



**FCC CFR47 PART 15 SUBPART C
CERTIFICATION
TEST REPORT**

FOR

802.11b Wireless CF Module

MODEL NUMBER: LT802 and T802

FCC ID: JWSLT802

REPORT NUMBER: 05U3622-1, Revision D

ISSUE DATE: NOVEMBER 28, 2005

Prepared for
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SANTA CRUZ, CA 95060, USA**

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NVLAP[®]
LAB CODE:200065-0

Revision History

Rev.	Issue Date	Revisions	Revised By
A	9/6/05	Initial Issue	DG
B	9/29/05	Added Portable Configuration data	MH
C	10/28/05	Changed Radio Certification from end product to modular: Revised photos, peripheral table, and EUT description	DG
D	11/28/05	Removed MPE section	DG

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: WORTH DATA, INC.
623 SWIFT STREET
SANTA CRUZ, CA, 95060, USA

EUT DESCRIPTION: 802.11b Wireless CF Module

MODEL: LT802 and T802

SERIAL NUMBER: 001

DATE TESTED: AUGUST 22, 2005 – SEPTEMBER 28, 2005

APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
FCC PART 15 SUBPART C	NO NON-COMPLIANCE NOTED

Compliance Certification Services, Inc. tested the above equipment in accordance with the requirements set forth in the above standards. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

Note: The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. This document may not be altered or revised in any way unless done so by Compliance Certification Services and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by Compliance Certification Services will constitute fraud and shall nullify the document. No part of this report may be used to claim product certification, approval, or endorsement by NVLAP, NIST, or any government agency.

Approved & Released For CCS By:

Tested By:



DAVID GARCIA
EMC SUPERVISOR
COMPLIANCE CERTIFICATION SERVICES



JOSEPH CHUNG
EMC ENGINEER
COMPLIANCE CERTIFICATION SERVICES

2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.4-2003, FCC CFR 47 Part 2 and FCC CFR 47 Part 15.

3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 561F Monterey Road, Morgan Hill, California, USA. The sites are constructed in conformance with the requirements of ANSI C63.4, ANSI C63.7 and CISPR Publication 22. All receiving equipment conforms to CISPR Publication 16-1, "Radio Interference Measuring Apparatus and Measurement Methods."

CCS is accredited by NVLAP, Laboratory Code 200065-0. The full scope of accreditation can be viewed at <http://www.ccsemc.com>.

4. CALIBRATION AND UNCERTAINTY

4.1. MEASURING INSTRUMENT CALIBRATION

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations, and is traceable to recognized national standards.

4.2. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

PARAMETER	UNCERTAINTY
Radiated Emission, 30 to 200 MHz	+/- 3.3 dB
Radiated Emission, 200 to 1000 MHz	+4.5 / -2.9 dB
Radiated Emission, 1000 to 2000 MHz	+4.5 / -2.9 dB
Power Line Conducted Emission	+/- 2.9 dB

Uncertainty figures are valid to a confidence level of 95%.

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF RADIO MODULE

The EUT is an 802.11b radio transceiver module intended for installation in a handheld terminal.

The radio module is manufactured by Unex Technology.

5.2. DESCRIPTION OF END PRODUCT

Handheld terminal model number LT802 has an integrated laser scanner and model number T802 is identical to LT802 except that the scanner is not installed. All tests requiring the end product were performed with model LT802 to represent the worst-case configuration.

5.3. MAXIMUM OUTPUT POWER

The transmitter has a maximum peak conducted output power as follows:

2400 to 2483.5 MHz Authorized Band

Frequency Range (MHz)	Mode	Output Power (dBm)	Output Power (mW)
2412 - 2462	802.11b	19.68	92.90

5.4. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes a single monopole antenna with a maximum gain of 0 dBi.

5.5. SOFTWARE AND FIRMWARE

The firmware installed in the EUT during testing was FCC test firmware.

The test utility software used during testing was Prism test Appliance, v. 3.1.3.

5.6. WORST-CASE MODE

The worst-case channel is determined as the channel with the highest output power. The highest measured output power was at 2437 MHz.

5.7. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT FOR STANDALONE TESTS

PERIPHERAL SUPPORT EQUIPMENT LIST				
Description	Manufacturer	Model	Serial Number	FCC ID
Laptop	Compaq	1200-XL106	1V05DCG225WS	DOC
AC Adapter	Compaq	PA-1600-19A	N/A	N/A

I/O CABLES

I/O CABLE LIST						
Cable No.	Port	# of Identical Ports	Connector Type	Cable Type	Cable Length	Remarks
1	AC	1	AC	Unshielded	1.5m	
2	DC	1	DC	Unshielded	2m	

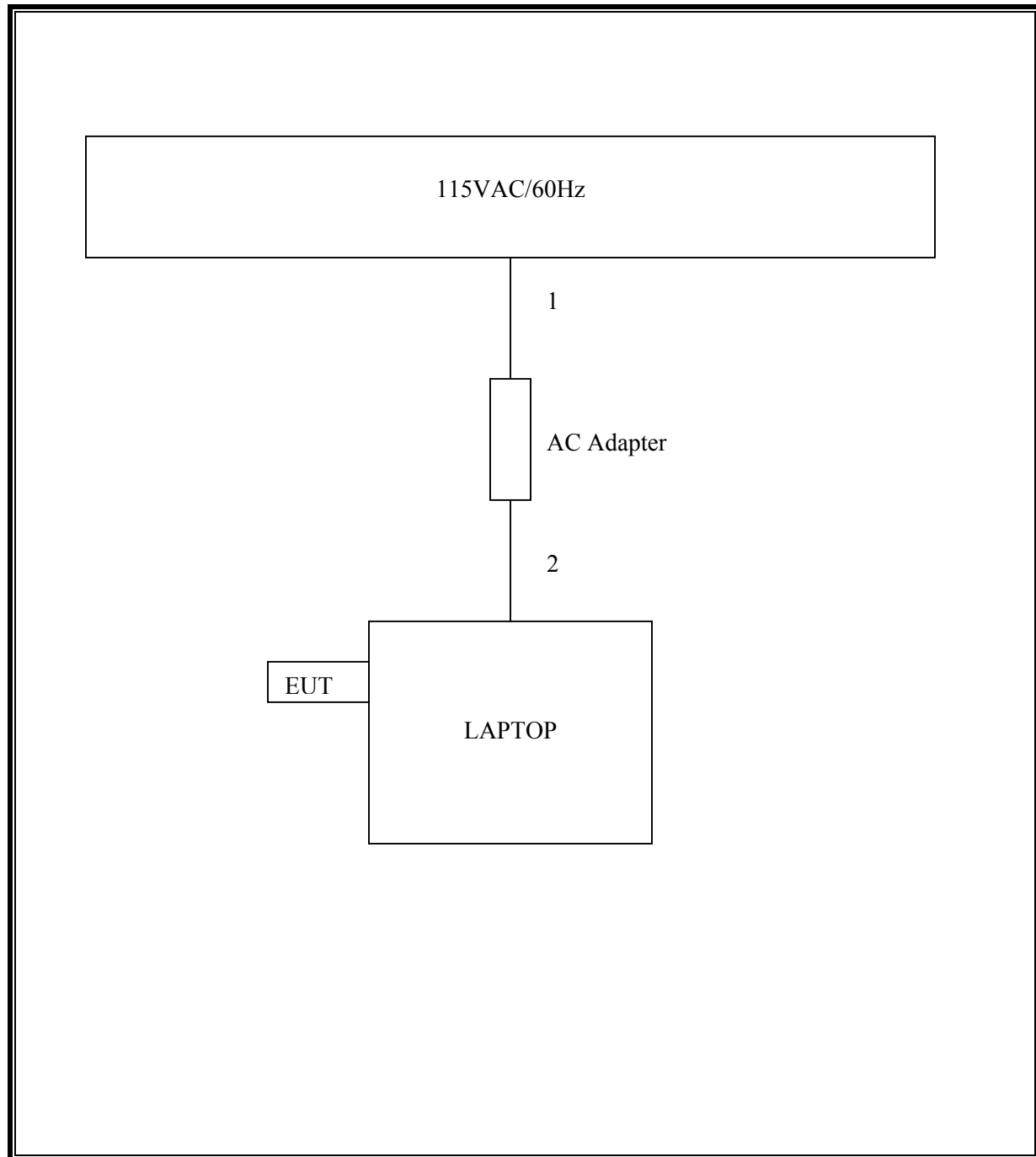
MODULAR TEST SETUP

The EUT is installed in a host laptop computer via a cardbus-to-compact flash adapter / extension board during the tests. Test software exercised the radio card.

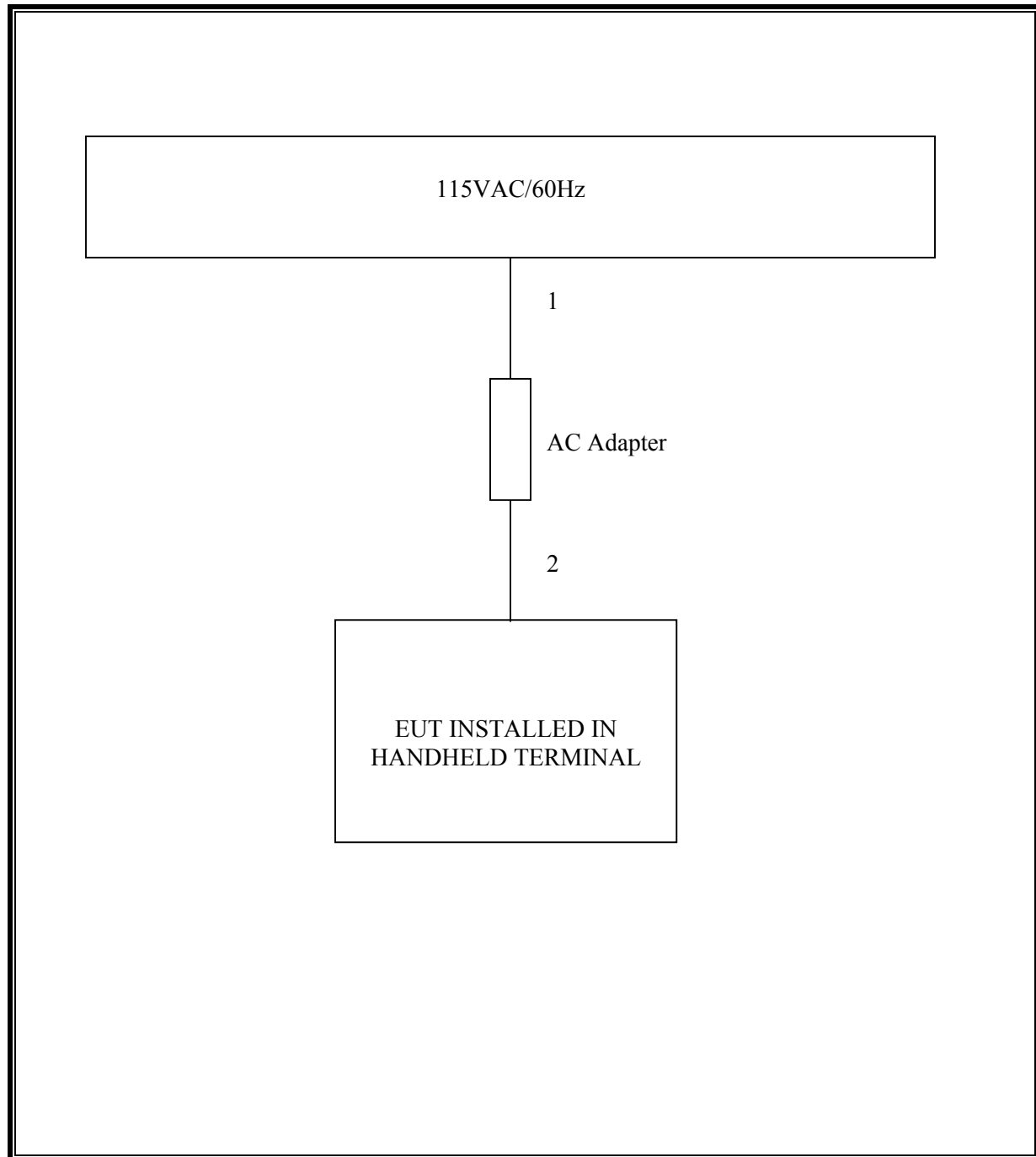
PORTABLE TEST SETUP

The EUT is installed in a handheld. Test software exercised the radio card.

SETUP DIAGRAM FOR STANDALONE TESTS



SETUP DIAGRAM FOR PORTABLE TESTS



SETUP FOR DIGITAL DEVICE TESTS

SUPPORT EQUIPMENT

PERIPHERAL SUPPORT EQUIPMENT LIST				
Description	Manufacturer	Model	Serial Number	FCC ID
Laptop	Compaq	1200-XL106	1V05DCG225WS	DOC
Laser Scanner	Worth Data	LZ100	N/A	N/A
AC Power Adapter	Group West	BUT-09-1660	N/A	N/A
Parallel Printer	HP	2225C	2511S41679	BS46XU2225C

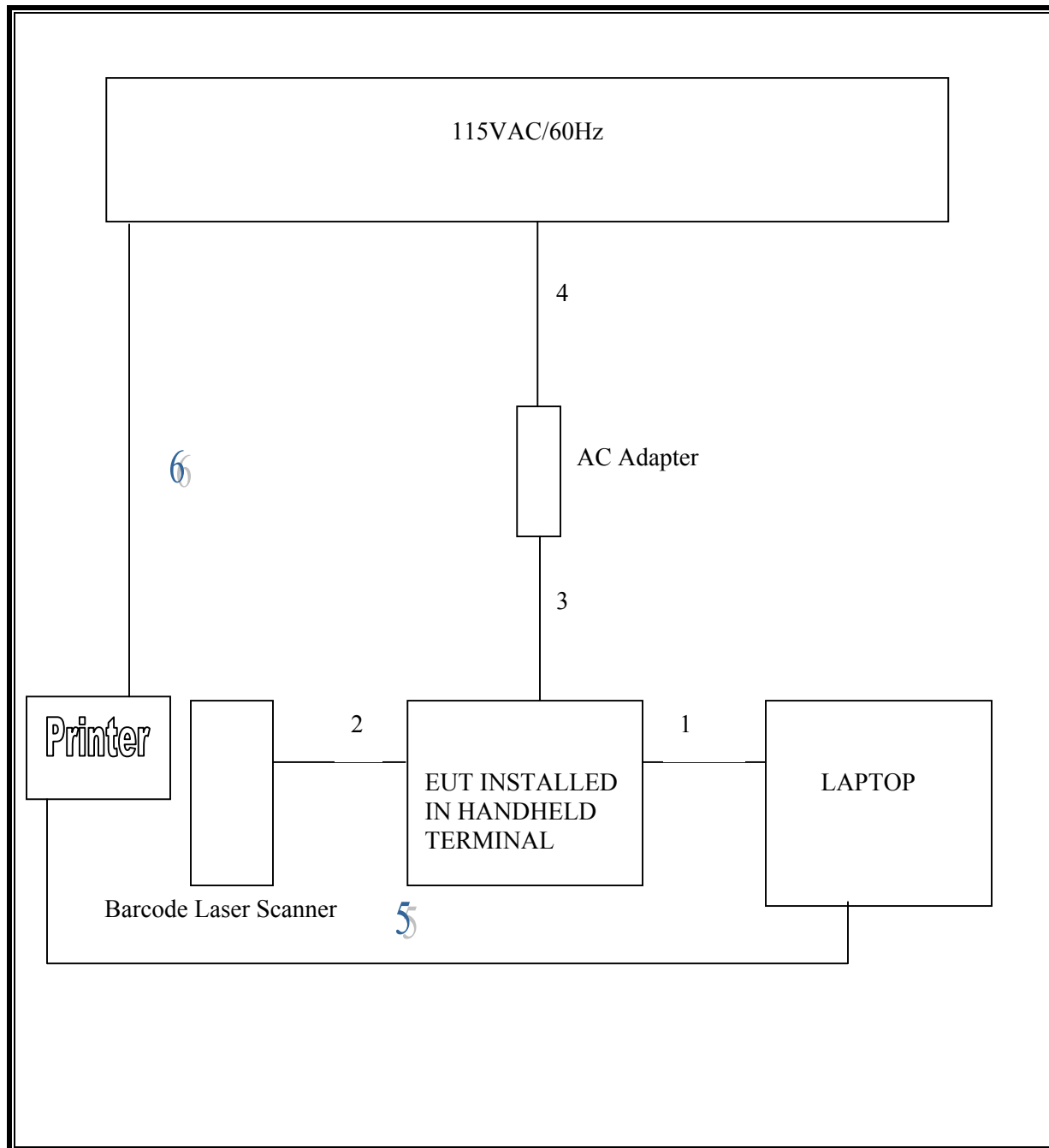
I/O CABLES

I/O CABLE LIST						
Cable No.	Port	# of Identical Ports	Connector Type	Cable Type	Cable Length	Remarks
1	RS232	1	RJ45/DB9	Shielded	1m	
2	Scanner	1	RJ45	Shielded	2m	
3	9V DC	1	5.5/2.1mm	Unshielded	1.5m	
4	AC	1	AC	Unshielded	2m	
5	Parallel	1	28 pin/Centronics	Shielded	2m	
6	AC	1	AC	Unshielded	2m	

TEST SETUP

The EUT is installed in a handheld terminal and was connected to a host laptop computer via an RS232 cable during the tests. Test software exercised the radio card.

SETUP DIAGRAM FOR DIGITAL DEVICE TESTS



6. TEST AND MEASUREMENT EQUIPMENT

The following test and measurement equipment was utilized for the tests documented in this report:

TEST EQUIPMENT LIST				
Name of Equipment	Manufacturer	Model No.	Serial No.	Due Date
Spectrum Analyzer 3 Hz ~ 44 GHz	Agilent	E4446A	US42070220	1/1/2006
Antenna, Horn 1 ~ 18 GHz	ETS	3117	29301	4/22/2006
Preamplifier 1-26.5 GHz	HP	8449B	3008A00931	6/24/2006
4.0 High Pass Filter	Micro Tronics	HPM13351	3	N/A
Power Meter	R & S	NRVS	DE 12101	10/21/2005
Power Sensor, 18 GHz, 300 mW	R&S	NRV-Z51	DE 13013	10/20/2005
EMI Receiver, 9 kHz ~ 2.9 GHz	HP	8542E	3942A00286	3/29/2006
RF Filter Section	HP	85420E	3705A00256	3/29/2006
Antenna, Bilog 30MHz ~ 2Ghz	Sunol Sciences	JB1	A121003	3/3/2006
LISN, 10 kHz ~ 30 MHz	FCC	LISN-50/250-25-2	2023	8/30/2005
LISN, 10 kHz ~ 30 MHz	Solar	8012-50-R-24-BNC	8379443	10/21/2005
Site A Line Stabilizer/Conditioner	Tripplite	LC-1800a	A005181	CNR
EMI Test Receiver	R & S	ESHS 20	827129/006	10/22/2005
Temperature / Humidity Chamber	Thermotron	SE 600-10-10	29800	6/10/2006
AC Power Source Series 400	ELGAR CORP	1751	C 01042	CNR

7. LIMITS AND RESULTS

7.1. CHANNEL TESTS

7.1.1. 6 dB BANDWIDTH

LIMIT

§15.247 (a) (2) For direct sequence systems, the minimum 6 dB bandwidth shall be at least 500 kHz.

TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer. The RBW is set to 100 kHz and the VBW is set to 300 kHz. The sweep time is coupled.

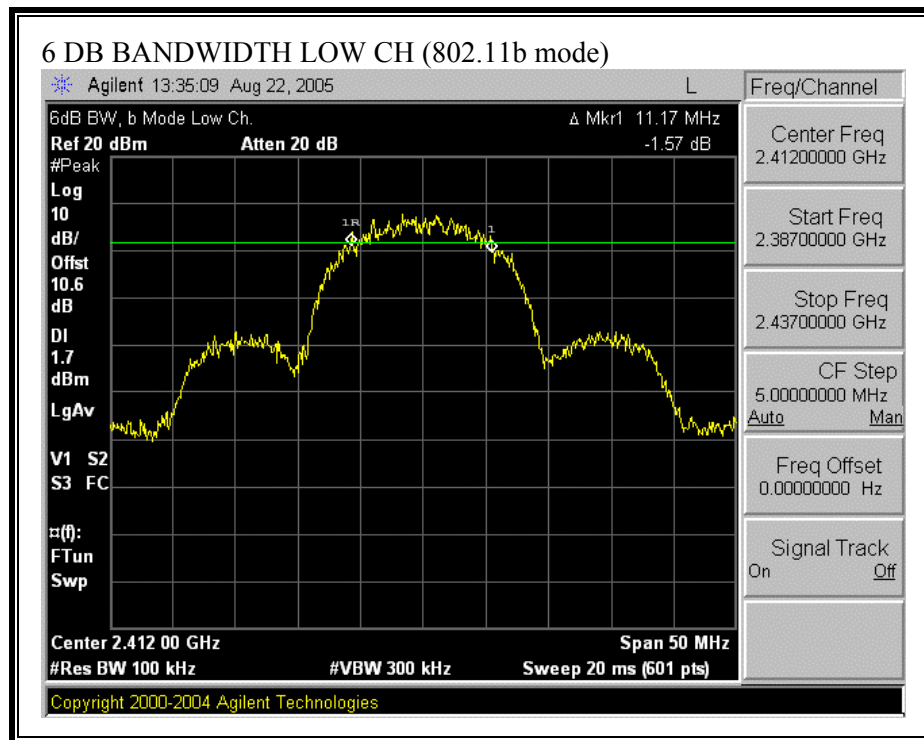
RESULTS

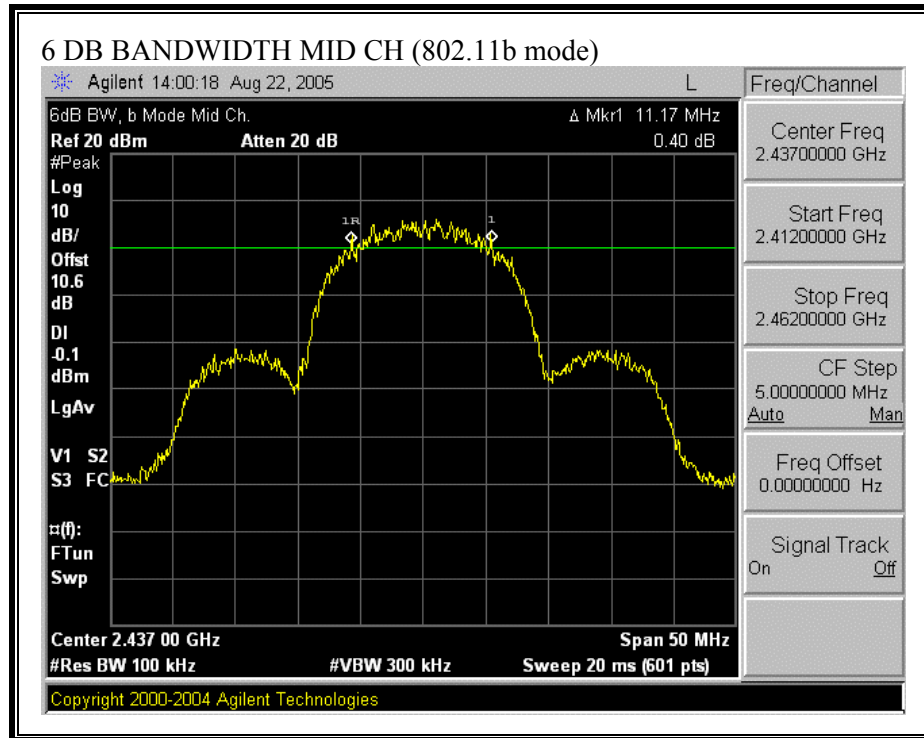
No non-compliance noted:

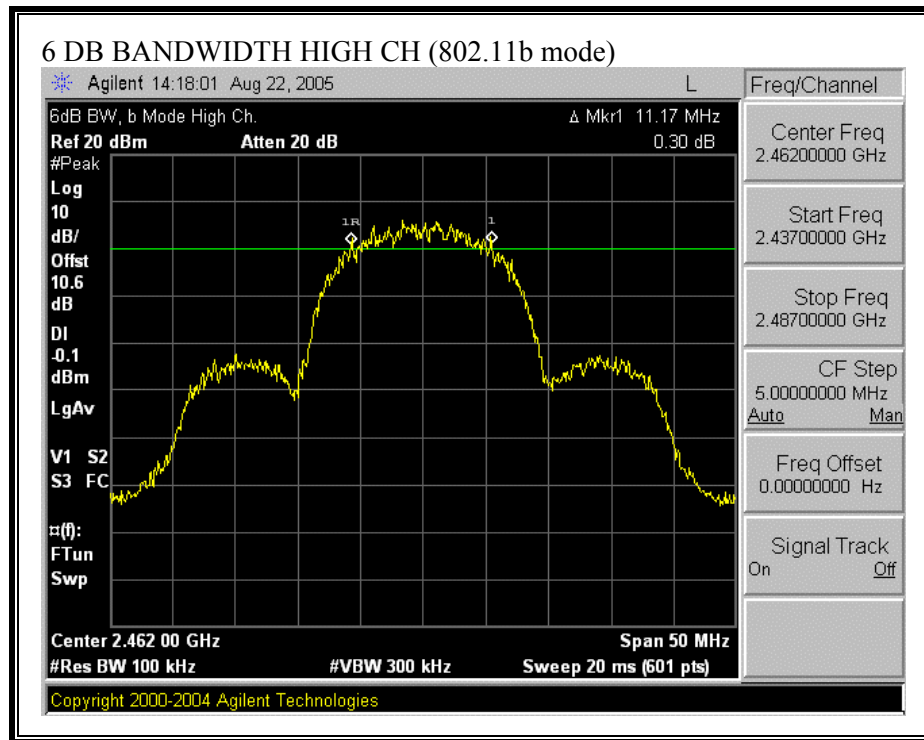
802.11b Mode

Channel	Frequency (MHz)	6 dB Bandwidth (kHz)	Minimum Limit (kHz)	Margin (kHz)
Low	2412	11170	500	10670
Middle	2437	11170	500	10670
High	2462	11170	500	10670

6 DB BANDWIDTH (802.11b MODE)







7.1.2. 99% BANDWIDTH

LIMIT

None; for reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to the spectrum analyzer. The RBW is set to 1% to 3% of the 99 % bandwidth. The VBW is set to 3 times the RBW. The sweep time is coupled. The spectrum analyzer internal 99% bandwidth function is utilized.

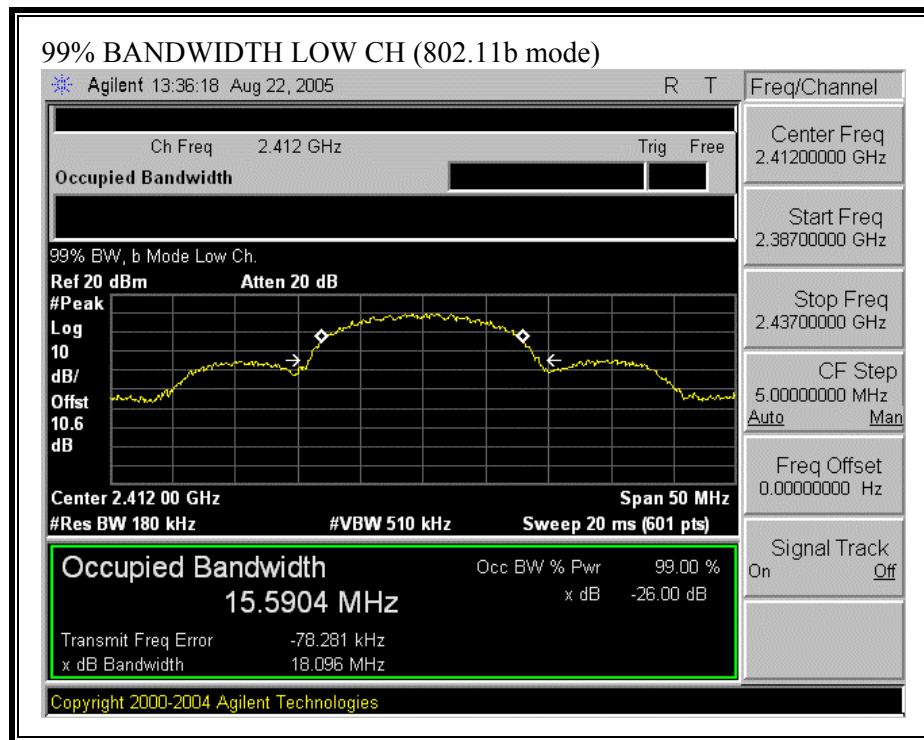
RESULTS

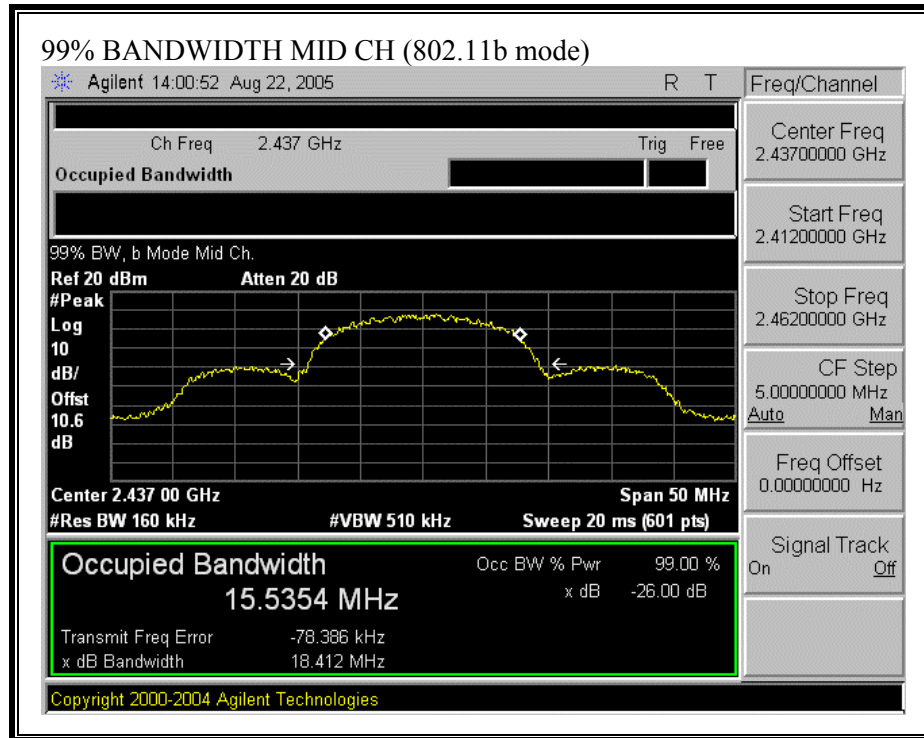
No non-compliance noted:

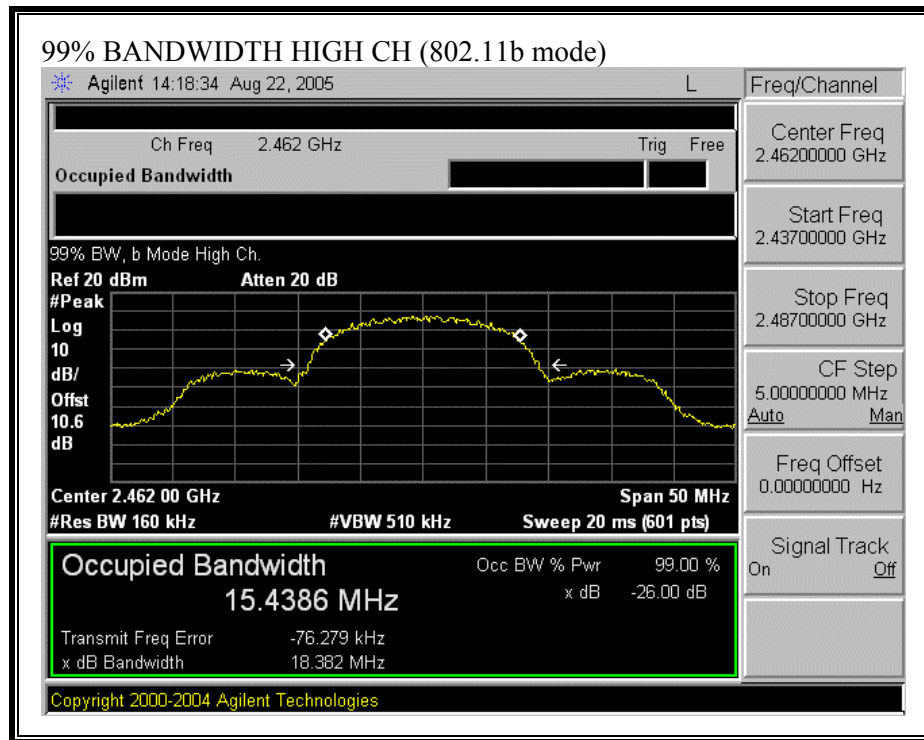
802.11b Mode

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	2412	15.5904
Middle	2437	15.5354
High	2462	15.4386

99% BANDWIDTH (802.11b MODE)







7.1.3. PEAK OUTPUT POWER

PEAK POWER LIMIT

§15.247 (b) The maximum peak output power of the intentional radiator shall not exceed the following:

§15.247 (b) (3) For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz , and 5725-5850 MHz bands: 1 watt.

§15.247 (b) (3) For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz , and 5725-5850 MHz bands: 1 watt. As an alternative to a peak power measurement, compliance with the one Watt limit can be based on a measurement of the maximum conducted output power. Maximum Conducted Output Power is defined as the total transmit power delivered to all antennas and antenna elements averaged across all symbols in the signaling alphabet when the transmitter is operating at its maximum power control level. Power must be summed across all antennas and antenna elements. The average must not include any time intervals during which the transmitter is off or is transmitting at a reduced power level. If multiple modes of operation are possible (e.g., alternative modulation methods), the maximum conducted output power is the highest total transmit power occurring in any mode.

§15.247 (b) (4) (i) Systems operating in the 2400–2483.5 MHz band that are used exclusively for fixed, point-to-point operations may employ transmitting antennas with directional gain greater than 6 dBi provided the maximum peak output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6 dBi.

TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer and the analyzer's internal channel power integration function is used to integrate the power over a bandwidth greater than or equal to the 99% bandwidth.

RESULTS

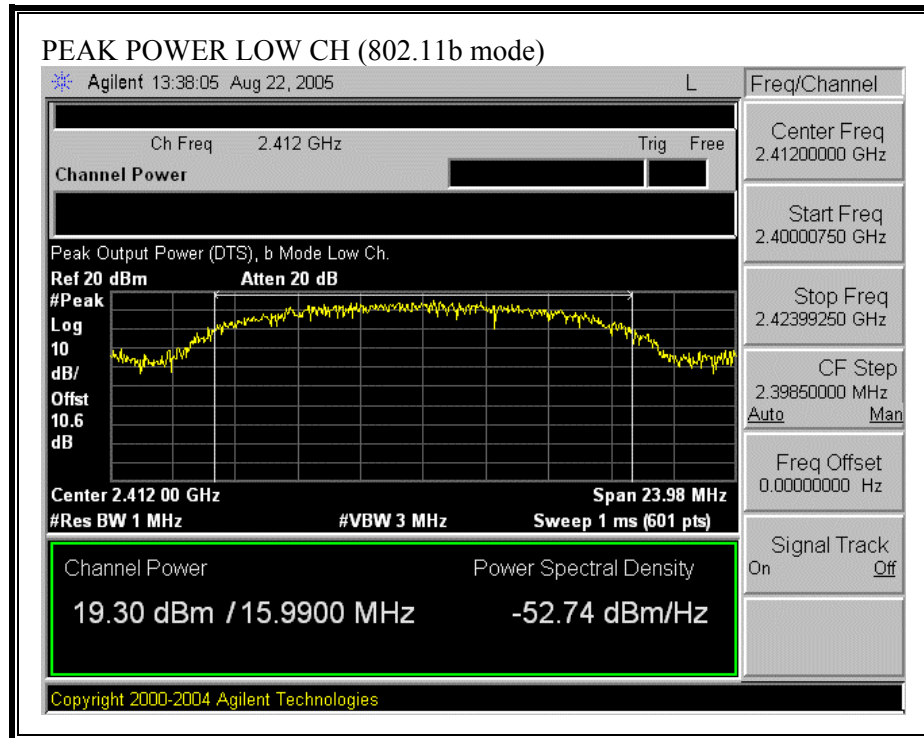
The maximum antenna gain is 0 dBi for other than fixed, point-to-point operations, therefore the limit is 30 dBm.

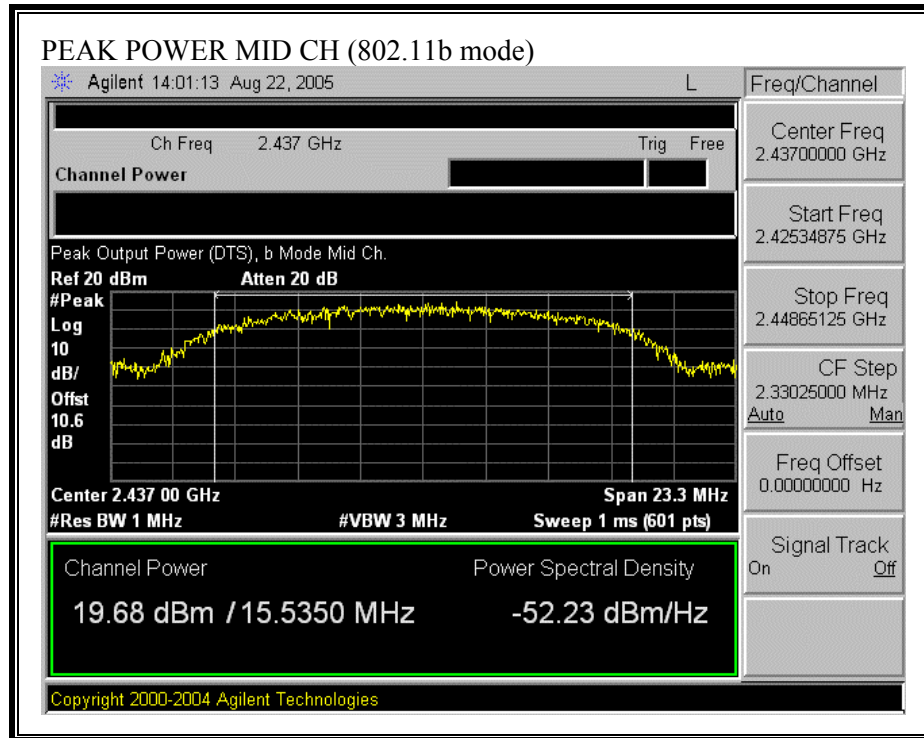
No non-compliance noted:

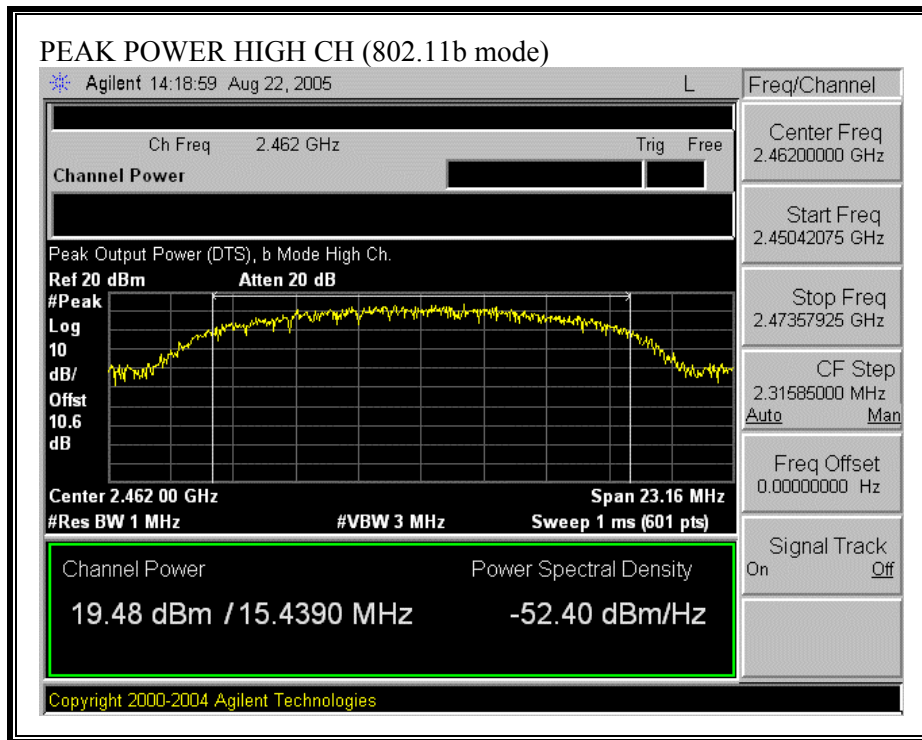
802.11b Mode

Channel	Frequency (MHz)	Peak Power (dBm)	Limit (dBm)	Margin (dB)
Low	2412	19.30	30	-10.70
Middle	2437	19.68	30	-10.32
High	2462	19.48	30	-10.52

OUTPUT POWER (802.11b MODE)







7.1.4. AVERAGE POWER

AVERAGE POWER LIMIT

None; for reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to a power meter.

RESULTS

No non-compliance noted:

The cable assembly insertion loss of 10.8 dB (including 10 dB pad and 0.8 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

802.11b Mode

Channel	Frequency (MHz)	Power (dBm)
Low	2412	15.65
Middle	2437	16.08
High	2462	15.68

7.1.5. PEAK POWER SPECTRAL DENSITY

LIMIT

§15.247 (d) For direct sequence systems, the peak power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer, the maximum level in a 3 kHz bandwidth is measured with the spectrum analyzer using RBW = 3 kHz and VBW > 3 kHz, sweep time = span / 3 kHz, and video averaging is turned off. The PPSD is the highest level found across the emission in any 3 kHz band.

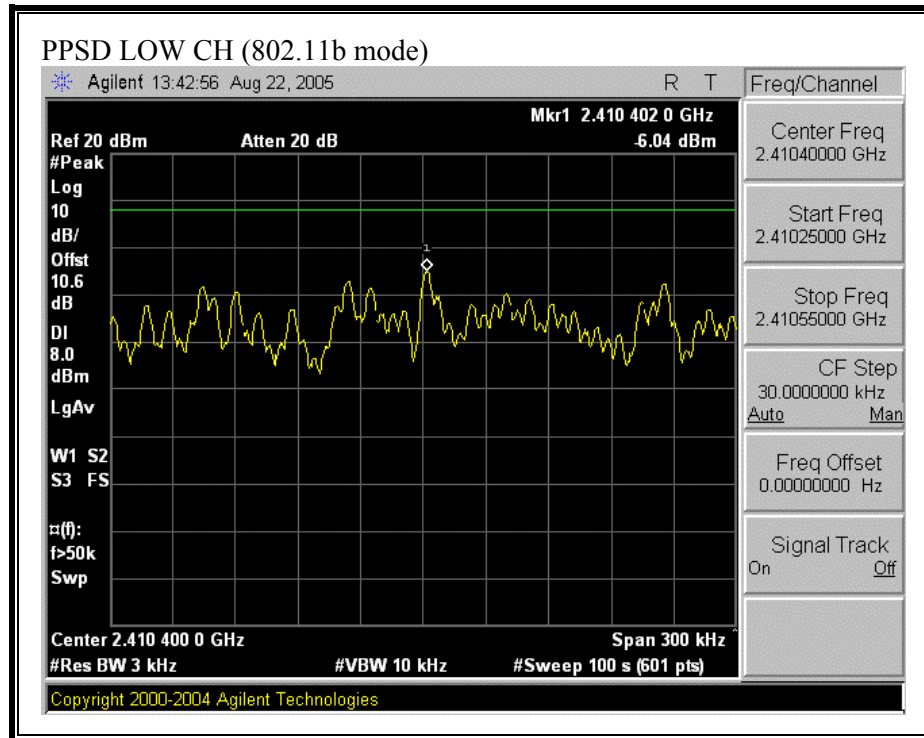
RESULTS

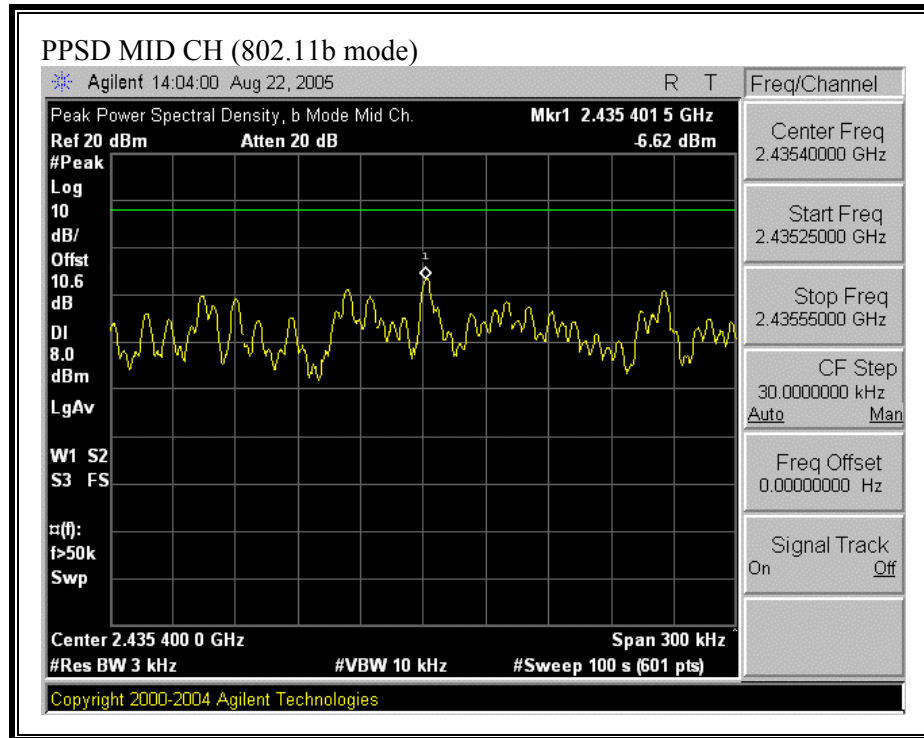
No non-compliance noted:

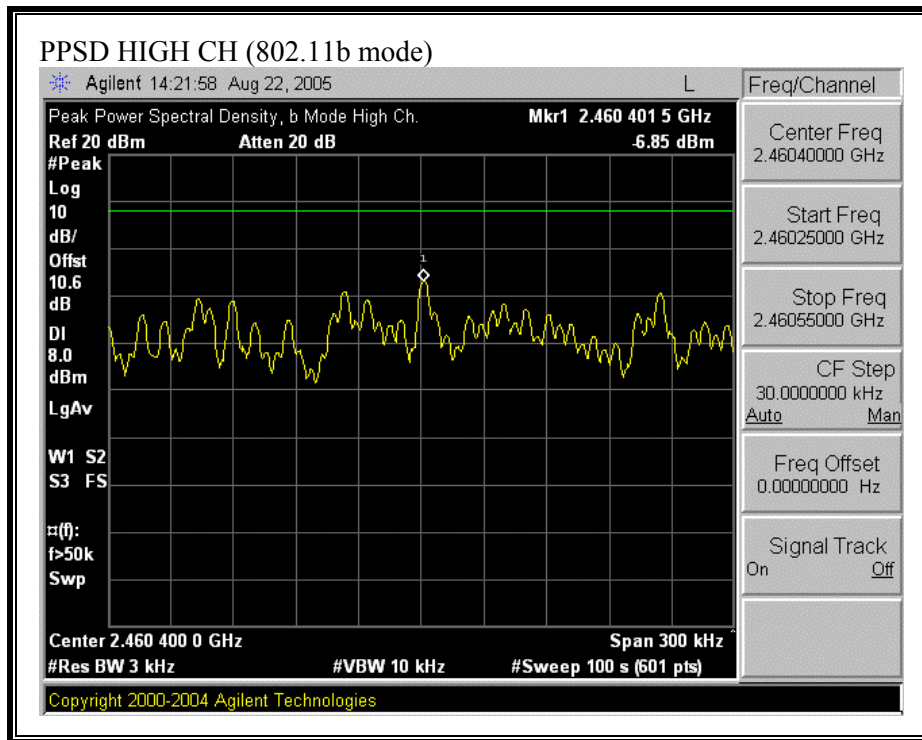
802.11b Mode

Channel	Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Margin (dB)
Low	2412	6.04	8	-1.96
Middle	2437	6.62	8	-1.38
High	2462	6.85	8	-1.15

PEAK POWER SPECTRAL DENSITY (802.11b MODE)







7.1.6. CONDUCTED SPURIOUS EMISSIONS

LIMITS

§15.247 (c) In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

TEST PROCEDURE

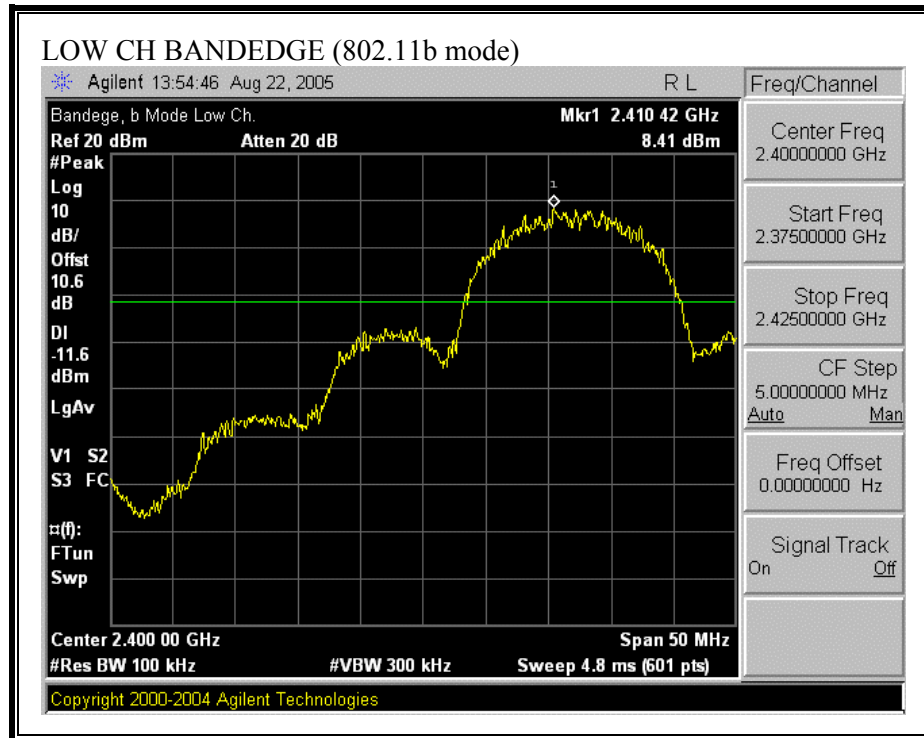
The transmitter output is connected to a spectrum analyzer. The resolution bandwidth is set to 100 kHz. The video bandwidth is set to 300 kHz.

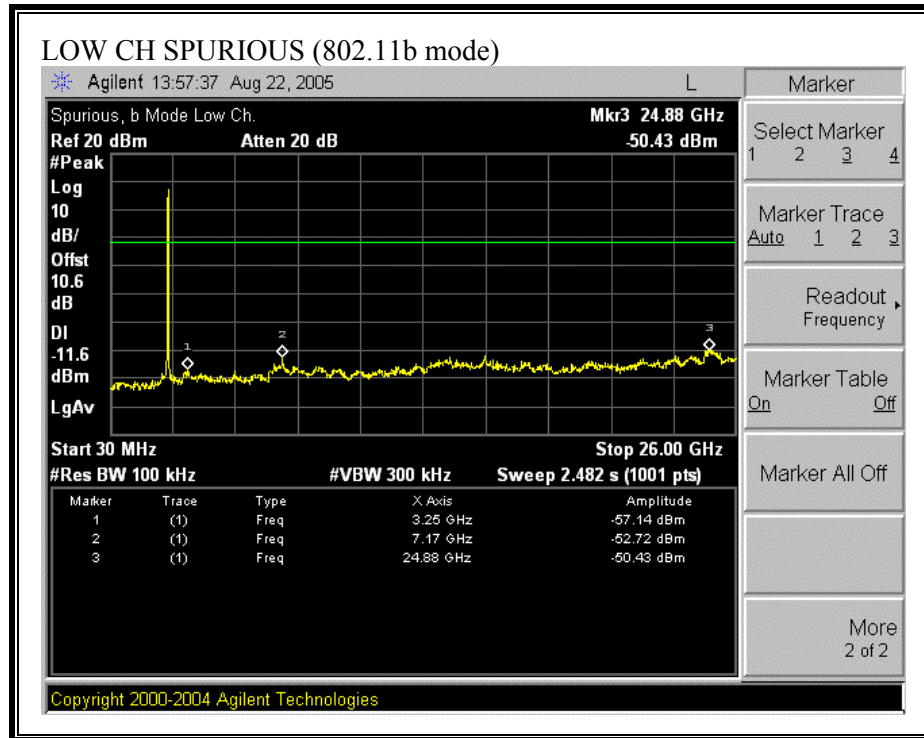
The spectrum from 30 MHz to 26 GHz is investigated with the transmitter set to the lowest, middle, and highest channels.

RESULTS

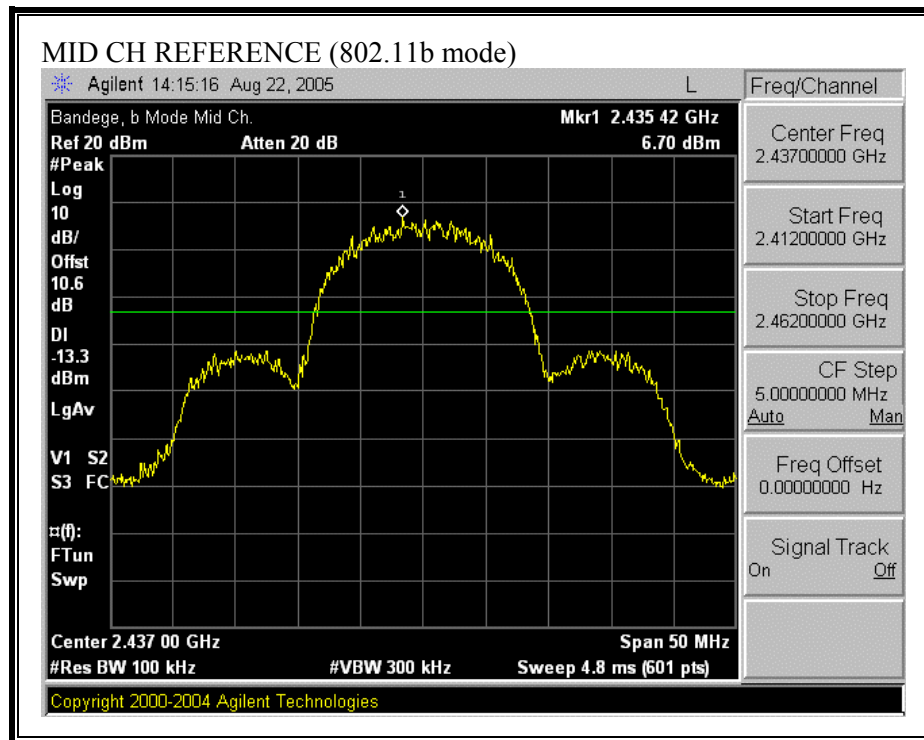
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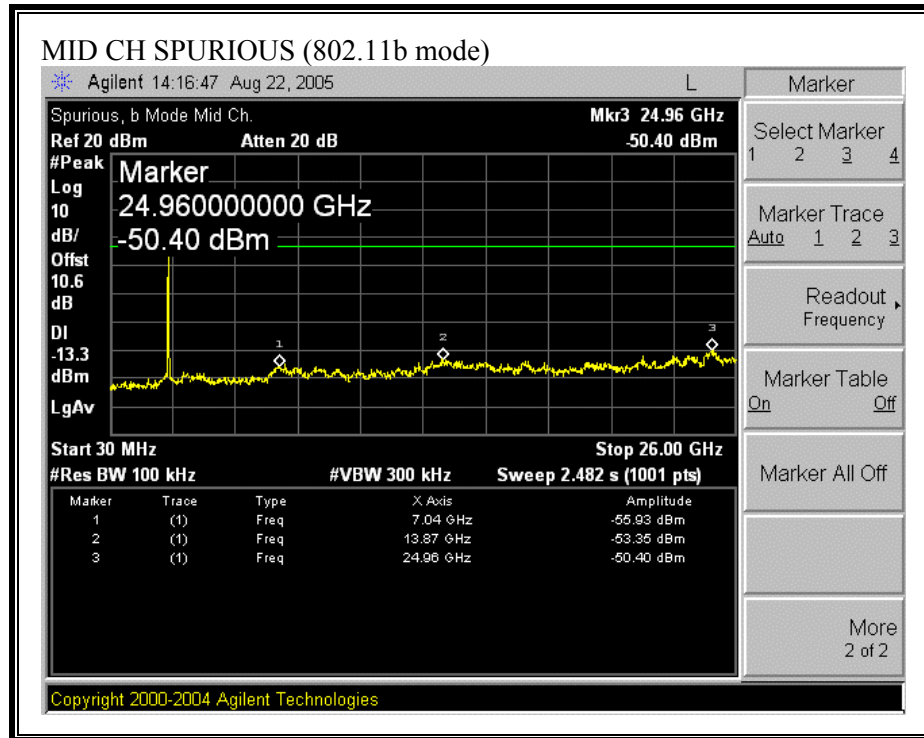
SPURIOUS EMISSIONS, LOW CHANNEL (802.11b MODE)



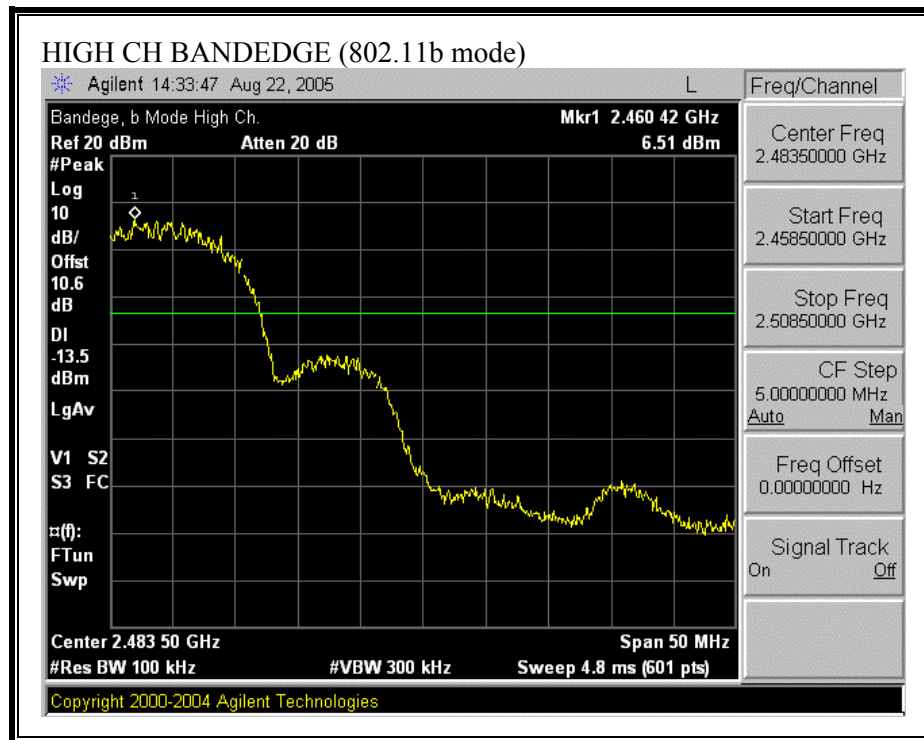


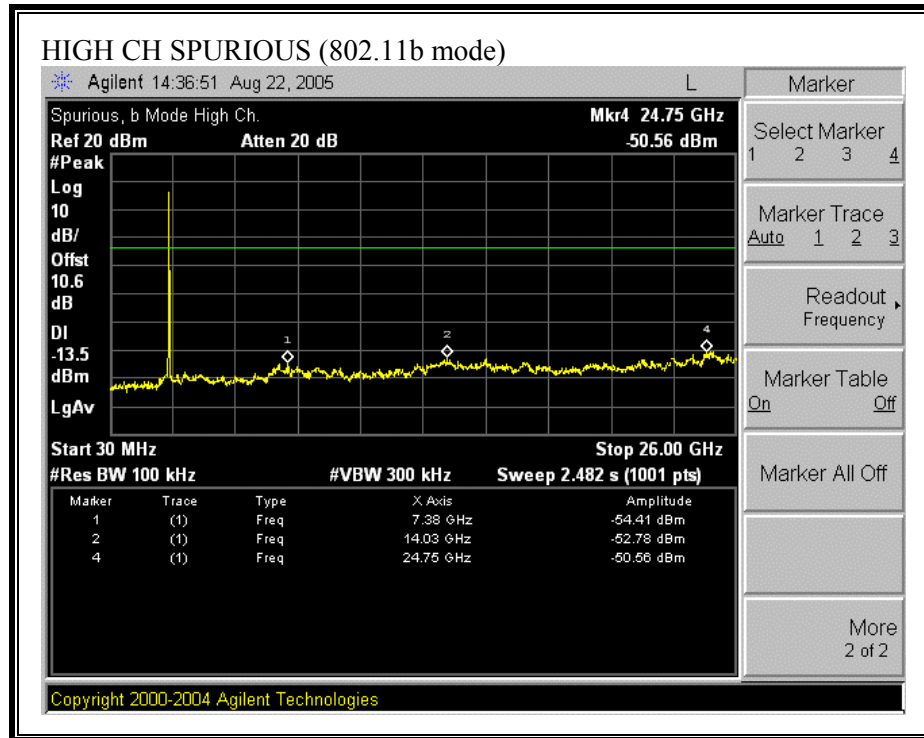
SPURIOUS EMISSIONS, MID CHANNEL (802.11b MODE)





SPURIOUS EMISSIONS, HIGH CHANNEL (802.11b MODE)





7.2. RADIATED EMISSIONS

7.2.1. TRANSMITTER RADIATED SPURIOUS EMISSIONS

LIMITS

§15.205 (a) Except as shown in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
¹ 0.495 - 0.505	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73 - 74.6	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1660 - 1710	10.6 - 12.7
6.26775 - 6.26825	108 - 121.94	1718.8 - 1722.2	13.25 - 13.4
6.31175 - 6.31225	123 - 138	2200 - 2300	14.47 - 14.5
8.291 - 8.294	149.9 - 150.05	2310 - 2390	15.35 - 16.2
8.362 - 8.366	156.52475 - 156.52525	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.7 - 156.9	2655 - 2900	22.01 - 23.12
8.41425 - 8.41475	162.0125 - 167.17	3260 - 3267	23.6 - 24.0
12.29 - 12.293	167.72 - 173.2	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	240 - 285	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	322 - 335.4	3600 - 4400	(²)
13.36 - 13.41			

¹ Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.

² Above 38.6

§15.205 (b) Except as provided in paragraphs (d) and (e), the field strength of emissions appearing within these frequency bands shall not exceed the limits shown in Section 15.209. At frequencies equal to or less than 1000 MHz, compliance with the limits in Section 15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000 MHz, compliance with the emission limits in Section 15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in Section 15.35 apply to these measurements.

§15.209 (a) Except as provided elsewhere in this Subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
30 - 88	100 **	3
88 - 216	150 **	3
216 - 960	200 **	3
Above 960	500	3

** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g., Sections 15.231 and 15.241.

§15.209 (b) In the emission table above, the tighter limit applies at the band edges.

TEST PROCEDURE

The EUT is placed on a non-conducting table 80 cm above the ground plane. The antenna to EUT distance is 3 meters. The EUT is configured in accordance with ANSI C63.4. The EUT is set to transmit in a continuous mode.

For measurements below 1 GHz the resolution bandwidth is set to 100 kHz for peak detection measurements or 120 kHz for quasi-peak detection measurements. Peak detection is used unless otherwise noted as quasi-peak.

For measurements above 1 GHz the resolution bandwidth is set to 1 MHz, then the video bandwidth is set to 1 MHz for peak measurements and 10 Hz for average measurements.

The spectrum from 30 MHz to 26 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in the 2.4 GHz band.

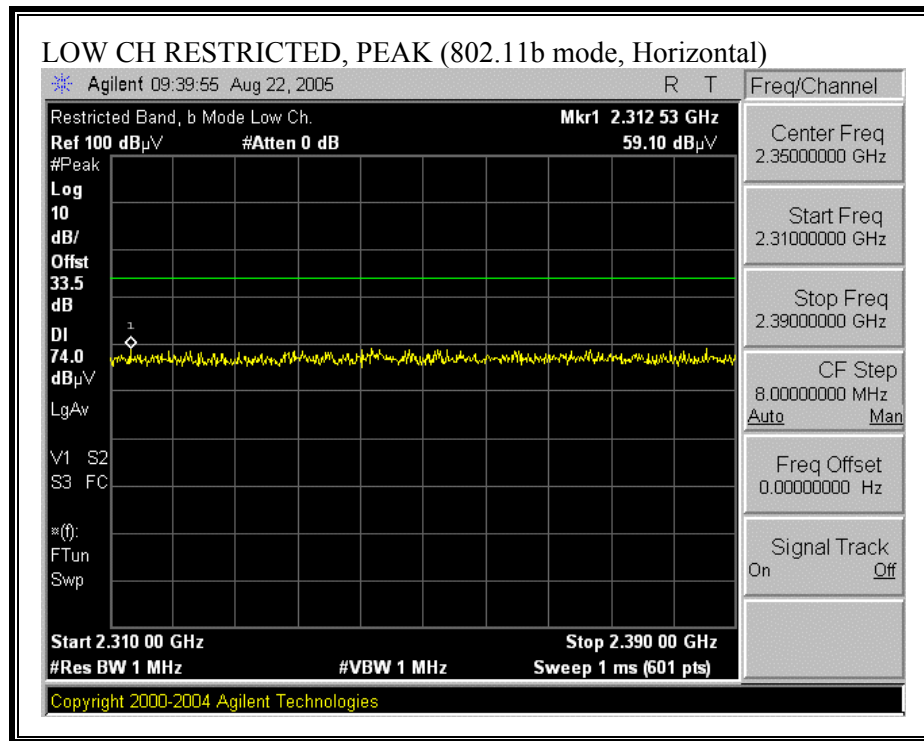
The spectrum from 30 MHz to 40 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in each 5 GHz band.

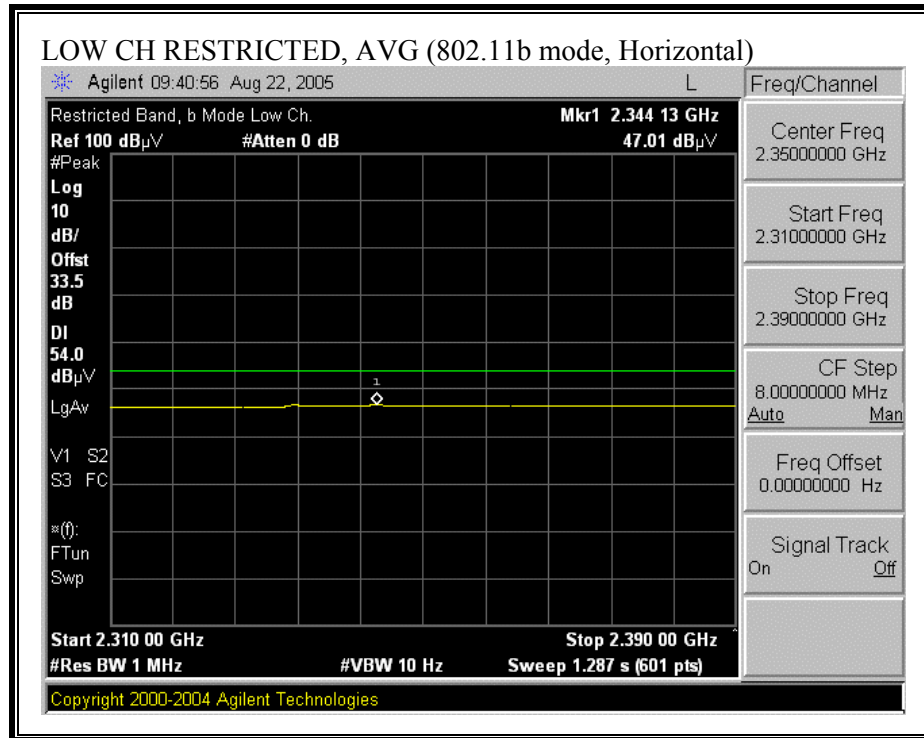
The frequency range of interest is monitored at a fixed antenna height and EUT azimuth. The EUT is rotated through 360 degrees to maximize emissions received. The antenna is scanned from 1 to 4 meters above the ground plane to further maximize the emission. Measurements are made with the antenna polarized in both the vertical and the horizontal positions.

Portable configurations are measured in X, Y, and Z-axis orientations, and the worst-case results are reported.

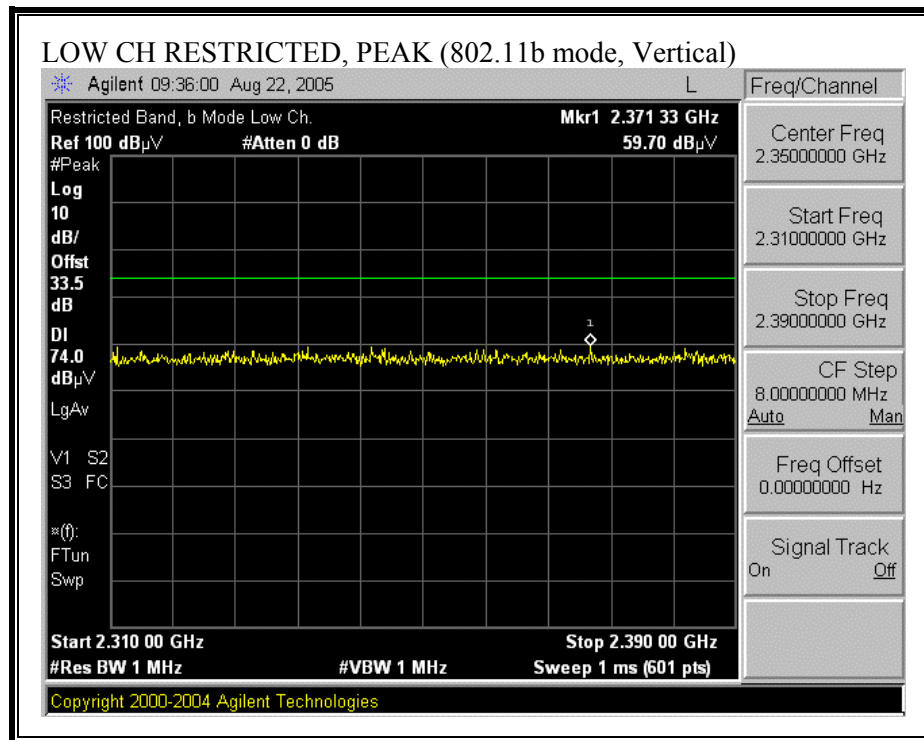
7.2.2. TRANSMITTER ABOVE 1 GHz FOR STANDALONE CONFIGURATION

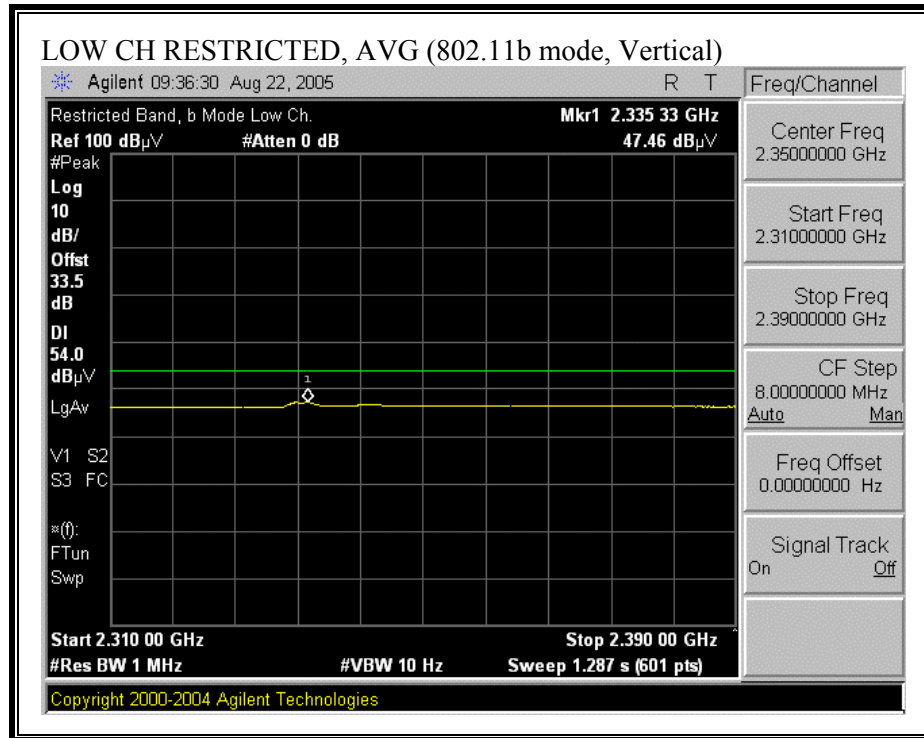
RESTRICTED BANDEDGE (b MODE, LOW CHANNEL, HORIZONTAL)



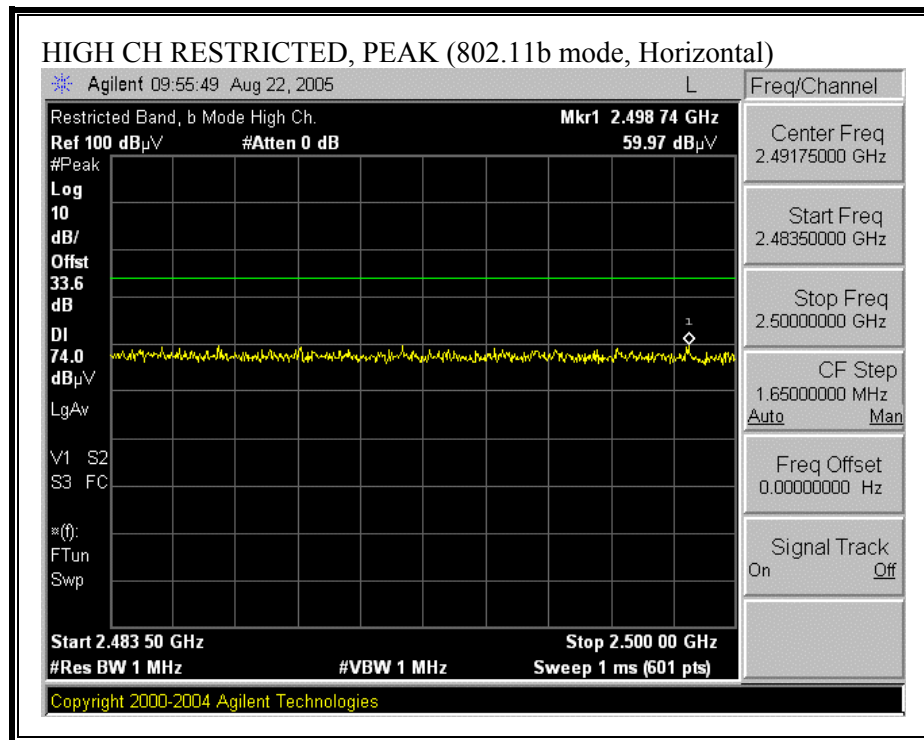


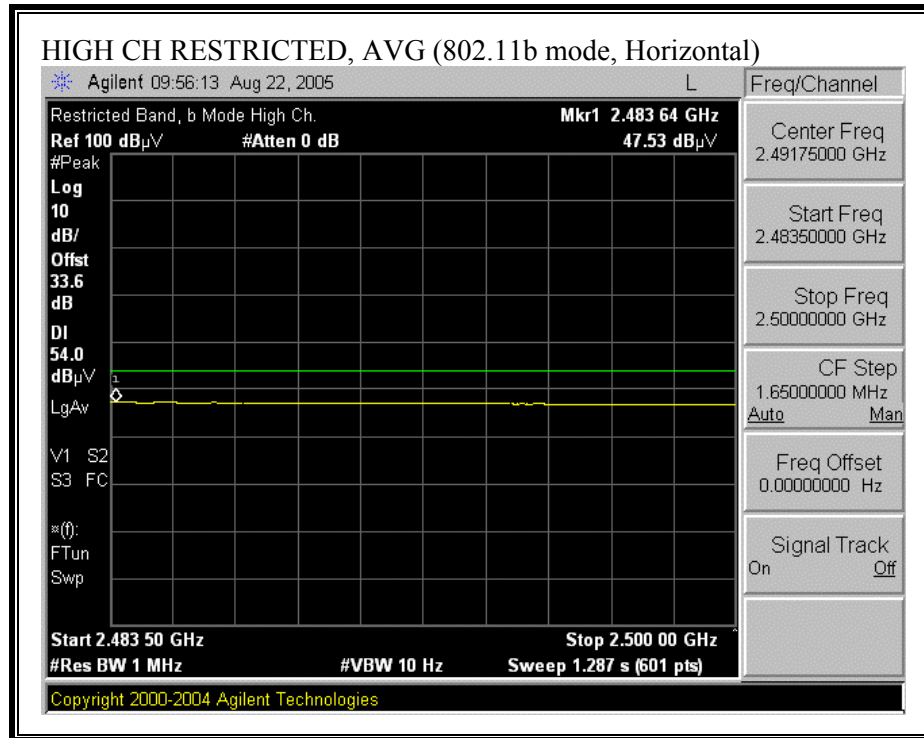
RESTRICTED BANDEDGE (b MODE, LOW CHANNEL, VERTICAL)



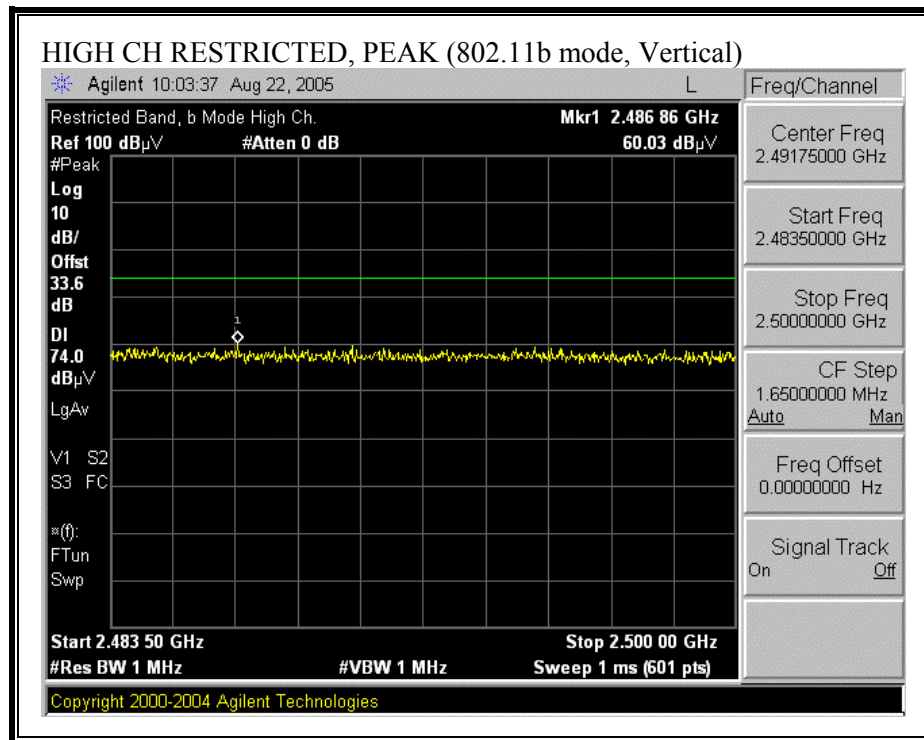


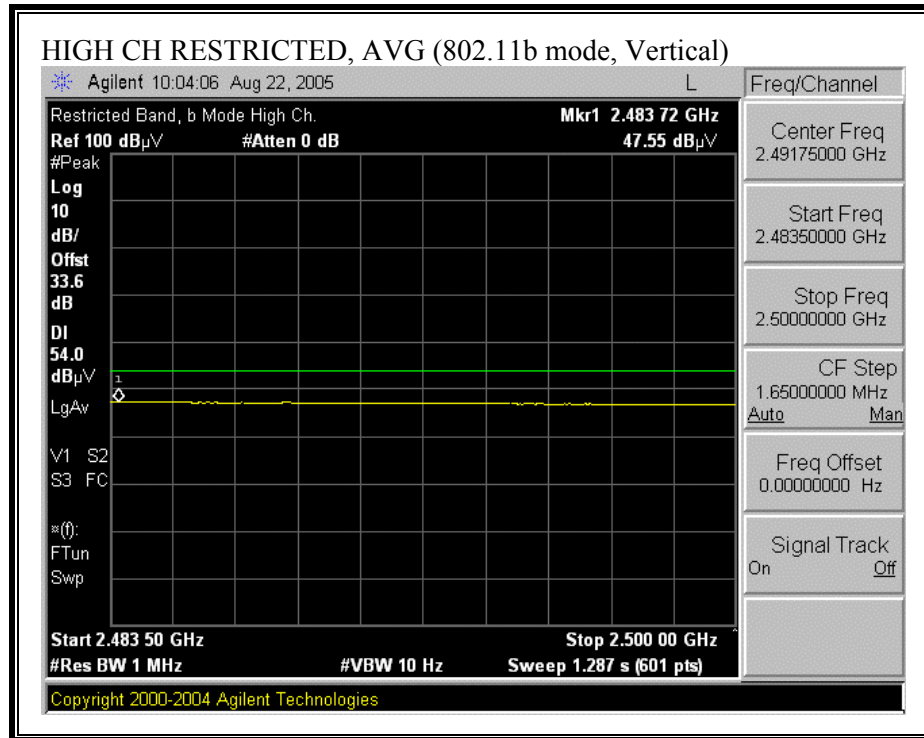
RESTRICTED BANDEDGE (b MODE, HIGH CHANNEL, HORIZONTAL)





RESTRICTED BANDEDGE (b MODE, HIGH CHANNEL, VERTICAL)





HARMONICS AND SPURIOUS EMISSIONS (b MODE)

08/22/05 High Frequency Measurement																
Compliance Certification Services, Morgan Hill Open Field Site																
Test Engr: Joseph Chung																
Project #: 05U3622-1																
Company: WORTH DATA																
EUT Descrip.: 802.11b Terminal																
EUT M/N: LT802/T802																
Test Target: FCC 15.205																
Mode Oper: TX																
f	Measurement Frequency					Amp	Preamp Gain					Avg Lim Average Field Strength Limit				
Dist	Distance to Antenna					D Corr	Distance Correct to 3 meters					Pk Lim Peak Field Strength Limit				
Read	Analyzer Reading					Avg	Average Field Strength @ 3 m					Avg Mar Margin vs. Average Limit				
AF	Antenna Factor					Peak	Calculated Peak Field Strength					Pk Mar Margin vs. Peak Limit				
CL	Cable Loss					HPF	High Pass Filter									
f	Dist	Read Pk	Read Avg	AF	CL	Amp	D Corr	Fitr	Peak	Avg	Pk Lim	Avg Lim	Pk Mar	Avg Mar	Notes	
GHz	(m)	dBuV	dBuV	dB/m	dB	dB	dB	dB	dBuV/m	dBuV/m	dBuV/m	dBuV/m	dB	dB	(V/H)	
LOW CHANNEL																
4.824	3.0	48.8	45.8	34.0	3.7	-33.6	0.0	0.6	53.6	50.6	74.0	54.0	-20.4	-3.4	H	
12.060	3.0	42.7	30.9	38.4	6.5	-33.5	0.0	0.9	55.1	43.3	74.0	54.0	-18.9	-10.7	H	
14.472	3.0	41.8	29.9	39.4	6.4	-32.8	0.0	0.9	55.8	43.9	74.0	54.0	-18.2	-10.1	H	
4.824	3.0	47.1	42.5	34.0	3.7	-33.6	0.0	0.6	51.9	47.3	74.0	54.0	-22.1	-6.7	V	
12.060	3.0	42.5	30.9	38.4	6.5	-33.5	0.0	0.9	54.9	43.3	74.0	54.0	-19.1	-10.7	V	
MID CHANNEL																
4.874	3.0	50.7	47.7	34.1	3.8	-33.5	0.0	0.6	55.6	52.6	74.0	54.0	-18.4	-1.4	H	
7.311	3.0	42.6	30.3	35.6	4.3	-33.3	0.0	0.6	49.9	37.6	74.0	54.0	-24.1	-16.4	H	
12.185	3.0	42.5	30.9	38.5	6.5	-33.4	0.0	0.9	55.0	43.4	74.0	54.0	-19.0	-10.6	H	
4.874	3.0	45.6	39.0	34.1	3.8	-33.5	0.0	0.6	50.5	43.9	74.0	54.0	-23.5	-10.1	V	
7.311	3.0	42.6	30.2	35.6	4.3	-33.3	0.0	0.6	49.9	37.5	74.0	54.0	-24.1	-16.5	V	
12.185	3.0	42.3	30.9	38.5	6.5	-33.4	0.0	0.9	54.8	43.4	74.0	54.0	-19.2	-10.6	V	
HIGH CHANNEL																
4.924	3.0	51.0	48.6	34.1	3.8	-33.5	0.0	0.6	55.9	53.6	74.0	54.0	-18.1	-0.4	H	
7.386	3.0	42.5	30.2	35.7	4.3	-33.3	0.0	0.6	49.9	37.5	74.0	54.0	-24.1	-16.5	H	
12.310	3.0	42.6	30.4	38.5	6.5	-33.4	0.0	0.9	55.2	43.0	74.0	54.0	-18.8	-11.0	H	
4.924	3.0	50.1	47.6	34.1	3.8	-33.5	0.0	0.6	55.1	52.5	74.0	54.0	-18.9	-1.5	V	
7.386	3.0	41.9	30.2	35.7	4.3	-33.3	0.0	0.6	49.3	37.5	74.0	54.0	-24.7	-16.5	V	
12.310	3.0	42.3	30.8	38.5	6.5	-33.4	0.0	0.9	54.9	43.3	74.0	54.0	-19.1	-10.7	V	
Note: No other emissions above noise floor.																

7.2.3. WORST-CASE RADIATED EMISSIONS BELOW 1 GHz FOR STANDALONE CONFIGURATION

HORIZONTAL DATA

Page: 1

	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark	Cable Loss	Probe Factor
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB		dB	dB
1	94.990	24.70	10.12	34.82	43.50	-8.68	Peak	0.79	9.33
2	153.190	19.11	14.03	33.14	43.50	-10.36	Peak	1.02	13.01
3	198.780	21.72	14.37	36.09	43.50	-7.41	Peak	1.18	13.19
4	245.340	29.56	13.72	43.28	46.00	-2.72	Peak	1.37	12.35
5	266.680	28.61	14.45	43.06	46.00	-2.94	Peak	1.39	13.07
6	315.180	23.80	16.08	39.88	46.00	-6.12	Peak	1.58	14.50

SPURIOUS EMISSIONS 30 TO 1000 MHz (WORST-CASE CONFIGURATION, VERTICAL)

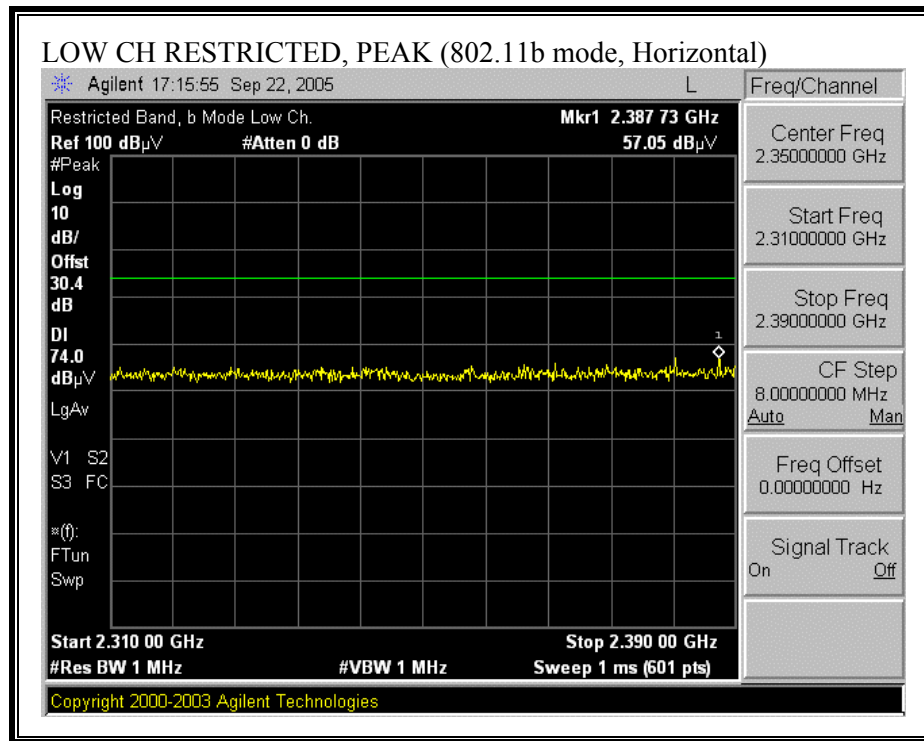
VERTICAL DATA

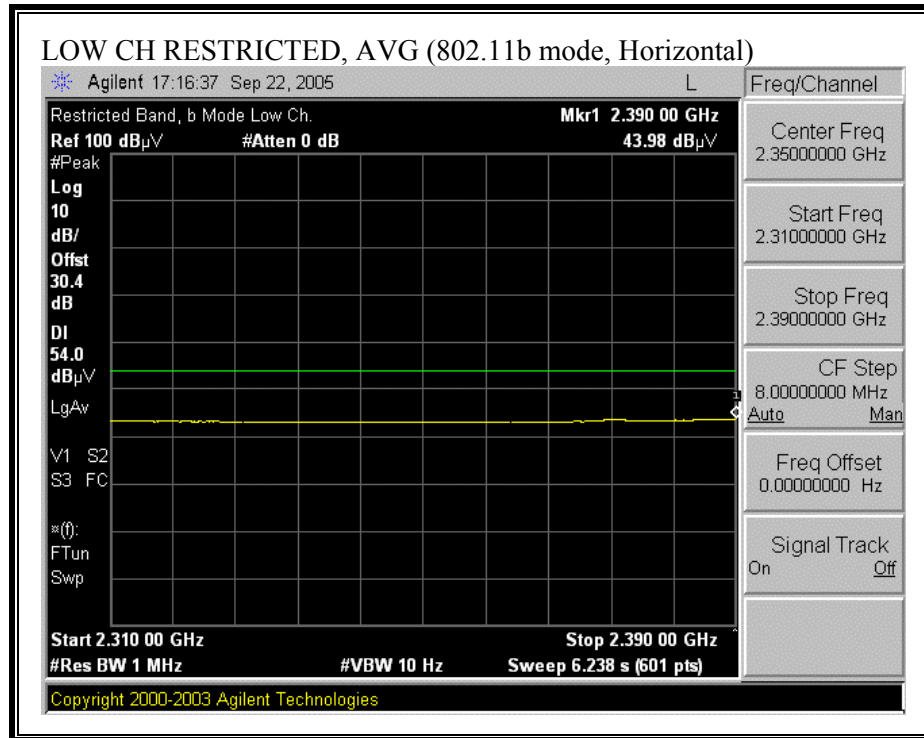
Page: 1

	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark	Cable Loss	Probe Factor
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB		dB	dB
1	94.990	33.60	9.85	43.45	43.50	-0.05	QP	0.78	9.07
2 *	94.990	36.71	10.12	46.83	43.50	3.33	Peak	0.79	9.33
3	106.630	30.41	12.87	43.28	43.50	-0.22	QP	0.84	12.03
4 *	106.630	31.94	12.87	44.81	43.50	1.31	Peak	0.84	12.03
5	162.890	22.09	13.68	35.77	43.50	-7.73	Peak	1.05	12.63
6	193.930	23.68	13.56	37.24	43.50	-6.26	Peak	1.16	12.40
7	269.590	21.86	14.61	36.47	46.00	-9.53	Peak	1.42	13.19

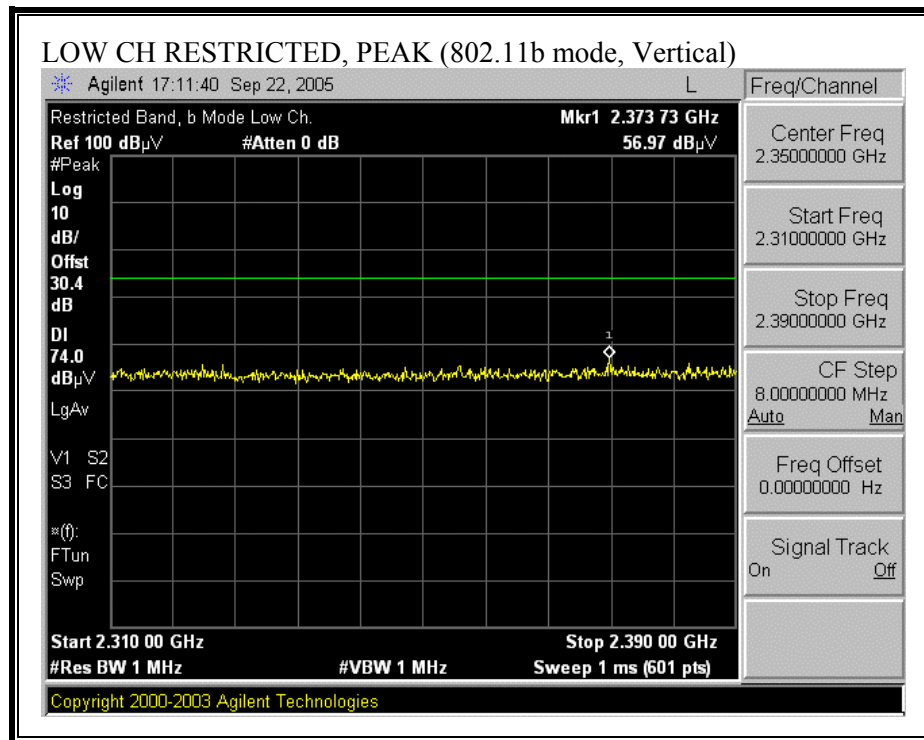
7.2.4. TRANSMITTER ABOVE 1 GHz FOR PORTABLE CONFIGURATION

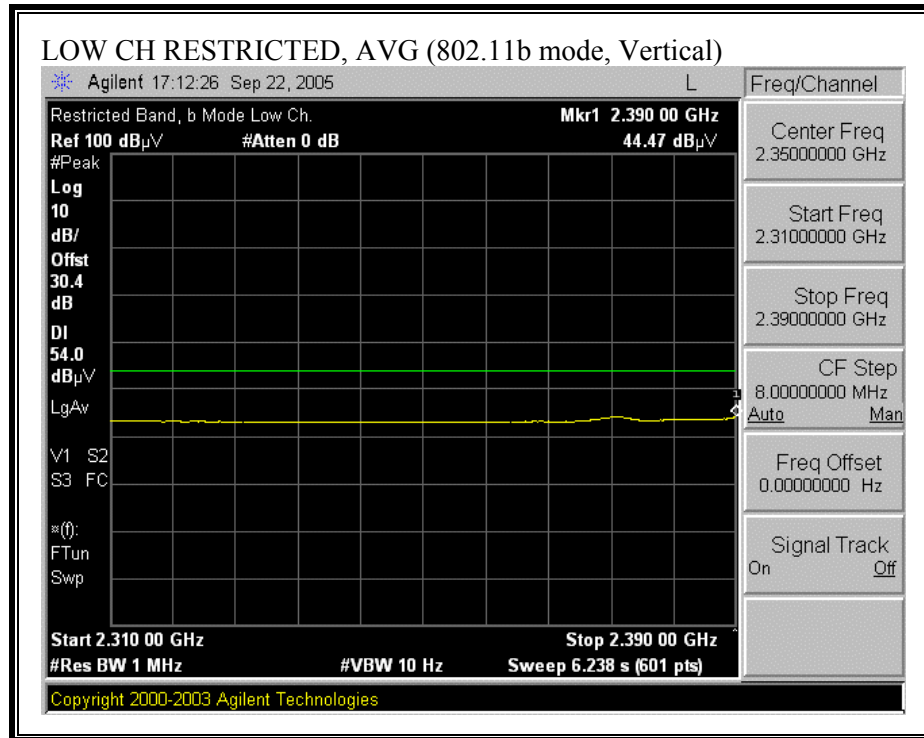
RESTRICTED BANDEDGE (b MODE, LOW CHANNEL, HORIZONTAL)



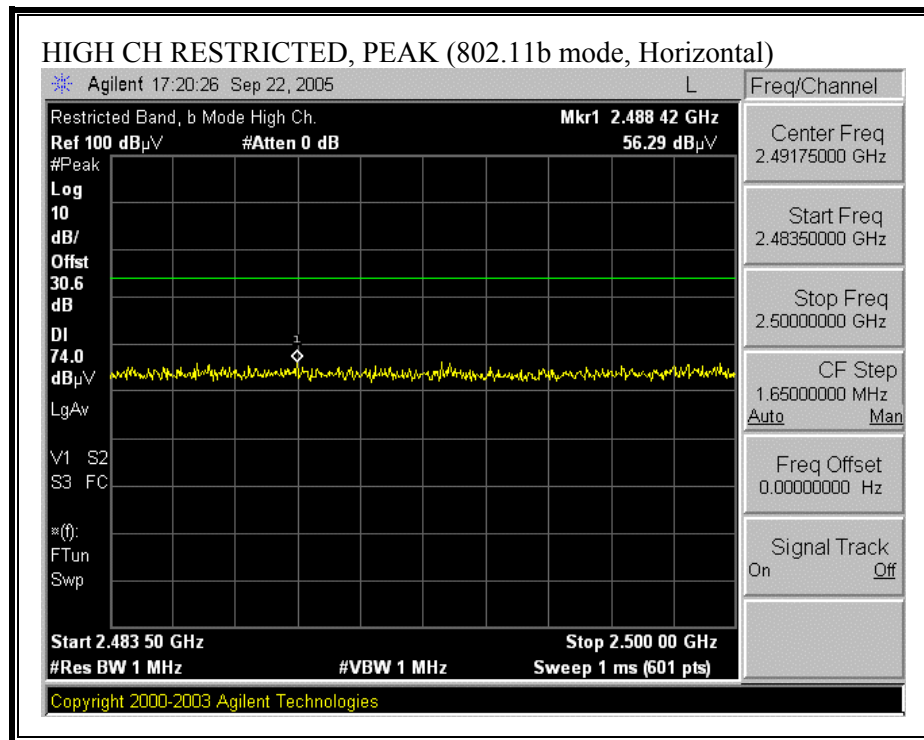


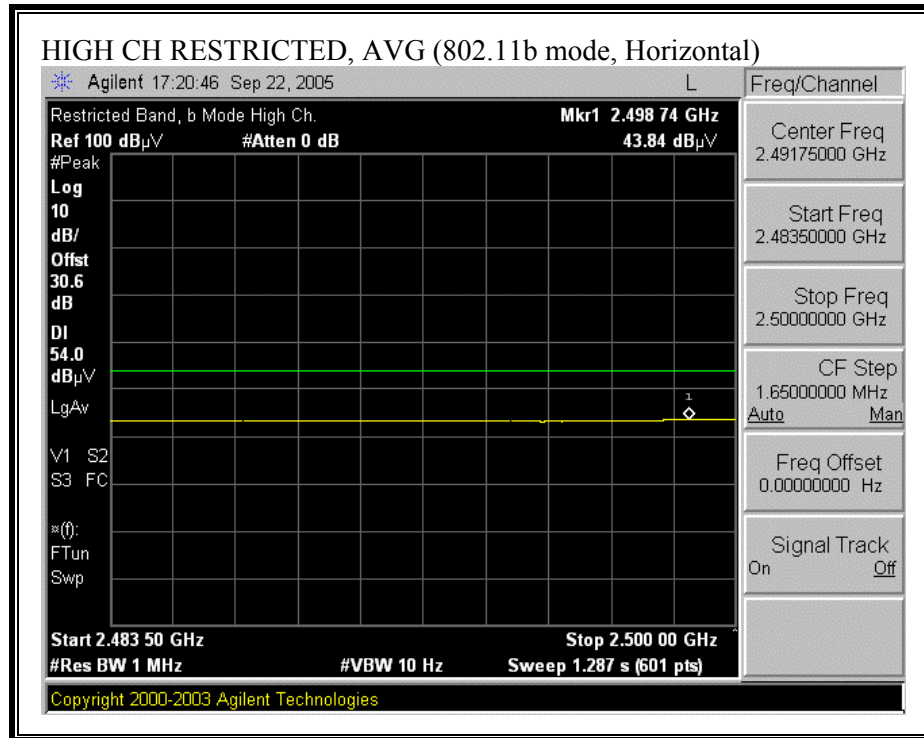
RESTRICTED BANDEDGE (b MODE, LOW CHANNEL, VERTICAL)



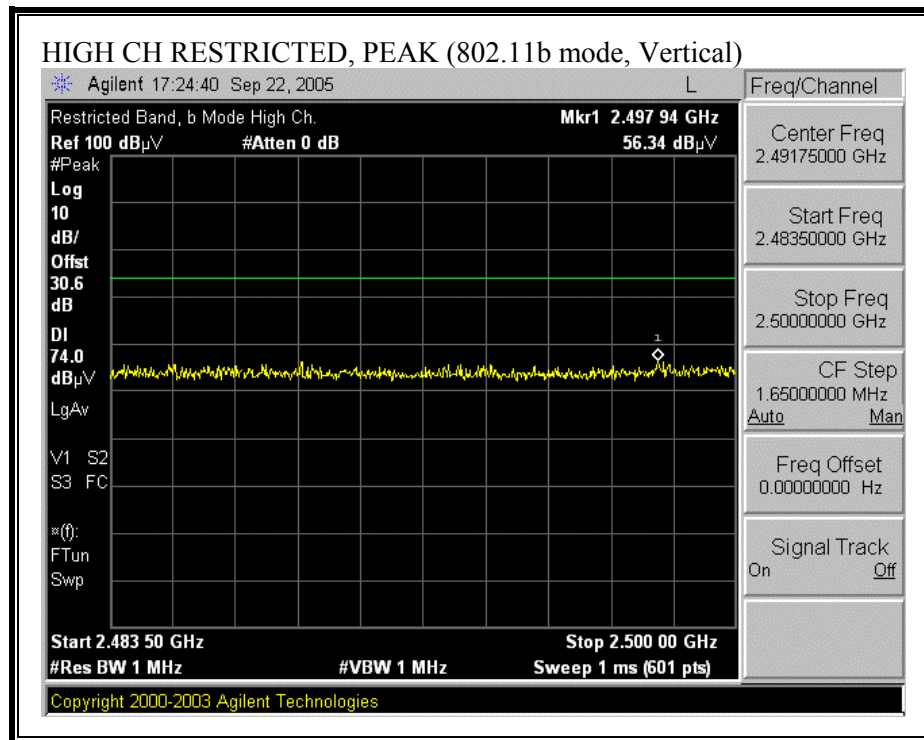


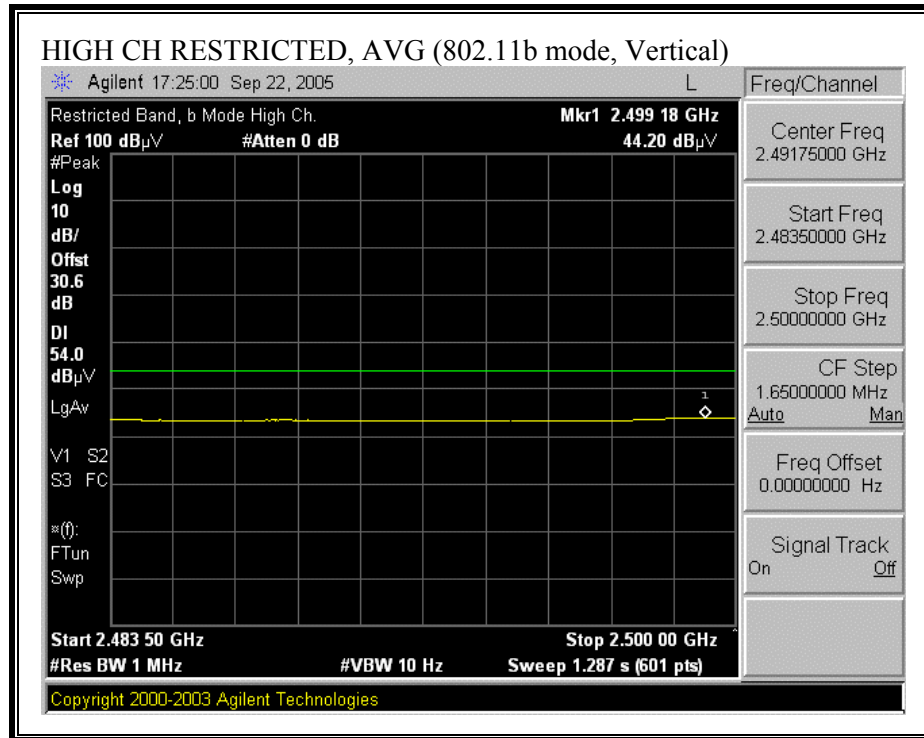
RESTRICTED BANDEDGE (b MODE, HIGH CHANNEL, HORIZONTAL)





RESTRICTED BANDEDGE (b MODE, HIGH CHANNEL, VERTICAL)





HARMONICS AND SPURIOUS EMISSIONS (b MODE)

09/28/05 High Frequency Measurement															
Compliance Certification Services, Morgan Hill Open Field Site															
Test Engr: Joseph Chung															
Project #: 05U3622-1															
Company: Worth Data															
EUT Descr.: Handheld 802.11b terminal with barcode scanner															
EUT M/N: LT802/T802															
Test Target: 15.209															
Mode Oper: TX															
Test Equipment:															
Horn 1-18GHz		Pre-amplifer 1-26GHz		Pre-amplifer 26-40GHz		Horn > 18GHz		Limit							
T60; S/N: 2238 @3m		T87 Miteq 924342						FCC 15.209							
Hi Frequency Cables															
2 foot cable		3 foot cable		12 foot cable		HPF		Reject Filter		Peak Measurements RBW=VBW=1MHz Average Measurements RBW=1MHz, VBW=10Hz					
William 177079009		Ninoux 202575001		William 187209004		HPF_4.0GHz									
f GHz	Dist (m)	Read Pk dBuV	Read Avg dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Filt dB	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes (V/H)
Low Ch															
4.824	3.0	56.6	52.2	33.6	4.6	-45.3	0.0	0.6	50.1	45.7	74	54	-23.9	-8.3	V
7.236	3.0	52.2	39.9	36.1	5.6	-43.3	0.0	0.6	51.2	38.8	74	54	-22.8	-15.2	V
9.648	3.0	47.2	37.4	38.1	6.6	-39.9	0.0	0.8	52.8	43.0	74	54	-21.2	-11.0	V
12.060	3.0	47.5	36.3	38.4	7.1	-40.0	0.0	0.9	53.8	42.6	74	54	-20.2	-11.4	V
4.824	3.0	53.7	48.2	33.6	4.6	-45.3	0.0	0.6	47.2	41.7	74	54	-26.8	-12.3	H
7.236	3.0	51.6	36.2	36.1	5.6	-43.3	0.0	0.6	50.5	35.1	74	54	-23.5	-18.9	H
9.648	3.0	46.5	35.3	38.1	6.6	-39.9	0.0	0.8	52.1	40.9	74	54	-21.9	-13.1	H
12.060	3.0	46.2	36.1	38.4	7.1	-40.0	0.0	0.9	52.5	42.4	74	54	-21.5	-11.6	H
Mid Ch															
4.874	3.0	53.9	47.8	33.7	4.6	-45.3	0.0	0.6	47.4	41.4	74	54	-26.6	-12.6	V
7.311	3.0	50.7	39.0	36.2	5.6	-43.2	0.0	0.6	49.8	38.2	74	54	-24.2	-15.8	V
9.748	3.0	47.6	35.6	38.1	6.6	-39.6	0.0	0.8	53.6	41.6	74	54	-20.4	-12.4	V
4.874	3.0	52.1	47.6	33.7	4.6	-45.3	0.0	0.6	45.7	41.2	74	54	-28.3	-12.8	H
7.311	3.0	50.8	38.2	36.2	5.6	-43.2	0.0	0.6	50.0	37.4	74	54	-24.0	-16.6	H
9.748	3.0	46.1	34.3	38.1	6.6	-39.6	0.0	0.8	52.1	40.3	74	54	-21.9	-13.7	H
12.185	3.0	48.7	37.2	38.4	7.2	-40.1	0.0	0.9	55.1	43.6	74	54	-18.9	-10.4	H
High Ch															
4.924	3.0	54.7	49.8	33.7	4.6	-45.4	0.0	0.6	48.3	43.5	74	54	-25.7	-10.5	V
7.386	3.0	50.8	38.1	36.2	5.6	-43.1	0.0	0.6	50.2	37.5	74	54	-23.8	-16.5	V
9.848	3.0	48.3	35.9	38.2	6.6	-39.4	0.0	0.8	54.6	42.2	74	54	-19.4	-11.8	V
4.924	3.0	54.6	48.2	33.7	4.6	-45.4	0.0	0.6	48.2	41.8	74	54	-25.8	-12.2	H
7.386	3.0	49.9	37.2	36.2	5.6	-43.1	0.0	0.6	49.3	36.6	74	54	-24.7	-17.4	H
9.848	3.0	47.0	35.3	38.2	6.6	-39.4	0.0	0.8	53.3	41.6	74	54	-20.7	-12.4	H
Note: No other emissions detected above noise floor.															
f	Measurement Frequency		Amp	Preamp Gain		Avg Lim	Average Field Strength Limit								
Dist	Distance to Antenna		D Corr	Distance Correct to 3 meters		Pk Lim	Peak Field Strength Limit								
Read	Analyzer Reading		Avg	Average Field Strength @ 3 m		Avg Mar	Margin vs. Average Limit								
AF	Antenna Factor		Peak	Calculated Peak Field Strength		Pk Mar	Margin vs. Peak Limit								
CL	Cable Loss		HPF	High Pass Filter											

7.2.5. WORST-CASE RADIATED EMISSIONS BELOW 1 GHz FOR PORTABLE CONFIGURATION

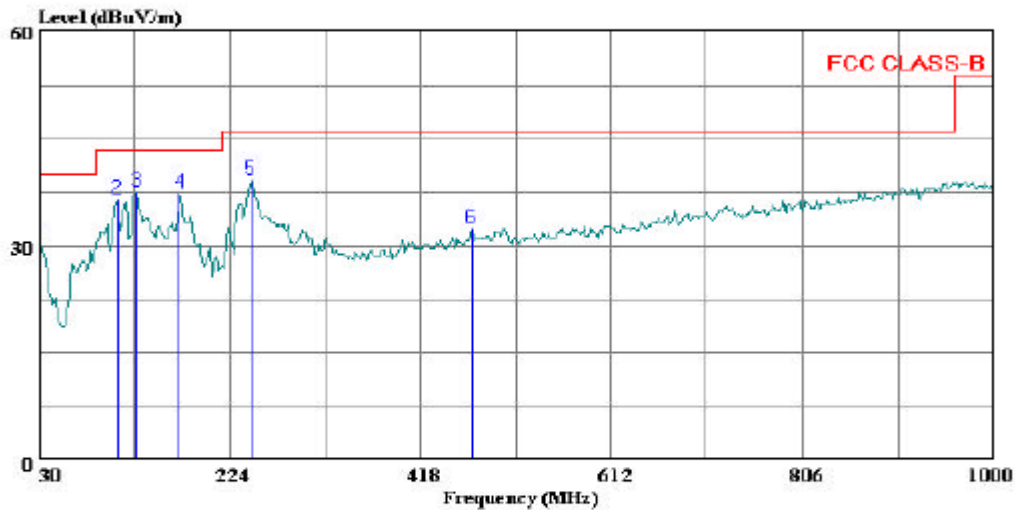
SPURIOUS EMISSIONS 30 TO 1000 MHz (WORST-CASE CONFIGURATION, HORIZONTAL)

HORIZONTAL PLOT



561F Monterey Road
Morgan Hill, CA 95037
Tel: (408) 463-0888
Fax: (408) 463-0885

Data#: 6 File#: Below 1 GHz.EMI Date: 09-28-2005 Time: 16:19:32



(Auxiliary ATC)

Trace: 5

Ref Trace:

Condition: FCC CLASS-B HORIZONTAL
Test Operator: : Joseph Chung
Project #: : 05U3622-1
Company: : Worth Data INC
EUT: : Handheld 802.11b terminal with barcode scanner
Model No.: : LT802/T802
Configuration : EUT only
Target of Test : FCC Class B
Mode of Operation: TX

HORIZONTAL DATA

Page: 1

	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
1	31.940	10.16	19.94	30.10	40.00	-9.90	Peak
2	109.540	23.06	13.44	36.50	43.50	-7.01	Peak
3	128.940	22.36	15.15	37.51	43.50	-5.99	Peak
4	172.590	24.15	13.31	37.46	43.50	-6.04	Peak
5	245.340	25.43	13.72	39.15	46.00	-6.85	Peak
6	470.380	12.81	19.65	32.46	46.00	-13.54	Peak

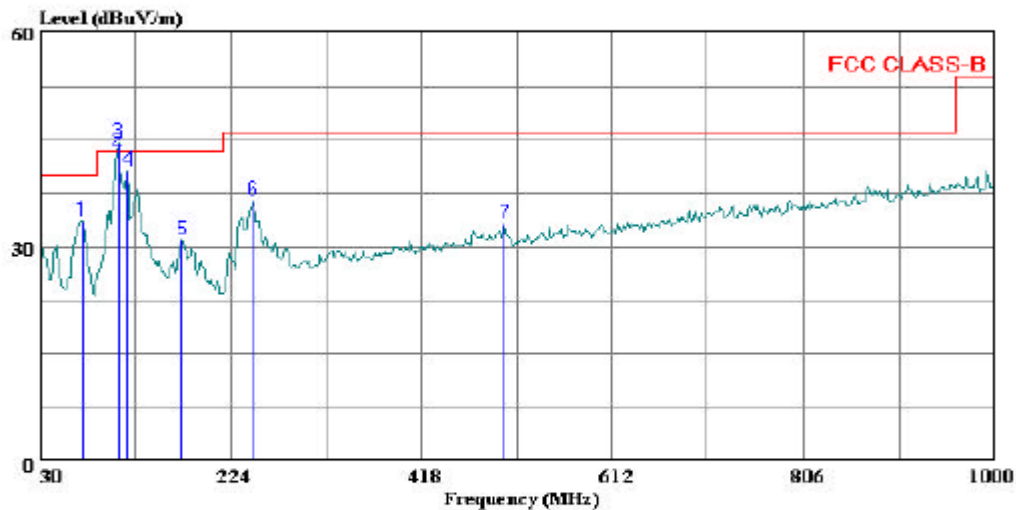
SPURIOUS EMISSIONS 30 TO 1000 MHz (WORST-CASE CONFIGURATION, VERTICAL)

VERTICAL PLOT



561F Monterey Road
Morgan Hill, CA 95037
Tel: (408) 463-0888
Fax: (408) 463-0885

Data#: 4 File#: Below 1 GHz.EMI Date: 09-28-2005 Time: 15:58:46



(Auxiliary ATC)

Trace: 1

Ref Trace:

Condition: FCC CLASS-B VERTICAL
Test Operator: : Joseph Chung
Project #: : 05U3622-1
Company: : Worth Data INC
EUT: : Handheld 802.11b terminal with barcode scanner
Model No.: : LT802/T802
Configuration : EUT only
Target of Test : FCC Class B
Mode of Operation: Worst Case TX

VERTICAL DATA

Page: 1

	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
1	72.680	24.41	9.23	33.64	40.00	-6.36	Peak
2	109.540	30.02	13.44	43.45	43.50	-0.05	QP
3 *	109.540	31.27	13.44	44.71	43.50	1.21	Peak
4	119.240	25.60	15.05	40.65	43.50	-2.85	Peak
5	174.530	17.80	13.18	30.98	43.50	-12.52	Peak
6	247.280	22.72	13.75	36.46	46.00	-9.54	Peak
7	502.390	12.94	20.24	33.18	46.00	-12.82	Peak

7.3. POWERLINE CONDUCTED EMISSIONS

LIMIT

§15.207 (a) Except as shown in paragraphs (b) and (c) of this section, for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table, as measured using a 50 μ H/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal.

The lower limit applies at the boundary between the frequency ranges.

Frequency of Emission (MHz)	Conducted Limit (dBuV)	
	Quasi-peak	Average
0.15-0.5	66 to 56 *	56 to 46 *
0.5-5	56	46
5-30	60	50

* Decreases with the logarithm of the frequency.

TEST PROCEDURE

The EUT is placed on a non-conducting table 40 cm from the vertical ground plane and 80 cm above the horizontal ground plane. The EUT is configured in accordance with ANSI C63.4.

The resolution bandwidth is set to 9 kHz for both peak detection and quasi-peak detection measurements. Peak detection is used unless otherwise noted as quasi-peak.

Line conducted data is recorded for both NEUTRAL and HOT lines.

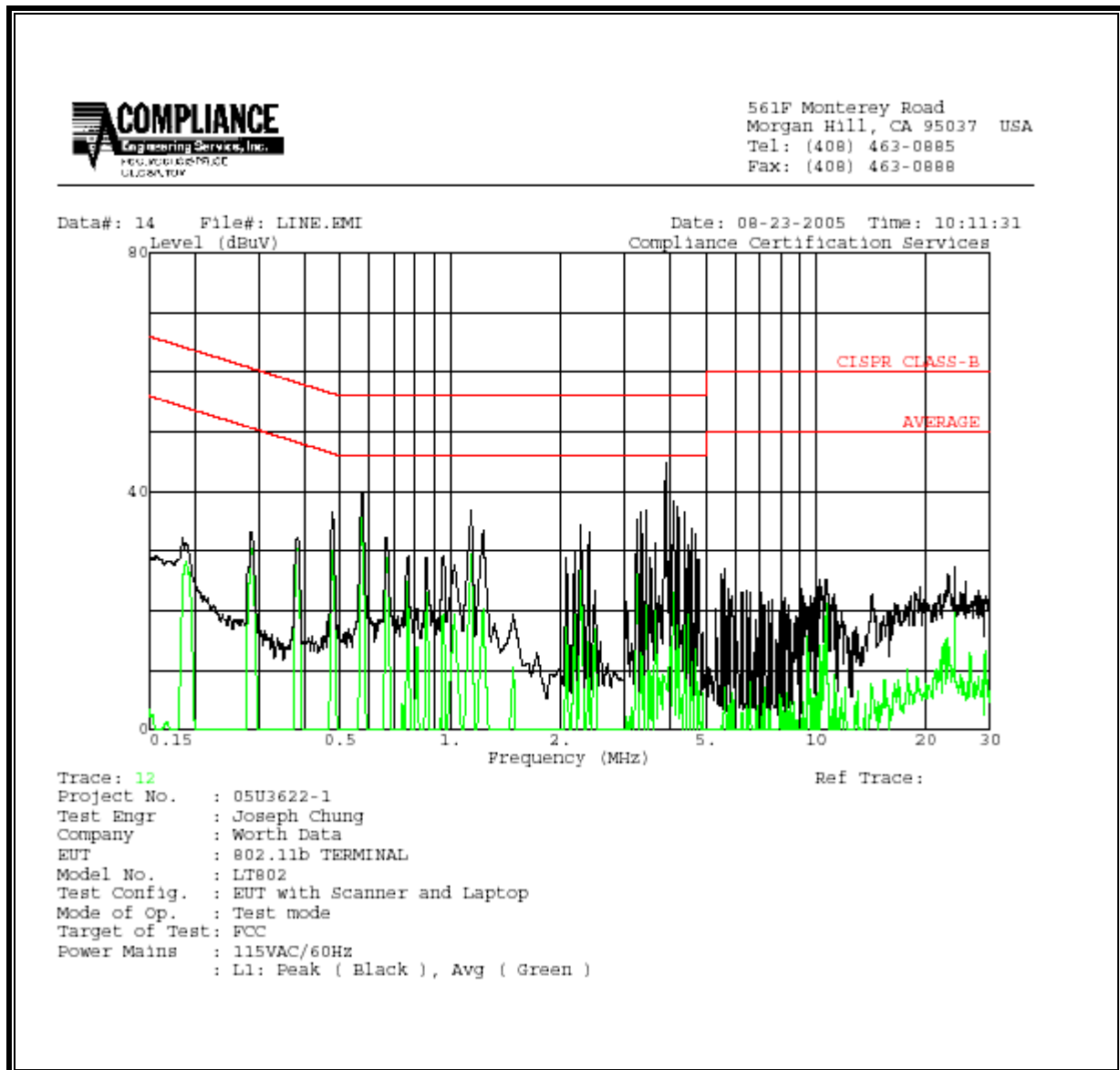
RESULTS

No non-compliance noted:

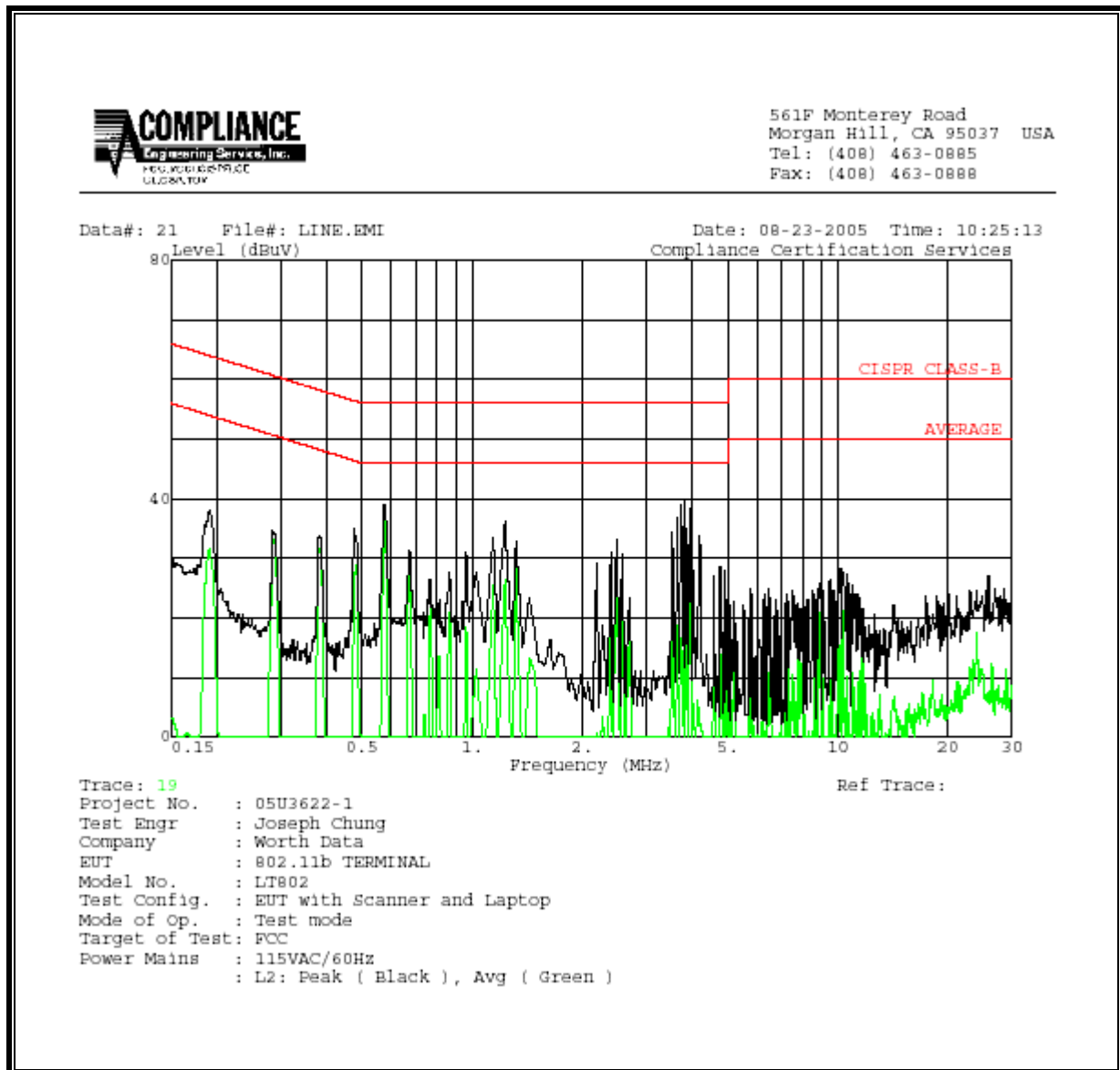
6 WORST EMISSIONS

CONDUCTED EMISSIONS DATA (115VAC 60Hz)									
Freq.	Reading			Closs	Limit	FCC_B	Margin		Remark
(MHz)	PK (dBuV)	QP (dBuV)	AV (dBuV)	(dB)	QP	AV	QP (dB)	AV (dB)	L1 / L2
0.57	39.80	--	37.62	0.00	56.00	46.00	-16.20	-8.38	L1
1.14	36.96	--	29.36	0.00	56.00	46.00	-19.04	-16.64	L1
3.88	44.70	--	33.99	0.00	56.00	46.00	-11.30	-12.01	L1
0.58	39.14	--	36.74	0.00	56.00	46.00	-16.86	-9.26	L2
1.23	36.20	--	26.55	0.00	56.00	46.00	-19.80	-19.45	L2
3.82	39.68	--	37.48	0.00	56.00	46.00	-16.32	-8.52	L2
6 Worst Data									

LINE 1 RESULTS

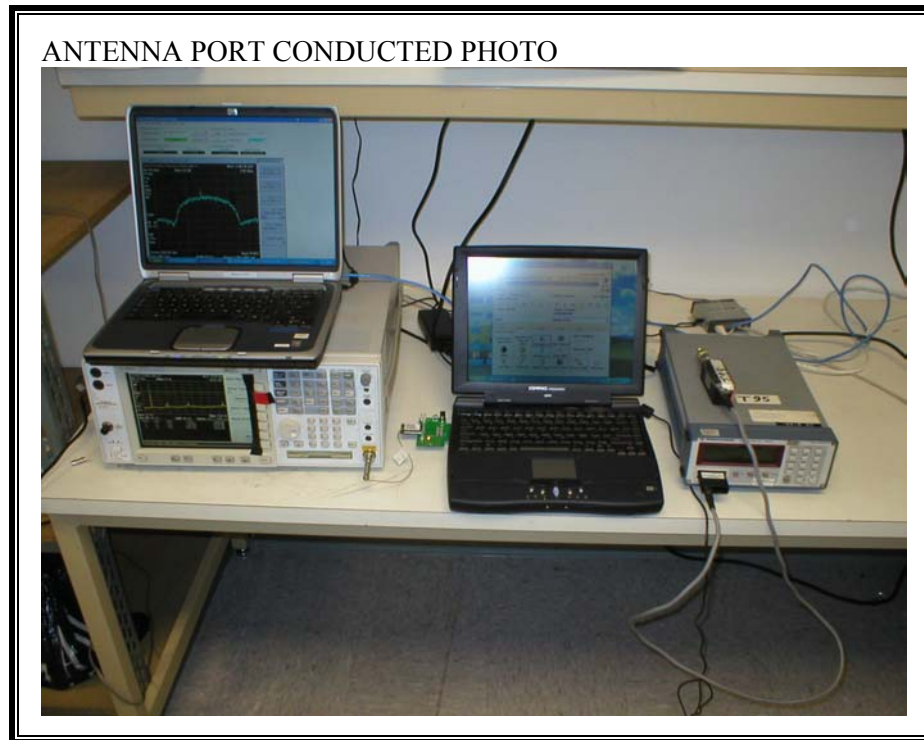


LINE 2 RESULTS



8. SETUP PHOTOS

ANTENNA PORT CONDUCTED RF MEASUREMENT SETUP



RADIATED RF MEASUREMENT SETUP

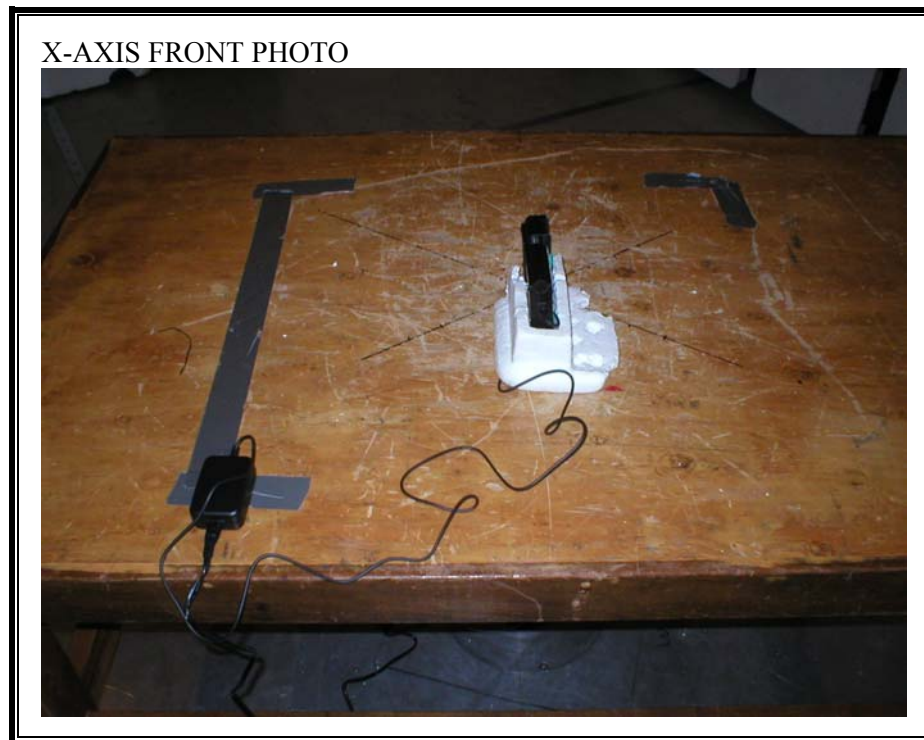
RADIATED FRONT PHOTO



RADIATED BACK PHOTO



RADIATED RF MEASUREMENT SETUP FOR PORTABLE CONFIGURATION



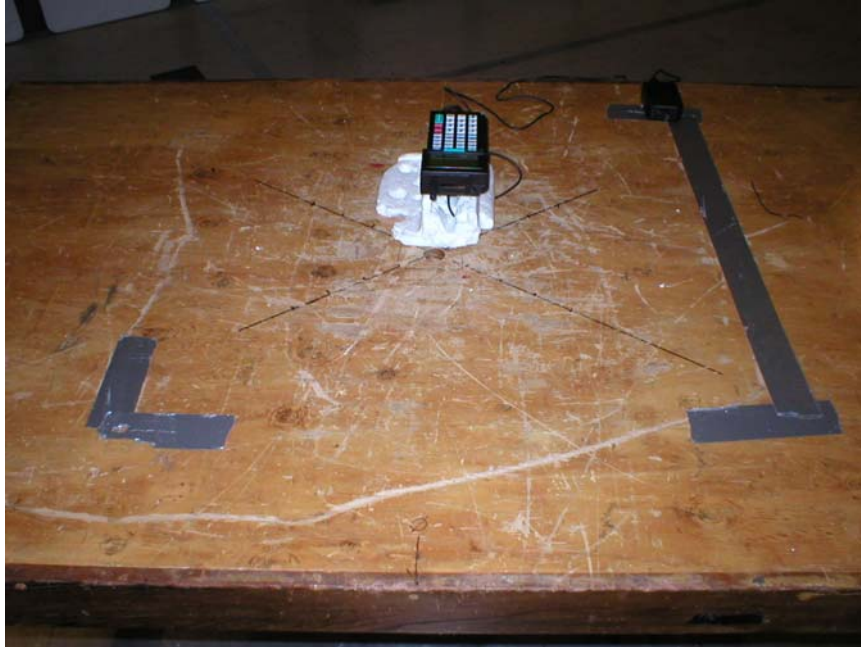
X-AXIS BACK PHOTO



Y-AXIS FRONT PHOTO



Y-AXIS BACK PHOTO



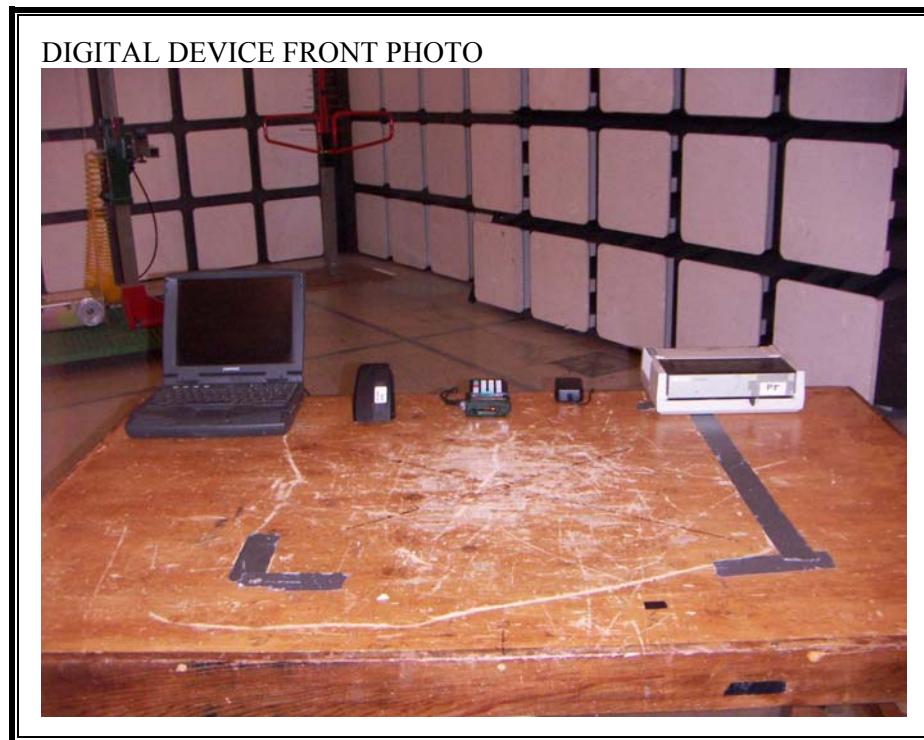
Z-AXIS FRONT PHOTO



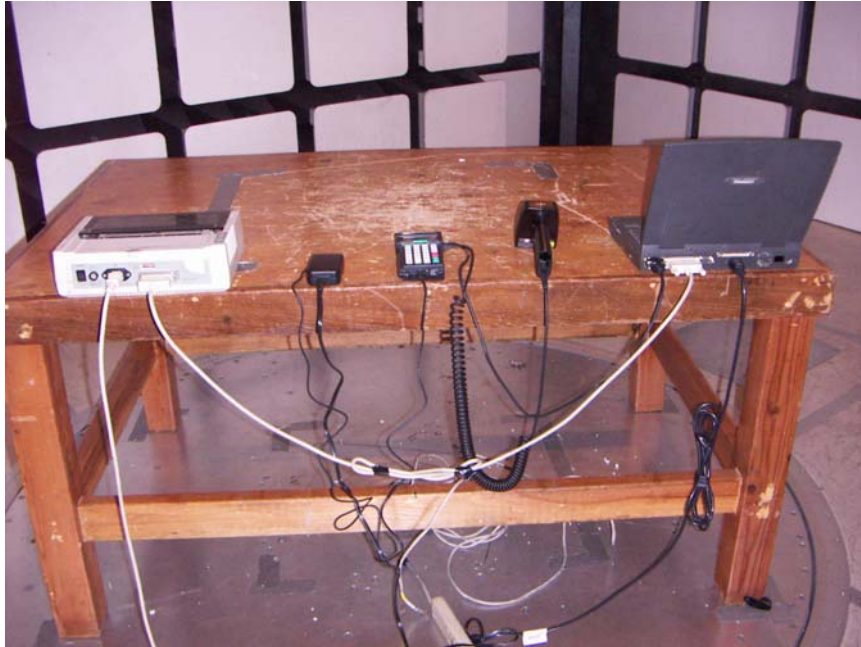
Z-AXIS BACK PHOTO



DIGITAL DEVICE RADIATED EMISSIONS SETUP



DIGITAL DEVICE BACK PHOTO



POWERLINE CONDUCTED EMISSIONS MEASUREMENT SETUP



LINE CONDUCTED BACK PHOTO



END OF REPORT