



**FCC CFR47 PART 15 SUBPART C  
CLASS II PERMISSIVE CHANGE  
TEST REPORT**

**FOR**

**802.11g MINI-PCI CARD**

**MODEL NUMBER: BCM94306MPLNA**

**FCC ID: QDS-BRCM1013**

**REPORT NUMBER: 04U2883-2**

**ISSUE DATE: AUGUST 05, 2004**

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## 1. TEST RESULT CERTIFICATION

**COMPANY NAME:** Broadcom Corp.  
190 Mathilda Place  
Sunnyvale, CA 94086, USA

**EUT DESCRIPTION:** Broadcom 802.11g Mini PCI Card

**MODEL:** BCM94306MPLNA

**DATE TESTED:** AUGUST 02-04, 2004

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:** This document reports conditions under which testing was conducted and results of tests performed. 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.

Approved & Released For CCS By:

Tested By:



THU CHAN  
EMC SUPERVISOR  
COMPLIANCE CERTIFICATION SERVICES

NEELESH RAJ  
EMC TECHNICIAN  
COMPLIANCE CERTIFICATION SERVICES

## 2. CLASS II PERMISSIVE CHANGE DESCRIPTION

Adding portable host, HP laptop (model: HSTNN-C02C)

The EUT is a WLAN 802.11g Mini PCI transceiver module, operating in the 2400-2483.5 MHz band. The radio utilizes two identical PIFA antennas for diversity, each with a maximum gain of 2.51dBi.

### 3. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.4/2001, FCC CFR 47 Part 2 and FCC CFR 47 Part 15.

### 4. 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>.



No part of this report may be used to claim or imply product endorsement by NVLAP or any agency of the US Government.

## 5. CALIBRATION AND UNCERTAINTY

### 5.1. 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.

### 5.2. 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%.

### 5.3. TEST AND MEASUREMENT EQUIPMENT

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

TEST EQUIPMENT LIST				
Description	Manufacturer	Model	Serial Number	Cal Due
LISN, 10 kHz ~ 30 MHz	FCC	50/250-25-2	114	10/13/04
EMI Test Receiver	R & S	ESHS 20	827129/006	10/22/05
Site A Line Stabilizer / Conditioner	Tripplite	LC-1800a	A0051681	CNR
Antenna, Horn 1 ~ 18 GHz	S	3115	6717	2/4/05
Amplifier 1-26GHz	MITEQ	NSP2600-SP	924341	6/10/05
Power Sensor, 100 kHz ~ 4.2 GHz	HP	8482A	2349A08568	1/16/06
Power Meter	HP	436A	2709A29209	1/16/06
EMI Test Receiver	R & S	ESIB40	100192	11/21/04
2.4-2.5GHz Reject filter	MICRO-TRONICS	BRM50702	2	CNR
Antenna, Horn 1 ~ 18 GHz	EMCO	3117	29301	12/26/04
Spectrum Analyzer	Agilent	E4446A	MY43360112	1/13/05
EMI Receiver, 9 kHz ~ 2.9 GHz	HP	8542E	3942A00286	11/21/04
RF Filter Section	HP	85420E	3705A00256	11/21/04
30MHz---- 2Ghz	Sunol Sciences	JB1 Antenna	A121003	12/22/04

## 6. SETUP OF EQUIPMENT UNDER TEST

### SUPPORT EQUIPMENT

PERIPHERAL SUPPORT EQUIPMENT LIST				
Description	Manufacturer	Model	Serial Number	FCC ID
HOST LAPTOP	HP	HSTNN-C02C	N/A	N/A
AC ADAPTER	HP	PPP009S	57BC30AU4Q204Y	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	1.86M	U.S (3 PRONG)
2	DC	1	DC	UNSHIELDED	1.86M	N/A

### TEST SETUP

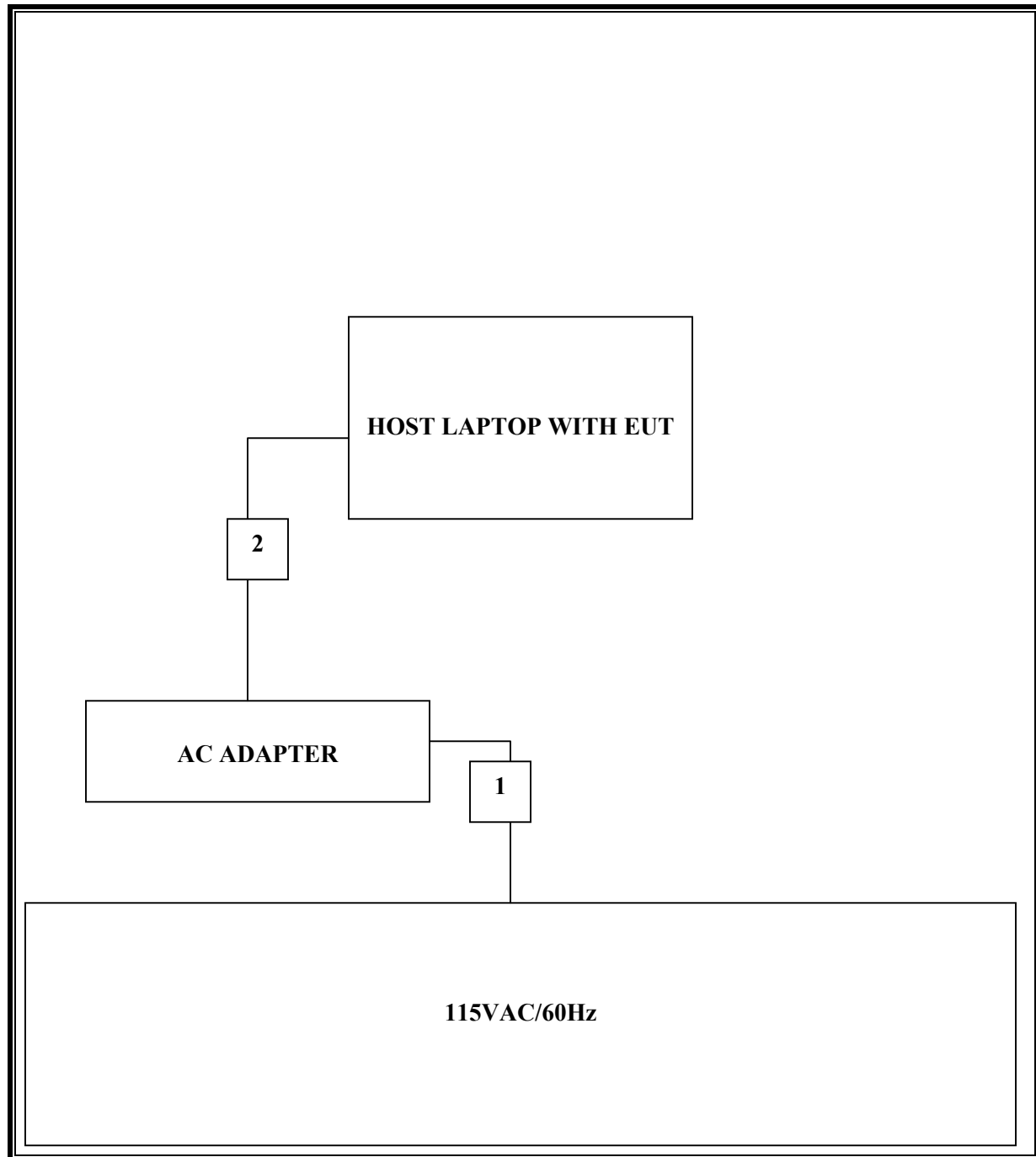
During the testing process the EUT was installed inside a host laptop computer and put in continuous transmit mode. Both 802.11b and 802.11g modes were both tested.

The EUT was tested as a portable device in the X, Y, and Z positions and as a mobile device. Worst-case was determined to be the high channel in the "Y" position yielding the highest EIRP in 802.11b mode.

The WLAN was Co-located with a Bluetooth transmitter.



**SETUP DIAGRAM FOR TESTS**



## 7. APPLICABLE LIMITS AND TEST RESULTS

### 7.1. RADIATED EMISSIONS

#### 7.1.1. 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
<sup>1</sup> 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	( <sup>2</sup> )
13.36 - 13.41			

<sup>1</sup> Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.

<sup>2</sup> 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.

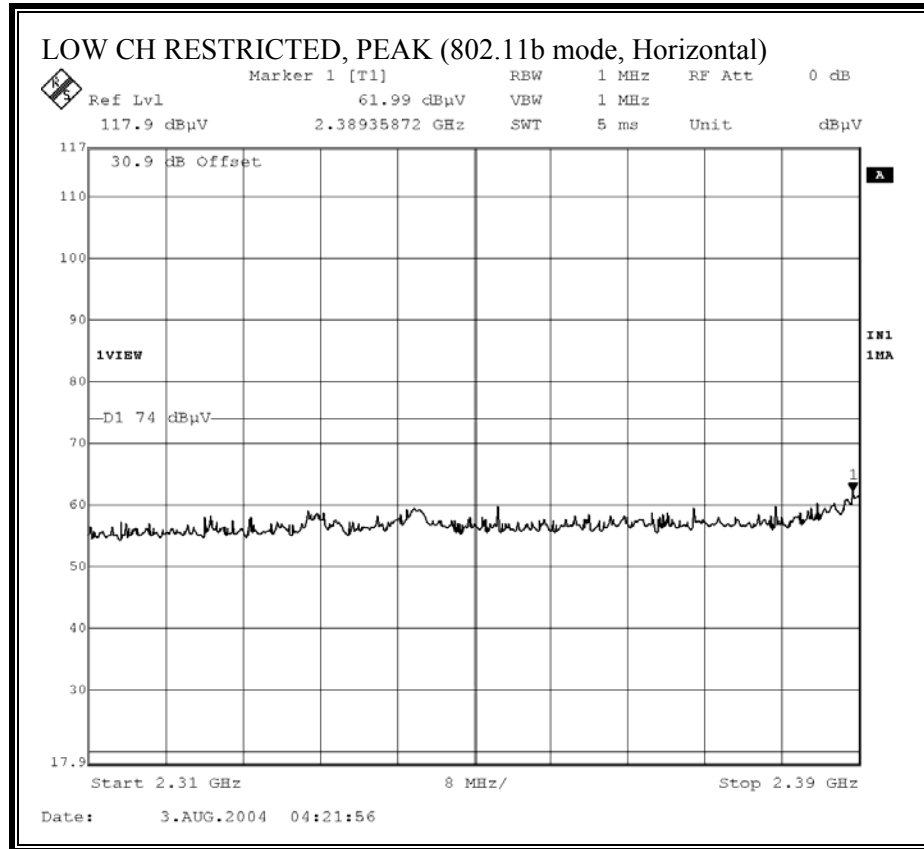
The frequency range of interest is monitored at a fixed antenna height and EUT azimuth. The EUT is rotated through 360 degrees to maximize emissions received. The antenna is scanned from 1 to 4 meters above the ground plane to further maximize the emission. Measurements are made with the antenna polarized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

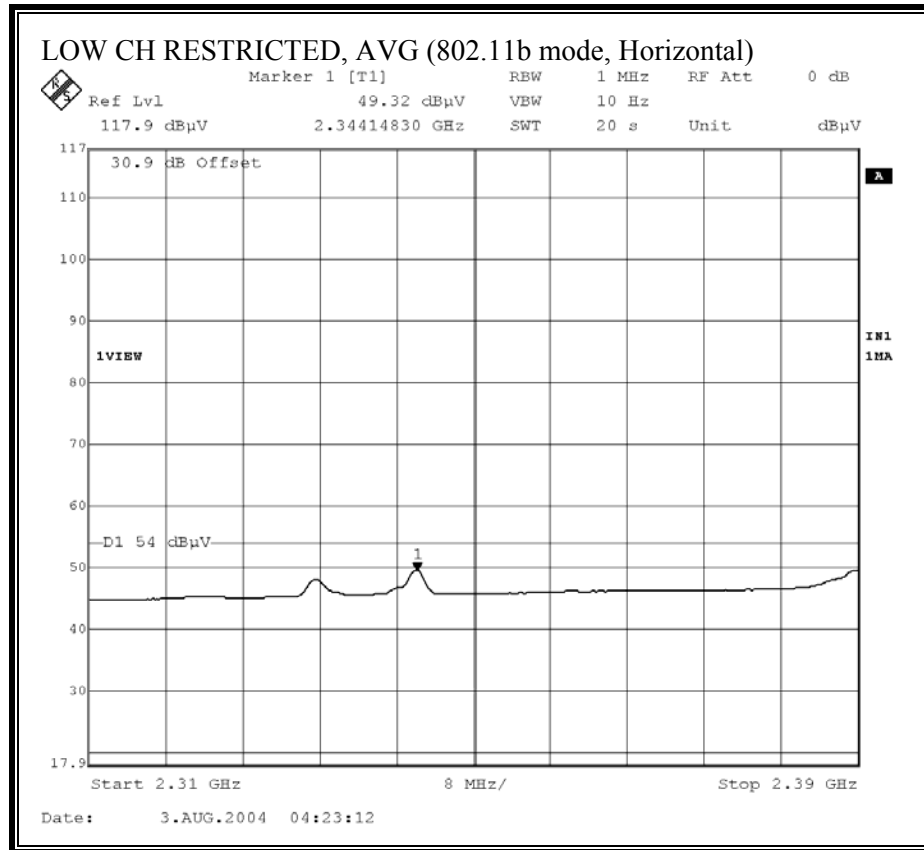
## **RESULTS**

No non-compliance noted:

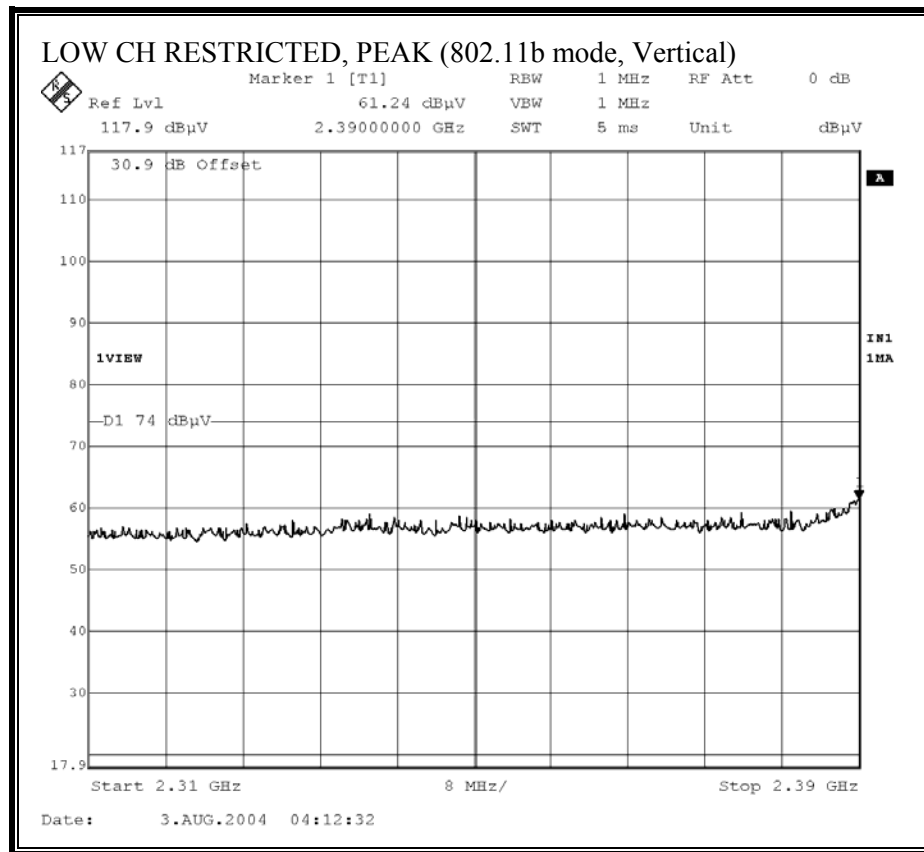
## 7.1.2. TRANSMITTER RADIATED EMISSIONS ABOVE 1 GHZ

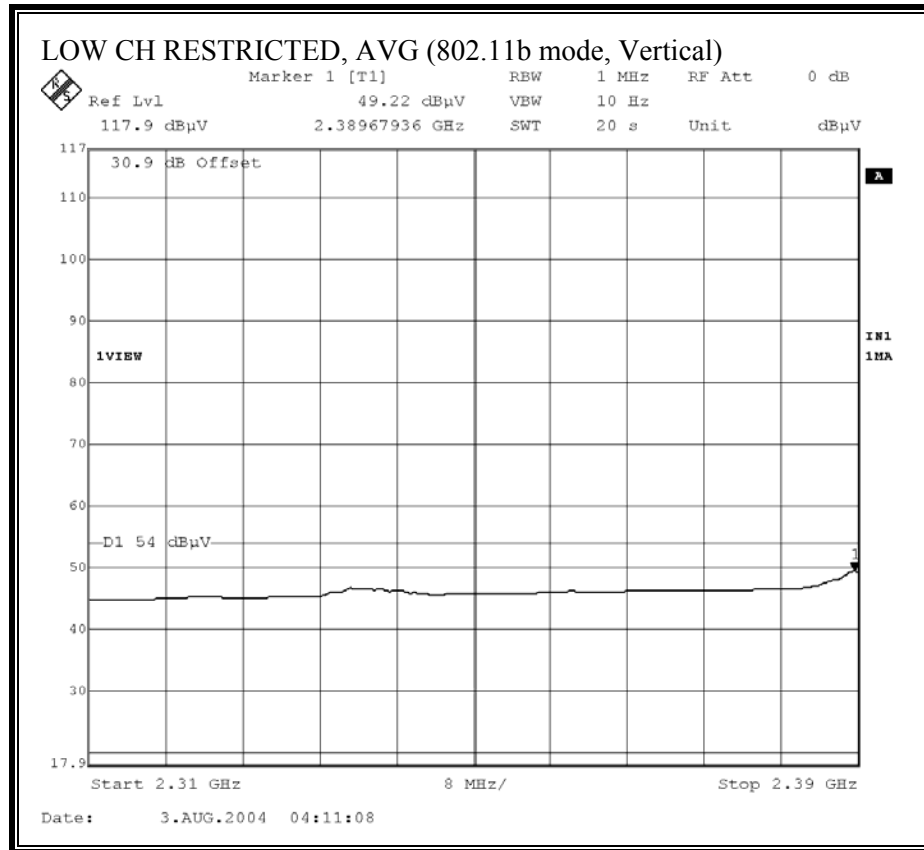
### RESTRICTED BANDEDGE (b MODE, LOW CHANNEL, HORIZONTAL)





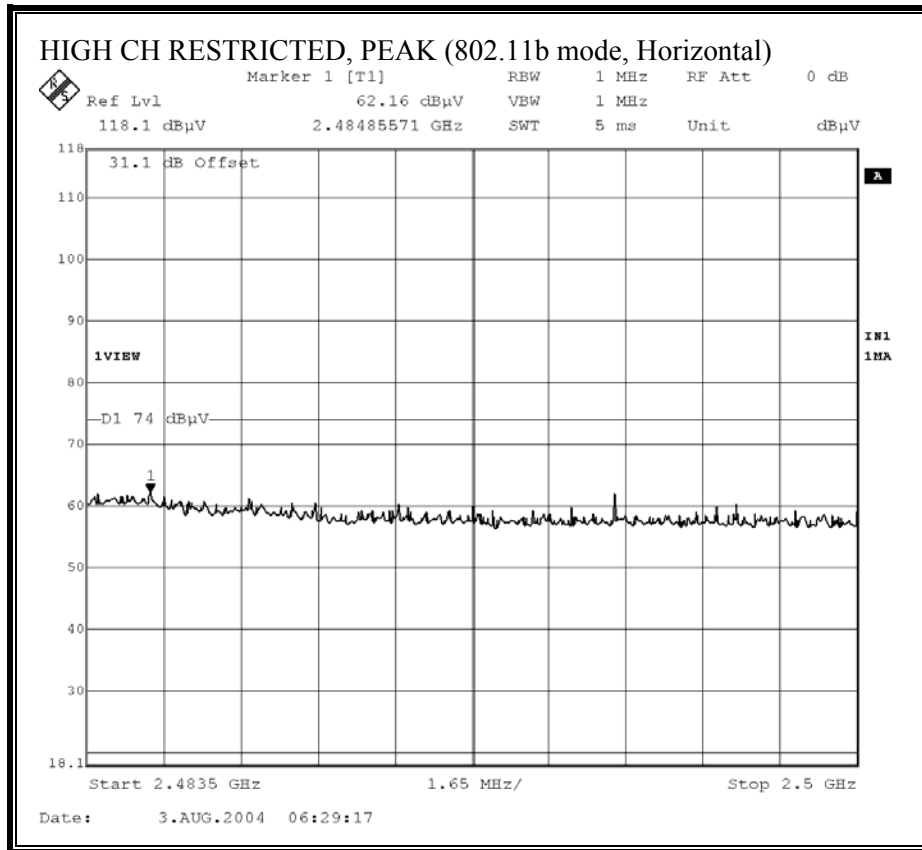
**RESTRICTED BANDEDGE (b MODE, LOW CHANNEL, VERTICAL)**

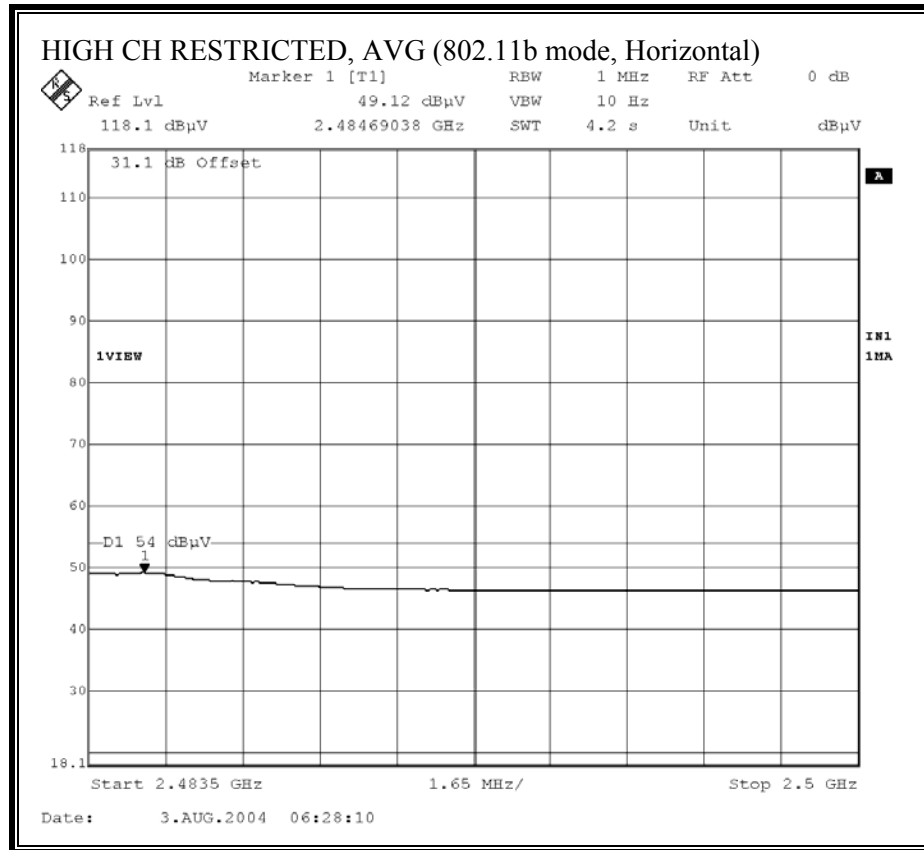




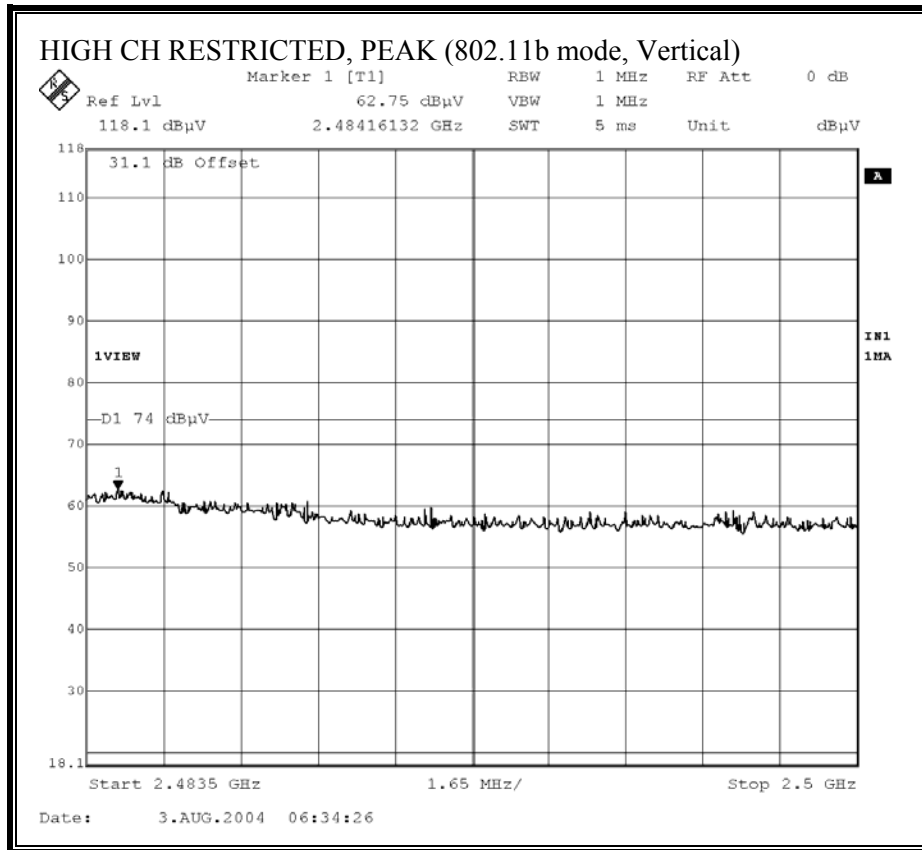


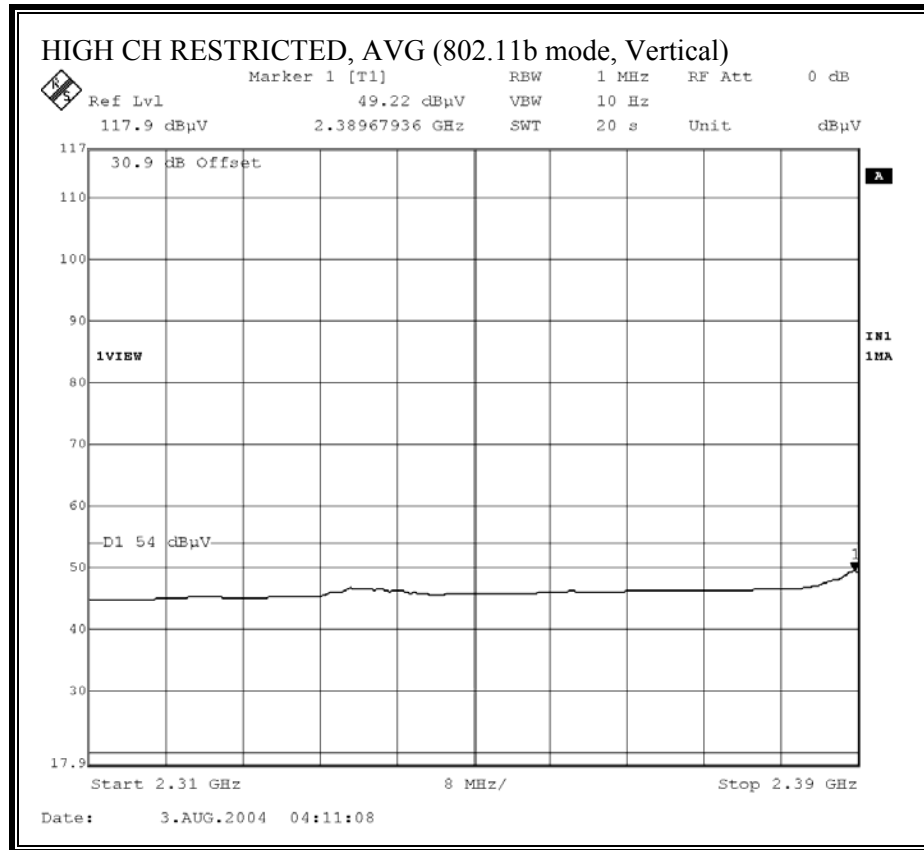
**RESTRICTED BANDEDGE (b MODE, HIGH CHANNEL, HORIZONTAL)**





**RESTRICTED BANDEDGE (b MODE, HIGH CHANNEL, VERTICAL)**

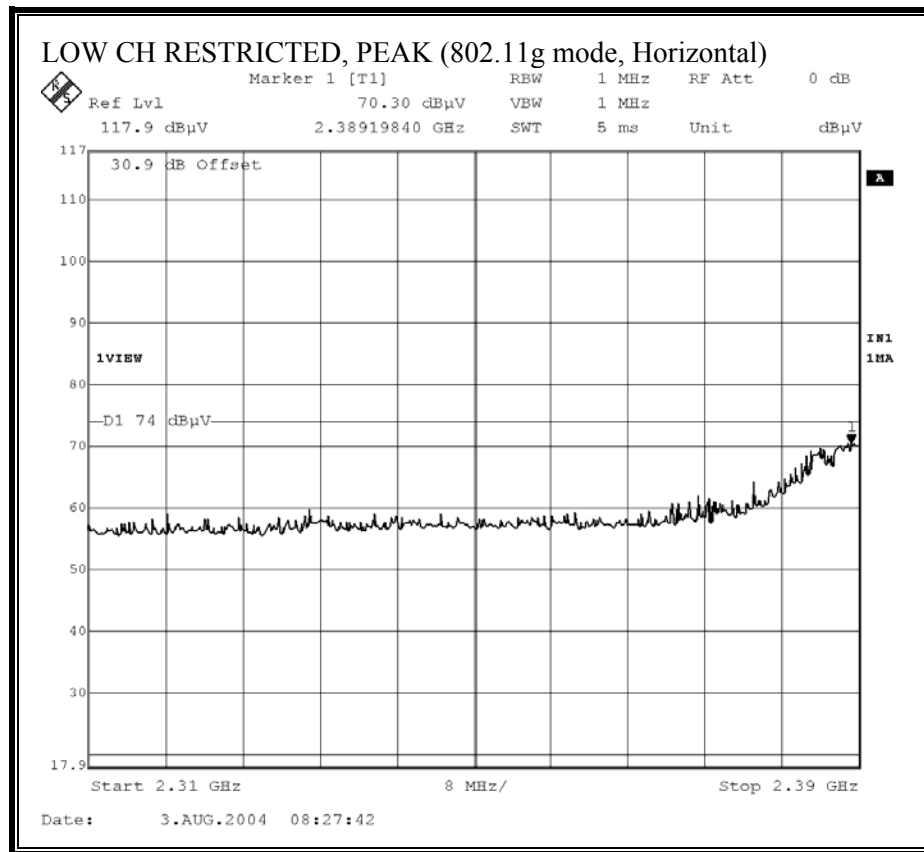


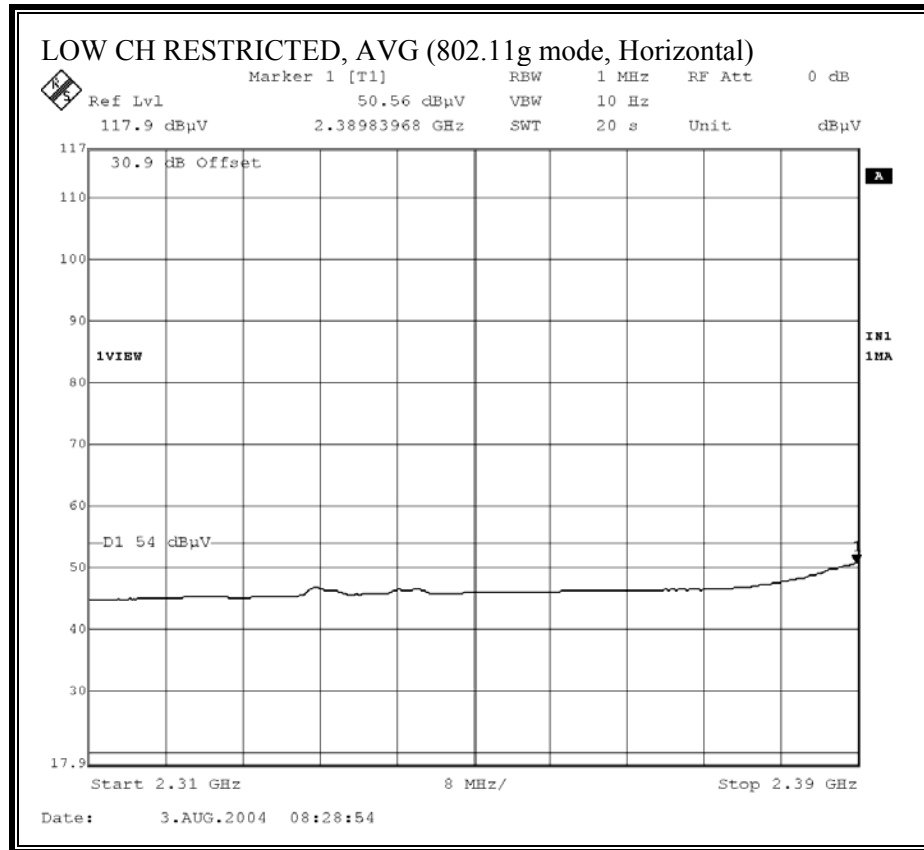


## HARMONICS AND SPURIOUS EMISSIONS (b MODE)

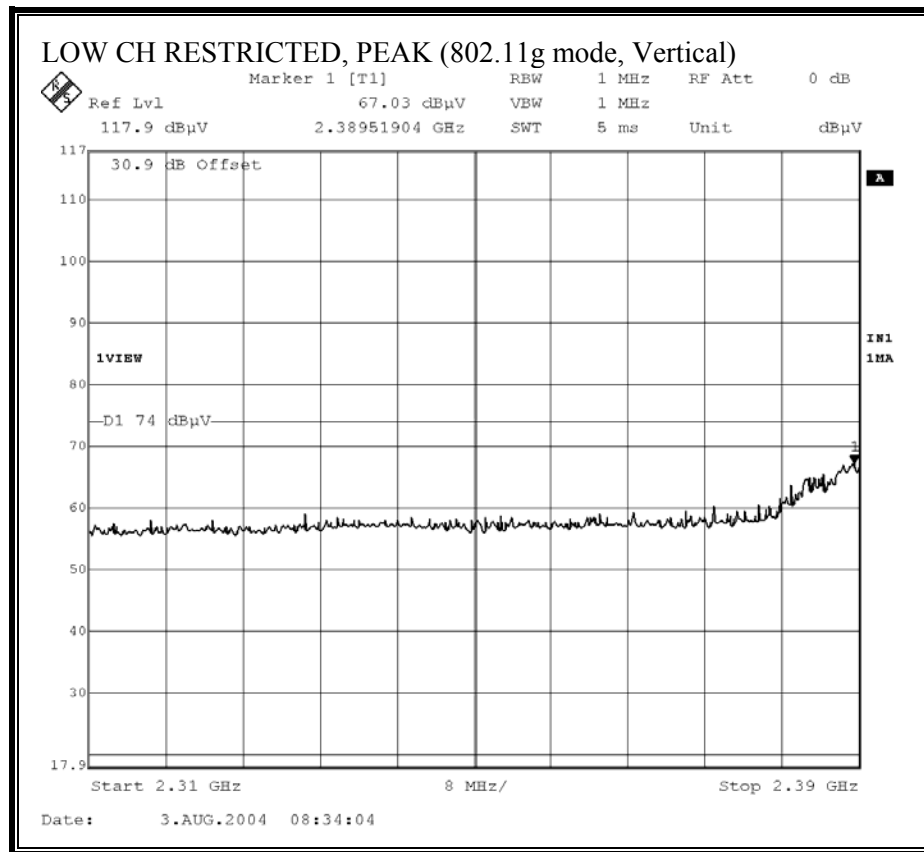
07/02/04 High Frequency Measurement																
Compliance Certification Services, Morgan Hill Open Field Site																
Test Engr: NEELESH RAJ																
Project #: 04U2883																
Company: BROADCOM																
EUT Descr.: 802.11																
EUT M/N: BCM94306MPLNA																
Test Target: FCC																
Mode Oper: TX B MODE																
Test Equipment:																
EMCO Horn 1-18GHz		Spectrum Analyzer		Pre-amplifier 1-26GHz		Pre-amplifier 26-40GHz		Horn > 18GHz								
T73; S/N: 6717 @3m				T86 Miteq 924341												
Hi Frequency Cables																
<input type="checkbox"/> (2 ft) <input checked="" type="checkbox"/> (2 ~ 3 ft) <input type="checkbox"/> (4 ~ 6 ft) <input checked="" type="checkbox"/> (12 ft)																
Limit																
FCC 15.205																
Peak Measurements: 1 MHz Resolution Bandwidth 1MHz Video Bandwidth																
Average Measurements: 1 MHz Resolution Bandwidth 10Hz Video Bandwidth																
f	Dist	Read Pk	Read Avg	AF	CL	Amp	D Corr	HPF	Peak	Avg	Pk Lim	Avg Lim	Pk Mar	Avg Mar	Notes	
GHz	feet	dBuV	dBuV	dB/m	dB	dB	dB		dBuV/m	dBuV/m	dBuV/m	dBuV/m	dB	dB		
LOW CHANNEL SPURIOUS																
4.824	9.8	60.0	44.3	33.4	3.2	-45.6	0.0	1.0	52.0	36.3	74.0	54.0	-22.0	-17.7	V	
12.060	9.8	45.9	33.1	39.2	5.9	-45.4	0.0	1.0	46.6	33.8	74.0	54.0	-27.4	-20.2	V	
4.824	9.8	59.1	42.1	33.4	3.2	-45.6	0.0	1.0	51.1	34.1	74.0	54.0	-22.9	-19.9	H	
12.060	9.8	46.3	34.0	39.2	5.9	-45.4	0.0	1.0	47.0	34.7	74.0	54.0	-27.0	-19.3	H	
MIDDLE CHANNEL SPURIOUS																
4.874	9.8	59.5	43.9	33.4	3.3	-45.6	0.0	1.0	51.5	35.9	74.0	54.0	-22.5	-18.1	V	
7.311	9.8	49.2	35.3	35.8	4.3	-46.6	0.0	1.0	43.7	29.8	74.0	54.0	-30.3	-24.2	V	
12.185	9.8	45.0	33.6	39.2	6.0	-45.6	0.0	1.0	45.5	34.1	74.0	54.0	-28.5	-19.9	V	
4.874	9.8	58.7	43.1	33.4	3.3	-45.6	0.0	1.0	50.7	35.2	74.0	54.0	-23.3	-18.8	H	
7.311	9.8	49.0	35.2	35.8	4.3	-46.6	0.0	1.0	43.5	29.7	74.0	54.0	-30.5	-24.3	H	
12.185	9.8	45.2	33.7	39.2	6.0	-45.6	0.0	1.0	45.7	34.2	74.0	54.0	-28.3	-19.8	H	
HIGH CHANNEL SPURIOUS																
4.924	9.8	59.1	44.1	33.5	3.3	-45.7	0.0	1.0	51.1	36.1	74.0	54.0	-22.9	-17.9	V	
7.386	9.8	49.0	36.3	36.0	4.3	-46.5	0.0	1.0	43.7	31.0	74.0	54.0	-30.3	-23.0	V	
12.310	9.8	45.6	33.0	39.2	6.0	-45.7	0.0	1.0	46.0	33.4	74.0	54.0	-28.0	-20.6	V	
4.924	9.8	58.9	44.0	33.5	3.3	-45.7	0.0	1.0	50.9	36.0	74.0	54.0	-23.1	-18.0	H	
7.386	9.8	50.3	36.7	36.0	4.3	-46.5	0.0	1.0	45.0	31.4	74.0	54.0	-29.0	-22.6	H	
12.310	9.8	45.3	33.8	39.2	6.0	-45.7	0.0	1.0	45.7	34.2	74.0	54.0	-28.3	-19.8	H	
NO OTHER SPURIOUS EMISSIONS DETECTED ABOVE THE SYSTEM NOISE IN THE RESTRICTED BANDS -20dB TO THE LIMIT																
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									

**RESTRICTED BANDEDGE (g MODE, LOW CHANNEL, HORIZONTAL)**

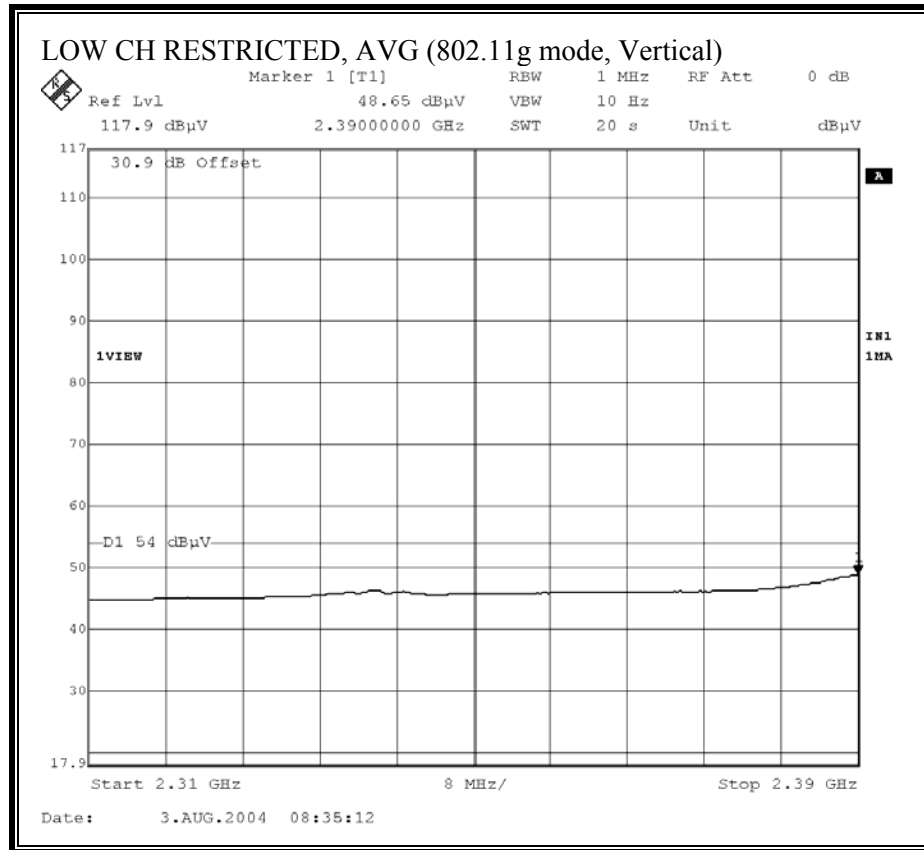




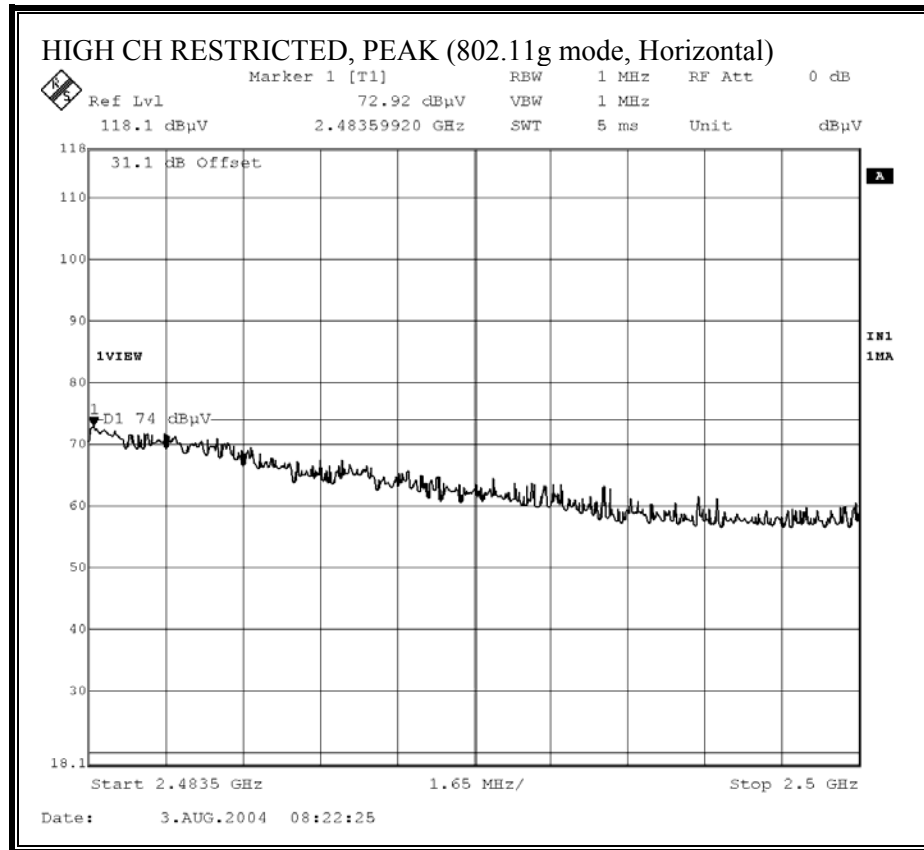
**RESTRICTED BANDEDGE (g MODE, LOW CHANNEL, VERTICAL)**

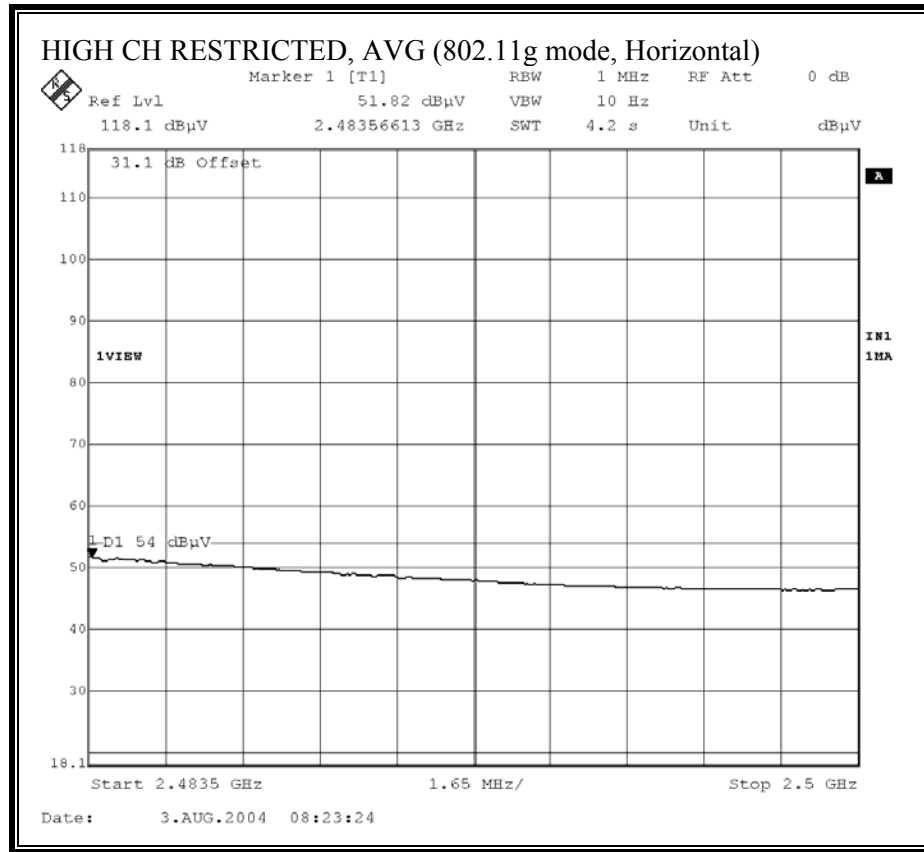




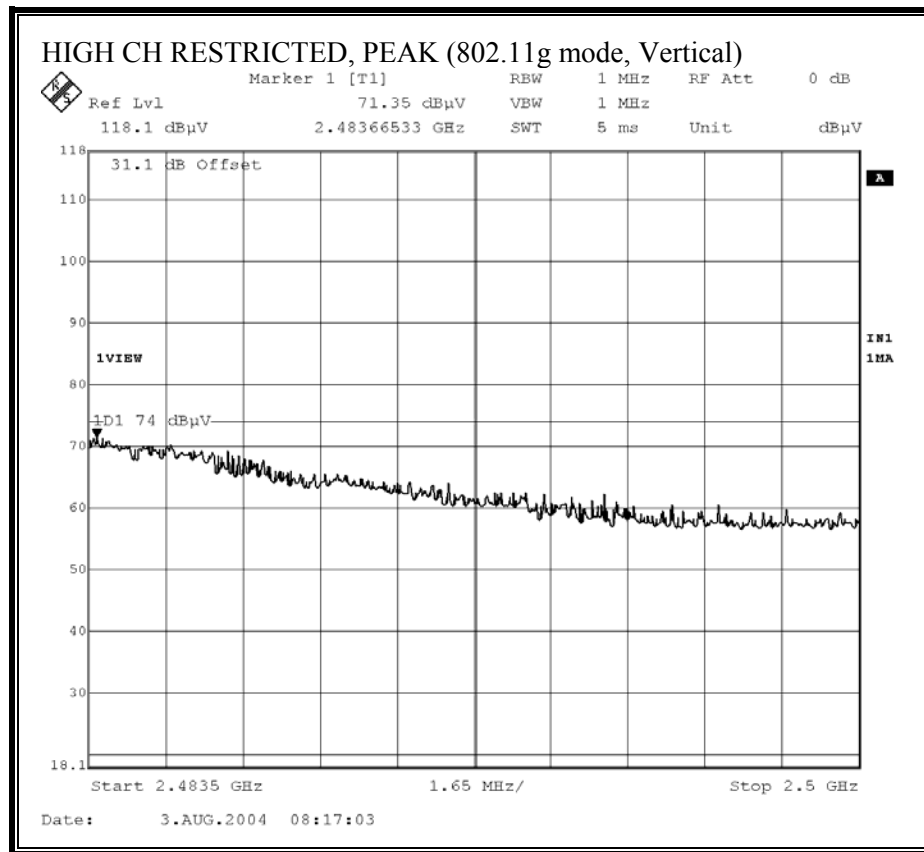


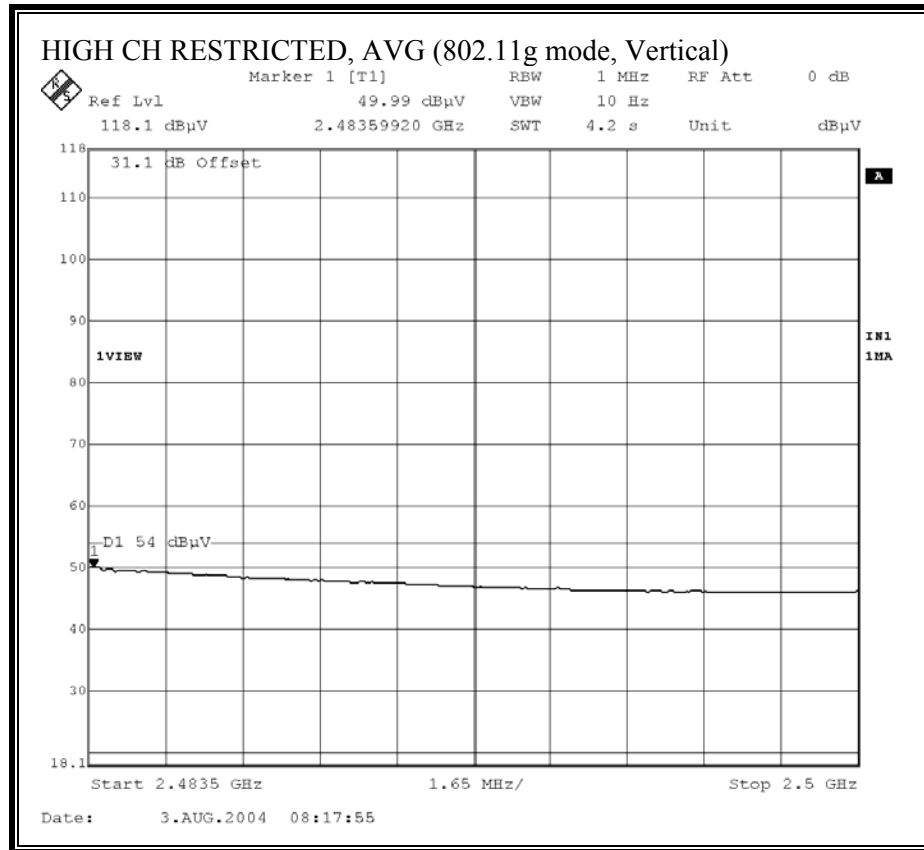
**RESTRICTED BANDEDGE (g MODE, HIGH CHANNEL, HORIZONTAL)**





**RESTRICTED BANDEDGE (g MODE, HIGH CHANNEL, VERTICAL)**



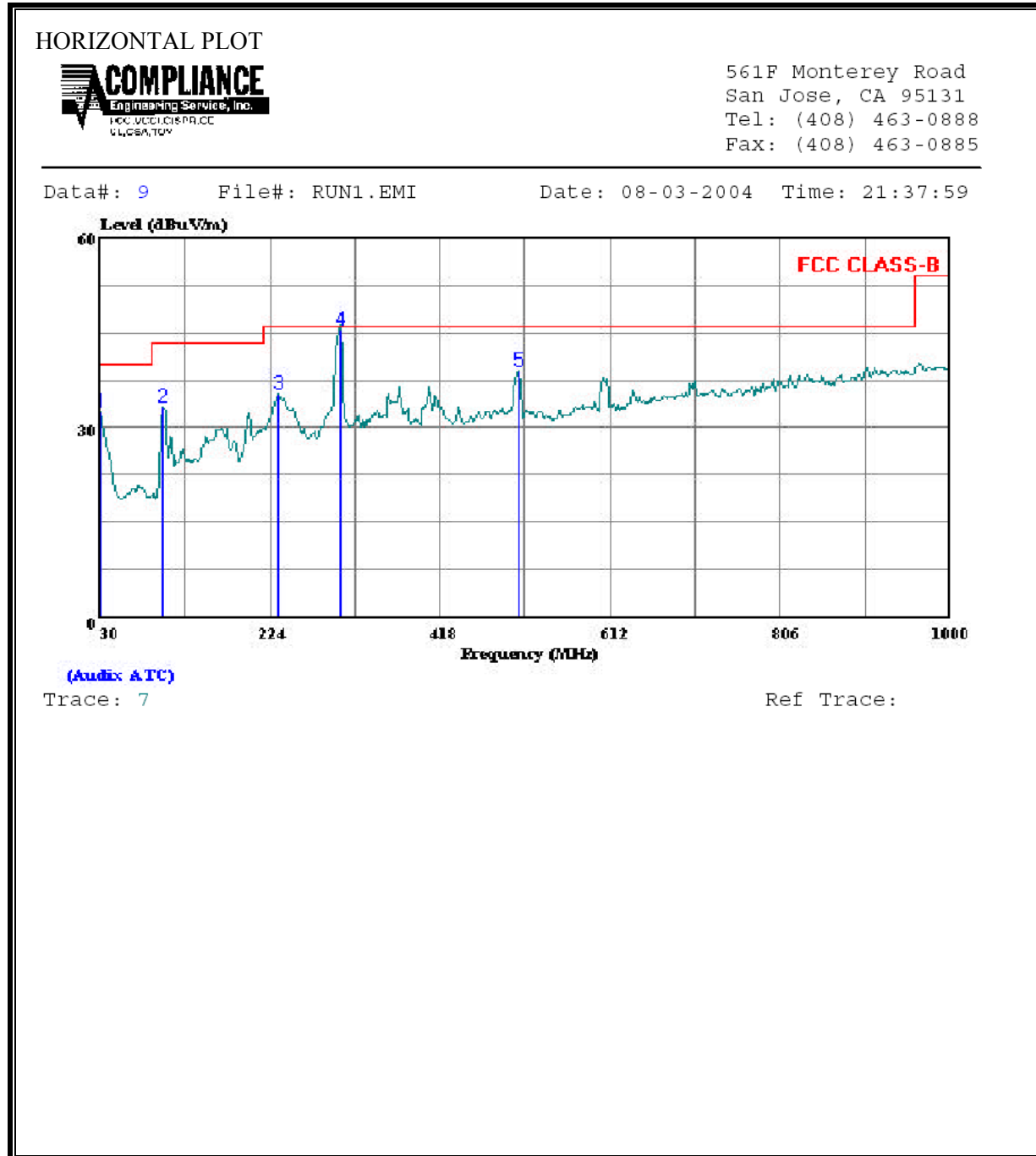


## HARMONICS AND SPURIOUS EMISSIONS (g MODE)

07/02/04 High Frequency Measurement																
Compliance Certification Services, Morgan Hill Open Field Site																
Test Engr: NEELESH RAJ																
Project #: 04U2883																
Company: BROADCOM																
EUT Descrip.: 802.11																
EUT M/N: BCM94306MPLNA																
Test Target: FCC																
Mode Oper: TX G MODE																
Test Equipment:																
EMCO Horn 1-18GHz		Spectrum Analyzer		Pre-amplifier 1-26GHz		Pre-amplifier 26-40GHz		Horn > 18GHz								
T73; S/N: 6717 @3m				T86 Miteq 924341												
Hi Frequency Cables				Limit		Peak Measurements:				Average Measurements:						
<input type="checkbox"/> (2 ft) <input checked="" type="checkbox"/> (2 ~ 3 ft) <input type="checkbox"/> (4 ~ 6 ft) <input checked="" type="checkbox"/> (12 ft)				FCC 15.205		1 MHz Resolution Bandwidth 1MHz Video Bandwidth				1 MHz Resolution Bandwidth 10Hz Video Bandwidth						
f	Dist	Read Pk	Read Avg.	AF	CL	Amp	D Corr	HPF	Peak	Avg	Pk Lim	Avg Lim	Pk Mar	Avg Mar	Notes	
GHz	feet	dBuV	dBuV	dB/m	dB	dB	dB		dBuV/m	dBuV/m	dBuV/m	dBuV/m	dB	dB		
LOW CHANNEL SPURIOUS																
4.824	9.8	67.2	42.9	33.4	3.2	-45.6	0.0	1.0	59.2	34.9	74.0	54.0	-14.8	-19.1	V	
12.060	9.8	53.3	40.6	39.2	5.9	-45.4	0.0	1.0	54.0	41.3	74.0	54.0	-20.0	-12.7	V	
4.824	9.8	64.3	41.9	33.4	3.2	-45.6	0.0	1.0	56.3	33.9	74.0	54.0	-17.7	-20.1	H	
12.060	9.8	52.9	40.0	39.2	5.9	-45.4	0.0	1.0	53.6	40.7	74.0	54.0	-20.4	-13.3	H	
MIDDLE CHANNEL SPURIOUS																
4.874	9.8	67.3	45.7	33.4	3.3	-45.6	0.0	1.0	59.3	37.7	74.0	54.0	-14.7	-16.3	V	
7.311	9.8	55.0	42.5	35.8	4.3	-46.6	0.0	1.0	49.6	37.0	74.0	54.0	-24.4	-17.0	V	
12.185	9.8	55.0	40.8	39.2	6.0	-45.6	0.0	1.0	55.5	41.3	74.0	54.0	-18.5	-12.7	V	
4.874	9.8	63.9	45.4	33.4	3.3	-45.6	0.0	1.0	55.9	37.4	74.0	54.0	-18.1	-16.6	H	
7.311	9.8	56.4	43.6	35.8	4.3	-46.6	0.0	1.0	50.9	38.1	74.0	54.0	-23.1	-15.9	H	
12.185	9.8	53.0	41.3	39.2	6.0	-45.6	0.0	1.0	53.5	41.8	74.0	54.0	-20.5	-12.2	H	
HIGH CHANNEL SPURIOUS																
4.924	9.8	67.9	44.6	33.5	3.3	-45.7	0.0	1.0	59.9	36.6	74.0	54.0	-14.1	-17.4	V	
7.386	9.8	55.1	43.1	36.0	4.3	-46.5	0.0	1.0	49.8	37.8	74.0	54.0	-24.2	-16.2	V	
12.310	9.8	54.0	41.0	39.2	6.0	-45.7	0.0	1.0	54.4	41.4	74.0	54.0	-19.6	-12.6	V	
4.924	9.8	65.8	44.3	33.5	3.3	-45.7	0.0	1.0	57.8	36.3	74.0	54.0	-16.2	-17.7	H	
7.386	9.8	55.8	42.1	36.0	4.3	-46.5	0.0	1.0	50.5	36.8	74.0	54.0	-23.5	-17.2	H	
12.310	9.8	53.1	40.5	39.2	6.0	-45.7	0.0	1.0	53.5	40.9	74.0	54.0	-20.5	-13.1	H	
NO OTHER SPURIOUS EMISSIONS DETECTED ABOVE THE SYSTEM NOISE IN THE RESTRICTED BANDS -20dB TO THE LIMIT																
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									

### 7.1.3. WORST-CASE RADIATED EMISSIONS BELOW 1 GHz

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



## HORIZONTAL DATA

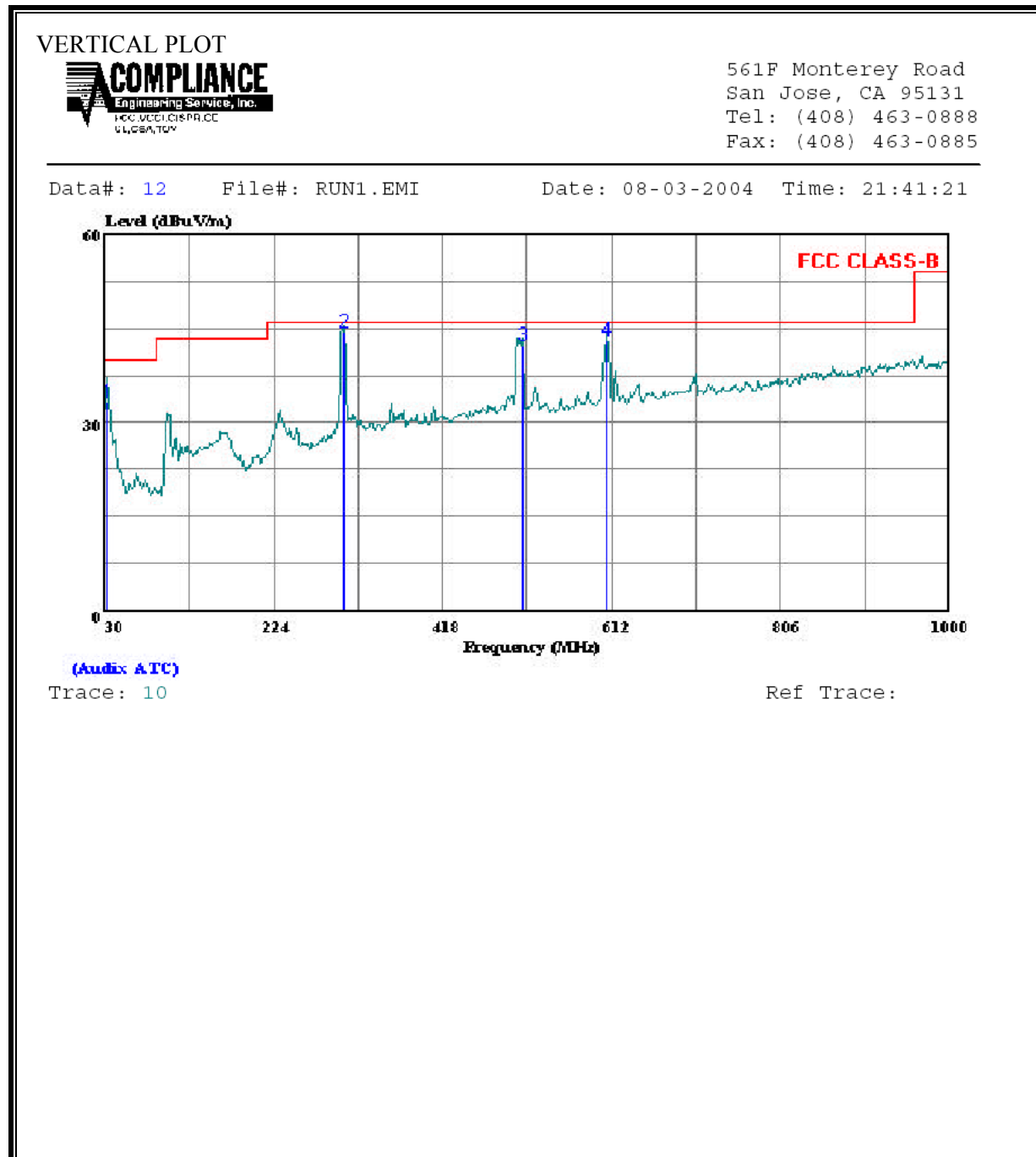
Condition: FCC CLASS-B 3m SUNOL BILOG 12/22/04 HORIZONTAL  
Test Operator: : NEELESH RAJ  
Project #: : 04U2883  
Company: : BROADCOM CORP  
EUT: : 802.11G  
Model No: : BCM94306MPLNA  
Configuration: : EUT  
Target of Test: : CLASS B  
Mode of Operation: TX WORST CASE  
: (WLAN=B MODE HIGH CHANNEL)

Page: 1

	Freq	Remark	Read Level	Factor	Level	Limit Line	Over Limit
	MHz		dBuV	dB	dBuV/m	dBuV/m	dB
1	30.000	Peak	9.49	22.95	32.44	40.00	-7.56
2	101.780	Peak	22.33	11.01	33.34	43.50	-10.16
3	232.730	Peak	21.84	13.39	35.23	46.00	-10.77
4	303.540	QP	29.34	15.99	45.33	46.00	-0.67
5	507.240	Peak	18.34	20.70	39.04	46.00	-6.96



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



## VERTICAL DATA

Condition: FCC CLASS-B 3m SUNOL BILOG 12/22/04 VERTICAL  
Test Operator: : NEELESH RAJ  
Project #: : 04U2883  
Company: : BROADCOM CORP  
EUT: : 802.11G  
Model No: : BCM94306MPLNA  
Configuration: : EUT  
Target of Test: : CLASS B  
Mode of Operation: TX WORST CASE  
: (WLAN=B MODE HIGH CHANNEL)

Page: 1

	Freq	Remark	Read Level	Factor	Level	Limit Line	Over Limit
	MHz		dBuV	dB	dBuV/m	dBuV/m	dB
1	31.940	QP	11.11	22.06	33.17	40.00	-6.83
2	303.540	QP	28.51	15.99	44.50	46.00	-1.50
3	509.180	QP	21.70	20.73	42.43	46.00	-3.57
4	606.180	QP	21.14	21.99	43.13	46.00	-2.87

## 7.2. 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  $\mu$ 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.

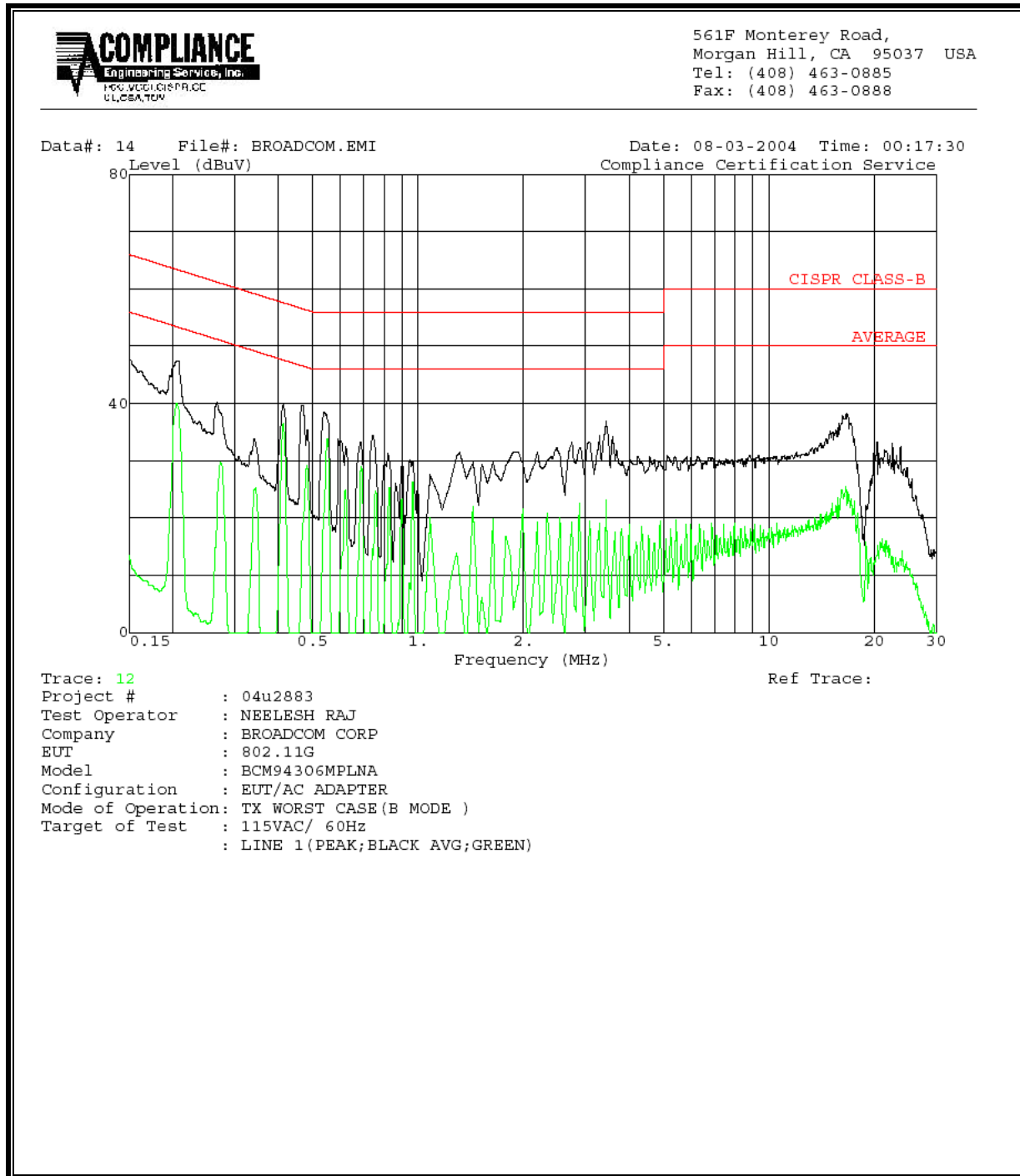
### RESULTS

No non-compliance noted:

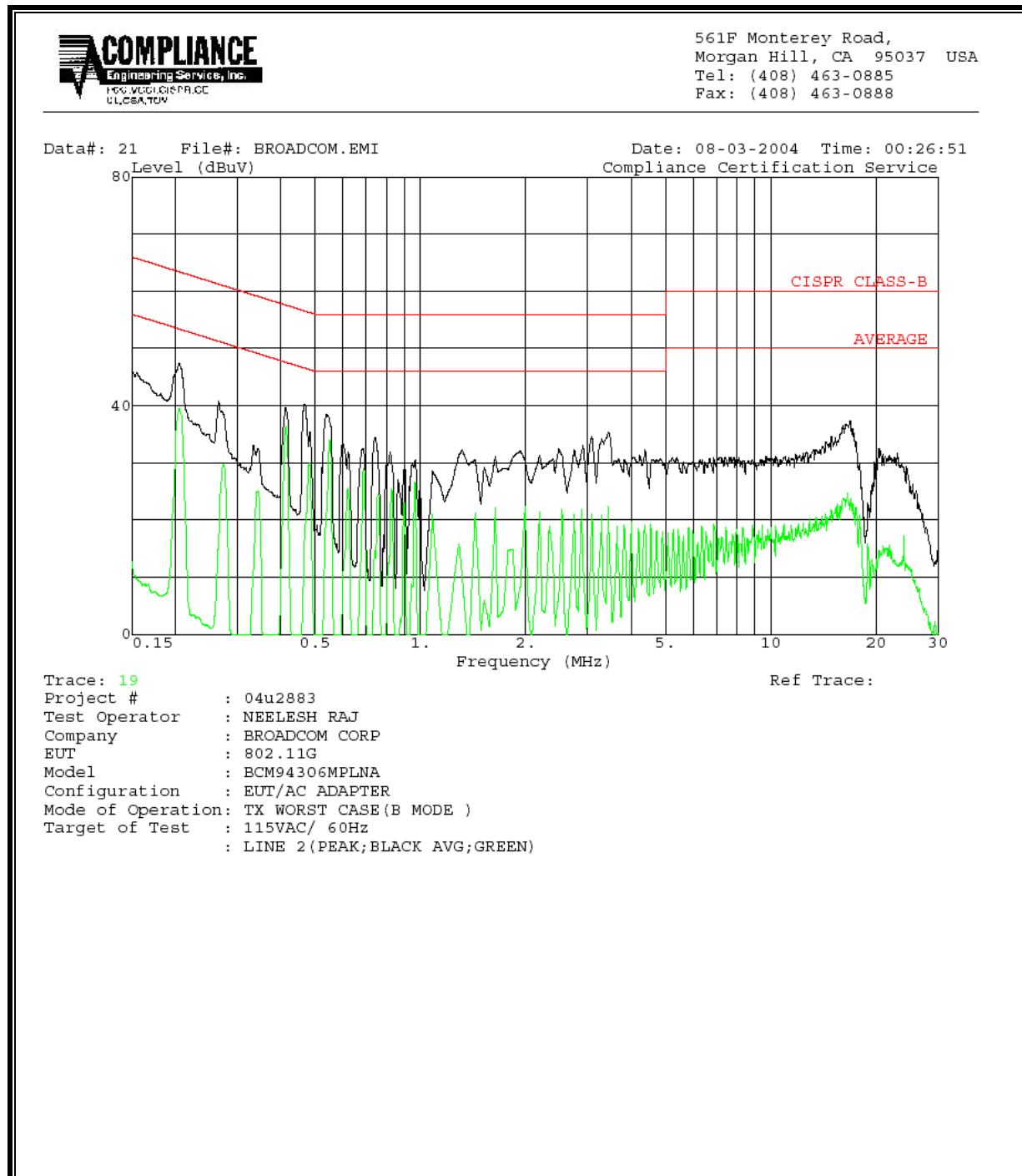
## 6 WORST EMISSIONS

CONDUCTED EMISSIONS DATA (115VAC 60Hz)									
Freq.	Reading			Closs	Limit	EN_B	Margin		Remark
(MHz)	PK (dBuV)	QP (dBuV)	AV (dBuV)	(dB)	QP	AV	QP (dB)	AV (dB)	L1 / L2
0.21	47.46	--	40.03	0.00	64.43	54.43	-16.97	-14.40	L1
16.66	38.34	--	24.52	0.00	60.00	50.00	-21.66	-25.48	L1
0.47	39.72	--	18.55	0.00	56.89	46.89	-17.17	-28.34	L1
0.21	47.38	--	39.53	0.00	64.43	54.43	-17.05	-14.90	L2
0.47	40.24	--	16.09	0.00	56.97	46.97	-16.73	-30.88	L2
0.41	39.60	--	36.26	0.00	58.49	48.49	-18.89	-12.23	L2
6 Worst Data									

## LINE 1 RESULTS



## LINE 2 RESULTS



## 8. CO-LOCATED TRANSMITTER EMISSIONS

### **SUPPLEMENTAL TEST PROCEDURE**

The EUT is placed on a non-conducting table 80 cm above the ground plane. The antenna The dominant transmitter is set to the worst case channel. The spurious emissions performance of the dominant transmitter is investigated as the settings of the non-dominant transmitter are varied. Worst case results are reported.

### **RESULTS**

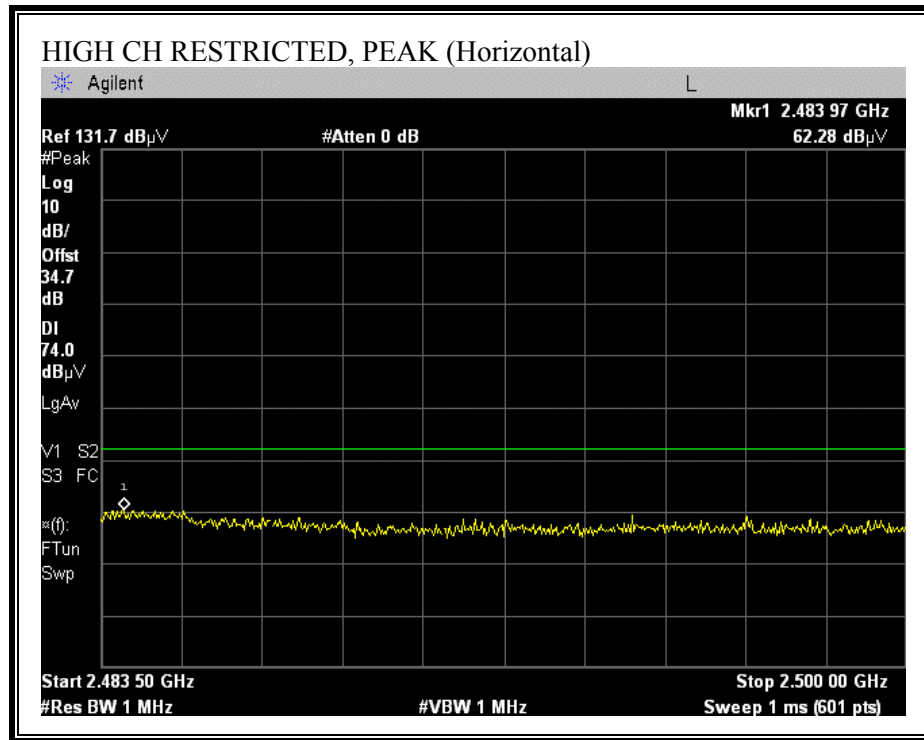
No non-compliance noted:

Dominant transmitter was the WLAN operating the 802.11b mode in the portable “Y” configuration on the high channel. The non-dominant transmitter was the bluetooth operating on the high channel with PRBS9 modulation at highest power.

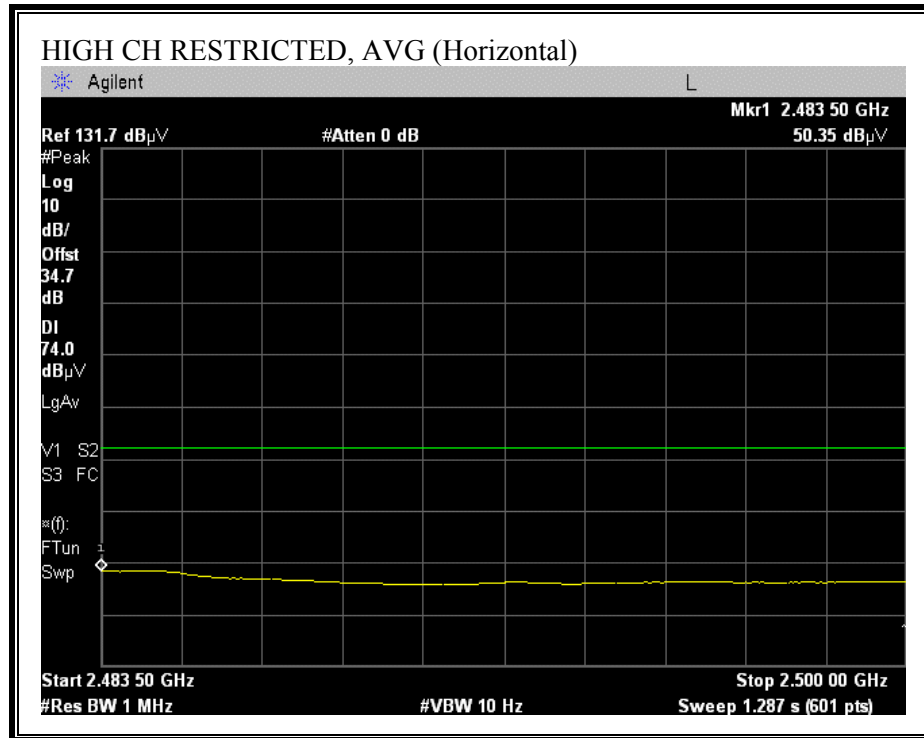
## 8.1. RADIATED EMISSIONS

### 8.1.1. CO-LOCATED RADIATED EMISSIONS ABOVE 1 GHZ

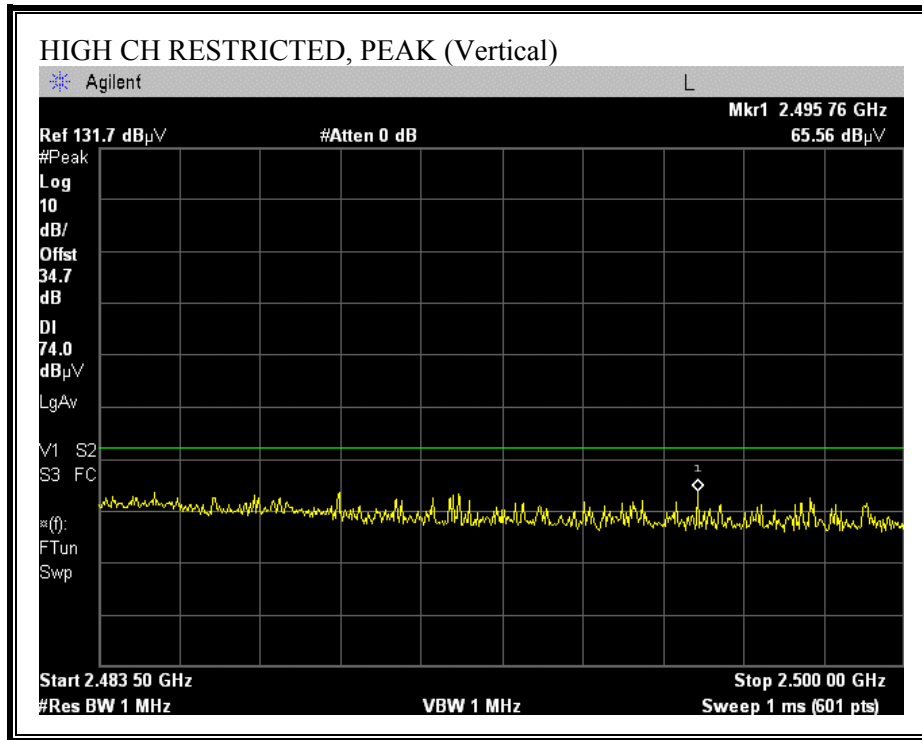
#### WORST-CASE RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)

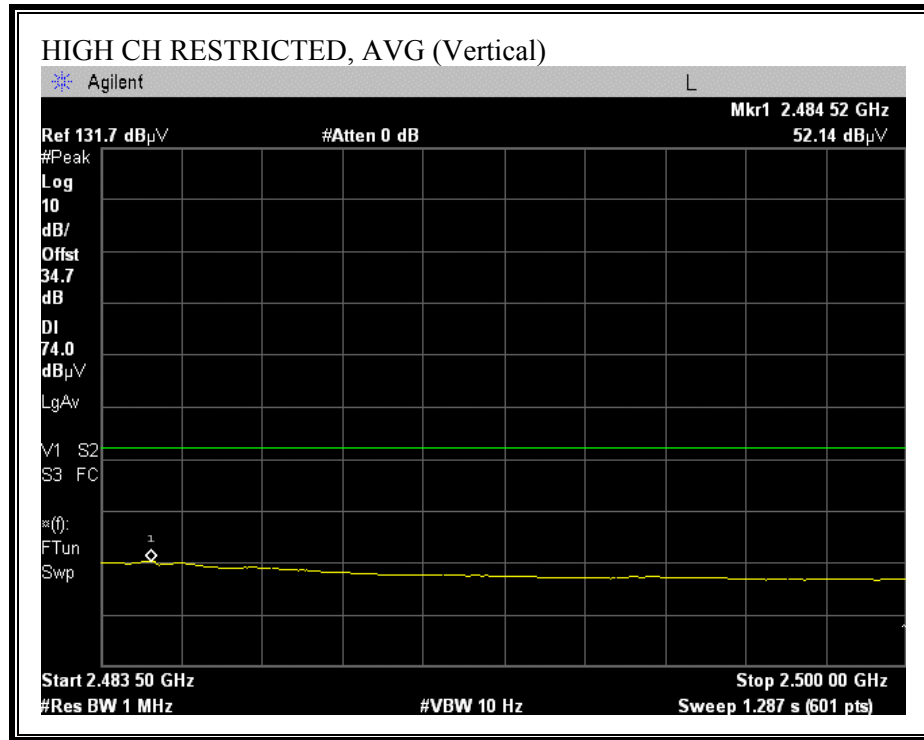






**WORST-CASE RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)**



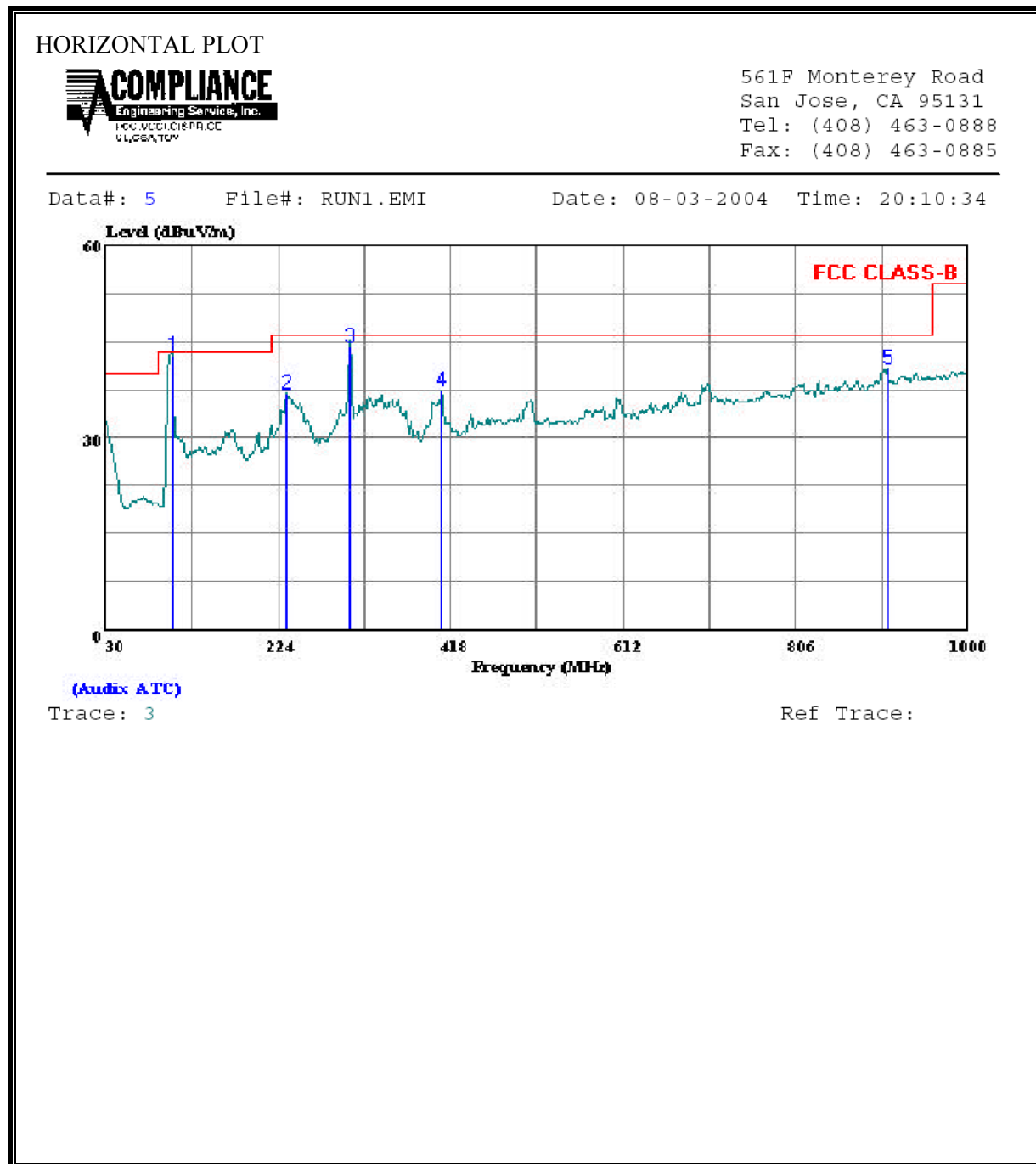


## WORST-CASE HARMONICS AND SPURIOUS EMISSIONS

07/03/04 High Frequency Measurement																
Compliance Certification Services, Morgan Hill Open Field Site																
Test Engr: NEELESH RAJ																
Project #: 04U2883																
Company: BROADCOM																
EUT Descr.: 802.11																
EUT M/N: BCM94306MPLNA																
Test Target: FCC																
Mode Oper: TX B MODE CO-LOCATED WITH BLUETOOTH HIGH CHANNEL																
Test Equipment:																
EMCO Horn 1-18GHz		Spectrum Analyzer		Pre-amplifier 1-26GHz		Pre-amplifier 26-40GHz		Horn > 18GHz								
T73; S/N: 6717 @3m				T86 Miteq 924341												
Hi Frequency Cables				Limit		Peak Measurements:				Average Measurements:						
<input type="checkbox"/> (2 ft) <input checked="" type="checkbox"/> (2 ~ 3 ft) <input type="checkbox"/> (4 ~ 6 ft) <input checked="" type="checkbox"/> (12 ft)				FCC 15.205		1 MHz Resolution Bandwidth 1MHz Video Bandwidth				1 MHz Resolution Bandwidth 10Hz Video Bandwidth						
f	Dist	Read Pk	Read Avg	AF	CL	Amp	D Corr	HPF	Peak	Avg	Pk Lim	Avg Lim	Pk Mar	Avg Mar	Notes	
GHz	feet	dBuV	dBuV	dB/m	dB	dB	dB		dBuV/m	dBuV/m	dBuV/m	dBuV/m	dB	dB		
HIGH CHANNEL SPURIOUS																
4.924	9.8	62.3	45.2	33.5	3.3	-45.7	0.0	1.0	54.4	37.2	74.0	54.0	-19.6	-16.8	V	
7.386	9.8	46.9	35.7	36.0	4.3	-46.5	0.0	1.0	41.6	30.4	74.0	54.0	-32.4	-23.6	V	
12.310	9.8	45.0	33.5	39.2	6.0	-45.7	0.0	1.0	45.4	33.9	74.0	54.0	-28.6	-20.1	V	
4.924	9.8	60.3	44.7	33.5	3.3	-45.7	0.0	1.0	52.3	36.7	74.0	54.0	-21.7	-17.3	H	
7.386	9.8	48.7	37.0	36.0	4.3	-46.5	0.0	1.0	43.4	31.7	74.0	54.0	-30.6	-22.3	H	
12.310	9.8	45.7	33.7	39.2	6.0	-45.7	0.0	1.0	46.1	34.1	74.0	54.0	-27.9	-19.9	H	
NO OTHER SPURIOUS EMISSIONS DETECTED ABOVE THE SYSTEM NOISE IN THE RESTRICTED BANDS -20dB TO THE LIMIT																
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									

## 8.1.2. CO-LOCATED RADIATED EMISSIONS BELOW 1 GHZ

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



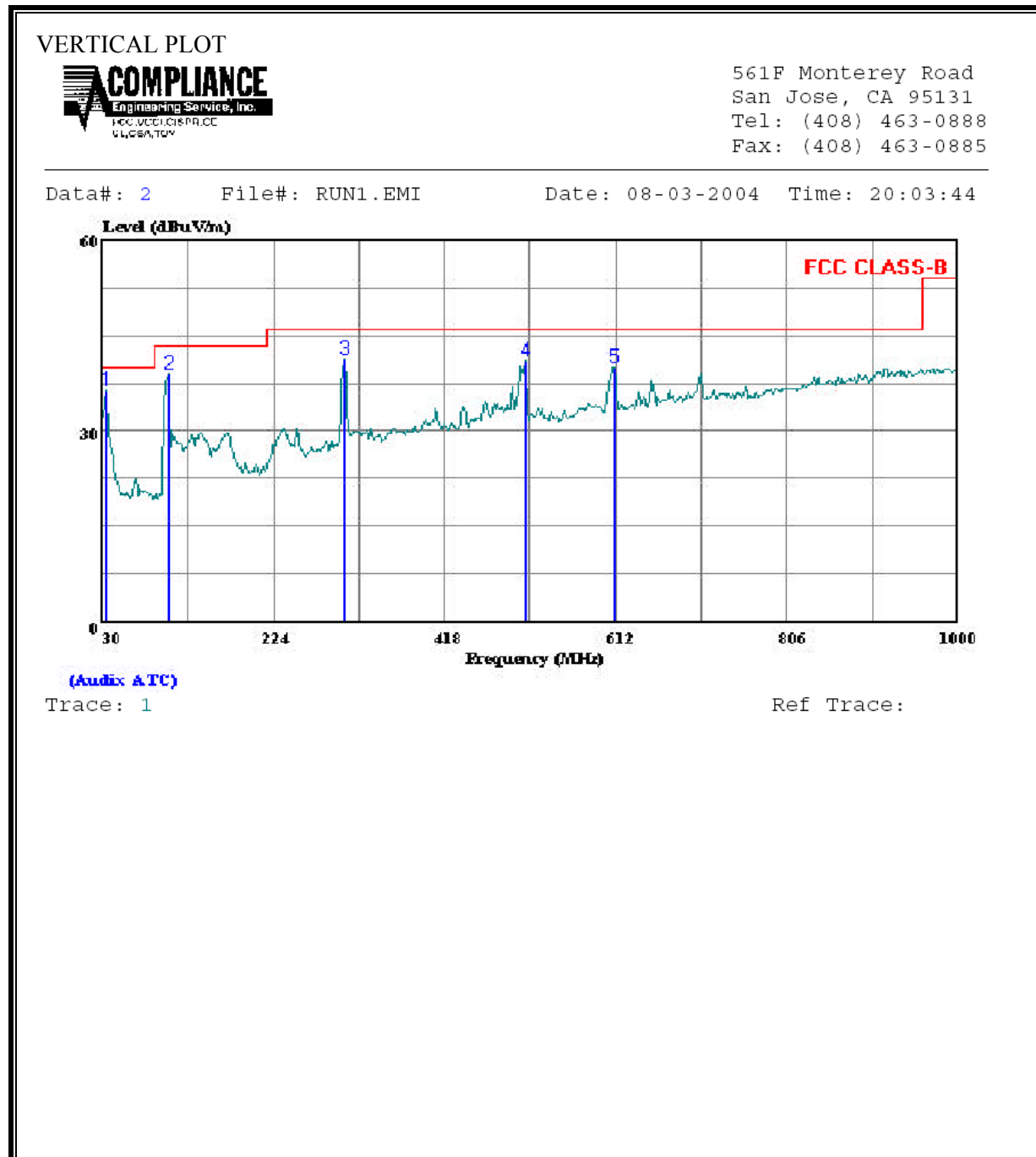
#### HORIZONTAL DATA

Condition: FCC CLASS-B 3m SUNOL BILOG 12/22/04 HORIZONTAL  
Test Operator: : NEELESH RAJ  
Project #: : 04U2883  
Company: : BROADCOM CORP  
EUT: : 802.11  
Model No: : BCM94306MPLNA  
Configuration: : EUT  
Target of Test: : CLASS B  
Mode of Operation: TX WORST CASE (CO-LOCATION)  
: (WLAN=B MODE HIGH CHANNEL)  
: (BLUETOOTH=HIGH CHANNEL)

Page: 1

	Freq	Remark	Read		Level	Limit	Over
			Level	Factor		Line	Limit
	MHz		dBuV	dB	dBuV/m	dBuV/m	dB
1	104.690	QP	30.81	12.11	42.92	43.50	-0.58
2	232.730	Peak	23.49	13.39	36.88	46.00	-9.12
3	305.480	QP	28.12	16.03	44.15	46.00	-1.85
4	407.330	Peak	18.92	18.39	37.31	46.00	-8.69
5	909.790	Peak	14.28	26.42	40.70	46.00	-5.30

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



#### VERTICAL DATA

Condition: FCC CLASS-B 3m SUNOL BILOG 12/22/04 VERTICAL  
Test Operator: : NEELESH RAJ  
Project #: : 04U2883  
Company: : BROADCOM CORP  
EUT: : 802.11  
Model No: : BCM94306MPLNA  
Configuration: : EUT  
Target of Test: : CLASS B  
Mode of Operation: TX WORST CASE (CO-LOCATION)  
: (WLAN=B MODE HIGH CHANNEL)  
: (BLUETOOTH=HIGH CHANNEL)

Page: 1

	Freq	Remark	Read		Limit		Over
			Level	Factor	Level	Line	Limit
	MHz		dBuV	dB	dBuV/m	dBuV/m	dB
1	33.880	Peak	15.70	20.70	36.40	40.00	-3.60
2	104.690	Peak	26.89	12.11	39.00	43.50	-4.50
3	305.480	Peak	25.39	16.03	41.42	46.00	-4.58
4	509.180	Peak	20.23	20.73	40.96	46.00	-5.04
5	611.030	Peak	18.08	22.03	40.11	46.00	-5.89



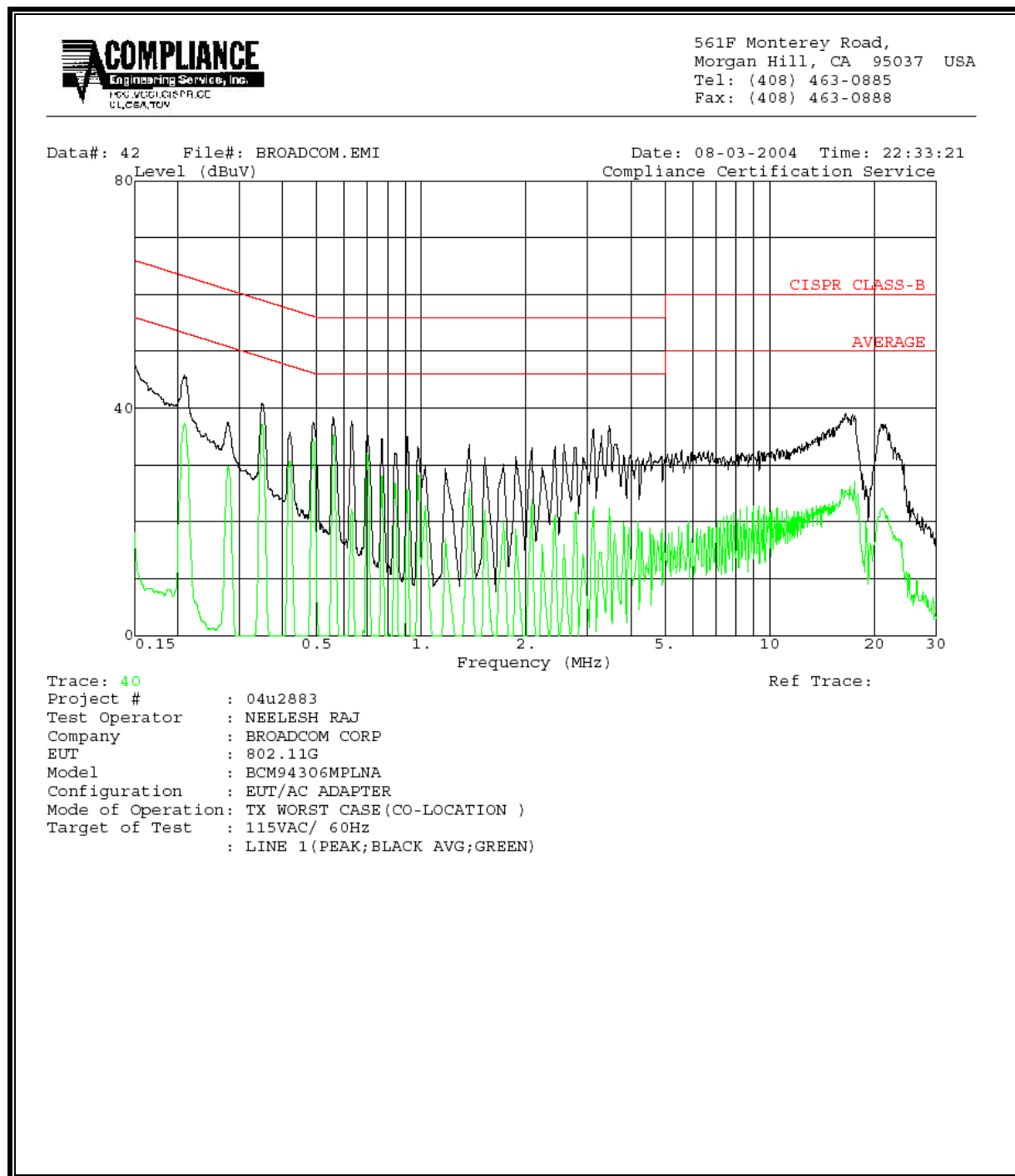
## 8.2. POWERLINE CONDUCTED EMISSIONS

### 8.2.1. CO-LOCATED POWERLINE CONDUCTED EMISSIONS

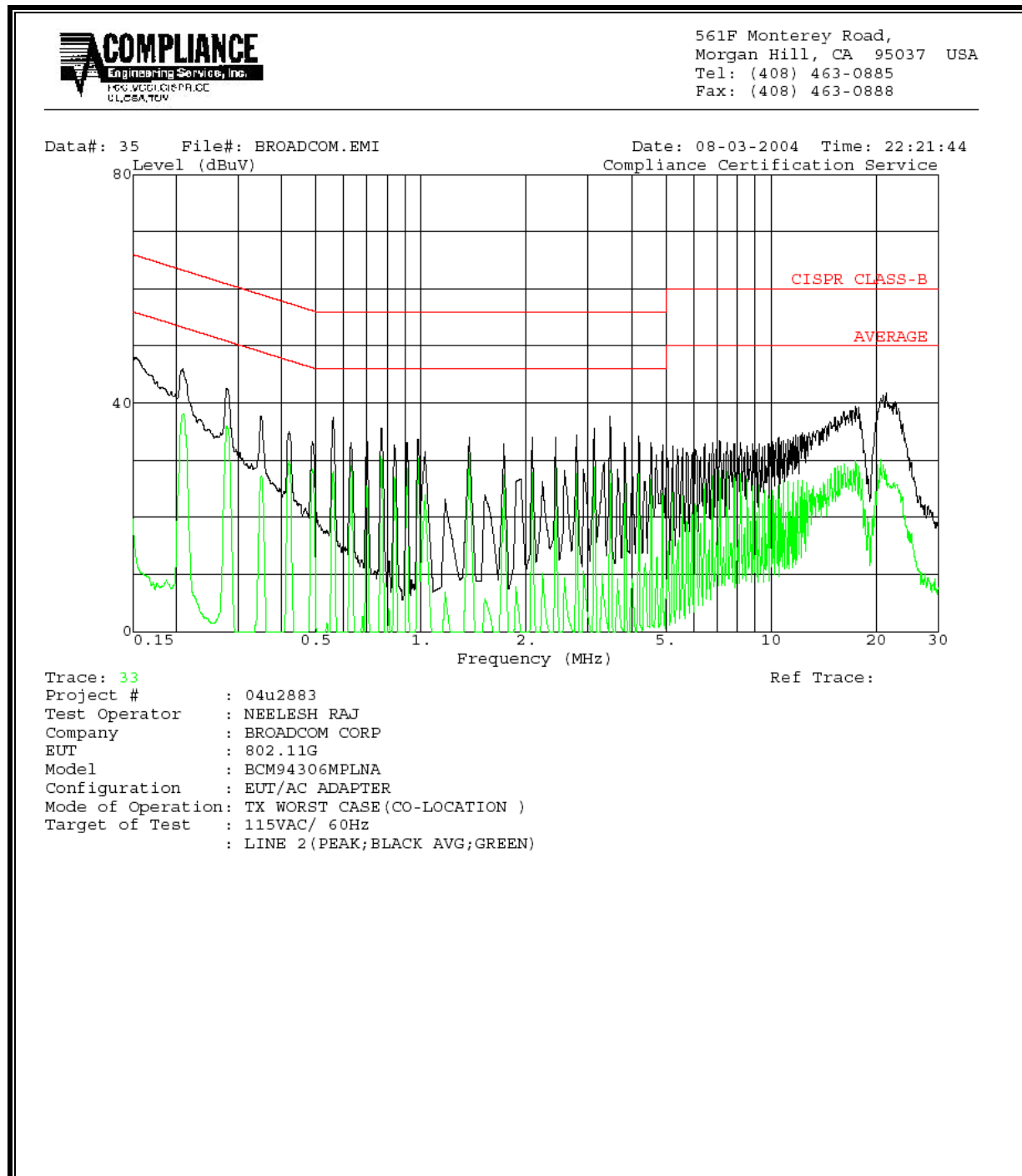
#### 6 WORST EMISSIONS

CONDUCTED EMISSIONS DATA (115VAC 60Hz)									
Freq.	Reading			Closs	Limit	EN B	Margin		Remark
(MHz)	PK (dBuV)	QP (dBuV)	AV (dBuV)	(dB)	QP	AV	QP (dB)	AV (dB)	L1 / L2
0.15	47.82	--	18.07	0.00	66.00	56.00	-18.18	-37.93	L1
0.21	45.82	--	37.26	0.00	64.34	54.34	-18.52	-17.08	L1
0.35	40.88	--	37.04	0.00	60.34	50.34	-19.46	-13.30	L1
0.15	49.16	--	19.78	0.00	66.00	56.00	-16.84	-36.22	L2
0.21	45.96	--	38.07	0.00	64.34	54.34	-18.38	-16.27	L2
0.28	42.58	--	36.04	0.00	62.31	52.31	-19.73	-16.27	L2
6 Worst Data									

## LINE 1 RESULTS



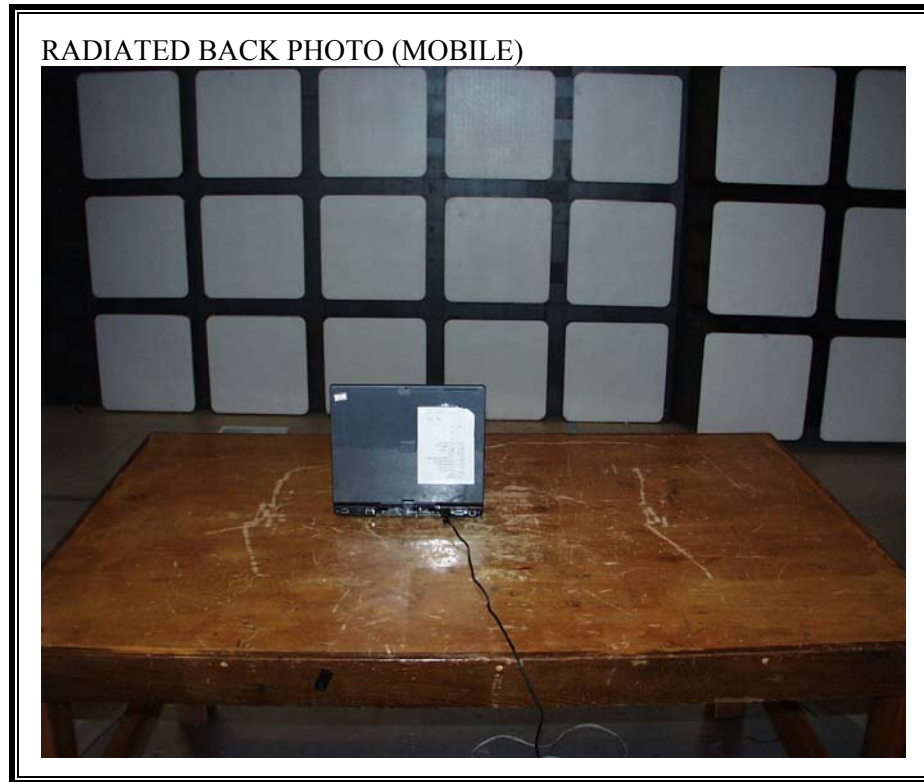
## LINE 2 RESULTS



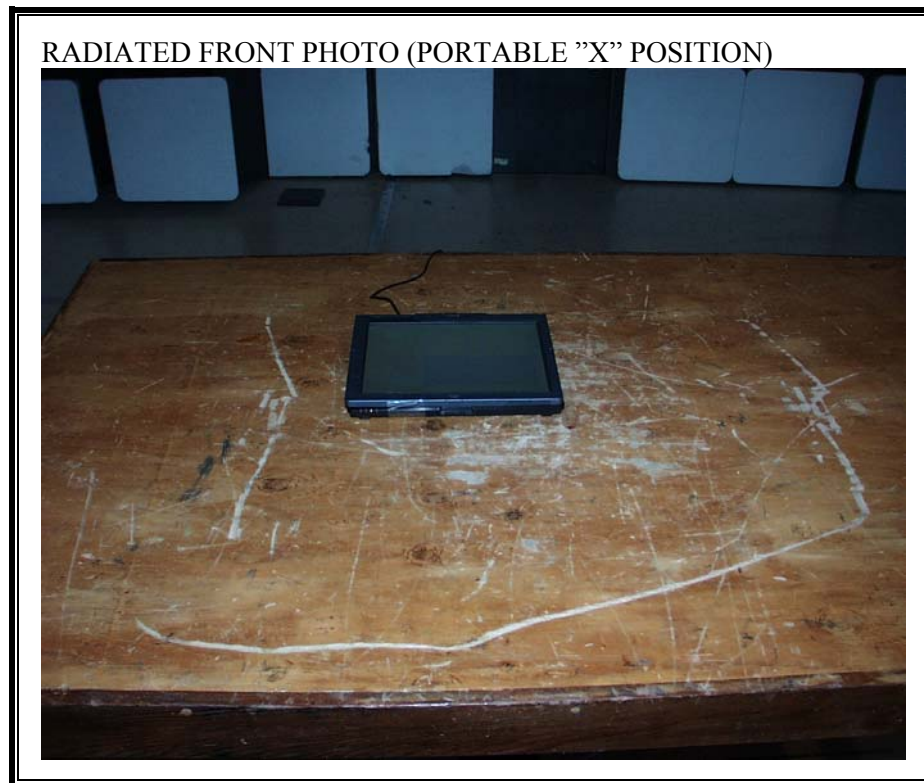
## 9. SETUP PHOTOS

### RADIATED RF MEASUREMENT SETUP (MOBILE)





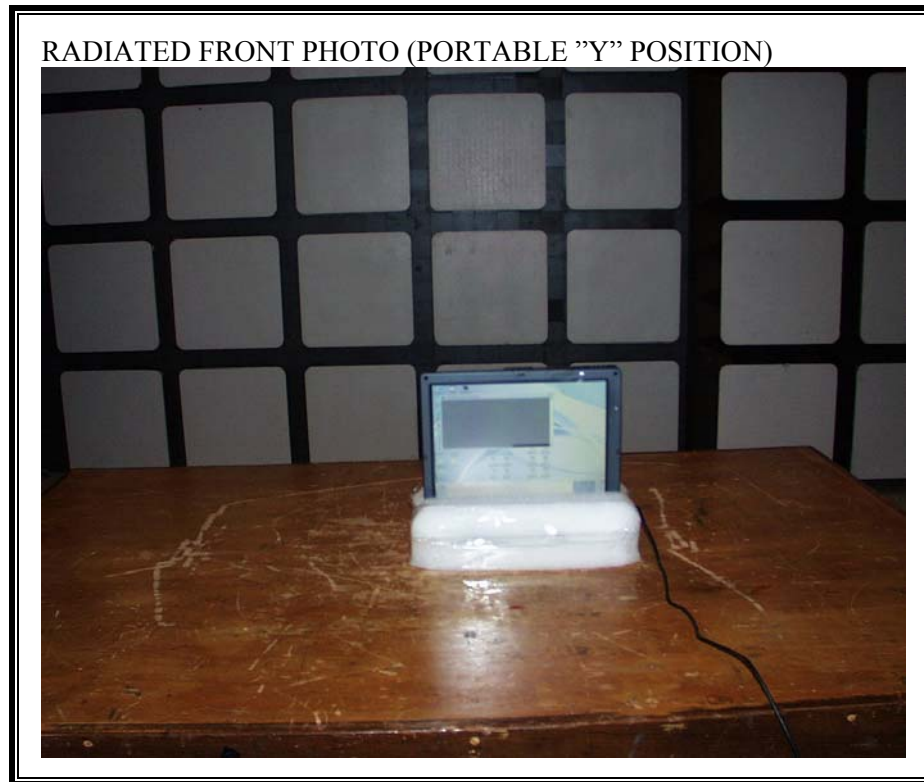
**RADIATED RF MEASUREMENT SETUP (PORTABLE)**



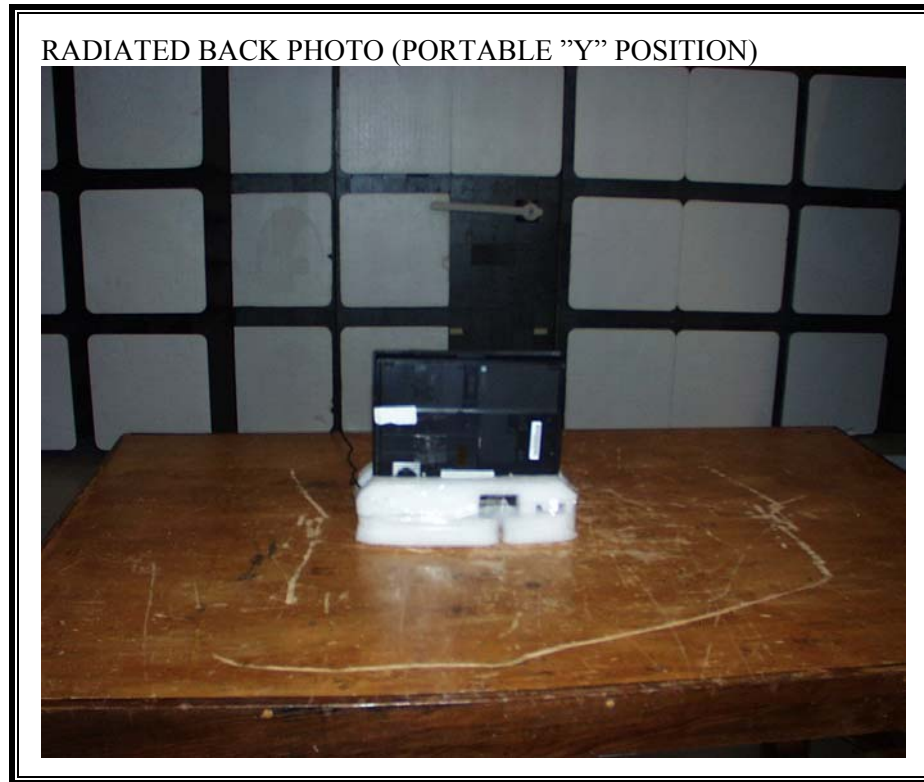
RADIATED BACK PHOTO (PORTABLE "X" POSITION)

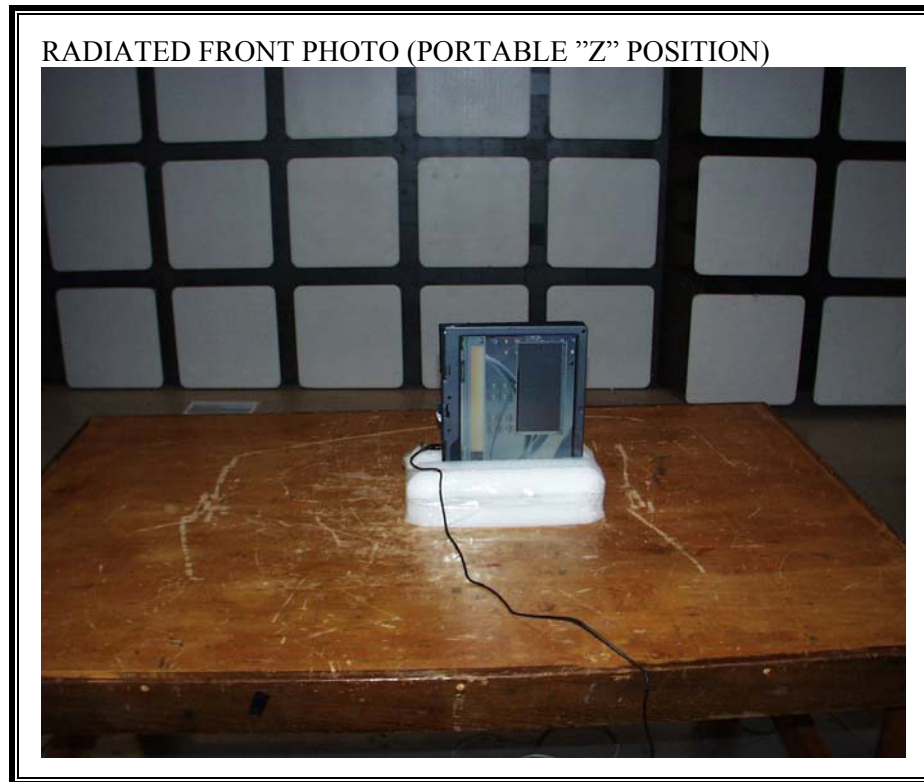








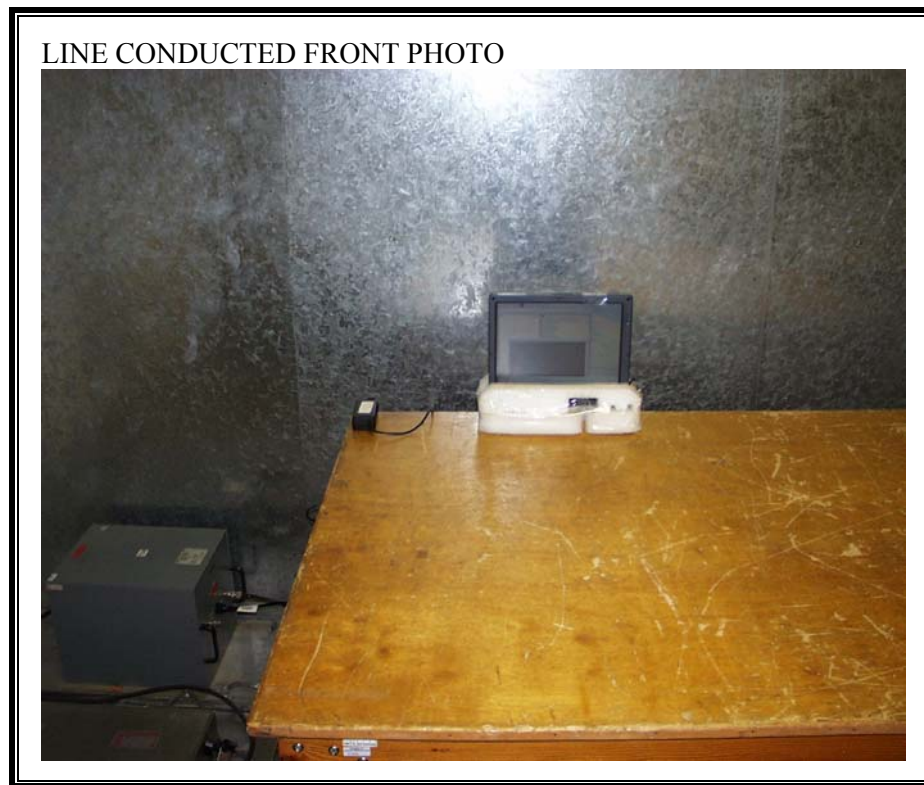




RADIATED BACK PHOTO (PORTABLE "Z" POSITION)



**POWERLINE CONDUCTED EMISSIONS MEASUREMENT SETUP**



LINE CONDUCTED BACK PHOTO



**END OF REPORT**