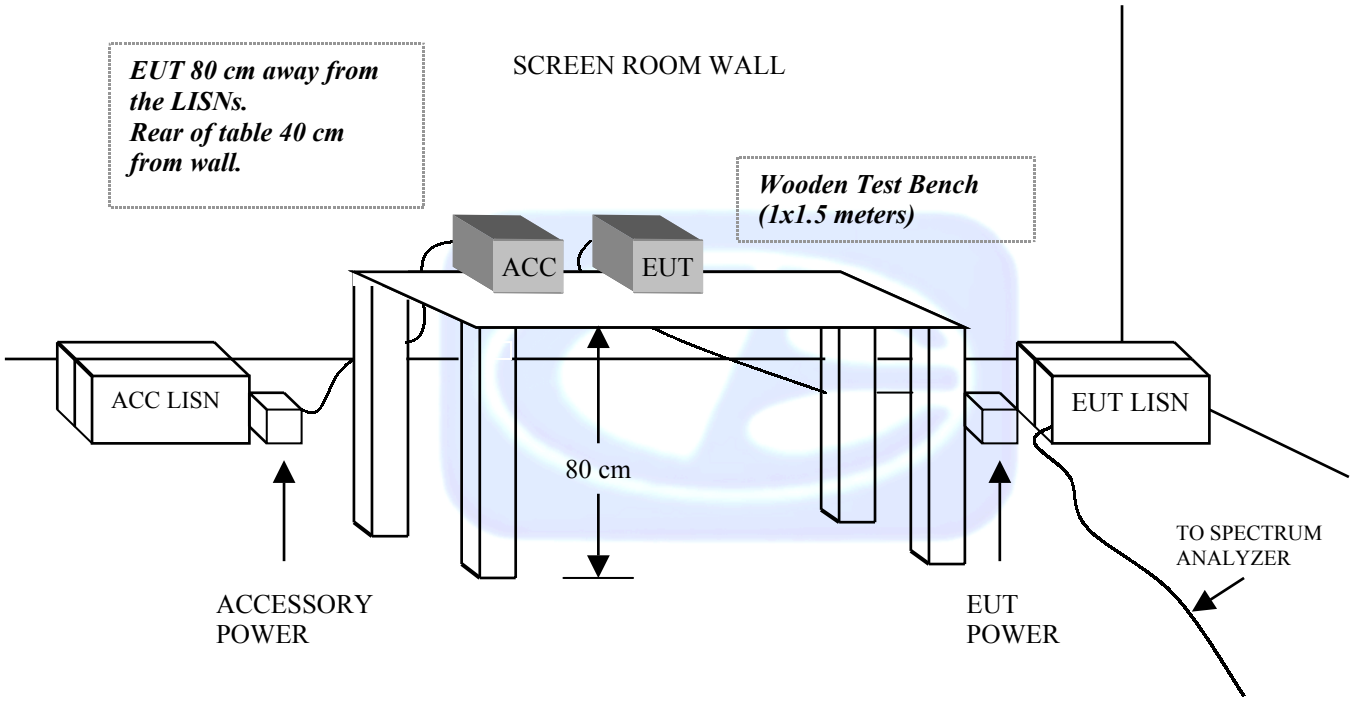
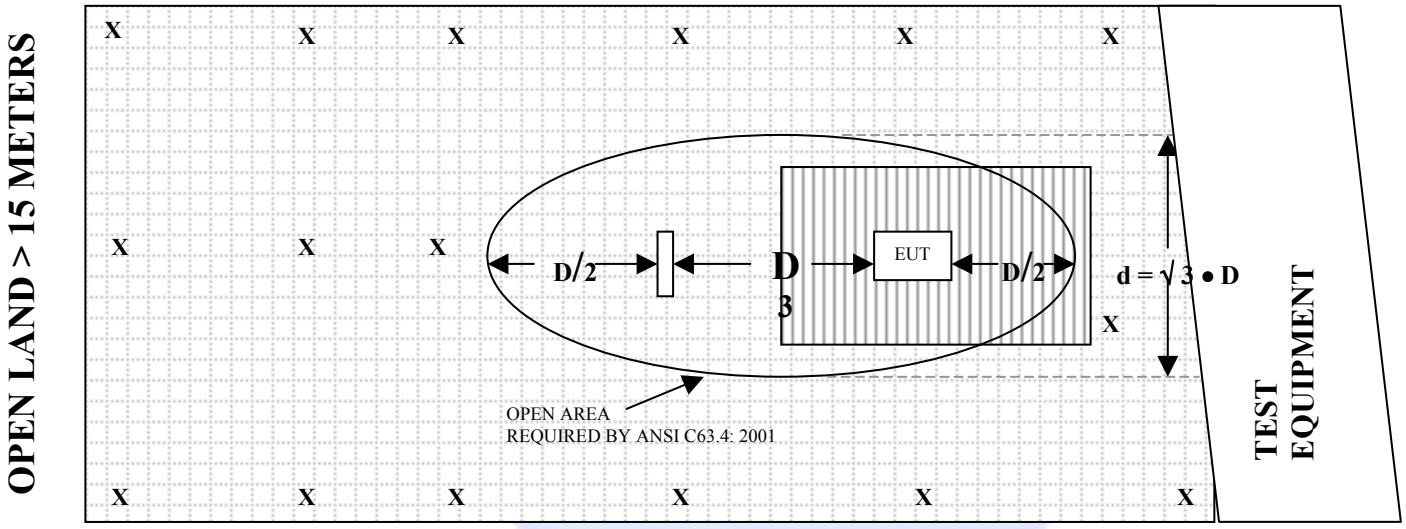


FIGURE 2: PLOT MAP AND LAYOUT OF 3 METER RADIATED SITE

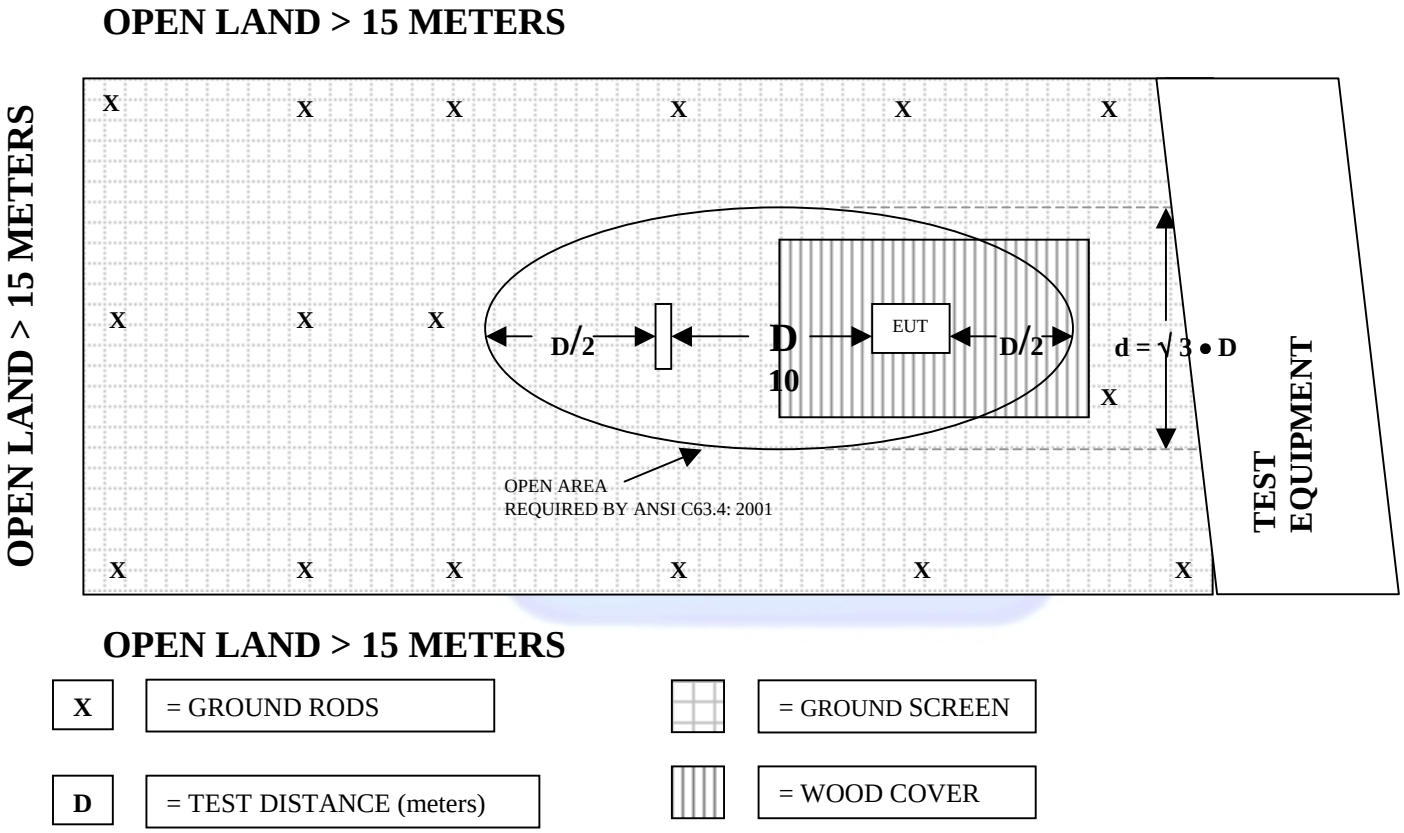
OPEN LAND > 15 METERS



OPEN LAND > 15 METERS

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

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



FRONT VIEW

TROY GROUP, INC.
EtherBridge
MODEL: ETHBG
FCC SUBPART C - RADIATED EMISSIONS – 08-19-03 and 08-25-03

PHOTOGRAPH SHOWING THE EUT CONFIGURATION FOR MAXIMUM EMISSIONS

REAR VIEW

TROY GROUP, INC.
EtherBridge
MODEL: ETHBG
FCC SUBPART C - RADIATED EMISSIONS – 08-19-03 and 08-25-03

PHOTOGRAPH SHOWING THE EUT CONFIGURATION FOR MAXIMUM EMISSIONS

FRONT VIEW

TROY GROUP, INC.
EtherBridge
MODEL: ETHBG
EN 55022 CLASS B - RADIATED EMISSIONS – 08-15-03

PHOTOGRAPH SHOWING THE EUT CONFIGURATION FOR MAXIMUM EMISSIONS

REAR VIEW

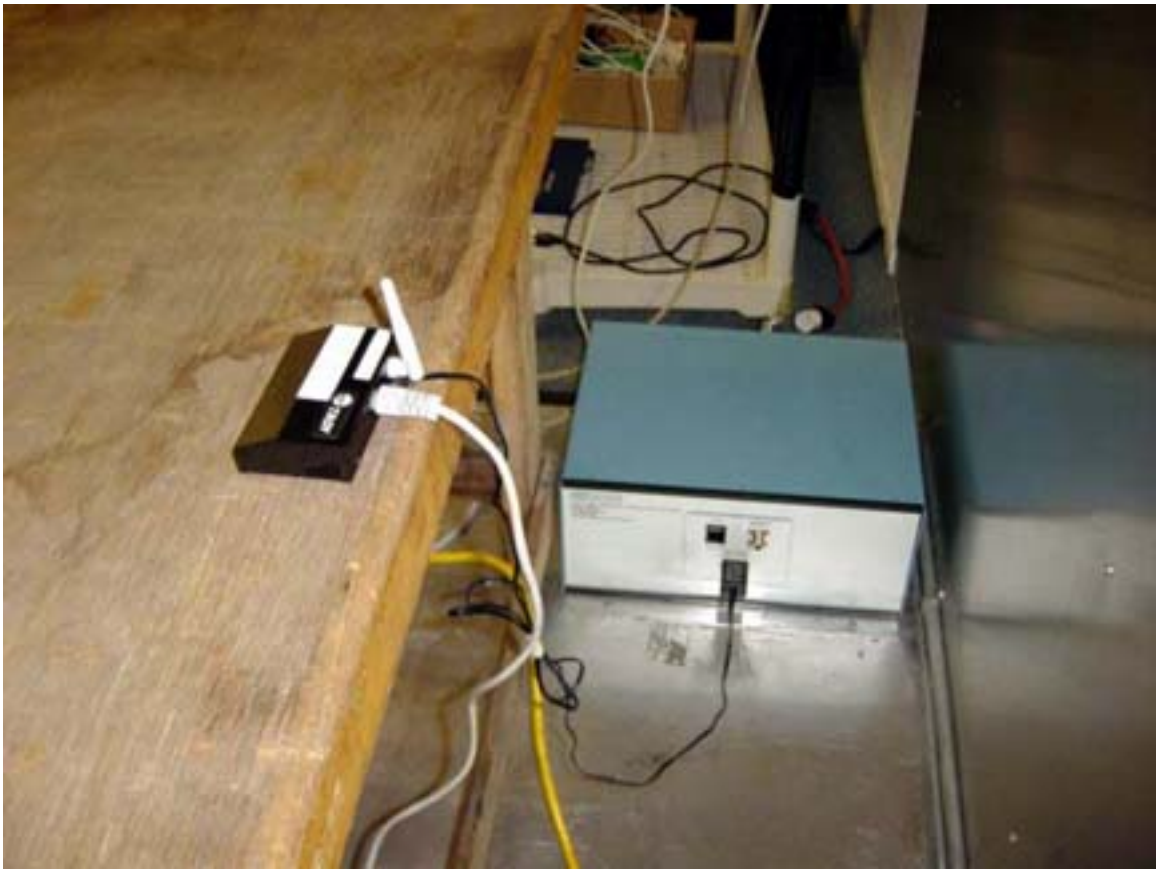
TROY GROUP, INC.
EtherBridge
MODEL: ETHBG
EN 55022 CLASS B - RADIATED EMISSIONS – 08-15-03

PHOTOGRAPH SHOWING THE EUT CONFIGURATION FOR MAXIMUM EMISSIONS

FRONT VIEW

TROY GROUP, INC.
EtherBridge
MODEL: ETHBG
FCC SUBPART B - CONDUCTED EMISSIONS – 08-15-03

PHOTOGRAPH SHOWING THE EUT CONFIGURATION FOR MAXIMUM EMISSIONS



REAR VIEW

TROY GROUP, INC.
EtherBridge
MODEL: ETHBG
FCC SUBPART B - CONDUCTED EMISSIONS – 08-15-03

PHOTOGRAPH SHOWING THE EUT CONFIGURATION FOR MAXIMUM EMISSIONS

COM-POWER AB-900

LAB J - BICONICAL ANTENNA

S/N: 14022

CALIBRATION DATE: MARCH 21, 2003

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

COM-POWER AL-100

LAB J - LOG PERIODIC ANTENNA

S/N: 16016

CALIBRATION DATE: NOVEMBER 16, 2002

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

COM-POWER PA-103

LAB J - PREAMPLIFIER

S/N: 1541

CALIBRATION DATE: JANUARY 13, 2003

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

COM-POWER AB-100

BICONICAL ANTENNA

S/N: 01548

CALIBRATION DATE: SEPTEMBER 19, 2002

FREQUENCY (MHz)	FACTOR (dB)	FREQUENCY (MHz)	FACTOR (dB)
30	14.30	120	10.70
35	14.00	125	11.40
40	13.70	140	12.70
45	12.00	150	12.50
50	11.40	160	12.90
60	9.70	175	14.10
70	8.30	180	14.70
80	7.60	200	15.10
90	7.80	250	16.90
100	8.60	300	19.10

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: 25196

CALIBRATION DATE: JANUARY 10, 2003

FREQUENCY (GHz)	FACTOR (dB)	FREQUENCY (GHz)	FACTOR (dB)
1.0	32.3	6.0	27.9
1.1	32.6	6.5	28.9
1.2	32.4	7.0	29.2
1.3	32.1	7.5	29.3
1.4	31.8	8.0	29.4
1.5	31.7	8.5	28.5
1.6	31.6	9.0	28.7
1.7	31.6	9.5	27.9
1.8	31.0	10.0	27.0
1.9	32.0	11.0	26.9
2.0	31.0	12.0	28.7
2.5	30.5	13.0	28.6
3.0	30.5	14.0	28.7
3.5	30.0	15.0	27.1
4.0	30.0	16.0	26.1
4.5	29.9	17.0	26.0
5.0	29.7	18.0	23.9
5.5	30.2		

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** : 1/2
Customer : Ron Tozaki **Date** : 08/15/2003
Manufacturer : Troy Group, Inc. **Time** : 08:40:23 AM
Eut name : Wireless Bridge **Lab** : J
Model : EtherBridge **Test Distance** : 10.00 Meters
Serial # : BVH205008-02081
Specification : EN 55022 Class B
Distance correction factor (20 * log(test/spec)) : 0.00
Test Mode : Qualification Scan
30 MHz to 299.999 MHz - (vertical and horizontal polarties)
Clocks: 20 MHz, 36 MHz, & 44 MHz
Test Engineer: James Ross

Pol	Freq	Reading	Cable loss	Antenna factor	Amplifier gain	Corr'd rdg = R	Limit = L	Delta R-L
	MHz	dBuV	dB	dB	dB	dBuV/m	dBuV/m	dB
V	40.000	39.60	0.70	11.00	33.30	18.00	30.00	-12.00
V	60.000	39.20	0.90	10.70	33.30	17.50	30.00	-12.50
V	80.000	39.60	1.10	8.30	33.30	15.70	30.00	-14.30
V	120.000	39.40	1.38	10.90	33.30	18.38	30.00	-11.62
V	140.000	39.50	1.59	12.00	33.30	19.79	30.00	-10.21
V	160.000	37.50	1.74	12.40	33.30	18.34	30.00	-11.66
V	180.000	35.90	1.82	13.70	33.30	18.12	30.00	-11.88
V	260.000	33.40	2.42	17.57	33.06	20.34	37.00	-16.66
V	280.000	33.70	2.62	18.47	32.98	21.81	37.00	-15.19
V	36.000	40.10	0.66	13.21	33.34	20.64	30.00	-9.36
V	72.000	38.10	1.02	9.33	33.30	15.15	30.00	-14.85
V	144.000	37.10	1.63	12.16	33.30	17.60	30.00	-12.40
V	216.000	34.30	2.03	16.18	33.23	19.28	30.00	-10.72
V	252.000	33.30	2.33	17.20	33.09	19.73	37.00	-17.27
V	288.000	34.00	2.65	18.81	32.95	22.51	37.00	-14.49
V	44.000	39.30	0.74	11.32	33.34	18.02	30.00	-11.98
V	88.000	40.60	1.18	8.87	33.30	17.35	30.00	-12.65
V	132.000	35.50	1.49	11.74	33.30	15.43	30.00	-14.57
V	176.000	34.00	1.80	13.38	33.30	15.89	30.00	-14.11
V	264.000	34.00	2.47	17.76	33.04	21.19	37.00	-15.81
H	40.000	39.70	0.70	11.00	33.30	18.10	30.00	-11.90
H	120.000	32.60	1.38	10.90	33.30	11.58	30.00	-18.42
H	180.000	30.80	1.82	13.70	33.30	13.02	30.00	-16.98
H	240.000	32.20	2.22	16.84	33.14	18.13	37.00	-18.87
H	36.000	41.20	0.66	13.21	33.34	21.74	30.00	-8.26
H	144.000	34.20	1.63	12.16	33.30	14.70	30.00	-15.30
H	252.000	32.10	2.33	17.20	33.09	18.53	37.00	-18.47
H	44.000	38.00	0.74	11.32	33.34	16.72	30.00	-13.28
H	152.000	34.40	1.71	12.40	33.30	15.21	30.00	-14.79
H	260.000	33.90	2.42	17.57	33.06	20.84	37.00	-16.16

Readings above are clock frequencies only - no actual emissions found

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Test Location : Compatible Electronics **Page** : 2/2
Customer : Ron Tozaki **Date** : 08/15/2003
Manufacturer : Troy Group, Inc. **Time** : 09:47:34 AM
Eut name : Wireless Bridge **Lab** : J
Model : EtherBridge **Test Distance** : 10.00 Meters
Serial # : BVH205008-02081
Specification : EN 55022 Class B
Distance correction factor (20 * log(test/spec)) : 0.00
Test Mode : Qualification Scan
300 MHz to 1000 MHz - (vertical and horizontal polarties)
Clocks: 20 MHz, 36 MHz, & 44 MHz
Test Engineer: James Ross

Pol	Freq	Reading	Cable loss	Antenna factor	Amplifier gain	Corr'd rdg = R	Limit = L	Delta R-L
	MHz	dBuV	dB	dB	dB	dBuV/m	dBuV/m	dB
H	308.000	31.60	2.72	14.39	32.90	15.80	37.00	-21.20
H	352.000	36.00	2.82	15.30	32.92	21.20	37.00	-15.80
H	396.000	36.90	3.17	15.21	33.27	22.01	37.00	-14.99
H	440.000	35.30	3.44	15.85	32.81	21.78	37.00	-15.22
H	484.000	32.40	3.71	17.11	32.49	20.72	37.00	-16.28
H	528.000	33.20	3.86	17.49	32.63	21.91	37.00	-15.09
H	572.000	31.20	3.99	17.94	32.57	20.56	37.00	-16.44
H	616.000	34.10	4.23	18.76	32.17	24.93	37.00	-12.07
H	660.000	31.60	4.52	19.16	31.96	23.32	37.00	-13.68
H	704.000	32.00	4.60	19.42	32.22	23.80	37.00	-13.20
H	748.000	33.40	4.60	19.69	32.49	25.20	37.00	-11.80
H	792.000	31.20	5.02	20.88	31.74	25.36	37.00	-11.64
H	836.000	31.20	5.25	22.19	31.89	26.74	37.00	-10.26
H	924.000	32.50	5.60	22.74	31.75	29.09	37.00	-7.91
H	968.000	31.20	5.85	23.79	31.73	29.11	37.00	-7.89
V	360.000	33.00	2.88	15.28	32.98	18.18	37.00	-18.82
V	404.000	34.00	3.23	15.27	33.25	19.24	37.00	-17.76
V	448.000	35.30	3.49	15.97	32.72	22.04	37.00	-14.96
V	492.000	32.90	3.75	17.36	32.45	21.56	37.00	-15.44
V	536.000	30.40	3.87	17.45	32.69	19.04	37.00	-17.96
V	540.000	32.20	3.88	17.44	32.72	20.80	37.00	-16.20
V	580.000	32.40	4.02	18.13	32.49	22.06	37.00	-14.94
V	620.000	32.80	4.26	18.80	32.14	23.73	37.00	-13.27
V	660.000	34.00	4.52	19.16	31.96	25.72	37.00	-11.28
V	748.000	32.70	4.60	19.69	32.49	24.50	37.00	-12.50
V	748.000	33.80	4.60	19.69	32.49	25.60	37.00	-11.40
V	836.000	32.80	5.25	22.19	31.89	28.34	37.00	-8.66
V	924.000	33.00	5.60	22.74	31.75	29.59	37.00	-7.41
V	968.000	30.60	5.85	23.79	31.73	28.51	37.00	-8.49

Readings above are clock frequencies only - no actual emissions found

---

RADIATED EMISSIONS (FCC SECTION 15.205 AND 15.247)

COMPANY	**TROY GROUP INC.**	**DATE**	**8/19/03**
EUT	**EtherBridge**	**DUTY CYCLE**	**N/A %**
MODEL	**ETHBG**	**PEAK TO AVG**	**N/A dB**
S/N	**BVH205008-02083**	**TEST DIST.**	**3 Meters**
TEST ENGINEER	**Kyle Fujimoto**	**LAB**	**B**

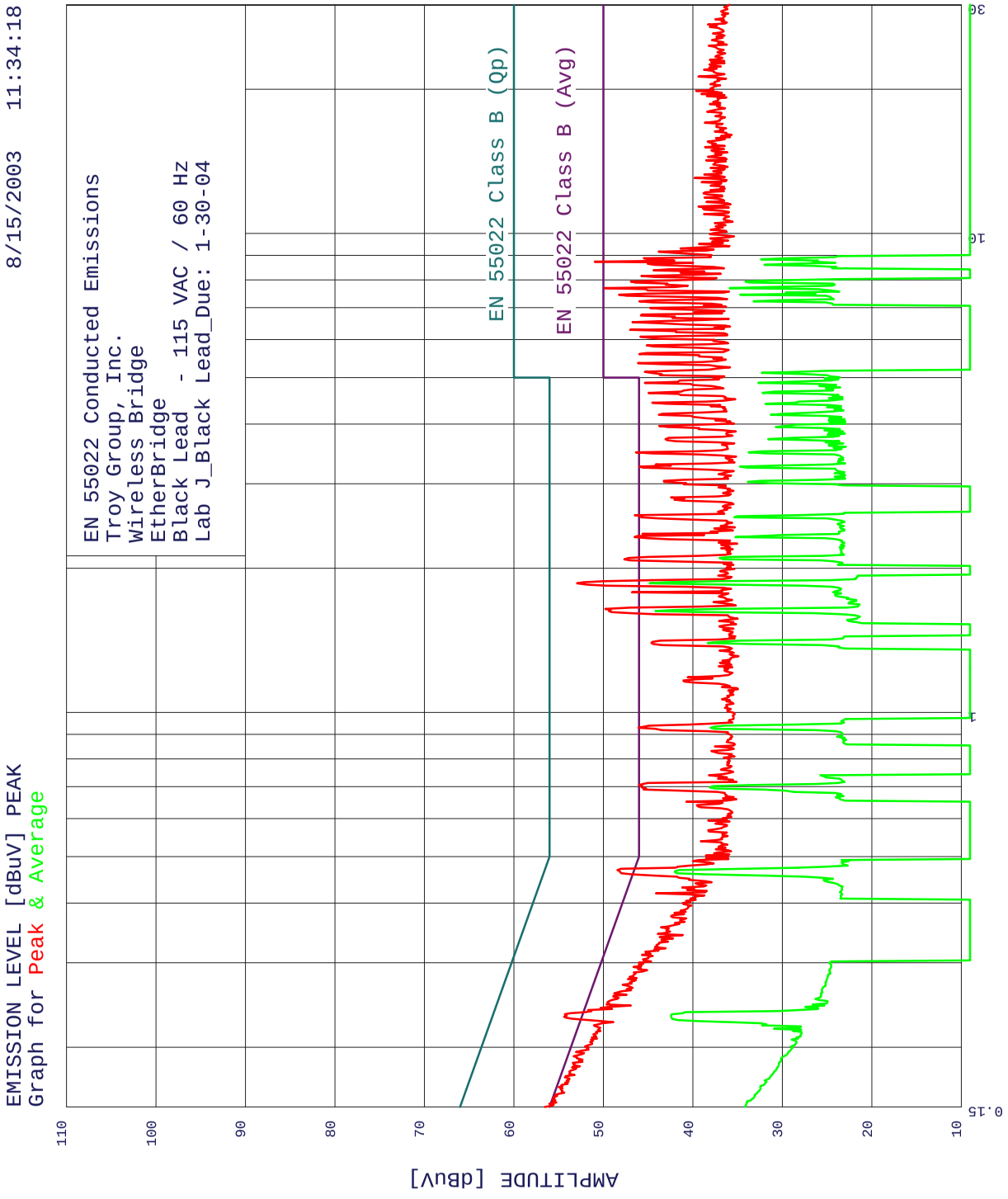
Frequency MHz	Peak Reading (dBuV)	Average (A) or Quasi-Peak (QP)	Antenna Polar. (V or H)	Antenna Height (meters)	EUT Azimuth (degrees)	EUT Axis (X,Y,Z)	EUT Tx Channel	Antenna Factor (dB)	Cable Loss (dB)	Amplifier Gain (dB)	Distance Factor (dB)	Mixer Factor (dB)	*Corrected Reading (dBuV/m)	Delta ** (dB)	Spec Limit (dBuV/m)	Comments
1496.0000	53.3	48.7 A	H	1.5	0	Y	LOW	26.6	2.2	31.7	0.0	0.0	**45.8**	**-8.2**	**54.0**	**Spurious - Digital Portion**
2038.0000	53.3	53.2 A	H	1.5	0	Y	LOW	29.5	2.2	31.0	0.0	0.0	**53.9**			*****
1496.0000	46.8	40.6 A	V	1.5	0	Y	LOW	26.6	2.2	31.7	0.0	0.0	**37.7**	**-16.3**	**54.0**	**Spurious - Digital Portion**
2038.0000	52.3	51.6 A	V	1.5	0	Y	LOW	29.5	2.2	31.0	0.0	0.0	**52.3**			*****
																*** - From Transmitter**
																Emissions Disappears when
																the Transmitter is stopped.
																*** - appears at 2063 at ch. 6**
																and 2088 at ch. 11
																*** - NOT in the restricted**
																band.

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

** DELTA = SPEC LIMIT - CORRECTED READING

CONDUCTED EMISSIONS

DATA SHEETS


8/15/2003 11:34:18
EN 55022 Conducted Emissions
Troy Group, Inc.
Wireless Bridge
EtherBridge
Black Lead - 115 VAC / 60 Hz
Lab J_Black Lead_Due: 1-30-04
EN 55022 Class B (Qp)
EN 55022 Class B (Avg)
EMISSION LEVEL [dBuV] PEAK
Graph for Peak & Average
AMPLITUDE [dBuV]
FREQUENCY [MHz]
110
100
90
80
70
60
50
40
30
20
10
30
1
0.15

EN 55022 Conducted Emissions 8/15/2003 11:34:18
Troy Group, Inc.
Wireless Bridge
EtherBridge
Black Lead - 115 VAC / 60 Hz
Lab J_Black Lead_Due: 1-30-04
TEST ENGINEER : James Ross

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49 highest peaks above -50.00 dB of EN 55022 Class B (Avg) limit line
Peak criteria : 3.00 dB, Curve : Peak

Peak#	Freq(MHz)	Amp(dBuV)	Limit(dB)	Delta(dB)
1	1.859	52.93	46.00	6.93**
2	1.646	49.77	46.00	3.77**
3	0.232	54.37	52.39	1.99**
4	0.469	48.41	46.53	1.87**
5	2.089	47.65	46.00	1.65**
6	8.729	50.95	50.00	0.95**
7	1.781	46.81	46.00	0.81**
8	2.322	46.51	46.00	0.51**
9	2.582	46.47	46.00	0.47**
10	3.492	46.34	46.00	0.34**
11	0.929	46.06	46.00	0.06**
12	0.705	46.00	46.00	0.00**
13	3.260	45.93	46.00	-0.07**
14	7.689	49.84	50.00	-0.16**
15	2.358	45.61	46.00	-0.39**
16	4.877	45.37	46.00	-0.63**
17	4.648	44.94	46.00	-1.06**
18	1.397	44.62	46.00	-1.38**
19	4.432	44.52	46.00	-1.48**
20	7.450	48.25	50.00	-1.75**
21	4.182	43.80	46.00	-2.20**
22	3.966	43.77	46.00	-2.23**
23	3.043	43.22	46.00	-2.78**
24	3.722	43.06	46.00	-2.94**
25	6.288	46.99	50.00	-3.01
26	7.940	46.92	50.00	-3.08**
27	6.525	46.75	50.00	-3.25
28	0.419	44.11	47.46	-3.35**
29	2.811	42.44	46.00	-3.56
30	5.362	46.12	50.00	-3.88
31	5.597	45.98	50.00	-4.02
32	7.217	45.96	50.00	-4.04**
33	6.091	45.84	50.00	-4.16
34	6.736	45.80	50.00	-4.20
35	8.148	45.75	50.00	-4.25
36	8.873	45.48	50.00	-4.52**
37	5.142	45.36	50.00	-4.64**
38	5.838	45.15	50.00	-4.85
39	1.166	41.06	46.00	-4.94
40	8.640	45.04	50.00	-4.96**
41	6.991	44.77	50.00	-5.23
42	0.651	40.74	46.00	-5.26
43	8.372	44.39	50.00	-5.61
44	9.160	43.83	50.00	-6.17
45	0.538	39.11	46.00	-6.89
46	9.304	41.36	50.00	-8.64
47	6.845	39.83	50.00	-10.17
48	13.061	39.80	50.00	-10.20
49	19.848	39.65	50.00	-10.35

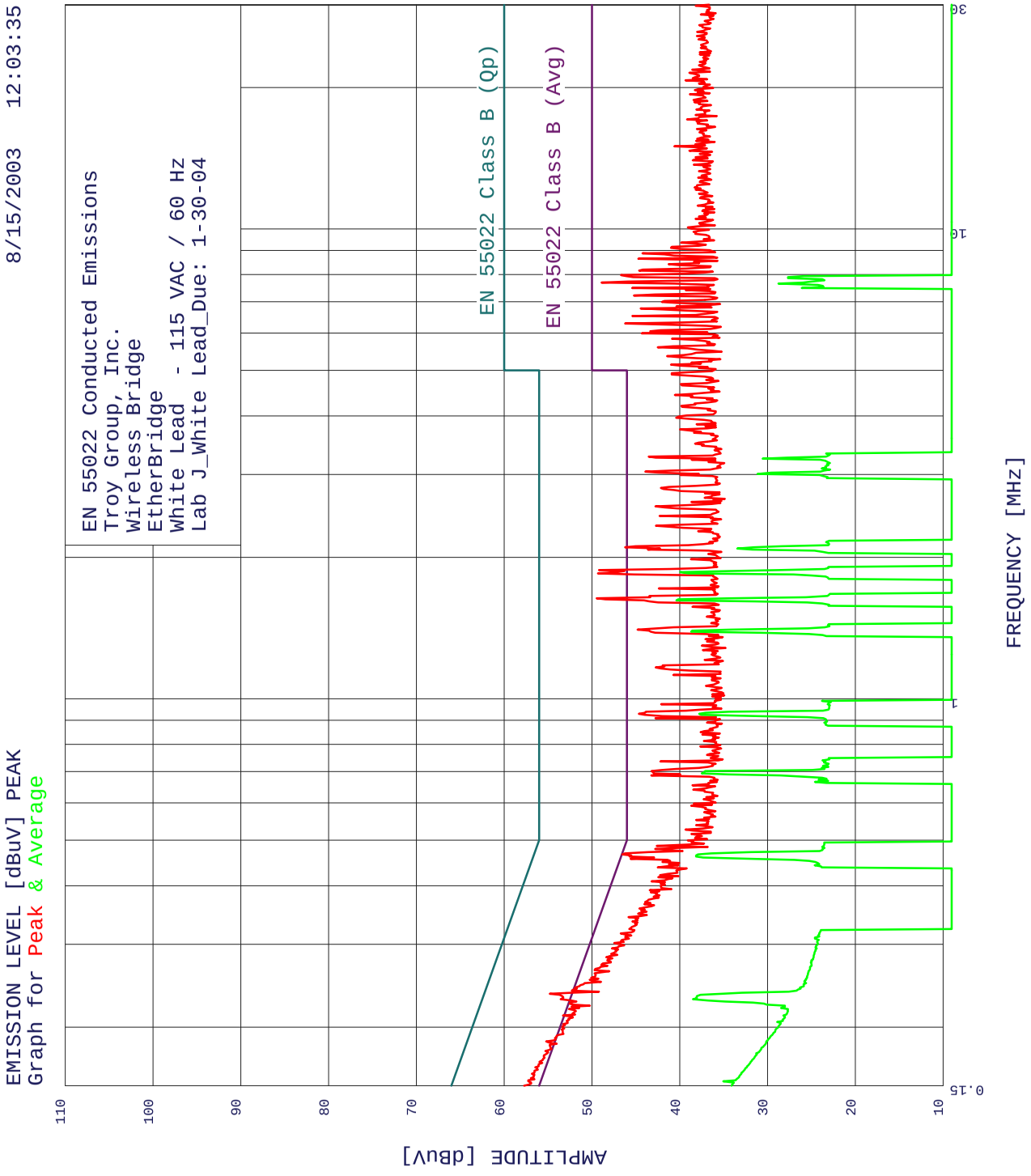
** Please See the Average Readings on the Next Page and on the Plot

EN 55022 Conducted Emissions 8/15/2003 11:34:18
Troy Group, Inc.
Wireless Bridge
EtherBridge
Black Lead - 115 VAC / 60 Hz
Lab J_Black Lead_Due: 1-30-04
TEST ENGINEER : James Ross

---

28 highest peaks above -50.00 dB of EN 55022 Class B (Avg) limit line
Peak criteria : 3.00 dB, Curve : Average

Peak#	Freq(MHz)	Amp(dBuV)	Limit(dB)	Delta(dB)
1	1.859	44.84	46.00	-1.16
2	1.629	44.16	46.00	-1.84
3	0.464	41.99	46.62	-4.63
4	1.397	38.35	46.00	-7.65
5	0.698	38.11	46.00	-7.89
6	0.929	38.00	46.00	-8.00
7	2.100	37.00	46.00	-9.00
8	0.233	42.42	52.34	-9.92
9	2.554	35.36	46.00	-10.64
10	2.322	35.23	46.00	-10.77
11	3.260	34.72	46.00	-11.28
12	3.027	33.85	46.00	-12.15
13	3.492	33.76	46.00	-12.24
14	4.877	32.66	46.00	-13.34
15	4.648	32.19	46.00	-13.81
16	7.689	35.90	50.00	-14.10
17	4.408	31.88	46.00	-14.12
18	3.722	31.59	46.00	-14.41
19	4.182	31.29	46.00	-14.71
20	3.945	30.72	46.00	-15.28
21	7.450	34.70	50.00	-15.30
22	7.940	34.10	50.00	-15.90
23	7.217	33.19	50.00	-16.81
24	8.825	32.39	50.00	-17.61
25	5.114	32.28	50.00	-17.72
26	8.595	32.00	50.00	-18.00
27	7.528	29.60	50.00	-20.40
28	0.219	30.92	52.87	-21.95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EN 55022 Conducted Emissions
Troy Group, Inc.
Wireless Bridge
EtherBridge
White Lead - 115 VAC / 60 Hz
Lab J_White Lead_Due: 1-30-04
EN 55022 Class B (Qp)
EN 55022 Class B (Avg)
EMISSION LEVEL [dBuV] PEAK
Graph for Peak & Average
AMPLITUDE [dBuV]
FREQUENCY [MHz]
110
100
90
80
70
60
50
40
30
20
10
30
1
0.15

EN 55022 Conducted Emissions 8/15/2003 12:03:35
Troy Group, Inc.
Wireless Bridge
EtherBridge
White Lead - 115 VAC / 60 Hz
Lab J_White Lead_Due: 1-30-04
TEST ENGINEER : James Ross

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49 highest peaks above -50.00 dB of EN 55022 Class B (Avg) limit line
Peak criteria : 3.00 dB, Curve : Peak

Peak#	Freq(MHz)	Amp(dBuV)	Limit(dB)	Delta(dB)
1	1.637	49.45	46.00	3.45**
2	1.849	49.30	46.00	3.30**
3	0.235	54.78	52.25	2.53**
4	2.100	46.22	46.00	0.22**
5	0.239	52.30	52.12	0.18**
6	0.466	46.52	46.58	-0.05**
7	7.689	48.89	50.00	-1.11**
8	1.404	44.79	46.00	-1.21**
9	0.929	44.65	46.00	-1.35**
10	3.043	43.91	46.00	-2.09**
11	3.277	43.53	46.00	-2.47**
12	0.686	43.23	46.00	-2.77**
13	0.701	43.22	46.00	-2.78**
14	0.909	42.77	46.00	-3.23**
15	2.568	42.76	46.00	-3.24
16	1.166	42.74	46.00	-3.26
17	2.334	42.69	46.00	-3.31
18	7.981	46.68	50.00	-3.32
19	0.479	42.77	46.36	-3.59**
20	0.486	42.60	46.23	-3.62**
21	1.717	42.36	46.00	-3.64
22	2.449	42.27	46.00	-3.73
23	6.288	46.21	50.00	-3.79
24	0.735	42.19	46.00	-3.81**
25	2.811	42.13	46.00	-3.87
26	0.974	42.12	46.00	-3.88**
27	7.489	45.40	50.00	-4.60**
28	6.525	45.38	50.00	-4.62
29	7.217	45.21	50.00	-4.79
30	4.928	40.89	46.00	-5.11
31	1.124	40.73	46.00	-5.27
32	8.640	44.70	50.00	-5.30
33	8.148	44.61	50.00	-5.39
34	4.432	40.54	46.00	-5.46
35	6.773	44.45	50.00	-5.55
36	3.966	40.38	46.00	-5.62
37	5.996	44.33	50.00	-5.67
38	8.873	44.25	50.00	-5.75
39	3.741	39.97	46.00	-6.03
40	4.672	39.86	46.00	-6.14
41	4.204	39.81	46.00	-6.19
42	6.059	43.35	50.00	-6.65
43	1.981	38.73	46.00	-7.27
44	2.624	38.65	46.00	-7.35
45	5.597	42.50	50.00	-7.50
46	6.991	42.02	50.00	-7.98
47	5.362	41.44	50.00	-8.56
48	8.416	41.26	50.00	-8.74
49	9.112	40.99	50.00	-9.01

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

EN 55022 Conducted Emissions 8/15/2003 12:03:35
Troy Group, Inc.
Wireless Bridge
EtherBridge
White Lead - 115 VAC / 60 Hz
Lab J_White Lead_Due: 1-30-04
TEST ENGINEER : James Ross

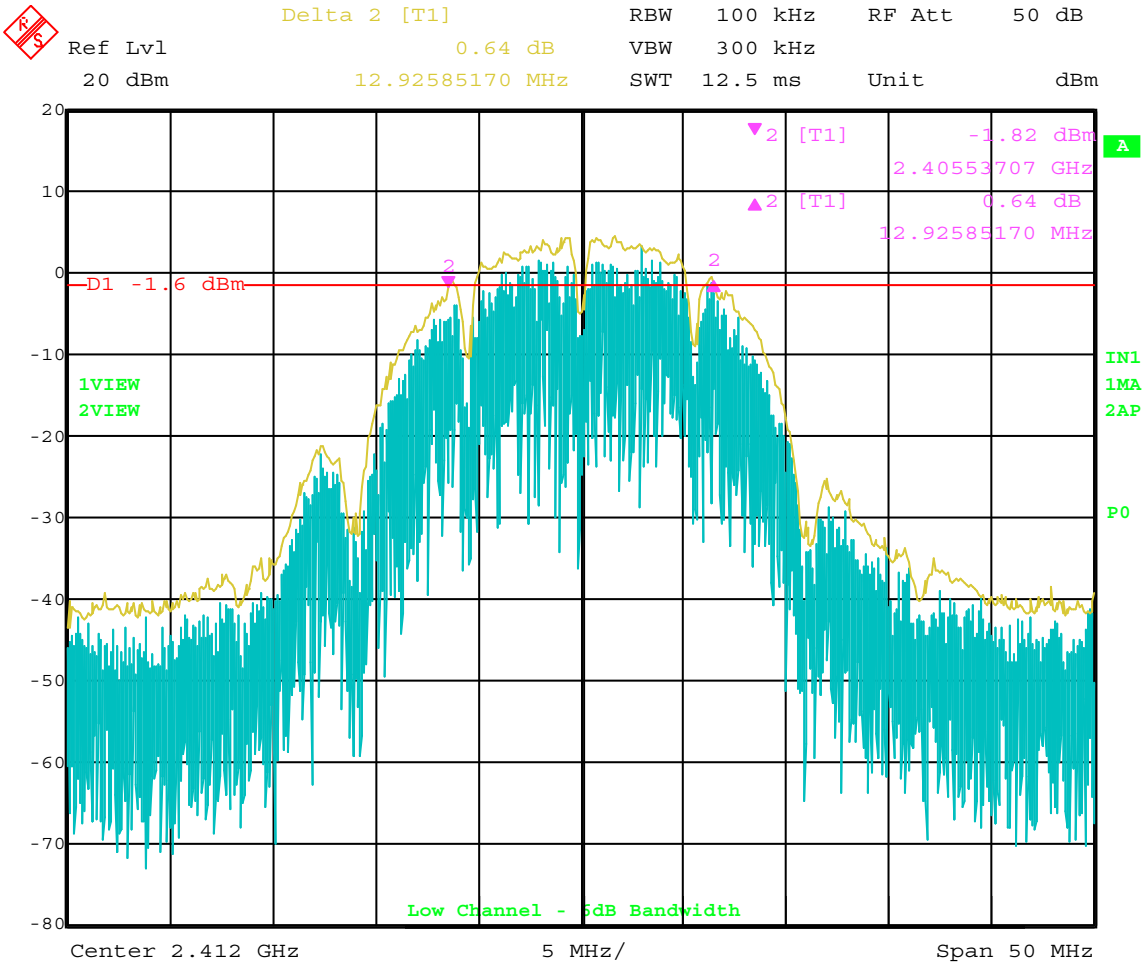
---

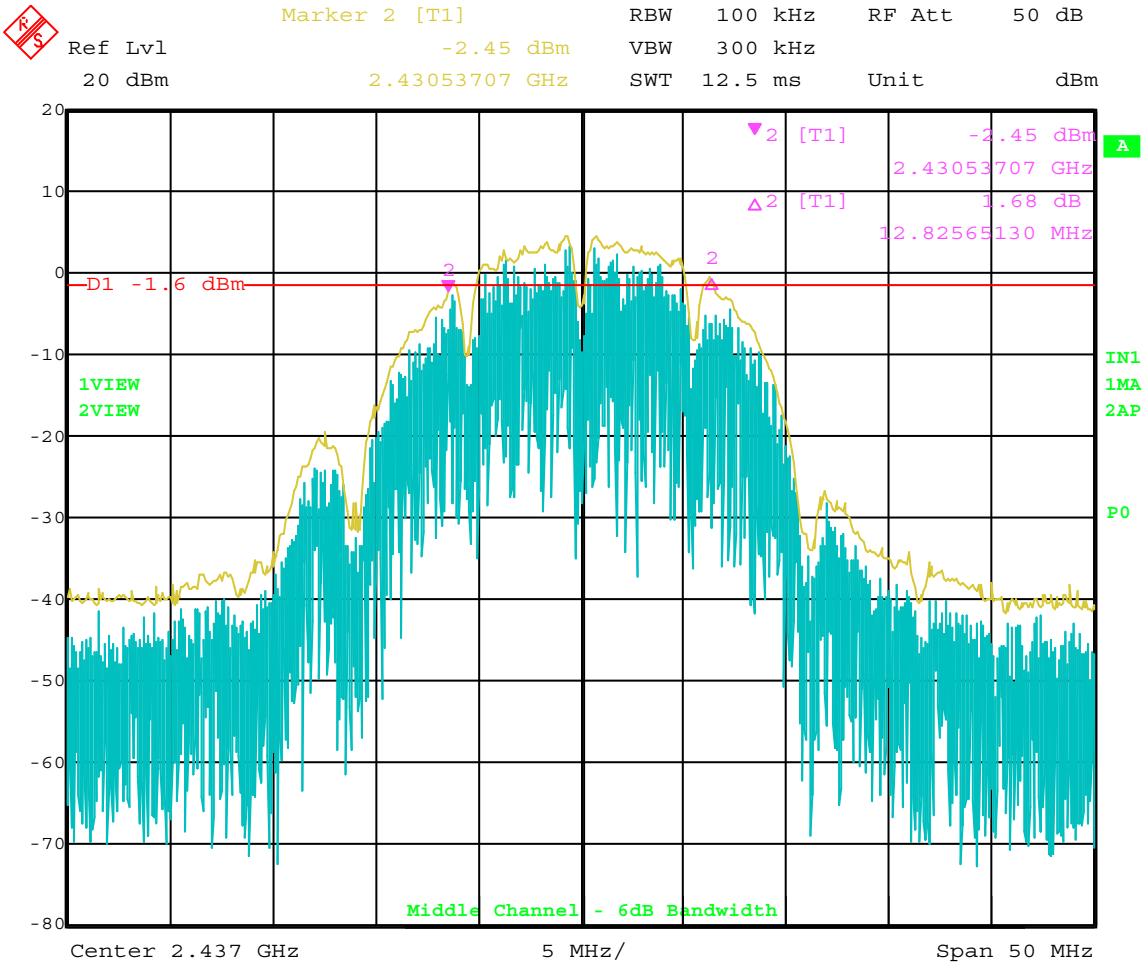
12 highest peaks above -50.00 dB of EN 55022 Class B (Avg) limit line
Peak criteria : 3.00 dB, Curve : Average

Peak#	Freq(MHz)	Amp(dBuV)	Limit(dB)	Delta(dB)
1	1.620	40.36	46.00	-5.64
2	1.859	39.92	46.00	-6.08
3	1.389	38.68	46.00	-7.32
4	0.929	37.78	46.00	-8.22
5	0.694	37.49	46.00	-8.51
6	0.461	38.13	46.67	-8.53
7	2.089	33.44	46.00	-12.56
8	0.229	38.47	52.48	-14.01
9	3.011	31.12	46.00	-14.88
10	3.243	30.55	46.00	-15.45
11	7.648	28.74	50.00	-21.26
12	7.856	27.67	50.00	-22.33

-6 dB BANDWIDTH

DATA SHEETS


Delta 2 [T1]
0.64 dB
12.92585170 MHz
RBW 100 kHz
VBW 300 kHz
SWT 12.5 ms
RF Att 50 dB
Unit dBm
Ref Lvl
20 dBm
2 [T1] -1.82 dBm
2.40553707 GHz
2 [T1] 0.64 dB
12.92585170 MHz
D1 -1.6 dBm
1VIEW
2VIEW
IN1
1MA
2AP
P0
A
Low Channel - 6dB Bandwidth
Center 2.412 GHz
5 MHz/
Span 50 MHz
Date: 21.AUG.2003 00:31:40



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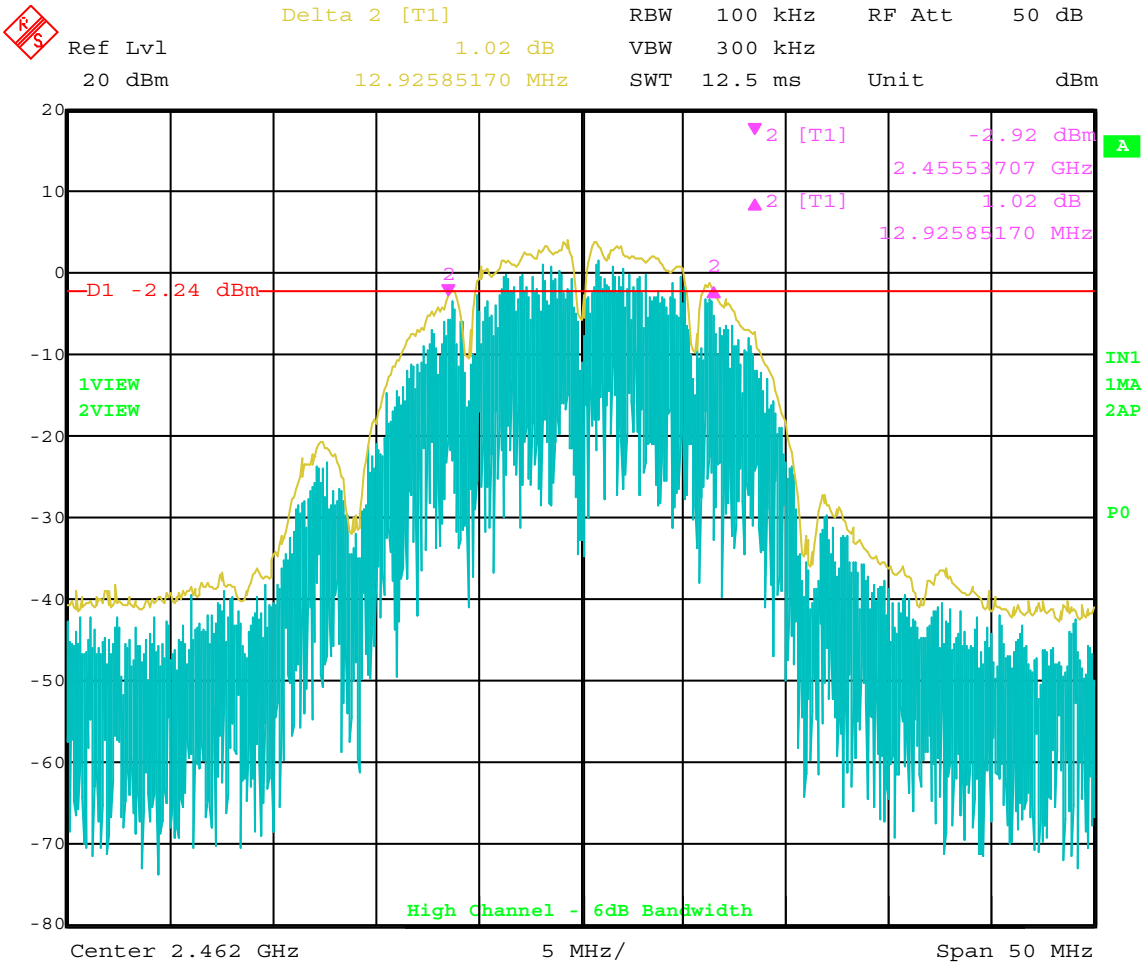

Delta 2 [T1]
RBW 100 kHz
RF Att 50 dB
Ref Lvl
1.02 dB
VBW 300 kHz
20 dBm
12.92585170 MHz
SWT 12.5 ms
Unit dBm
2 [T1]
-2.92 dBm
2.45553707 GHz
2 [T1]
1.02 dB
12.92585170 MHz
A
D1 -2.24 dBm
1VIEW
2VIEW
IN1
1MA
2AP
P0
High Channel - 6dB Bandwidth
Center 2.462 GHz
5 MHz/
Span 50 MHz
Date: 21.AUG.2003 00:36:01

PEAK POWER OUTPUT

DATA SHEETS

PEAK OUTPUT POWER

TROY GROUP, INC.

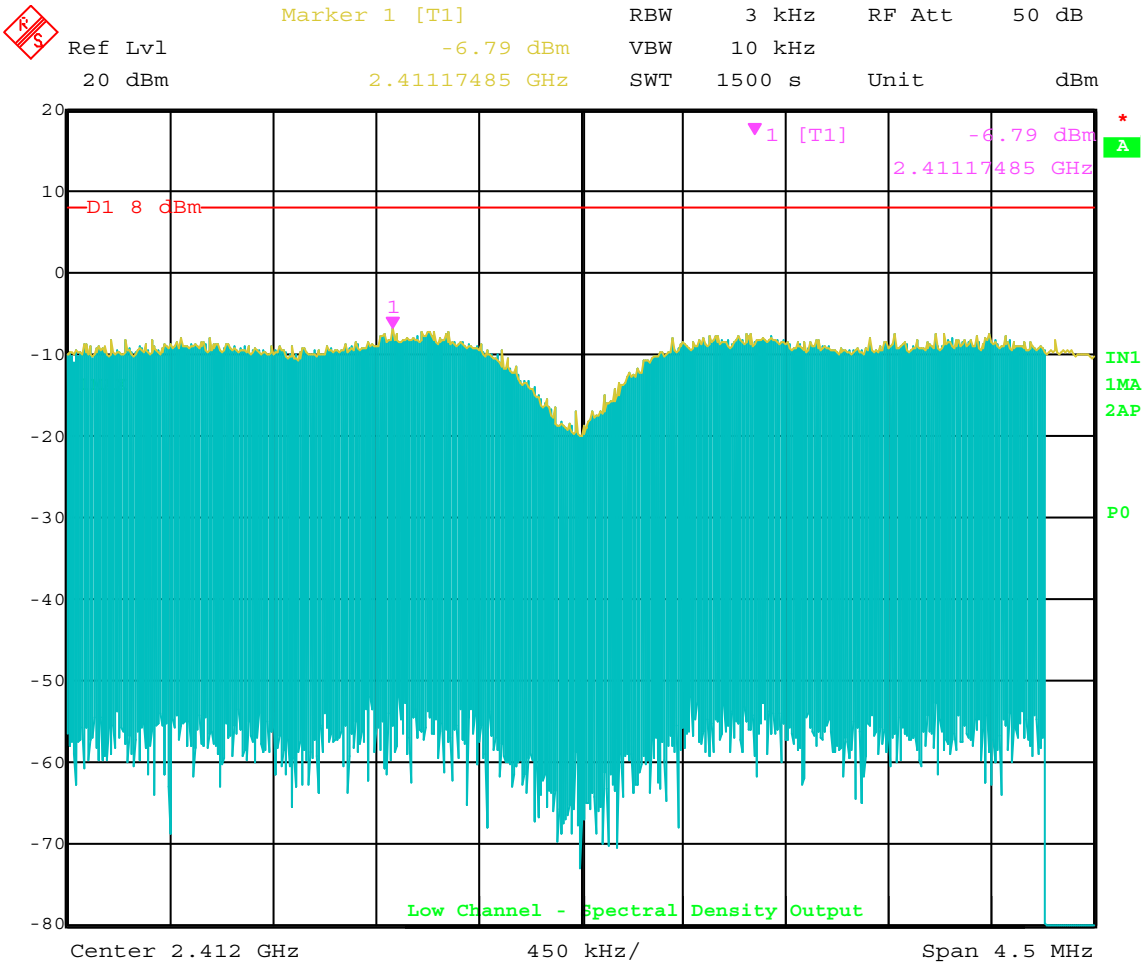
EtherBridge

MODEL: ETHBG

CHANNEL	PEAK POWER OUTPUT (dBm)
LOW (CHANNEL 1)	14.88
MIDDLE (CHANNEL 6)	14.93
HIGH (CHANNEL 11)	14.58

PEAK POWER SPECTRAL DENSITY

DATA SHEETS



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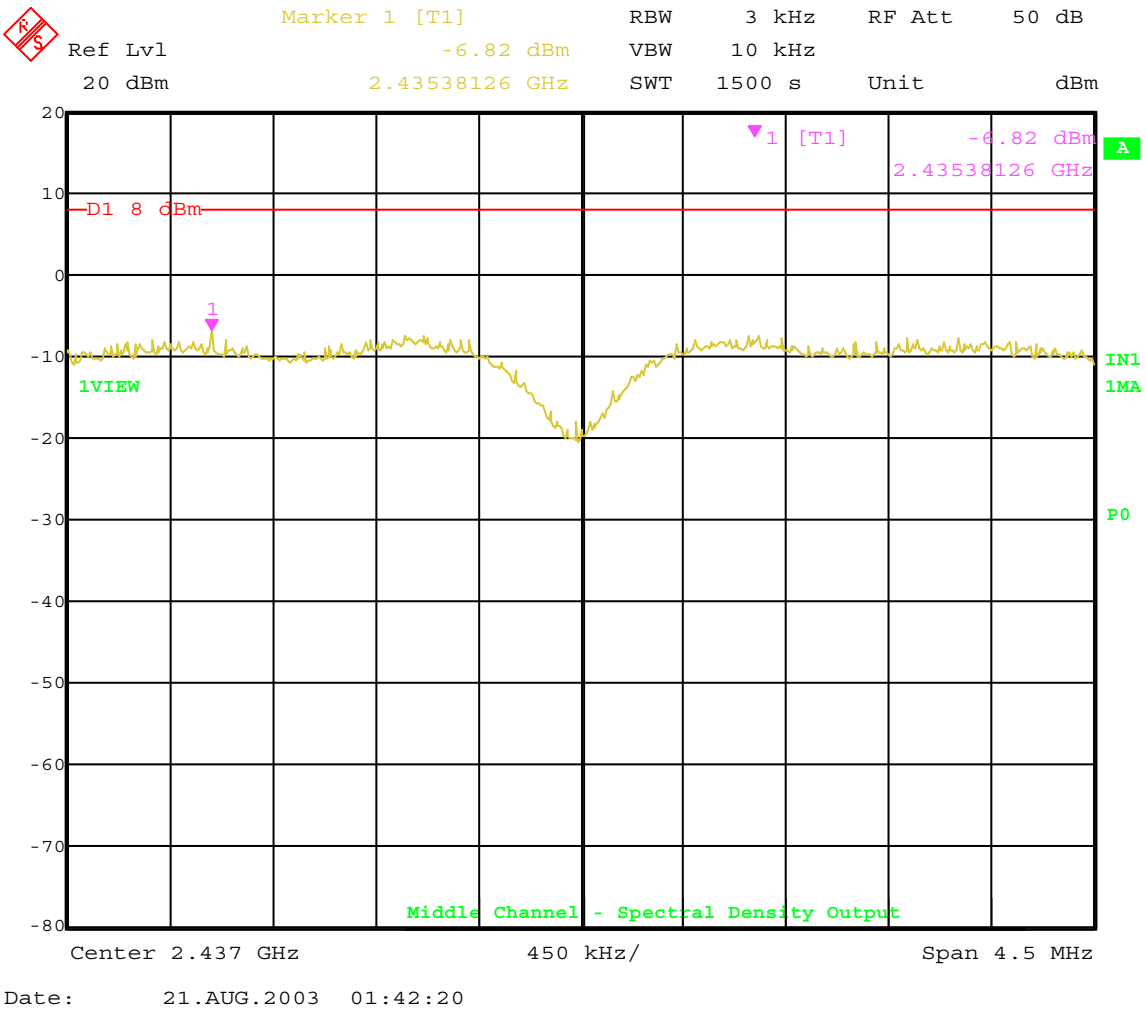

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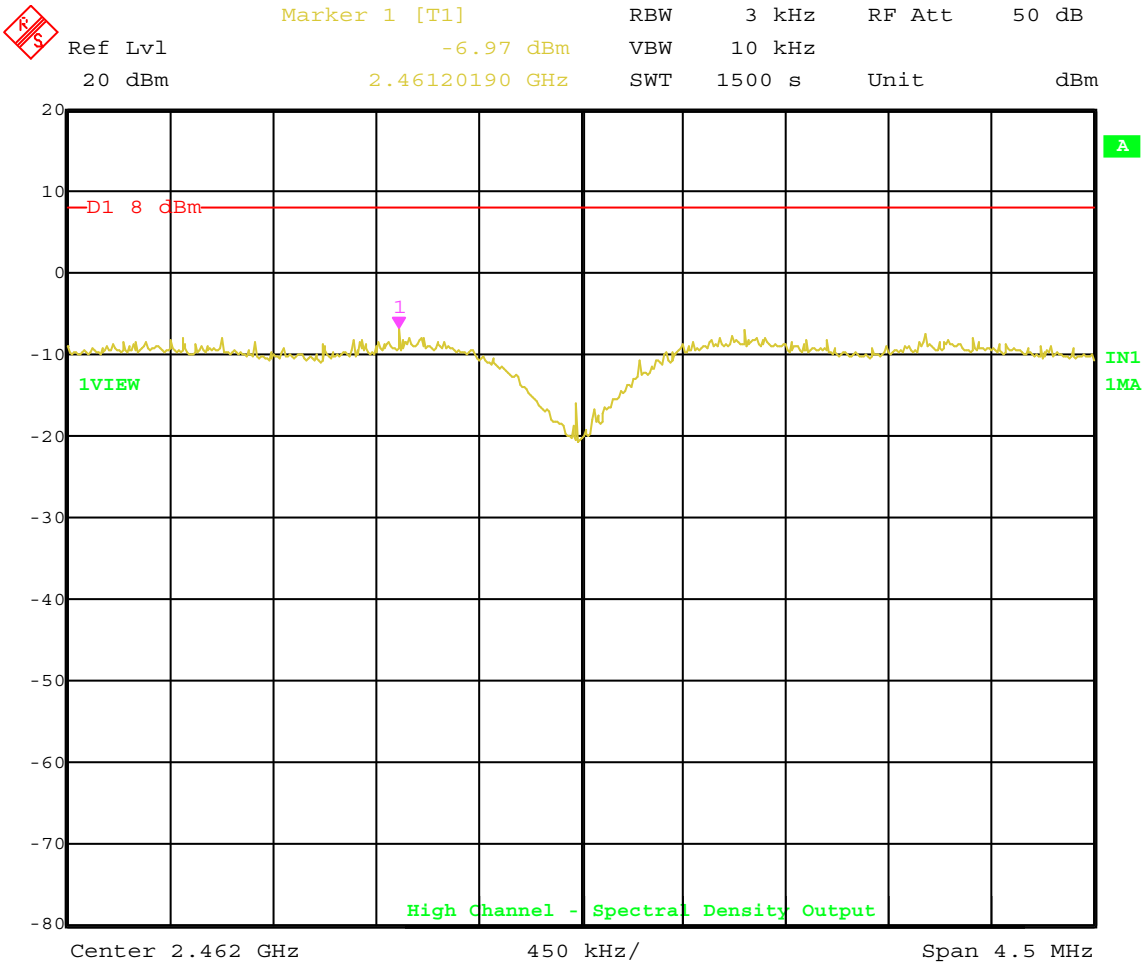


Date: 22.AUG.2003 18:03:27

RADIATED EMISSIONS

DATA SHEETS for the TRANSMITTER PORTION

RADIATED EMISSIONS (FCC SECTION 15.205 AND 15.247)

COMPANY	**TROY GROUP INC.**	**DATE**	**8/19/03**	
EUT	**EtherBridge**	**DUTY CYCLE**	**N/A**	**%**
MODEL	**ETHBG**	**PEAK TO AVG**	**N/A**	**dB**
S/N	**BVH205008-02083**	**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	101.3	A	H	1.0	90			30.2	2.5	30.6	0.0	0.0	**103.4**	**103.4**		
2412.0000	104.4	A	V	1.5	0			30.2	2.5	30.6	0.0	0.0	**106.5**	**106.5**		
2437.0000	98.7	A	H	1.0	270			30.3	2.5	30.6	0.0	0.0	**100.9**	**100.9**		
2437.0000	103.3	A	V	1.0	0			30.3	2.5	30.6	0.0	0.0	**105.5**	**105.5**		
2462.0000	93.9	A	H	2.0	0			30.3	2.6	30.5	0.0	0.0	**96.3**	**96.3**		
2462.0000	101.7	A	V	1.5	90			30.3	2.6	30.5	0.0	0.0	**104.1**	**104.1**		

* 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**	**8/19/03**	
EUT	**EtherBridge**	**DUTY CYCLE**	**N/A**	**%**
MODEL	**ETHBG**	**PEAK TO AVG**	**N/A**	**dB**
S/N	**BVH205008-02083**	**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	40.1	A	H	1.0	90	Y	LOW	35.1	3.8	29.8	0.0	0.0	**49.2**	**-4.8**	**54.0**	
4824.0000	41.1	A	V	1.0	180	Y	LOW	35.1	3.8	31.1	0.0	0.0	**48.9**	**-5.1**	**54.0**	
4874.0000	39.7	A	H	1.0	180	Y	MID	35.3	3.8	29.8	0.0	0.0	**49.0**	**-5.0**	**54.0**	
4874.0000	41.2	A	V	1.0	0	Y	MID	35.3	3.8	29.8	0.0	0.0	**50.5**	**-3.5**	**54.0**	
4924.0000	40.5	A	H	1.0	90	Y	HIGH	35.4	3.8	29.7	0.0	0.0	**50.0**	**-4.0**	**54.0**	
4924.0000	38.9	A	V	1.5	180	Y	HIGH	35.4	3.8	29.7	0.0	0.0	**48.4**	**-5.6**	**54.0**	

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

** DELTA = SPEC LIMIT - CORRECTED READING

RADIATED EMISSIONS (FCC SECTION 15.205 AND 15.247)

COMPANY	**TROY GROUP INC.**	**DATE**	**8/19/03**	
EUT	**EtherBridge**	**DUTY CYCLE**	**N/A**	**%**
MODEL	**ETHBG**	**PEAK TO AVG**	**N/A**	**dB**
S/N	**BVH205008-02083**	**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	37.0	29.6 A	H	1.0	90	Y	LOW	40.5	4.8	29.3	0.0	0.0	**45.7**	**-8.3**	**54.0**	**No Harmonics nor**
																Emissions Found after
																the 3rd Harmonic
7236.0000	38.1	29.3 A	V	1.0	180	Y	LOW	40.5	4.8	29.3	0.0	0.0	**45.4**	**-8.6**	**54.0**	
7311.0000	38.3	28.5 A	H	1.0	90	Y	MID	40.7	4.9	29.3	0.0	0.0	**44.8**	**-9.2**	**54.0**	
7311.0000	39.2	28.6 A	V	1.5	90	Y	MID	40.7	4.9	29.3	0.0	0.0	**44.9**	**-9.1**	**54.0**	
7386.0000	38.6	27.5 A	H	1.0	90	Y	HIGH	40.8	4.9	29.3	0.0	0.0	**43.9**	**-10.1**	**54.0**	
7386.0000	41.2	30.0 A	V	1.5	0	Y	HIGH	40.8	4.9	29.3	0.0	0.0	**46.4**	**-7.6**	**54.0**	

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

** DELTA = SPEC LIMIT - CORRECTED READING

RADIATED EMISSIONS (FCC SECTION 15.205 AND 15.247)

COMPANY	**TROY GROUP INC.**	**DATE**	**8/19/03**
EUT	**EtherBridge**	**DUTY CYCLE**	**N/A %**
MODEL	**ETHBG**	**PEAK TO AVG**	**N/A dB**
S/N	**BVH205008-02083**	**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
1496.0000	53.3	48.7 A	H	1.5	0	Y	LOW	26.6	2.2	31.7	0.0	0.0	**45.8**	**-8.2**	**54.0**	**Spurious - Digital Portion**
2038.0000	53.3	53.2 A	H	1.5	0	Y	LOW	29.5	2.2	31.0	0.0	0.0	**53.9**			*****
1496.0000	46.8	40.6 A	V	1.5	0	Y	LOW	26.6	2.2	31.7	0.0	0.0	**37.7**	**-16.3**	**54.0**	**Spurious - Digital Portion**
2038.0000	52.3	51.6 A	V	1.5	0	Y	LOW	29.5	2.2	31.0	0.0	0.0	**52.3**			*****
																*** - From Transmitter**
																Emissions Disappears when
																the Transmitter is stopped.
																*** - appears at 2063 at ch. 6**
																and 2088 at ch. 11
																*** - NOT in the restricted**
																band.

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

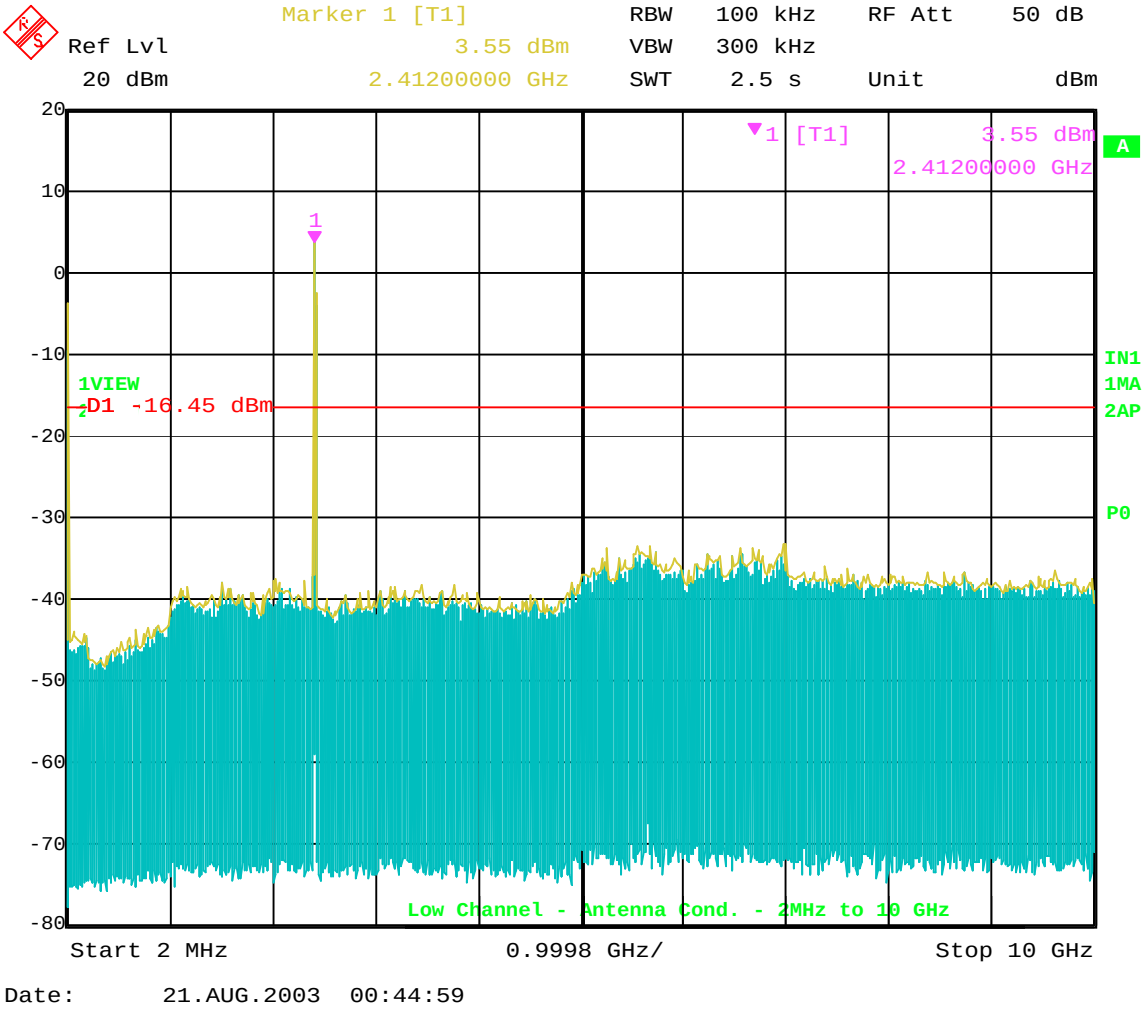
** DELTA = SPEC LIMIT - CORRECTED READING

Test Location : Compatible Electronics **Page** : 1/1
Customer : Troy Group, Inc. **Date** : 8/25/2003
Manufacturer : Troy Group, Inc. **Time** : 10:47:42
Eut name : EtherBridge **Lab** : D
Model : ETHBG **Test Distance** : 3.0 Meters
Serial # : BUH205008-02083
Specification : FCC Class B
Distance correction factor (20 * log(test/spec)) : 0.00
Test Mode : Spurious Emissions from the Transmitter
10 kHz to 1000 MHz - See Previous Page for 1000 MHz to 25000 MHz
Vertical and Horizontal Polarization
Tested By: Kyle Fujimoto

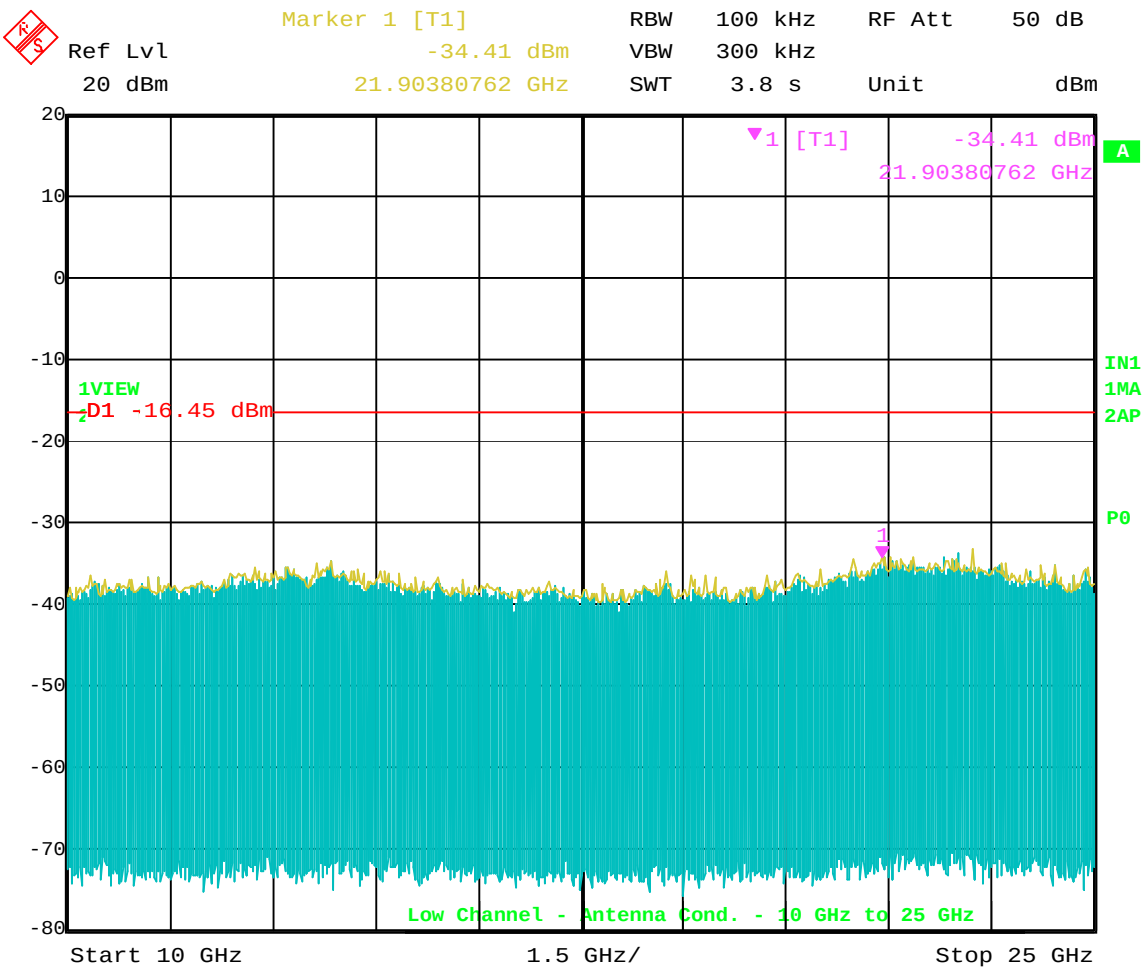
Pol	Freq	Rdng	Cable loss	Ant factor	Amp gain	Cor'd rdg = R	Limit = L	Delta R-L
	MHz	dBuV	dB	dB	dB	dBuV	dBuV/m	dB
1H	212.530	51.20	2.60	15.59	38.30	31.10	43.50	-12.40
2V	293.197	45.70	3.25	18.82	38.35	29.42	46.00	-16.58
3V	300.514	41.30	3.30	13.11	38.30	19.42	46.00	-26.58
4H	301.709	52.00	3.31	13.15	38.30	30.16	46.00	-15.84
5V	308.022	49.50	3.35	13.32	38.30	27.87	46.00	-18.13
6H	308.053	64.00	3.35	13.32	38.30	42.37	46.00	-3.63
7V	320.022	43.20	3.43	13.64	38.30	21.97	46.00	-24.03
8H	326.453	55.50	3.46	13.81	38.30	34.48	46.00	-11.52
9H	332.053	48.10	3.50	13.96	38.30	27.25	46.00	-18.75
10H	396.065	58.90	3.79	14.31	38.30	38.69	46.00	-7.31
11V	398.500	48.90	3.79	14.30	38.30	28.70	46.00	-17.30
12H	440.065	58.70	3.96	15.43	37.98	40.12	46.00	-5.88
13V	615.580	35.50	4.70	17.78	38.04	19.94	46.00	-26.06

RF ANTENNA CONDUCTED

DATA SHEETS



Note: Frequency at 2 MHz is really 0 Hz. This was verified by reducing the frequency span on the EMI Receiver. Also, the EUT was tested from 9 kHz to 30 MHz at 3 Meters to verfiy no emissions were coming from the EUT.
Please see the Spurious Emission Data Sheet Below 1 GHz for details.



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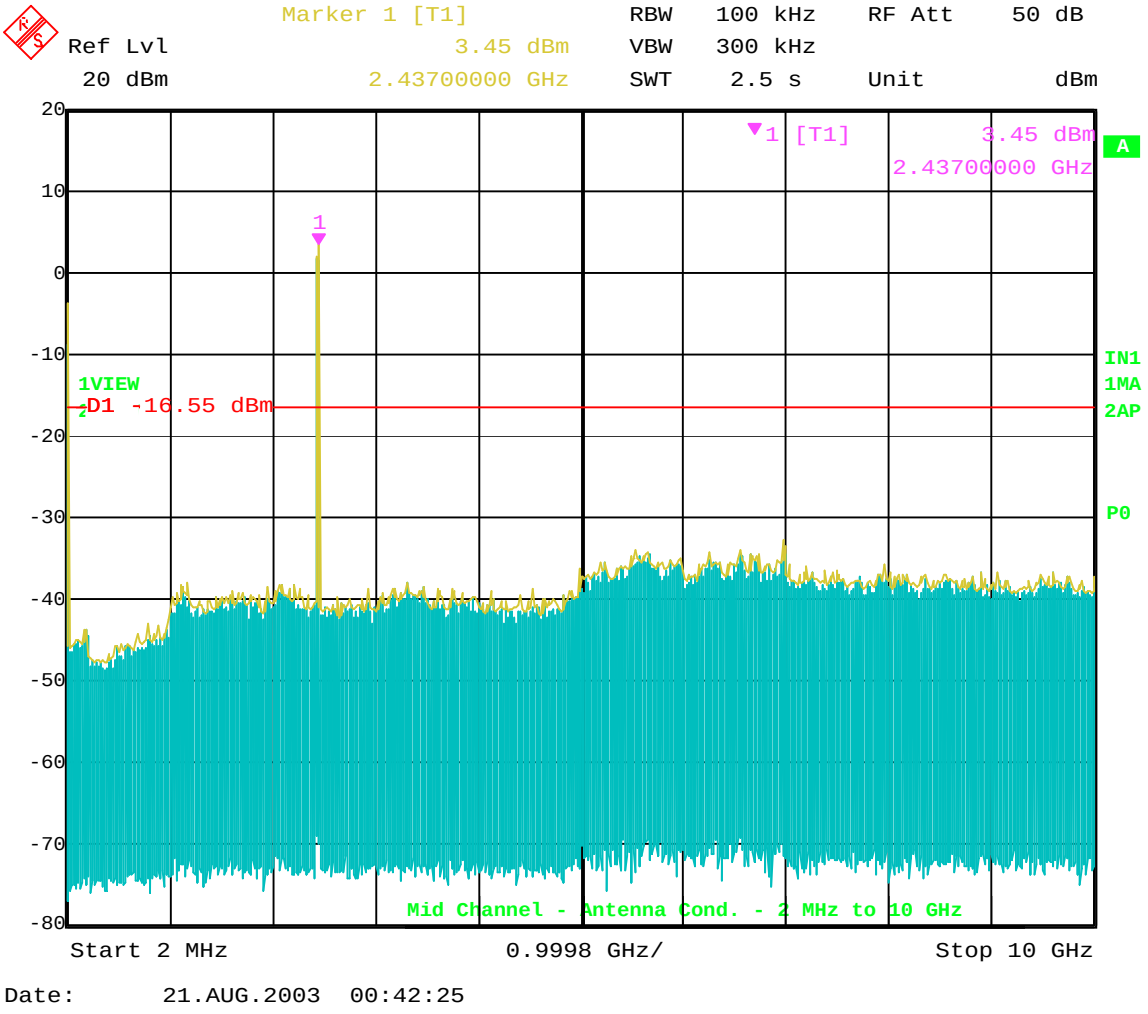
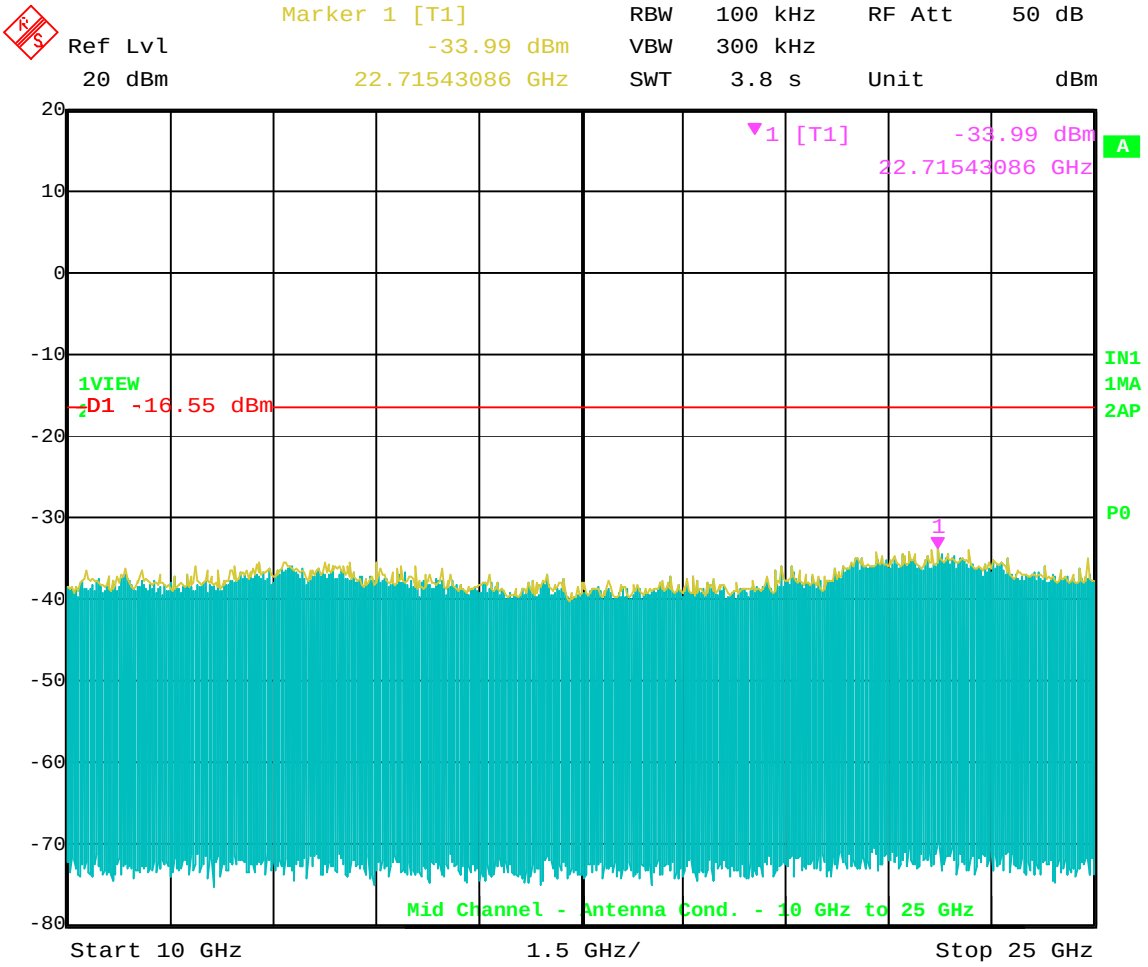


Note: Frequency at 2 MHz is really 0 Hz. This was verified by reducing the frequency span on the EMI Receiver. Also, the EUT was tested from 9 kHz to 30 MHz at 3 Meters to verfiy no emissions were coming from the EUT.
Please see the Spurious Emission Data Sheet Below 1 GHz for details.



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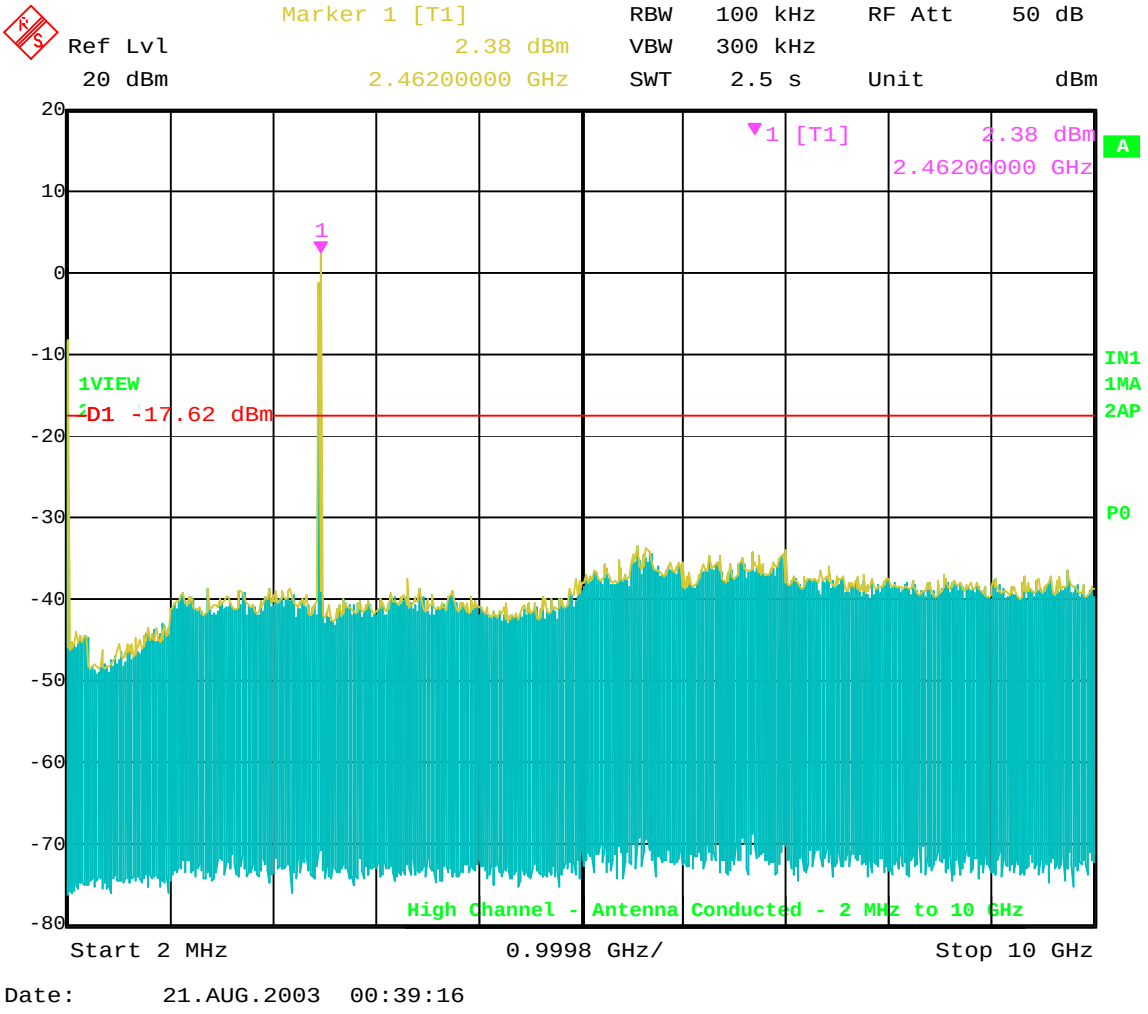
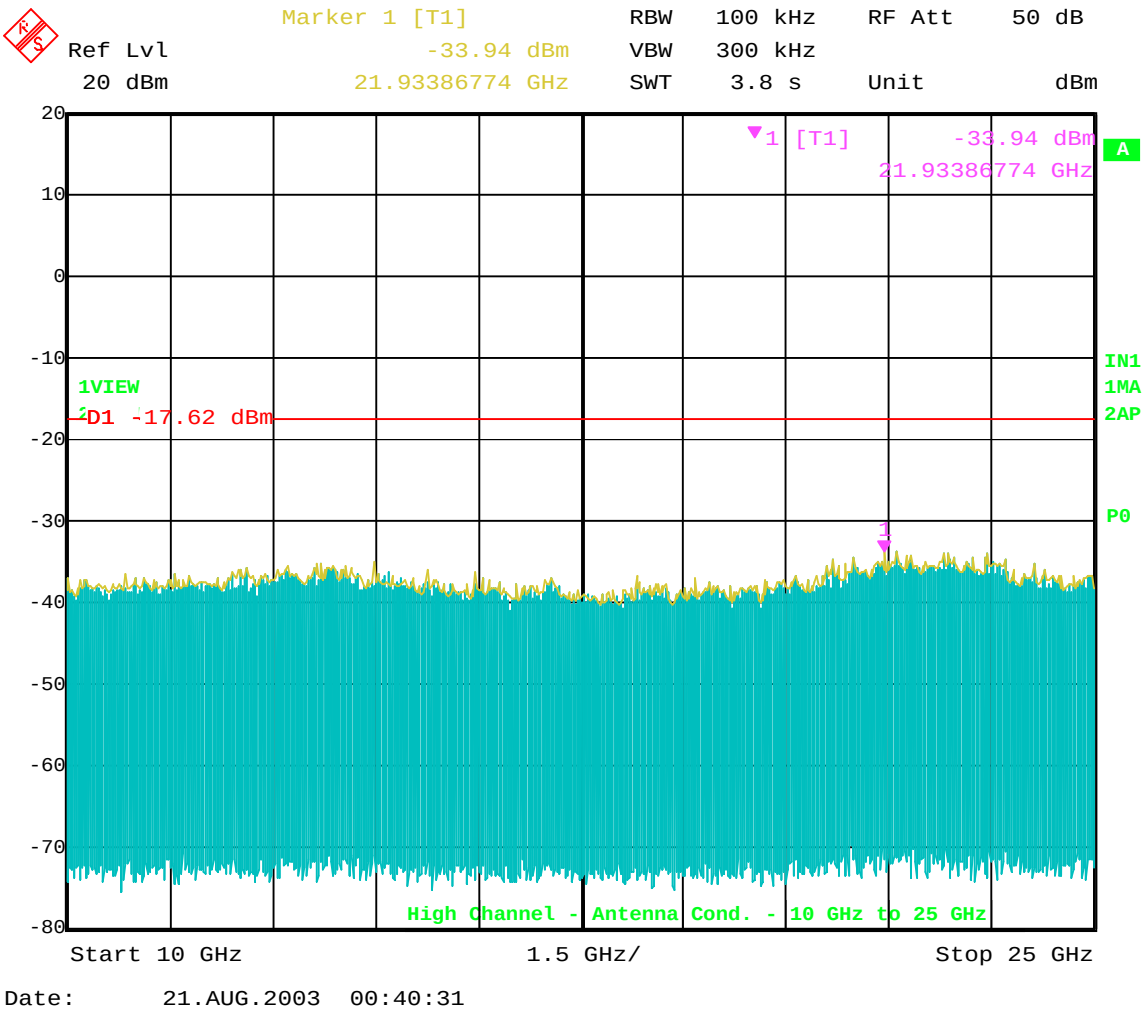
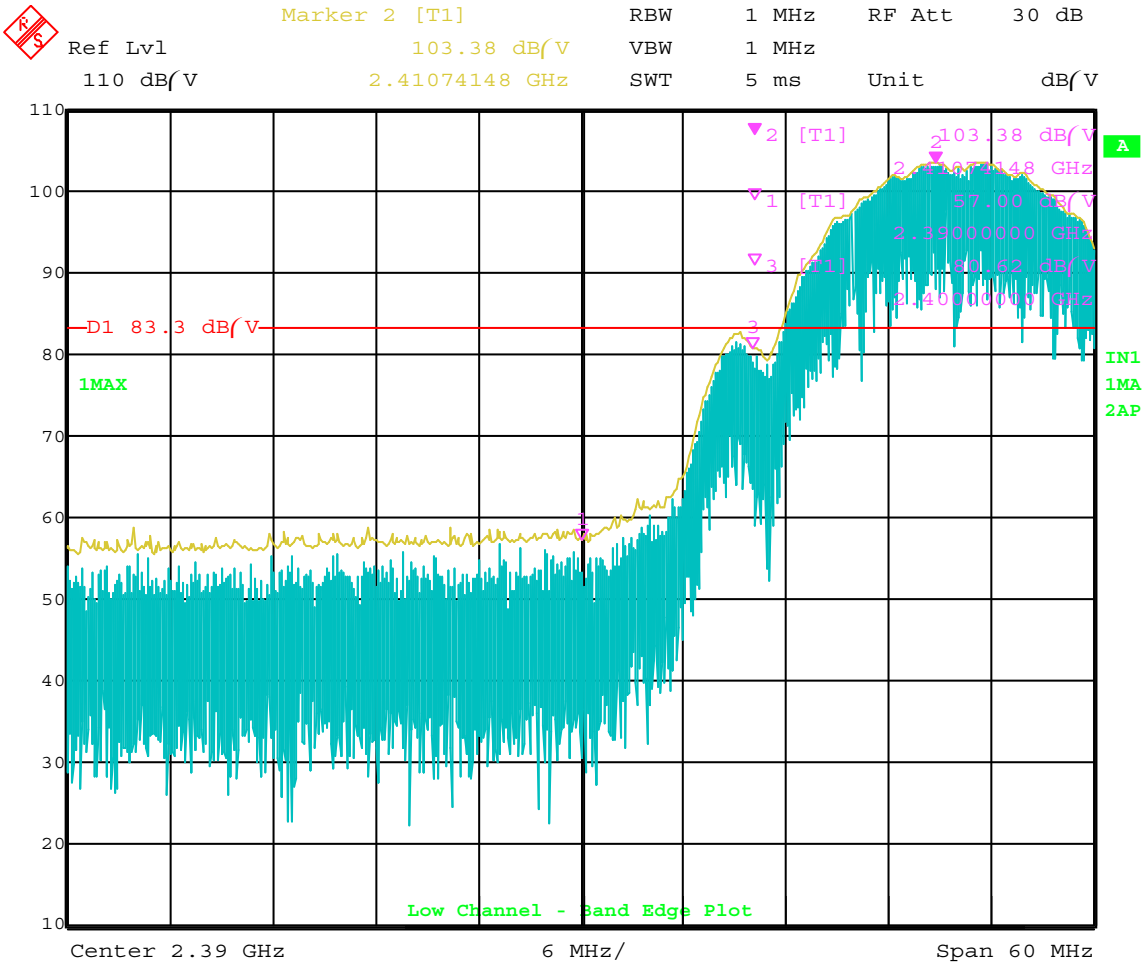


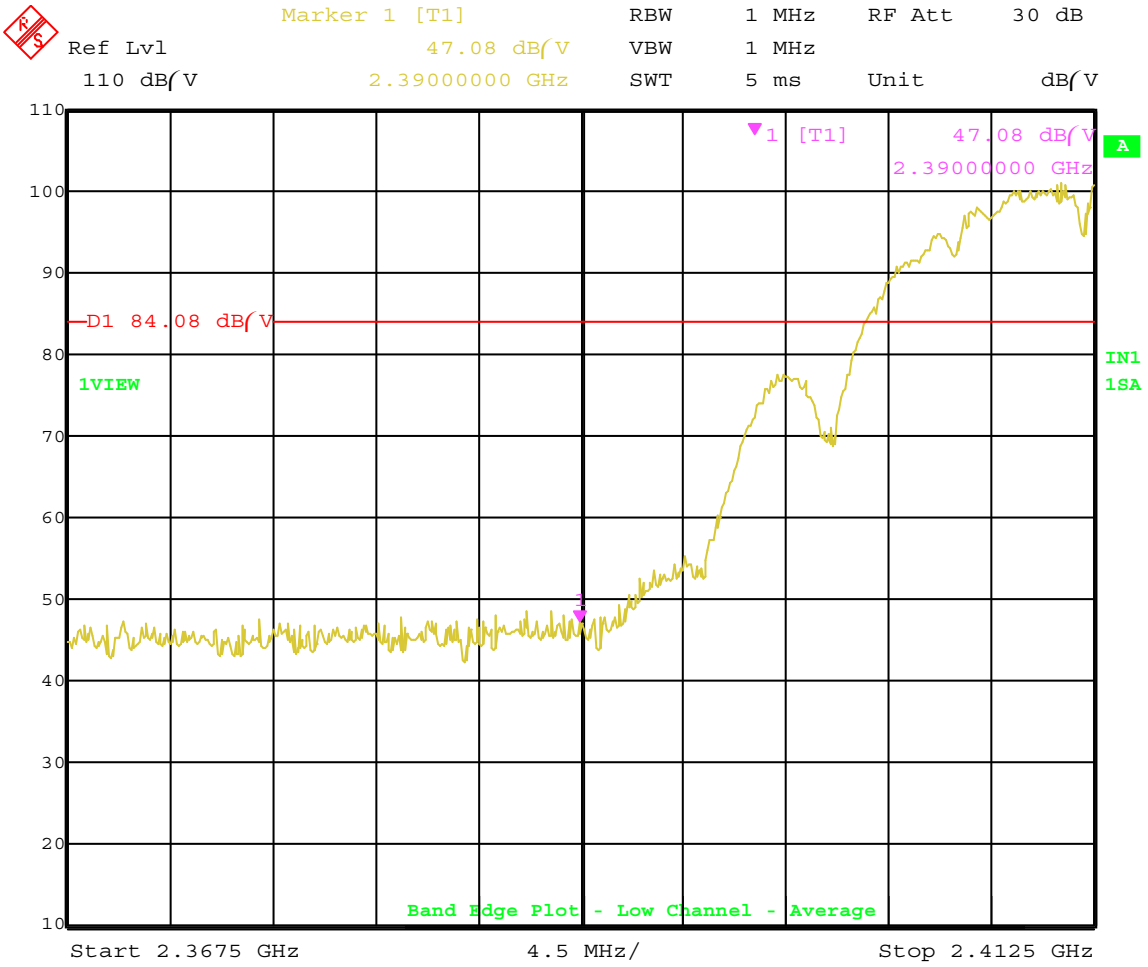
Note: Frequency at 2 MHz is really 0 Hz. This was verified by reducing the frequency span on the EMI Receiver. Also, the EUT was tested from 9 kHz to 30 MHz at 3 Meters to verfiy no emissions were coming from the EUT.
Please see the Spurious Emission Data Sheet Below 1 GHz for details.

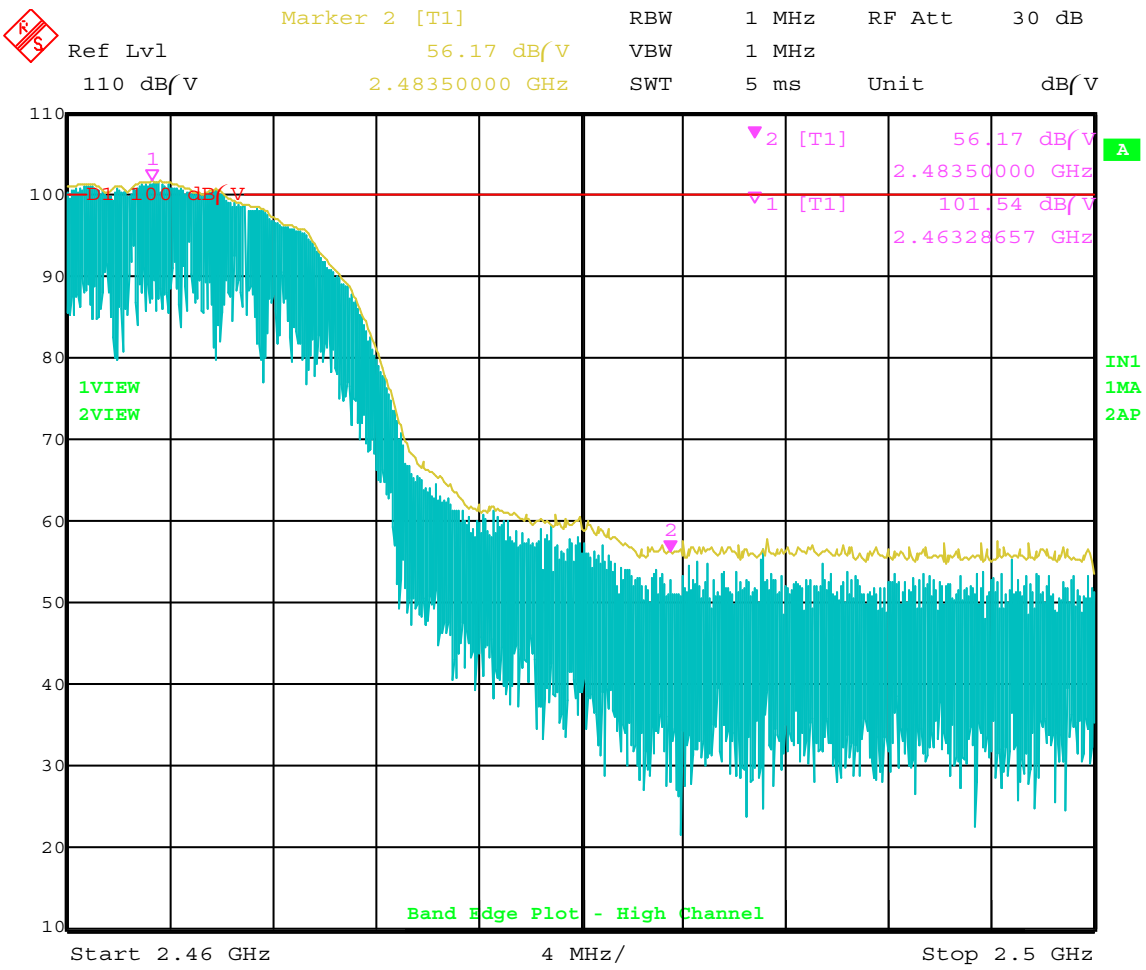

Marker 1 [T1]
RBW 100 kHz
RF Att 50 dB
Ref Lvl
-33.94 dBm
VBW 300 kHz
20 dBm
21.93386774 GHz
SWT 3.8 s
Unit dBm
1 [T1]
-33.94 dBm
21.93386774 GHz
A
1VIEW
D1 -17.62 dBm
IN1
1MA
2AP
P0
High Channel - Antenna Cond. - 10 GHz to 25 GHz
Start 10 GHz
1.5 GHz/
Stop 25 GHz
Date: 21.AUG.2003 00:40:31

BAND EDGE

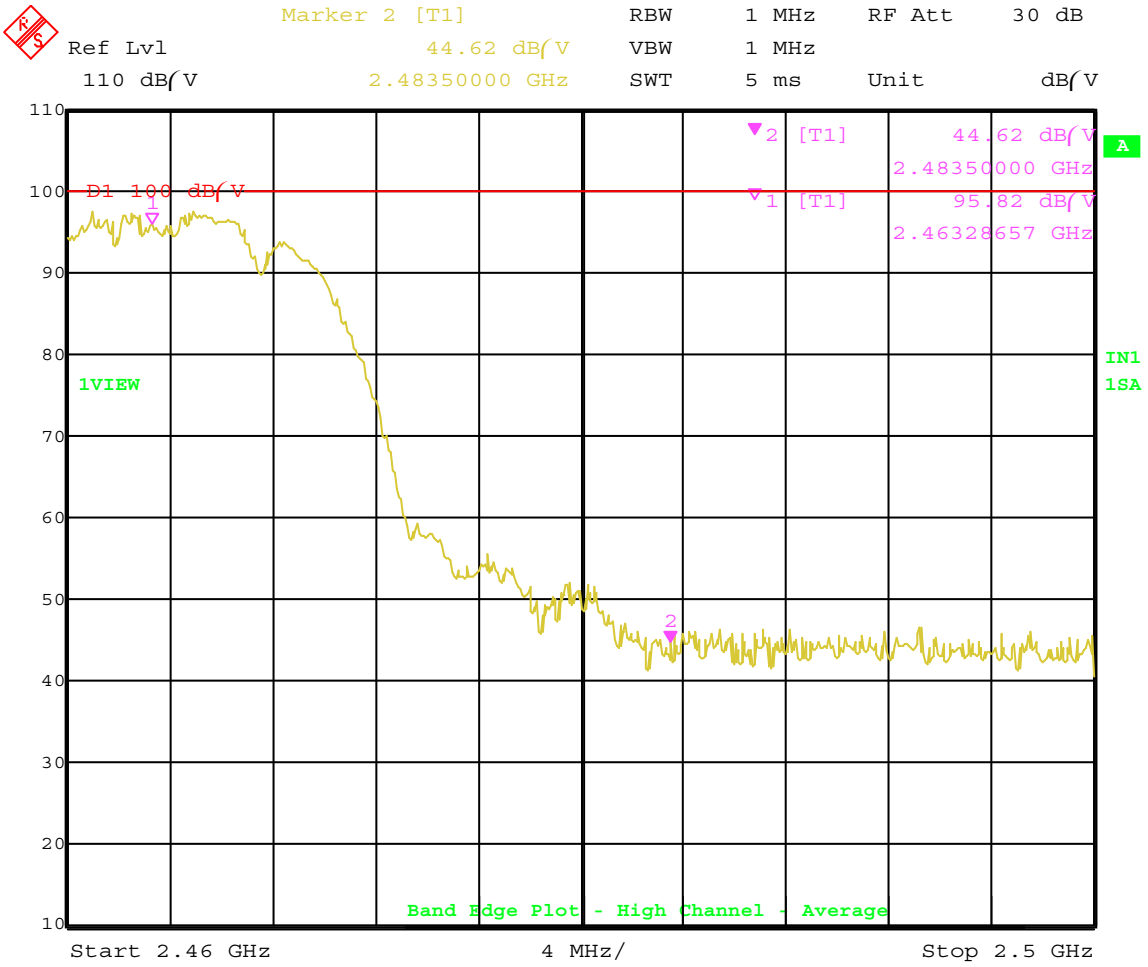
DATA SHEETS


Marker 2 [T1]
RBW 1 MHz
RF Att 30 dB
Ref Lvl
103.38 dBµV
VBW 1 MHz
110 dBµV
2.41074148 GHz
SWT 5 ms
Unit dBµV
2 [T1]
103.38 dBµV
1 [T1]
57.00 dBµV
2.39000000 GHz
3 [T1]
80.62 dBµV
2.40000000 GHz
D1 83.3 dBµV
1MAX
A
IN1
1MA
2AP
Low Channel - Band Edge Plot
Center 2.39 GHz
6 MHz/
Span 60 MHz
Date: 20.AUG.2003 01:05:26


Marker 1 [T1]
RBW 1 MHz
RF Att 30 dB
Ref Lvl
47.08 dBµV
VBW 1 MHz
110 dBµV
2.39000000 GHz
SWT 5 ms
Unit dBµV
1 [T1]
47.08 dBµV
2.39000000 GHz
A
D1 84.08 dBµV
1VIEW
IN1
1SA
Band Edge Plot - Low Channel - Average
Start 2.3675 GHz
4.5 MHz/
Stop 2.4125 GHz
Date: 19.AUG.2003 19:04:38



Date: 19.AUG.2003 19:08:37


Marker 2 [T1]
RBW 1 MHz
RF Att 30 dB
Ref Lvl
44.62 dBµV
VBW 1 MHz
110 dBµV
2.48350000 GHz
SWT 5 ms
Unit dBµV
2 [T1]
44.62 dBµV
2.48350000 GHz
1 [T1]
95.82 dBµV
2.46328657 GHz
D1 100 dBµV
A
IN1
1SA
1VIEW
Band Edge Plot - High Channel - Average
Start 2.46 GHz
4 MHz/
Stop 2.5 GHz
Date: 19.AUG.2003 19:09:54

RADIATED EMISSIONS (FCC SECTION 15.205 AND 15.247)

COMPANY	**TROY GROUP INC.**	**DATE**	**8/19/03**	
EUT	**EtherBridge**	**DUTY CYCLE**	**N/A**	**%**
MODEL	**ETHBG**	**PEAK TO AVG**	**N/A**	**dB**
S/N	**N/A**	**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	56.8	44.7 A	H	1.5	0	Y	LOW	30.2	2.5	30.6	0.0	0.0	**46.9**	**-7.1**	**54.0**	**Band Edge - Low Channel**
2390.0000	57.0	47.1 A	V	1.5	0	Y	LOW	30.2	2.5	30.6	0.0	0.0	**49.3**	**-4.7**	**54.0**	**Band Edge - Low Channel**
2483.5000	53.2	44.0 A	H	2.0	180	Y	HIGH	30.4	2.6	30.5	0.0	0.0	**46.5**	**-7.5**	**54.0**	**Band Edge - High Channel**
2483.5000	56.2	44.6 A	V	1.0	90	Y	HIGH	30.4	2.6	30.5	0.0	0.0	**47.1**	**-6.9**	**54.0**	**Band Edge - High Channel**
																Note: Worst Case
																Polarization (Vertical)
																is also shown on the plots
																on the previous pages.

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

** DELTA = SPEC LIMIT - CORRECTED READING