



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

**FOR**

**802.11b/g TRANSCEIVER IN SD FORM FACTOR**

**MODEL NUMBER: EYE-FI-2GB**

**REPORT NUMBER: 07U11324-1, REVISION B**

**ISSUE DATE: OCTOBER 15, 2007**

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**NVLAP LAB CODE 200065-0**

Revision History

<u>Rev.</u>	<u>Issue Date</u>	<u>Revisions</u>	<u>Revised By</u>
--	09/27/07	Initial Issue	F. Ibrahim
B	10/15/07	Removed reference to FCC Subpart E in section 1	F. Ibrahim

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# 1. ATTESTATION OF TEST RESULTS

**COMPANY NAME:** EYE-FI, INC.  
305 W. EVELYN AVENUE  
MOUNTAIN VIEW, CA 94041, U.S.A.

**EUT DESCRIPTION:** 802.11B/G TRANSCEIVER IN SD FORM FACTOR

**MODEL:** EYE-FI-2GB

**SERIAL NUMBER:** 02000

**DATE TESTED:** SEPTEMBER 20-22, 2007

APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
CFR 47 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:



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FRANK IBRAHIM  
EMC SUPERVISOR  
COMPLIANCE CERTIFICATION SERVICES

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CAN MING 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, FCC CFR 47 Part 15.

## 3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 47173 Benicia Street, Fremont, California, USA.

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 EUT

The EUT is an 802.11b/g transceiver in Secure Digital (SD) form factor.

The radio module is manufactured by Wintec Industries, Inc.

### 5.2. MAXIMUM OUTPUT POWER

The transmitter has a maximum peak output power as follows:

Frequency Range (MHz)	Mode	Output EIRP (dBm)	Antenna Gain (dBi)	Output Conducted Power (dBm)	Output Conducted Power (mW)
2412 - 2462	802.11b/g	13.14	1.50	11.64	14.59

### 5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes an internal antenna with a gain of 1.5 dBi.

### 5.4. SOFTWARE AND FIRMWARE

The firmware revision installed in the EUT during testing was "August 16, 2007".

### 5.5. WORST-CASE CONFIGURATION AND MODE

Three orthogonal orientations for the EUT were investigated, and it was found that Y orientation is the worst case.

The worst-case channel is determined as the channel with the highest output power, highest measured output power was for Middle Channel (2437 MHz), therefore, for radiated emissions below 1 GHz and for power line conducted emissions, Y orientation and middle channel were used.

## 5.6. DESCRIPTION OF TEST SETUP

### SUPPORT EQUIPMENT

PERIPHERAL SUPPORT EQUIPMENT LIST				
Description	Manufacturer	Model	Serial Number	FCC ID
Camera	Canon	PC1130	242-8915285	N/A
Ac Adapter	Buffalo	U1318-0526	706-0159791	N/A
Router	Buffalo	WHR-HP-651	940-74572764	FDI-091015770
PC	Apple	MAC	YM2627CWQA	N/A
Ac Adapter	Apple	A1188	N/A	N/A
DC/DC	SIMA	SOP-60M	N/A	N/A
Ac Adapter	T6I	UD-1310C	N/A	N/A

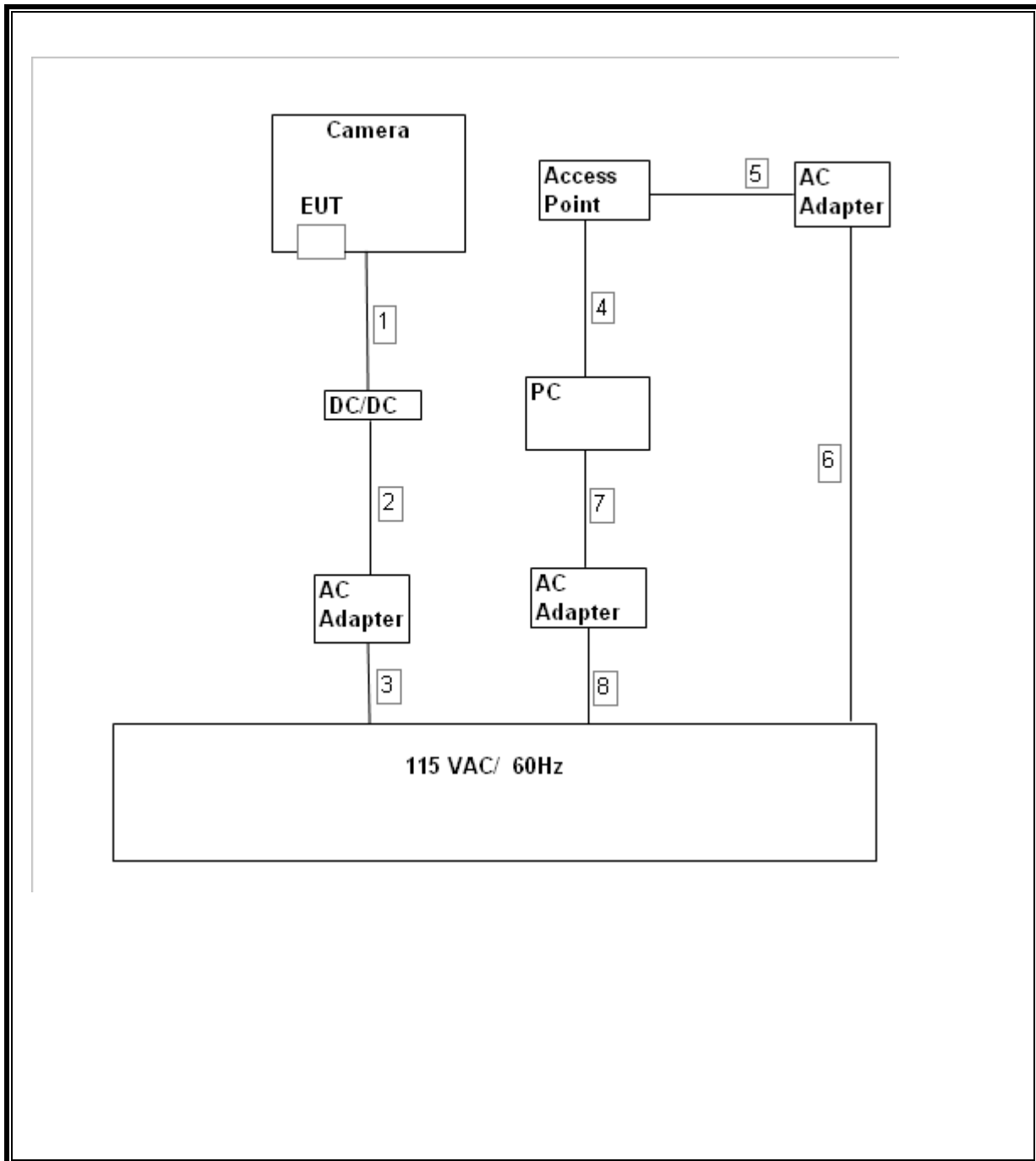
### I/O CABLES

I/O CABLE LIST						
Cable No.	Port	# of Identical Ports	Connector Type	Cable Type	Cable Length	Remarks
1	DC	1	DC	Unshielded	2m	N/A
2	DC	1	DC	Unshielded	2m	N/A
3	AC	1	AC	Unshielded	2m	N/A
4	Ethernet	1	RJ45	Unshielded	2m	Ferrite on PC END
5	DC	1	DC	Unshielded	2m	N/A
6	AC	1	AC	Unshielded	2m	N/A
7	DC	1	DC	Unshielded	2m	N/A
8	AC	1	AC	Unshielded	2m	N/A

### TEST SETUP

The EUT is installed in a host camera during the tests. Test software exercised the EUT.

**SETUP DIAGRAM FOR TESTS**





## 6. 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	S/N	Cal Due
Spectrum Analyzer 3 Hz ~ 44 GHz	Agilent / HP	E4446A	MY45300064	03/18/08
Antenna, Horn 1 ~ 18 GHz	EMCO	3115	6717	04/15/08
Preamplifier, 1 ~ 26.5 GHz	Agilent / HP	8449B	3008A00369	08/01/08
EMI Receiver, 9 kHz ~ 2.9 GHz	Agilent / HP	8542E	3942A00286	06/12/08
RF Filter Section	Agilent / HP	85420E	3705A00256	06/12/08
EMI Test Receiver	R & S	ESHS 20	827129/006	01/27/08
LISN, 10 kHz ~ 30 MHz	FCC	LISN-50/250-25-2	2023	10/15/07
Antenna, Bilog 30 MHz ~ 2 GHz	Sunol Sciences	JB1	A121003	11/13/07
Preamplifier, 1300 MHz	Agilent / HP	8447D	1937A02062	01/23/08
Antenna, Horn 18 ~ 26 GHz	ARA	MWH-1826/B	1049	09/12/08

## 7. CHANNEL TEST RESULTS

### 7.1. 6 dB BANDWIDTH

#### LIMITS

FCC §15.247 (a) (2)

The minimum 6 dB bandwidth shall be at least 500 kHz.

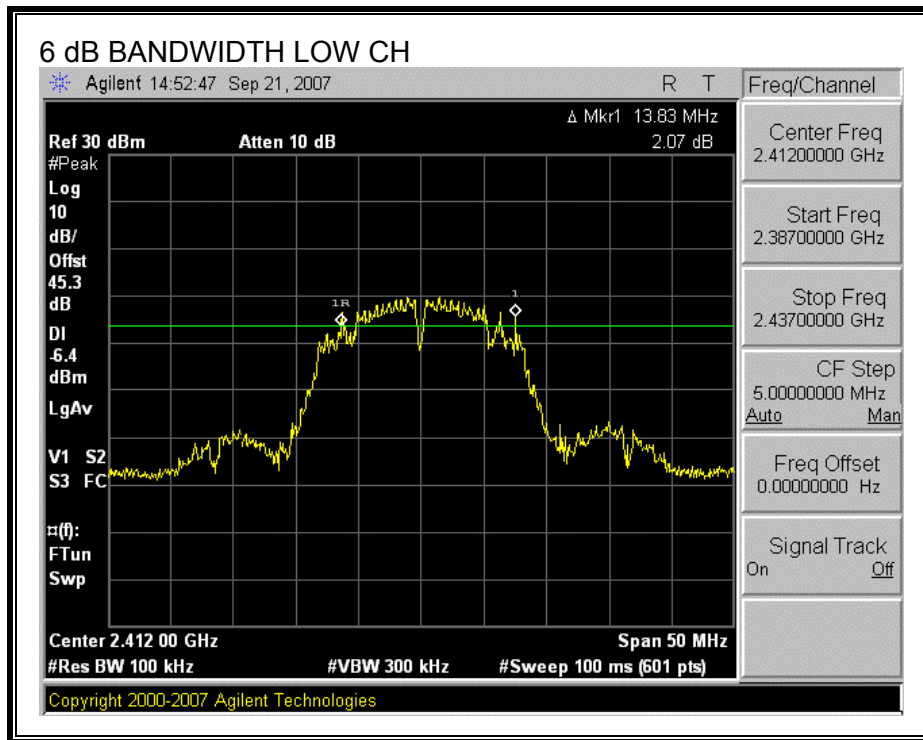
#### TEST PROCEDURE

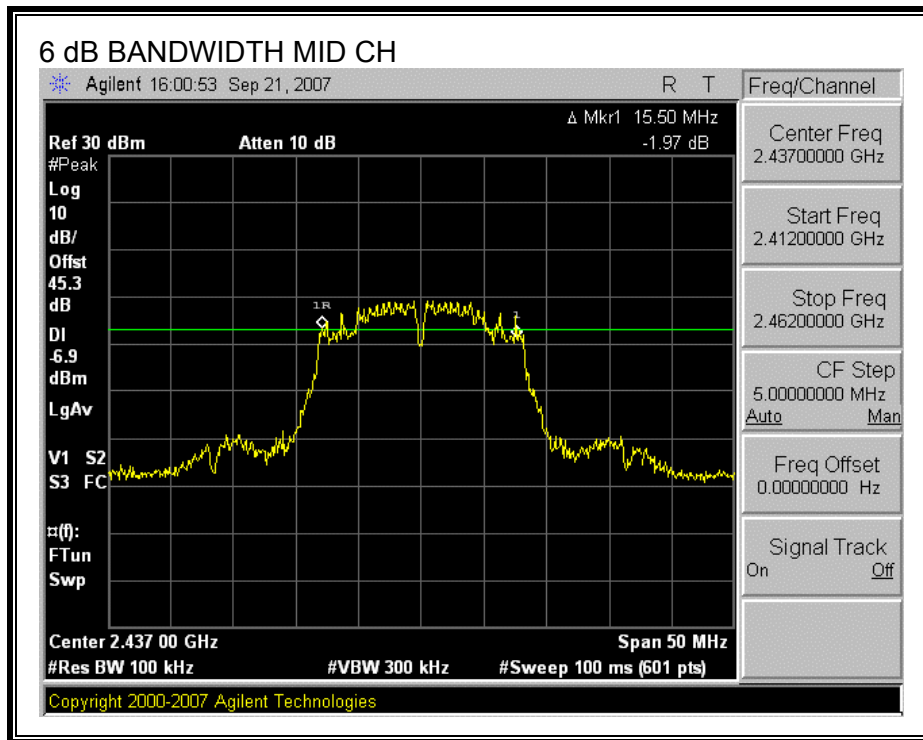
The transmitter radiated fundamental frequency is received by a horn antenna that was connected to a spectrum analyzer. The RBW is set to 100 kHz and the VBW is set to 300 kHz. The sweep time is coupled.

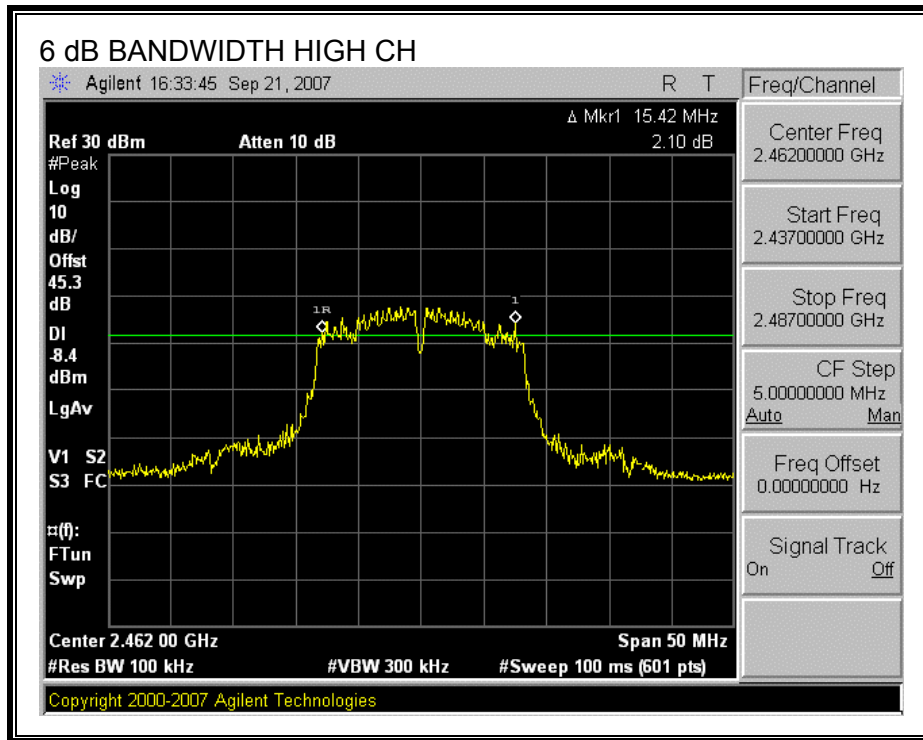
#### RESULTS

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	2412	13.83	0.5
Middle	2437	15.50	0.5
High	2462	15.42	0.5

**6 dB BANDWIDTH**







## 7.2. 99% BANDWIDTH

### LIMITS

None; for reporting purposes only.

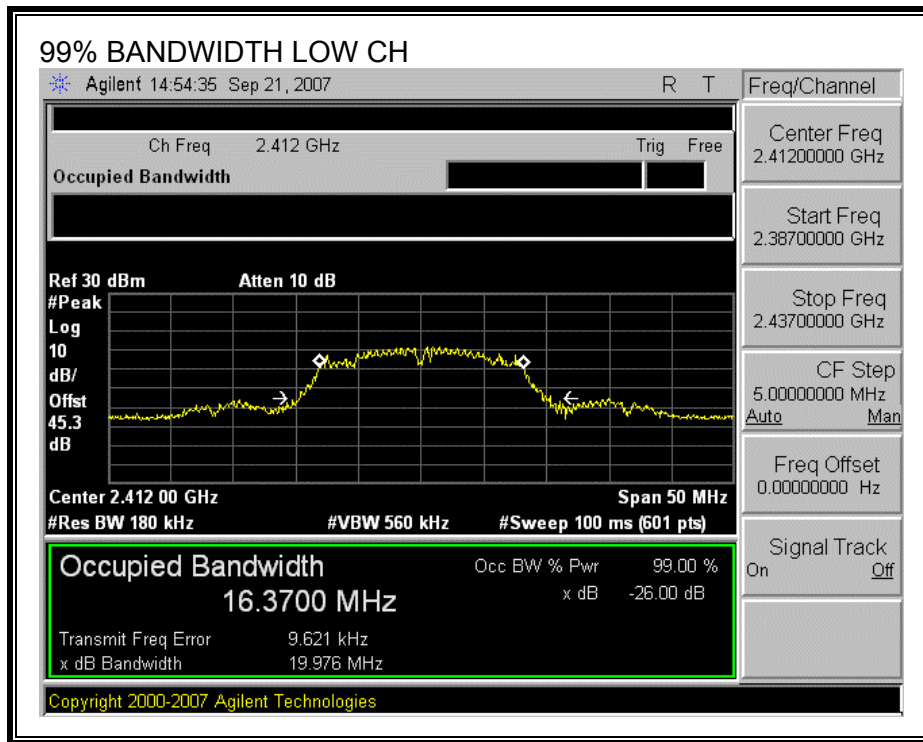
### TEST PROCEDURE

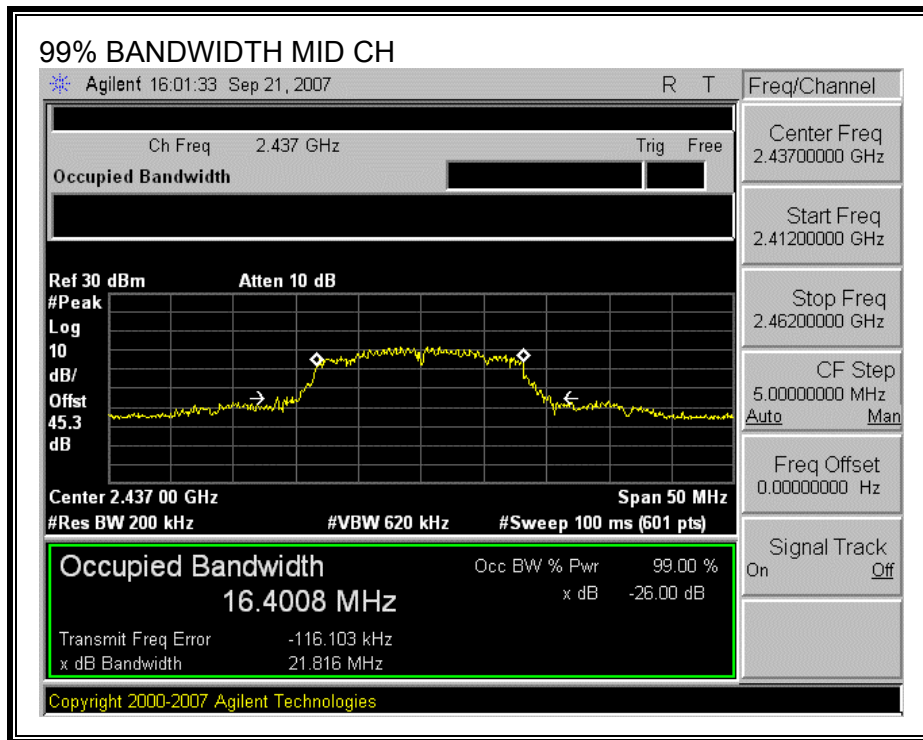
The transmitter radiated fundamental frequency is received by a horn antenna that was connected to the spectrum analyzer. The RBW is set to 1% to 3% of the 99 % bandwidth. The VBW is set to 3 times the RBW. The sweep time is coupled. The spectrum analyzer internal 99% bandwidth function is utilized.

### RESULTS

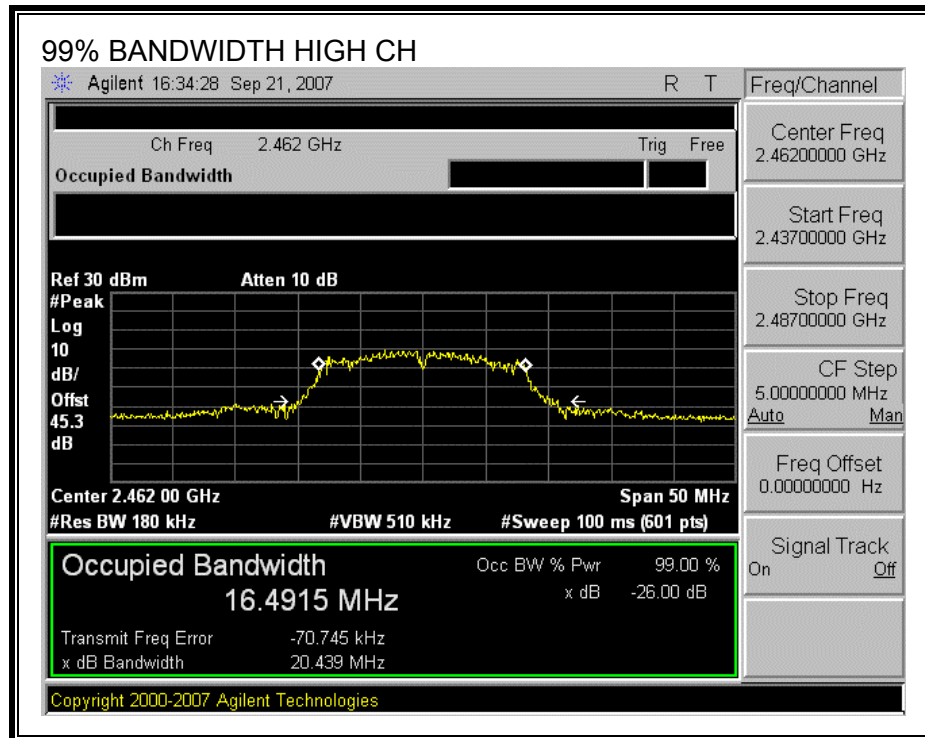
Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	2412	16.3700
Middle	2437	16.4008
High	2462	16.4915

**99% BANDWIDTH**









### 7.3. OUTPUT POWER

#### LIMITS

FCC §15.247 (b)

The maximum antenna gain is less than or equal to 6 dBi, therefore the limit is 30 dBm.

#### TEST PROCEDURE

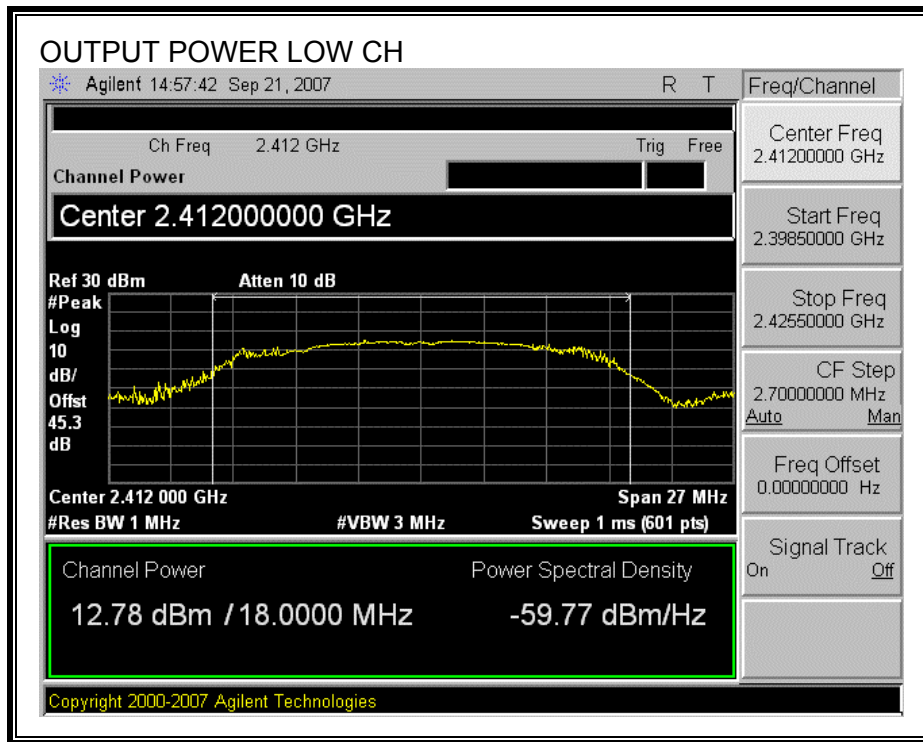
Peak power is measured using the spectrum analyzer's internal channel power integration function. Power is integrated over a bandwidth greater than or equal to the 99% bandwidth.

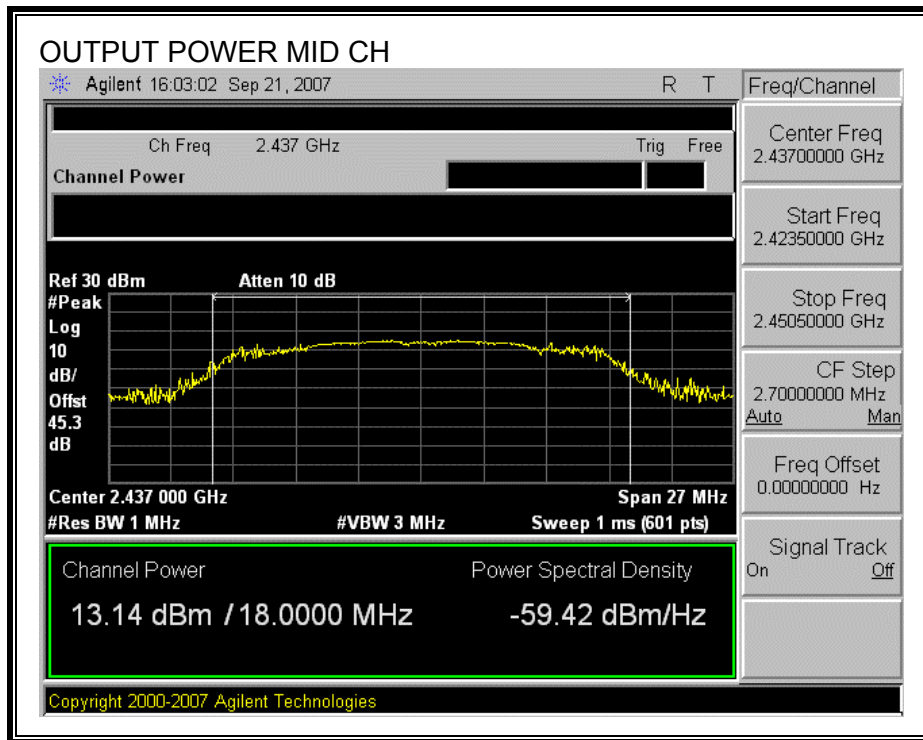
Maximum Conducted Output Power based on RMS averaging over a time interval is calculated based on the measured EIRP in accordance with FCC document "Measurement of Digital Transmission Systems Operating under Section 15.247", March 23, 2005. The transmitter operates continuously therefore Power Output Option 2, Method # 1 is used.

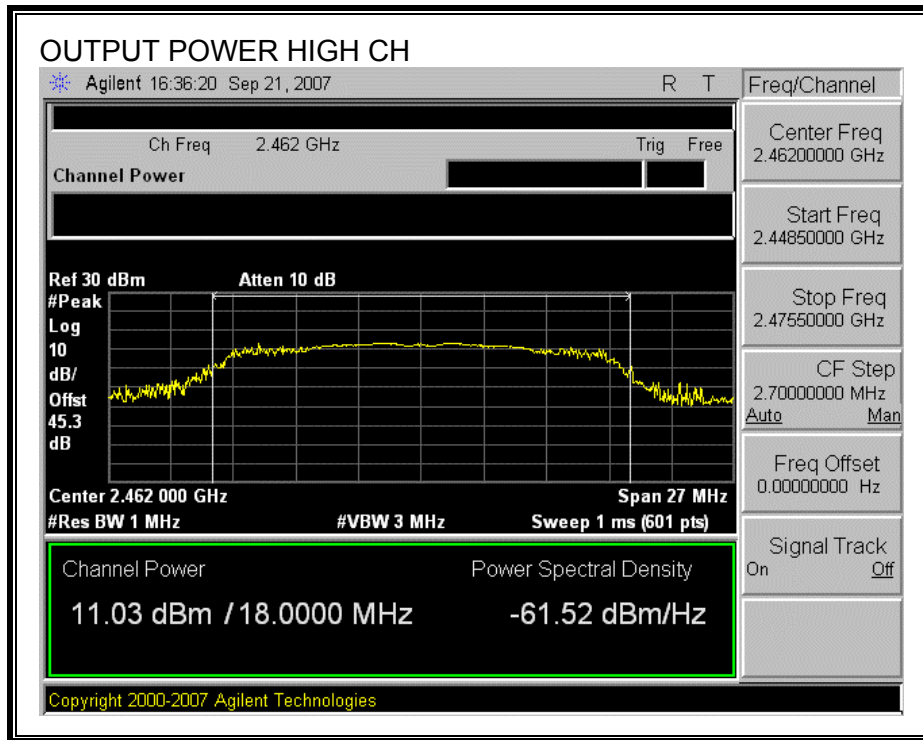
#### RESULTS

Channel	Frequency (MHz)	Measured EIRP (dBm)	Antenna Gain (dBi)	RF Conducted Power (dBm)	Limit (dBm)	Margin (dB)
Low	2412	12.78	1.50	11.28	30	-18.72
Middle	2437	13.14	1.50	11.64	30	-18.36
High	2462	11.03	1.50	9.53	30	-20.47

**OUTPUT POWER**







## 7.4. POWER SPECTRAL DENSITY

### LIMITS

FCC §15.247 (e)

The power spectral density conducted from the transmitter to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

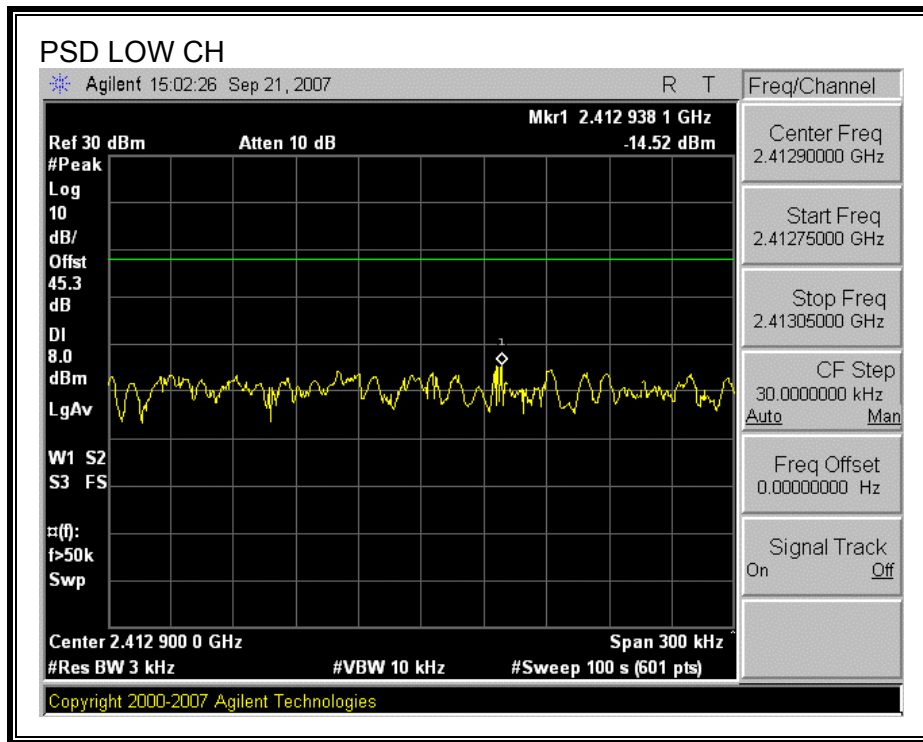
### TEST PROCEDURE

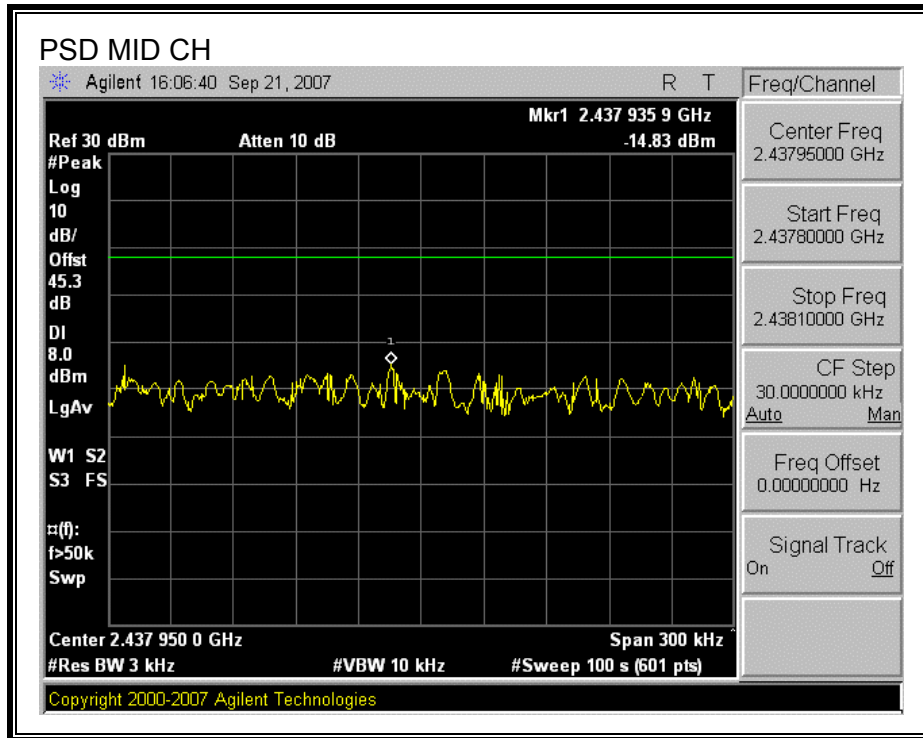
Output power was measured based on the use of a peak measurement, therefore the power spectral density was measured using PSD Option 1 in accordance with FCC document "Measurement of Digital Transmission Systems Operating under Section 15.247", March 23, 2005.

### RESULTS

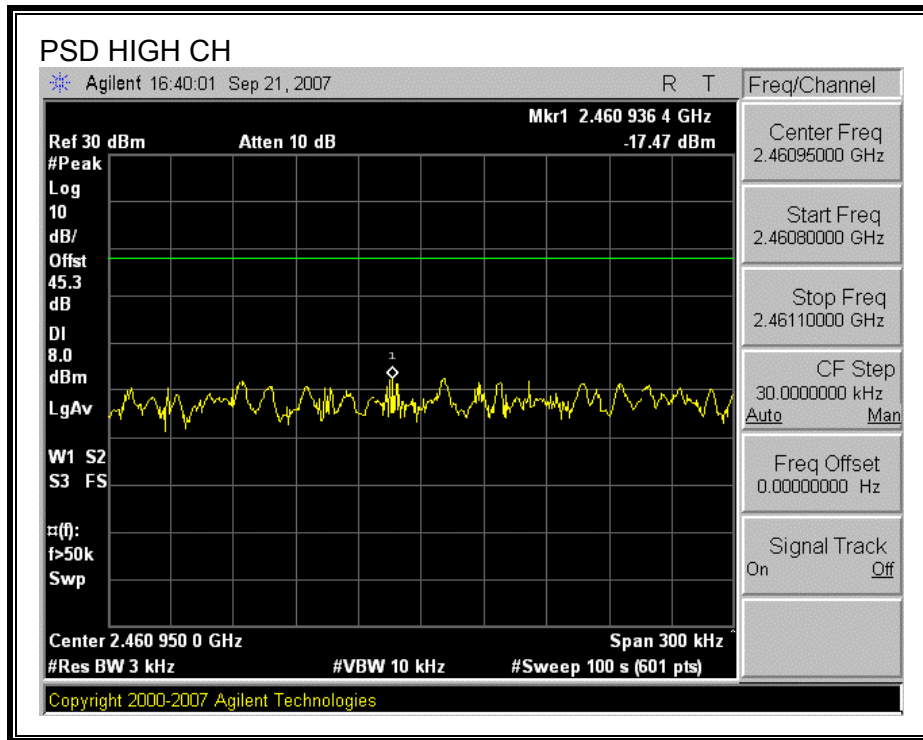
Channel	Frequency (MHz)	EIRP PPSD (dBm)	Antenna Gain (dBi)	Conducted PPSD (dBm)	Limit (dBm)	Margin (dB)
Low	2412	-14.52	1.50	-16.02	8	-24.02
Middle	2437	-14.83	1.50	-16.33	8	-24.33
High	2462	-17.47	1.50	-18.97	8	-26.97

**POWER SPECTRAL DENSITY**









## 8. RADIATED TEST RESULTS

### 8.1 LIMITS AND PROCEDURE

#### LIMITS

FCC §15.205 and §15.209

Frequency Range (MHz)	Field Strength Limit (uV/m) at 3 m	Field Strength Limit (dBuV/m) at 3 m
30 - 88	100	40
88 - 216	150	43.5
216 - 960	200	46
Above 960	500	54

#### 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, and 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 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.

## **8.2 RADIATED SPURIOUS EMISSIONS (OUTSIDE RESTRICTED BANDS)**

### **LIMITS**

FCC §15.247 (d)

Output power was measured based on the use of a peak measurement, therefore the required attenuation is 20 dB.

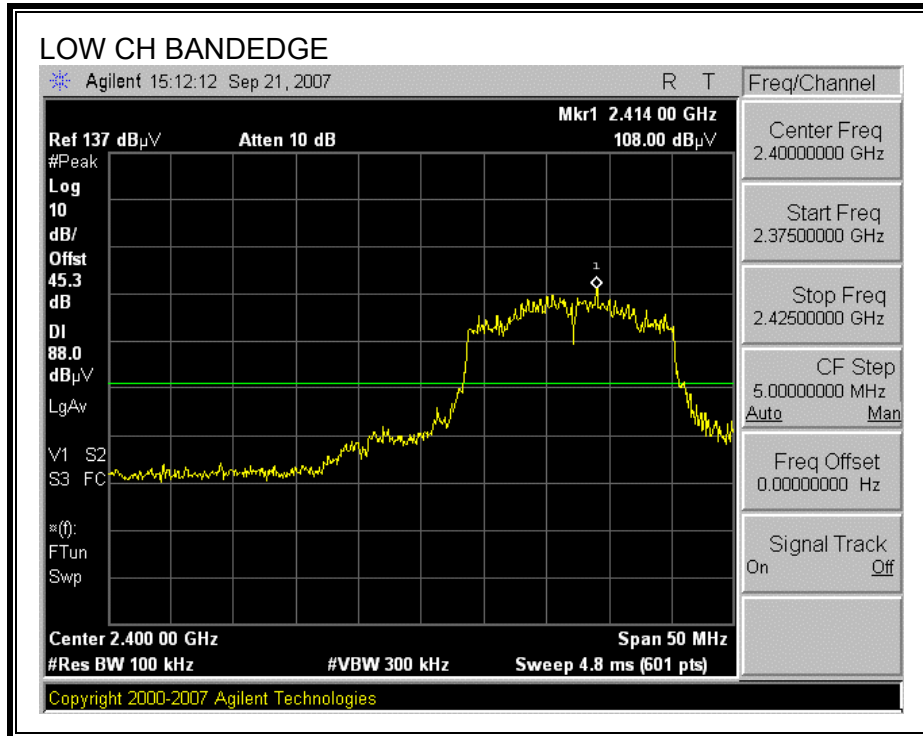
### **TEST PROCEDURE**

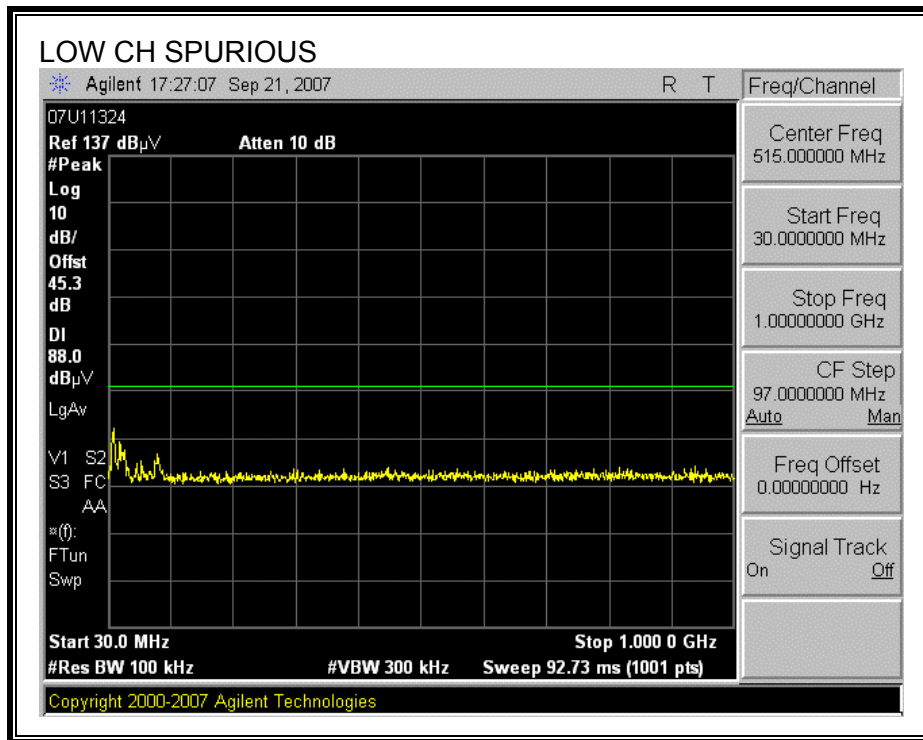
The transmitter radiated fundamental frequency is received by a horn antenna that is connected to a spectrum analyzer. The resolution bandwidth is set to 100 kHz. The video bandwidth is set to 300 kHz.

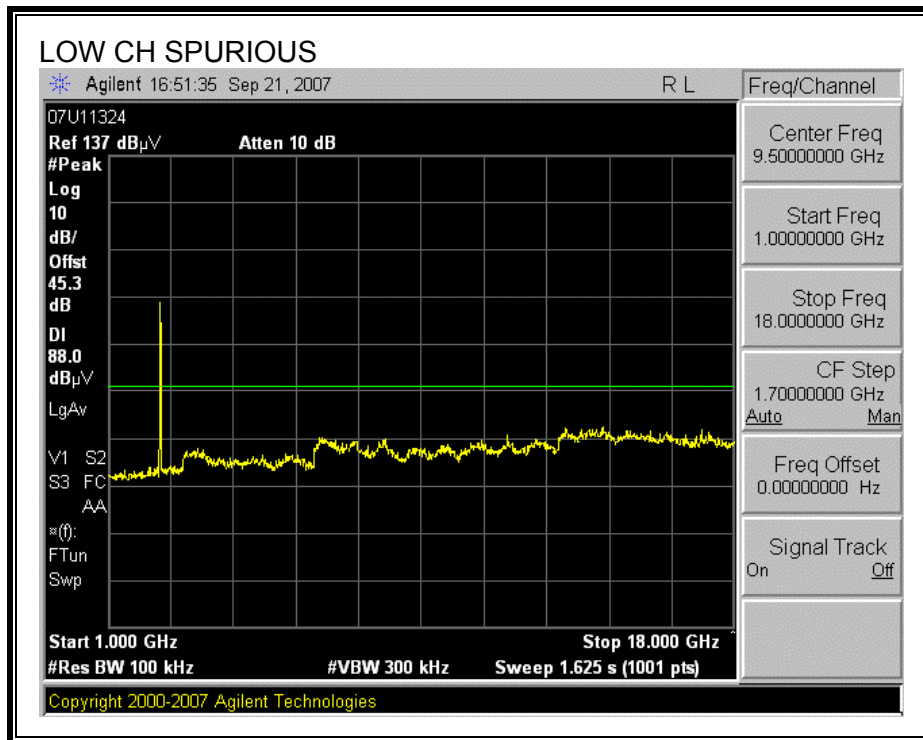
The spectrum from 30 MHz to 26 GHz is investigated with the transmitter set to the lowest, middle, and highest channels.

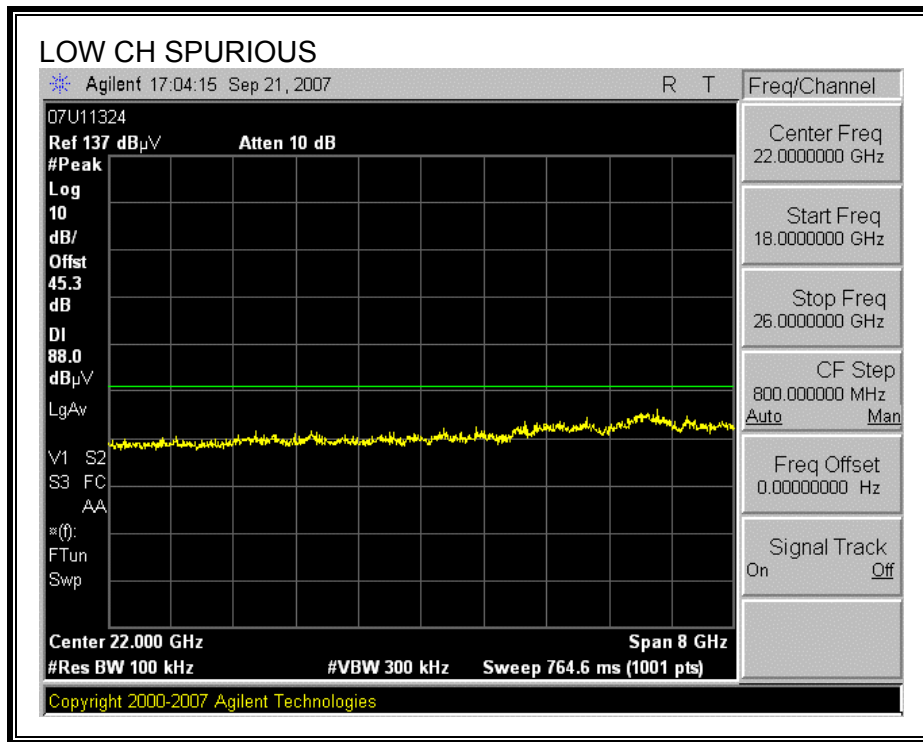
**RESULTS**

**SPURIOUS EMISSIONS, LOW CHANNEL**

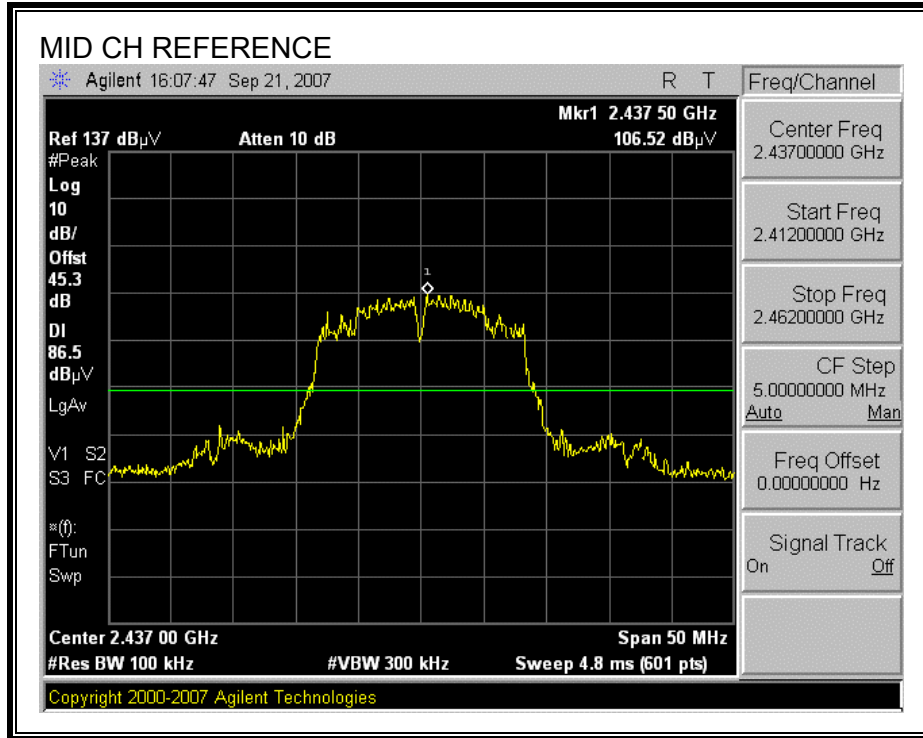




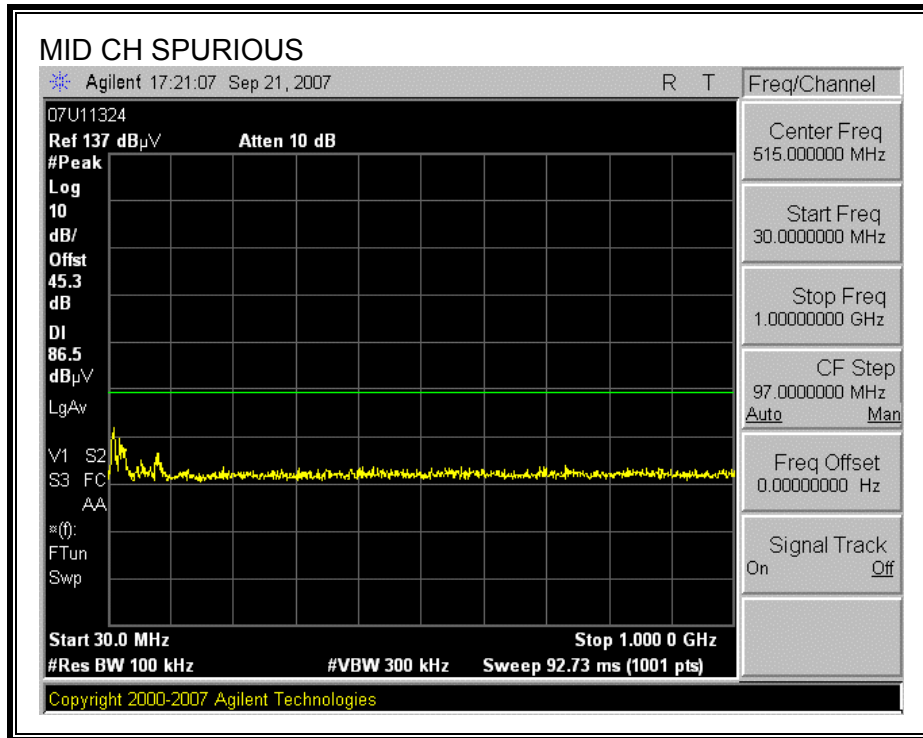


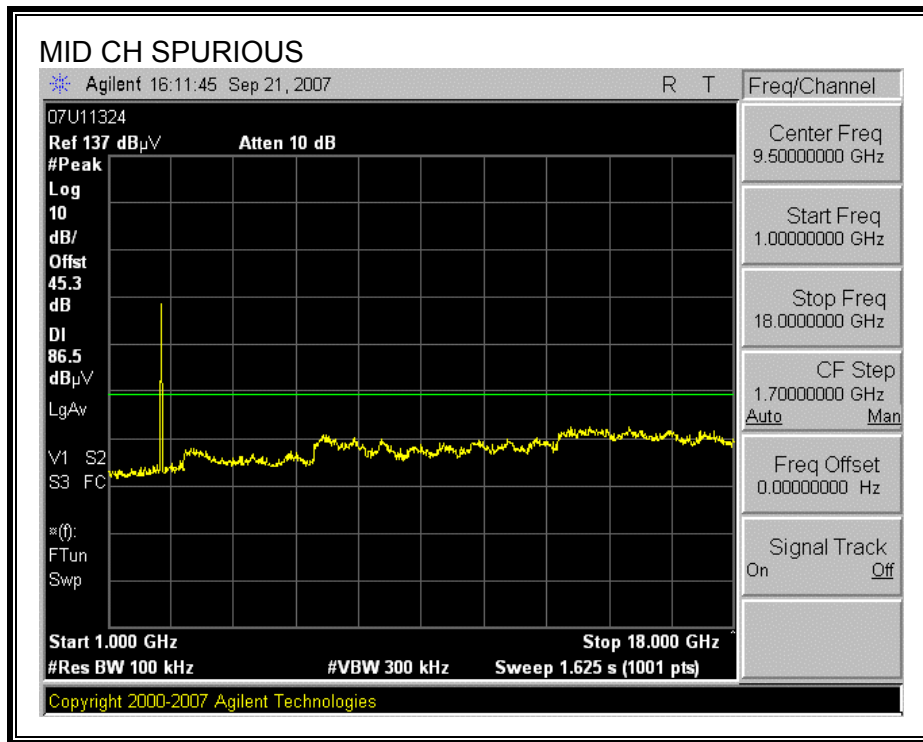


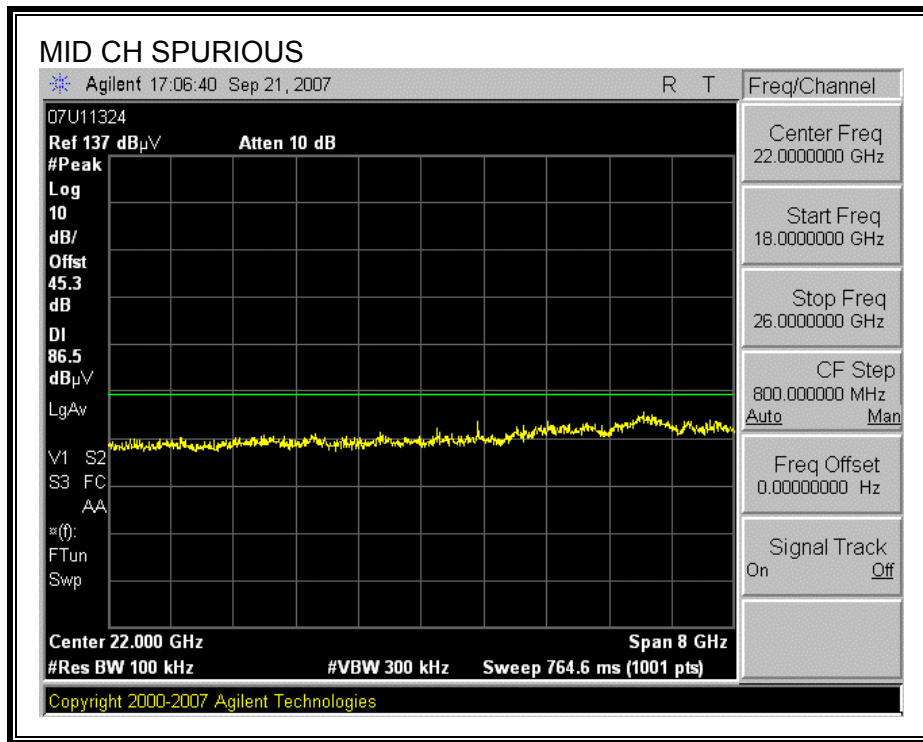
**SPURIOUS EMISSIONS, MID CHANNEL**



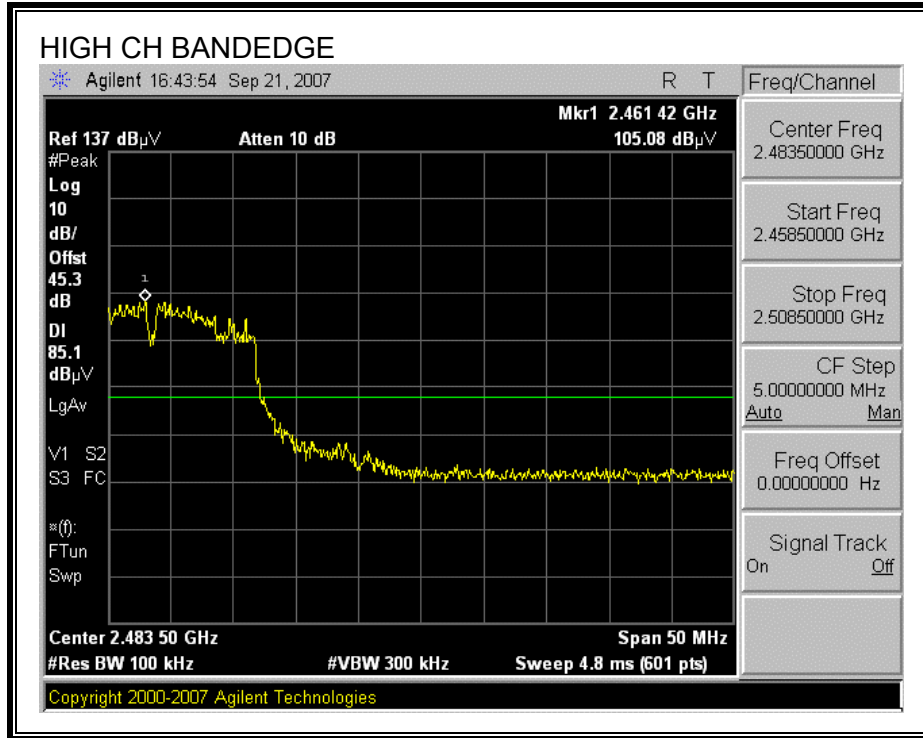


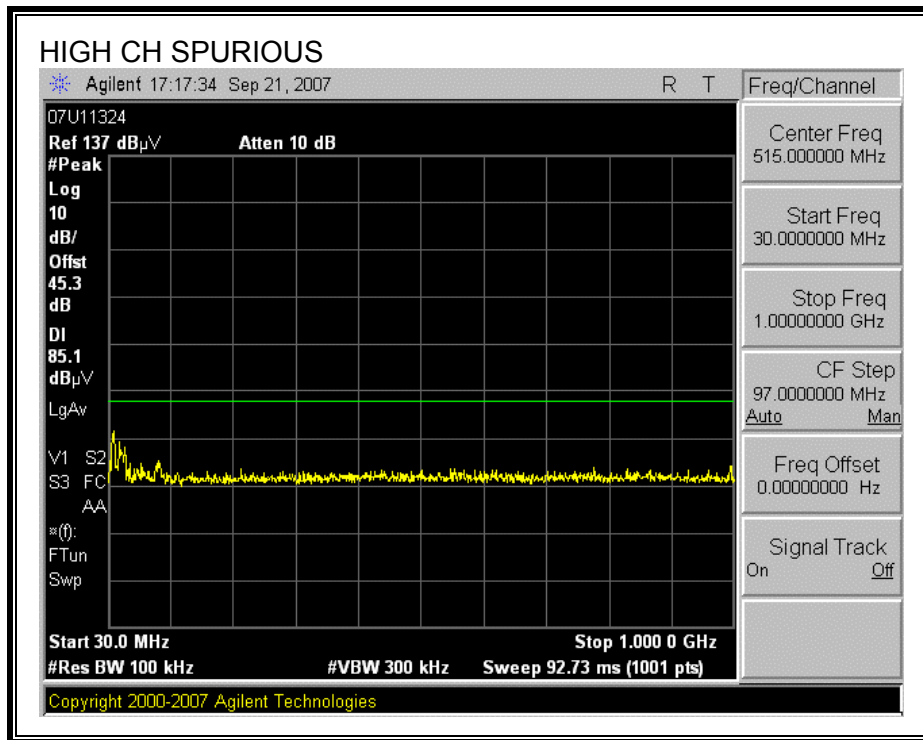


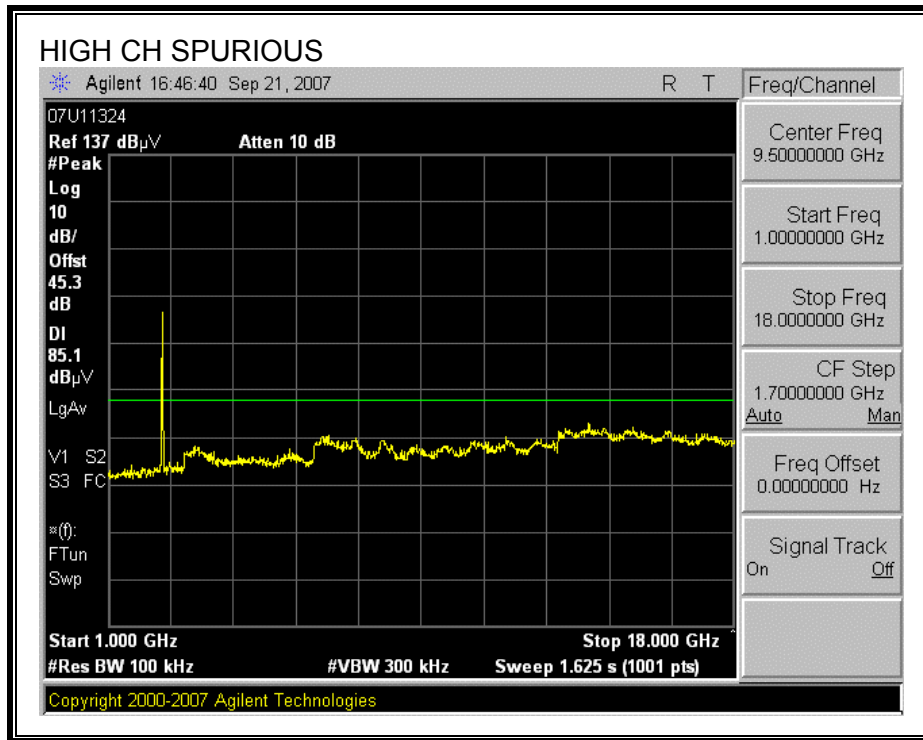


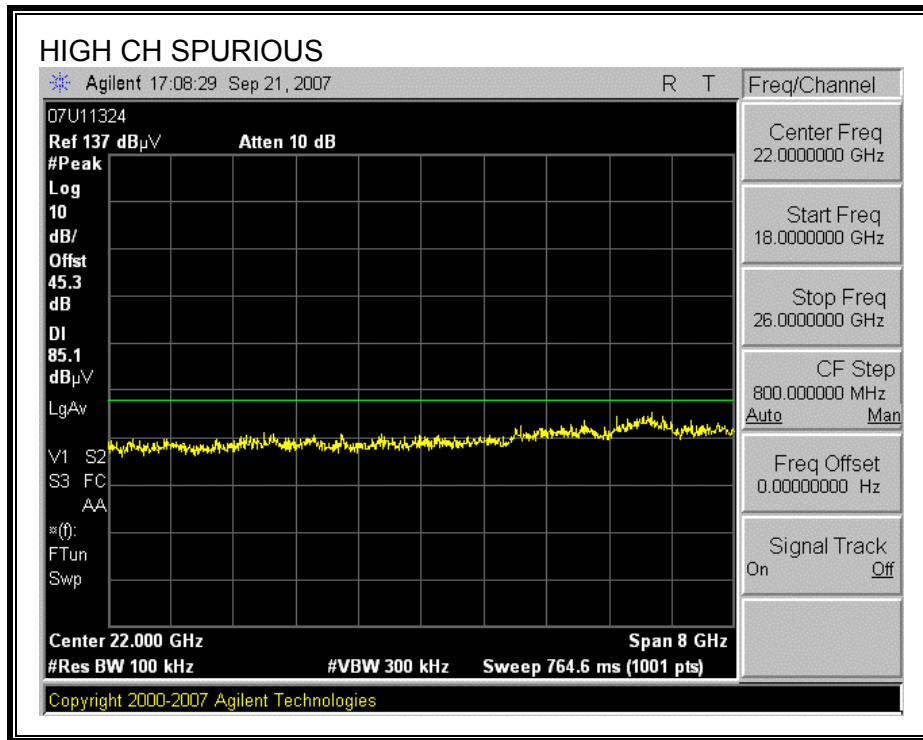


**SPURIOUS EMISSIONS, HIGH CHANNEL**



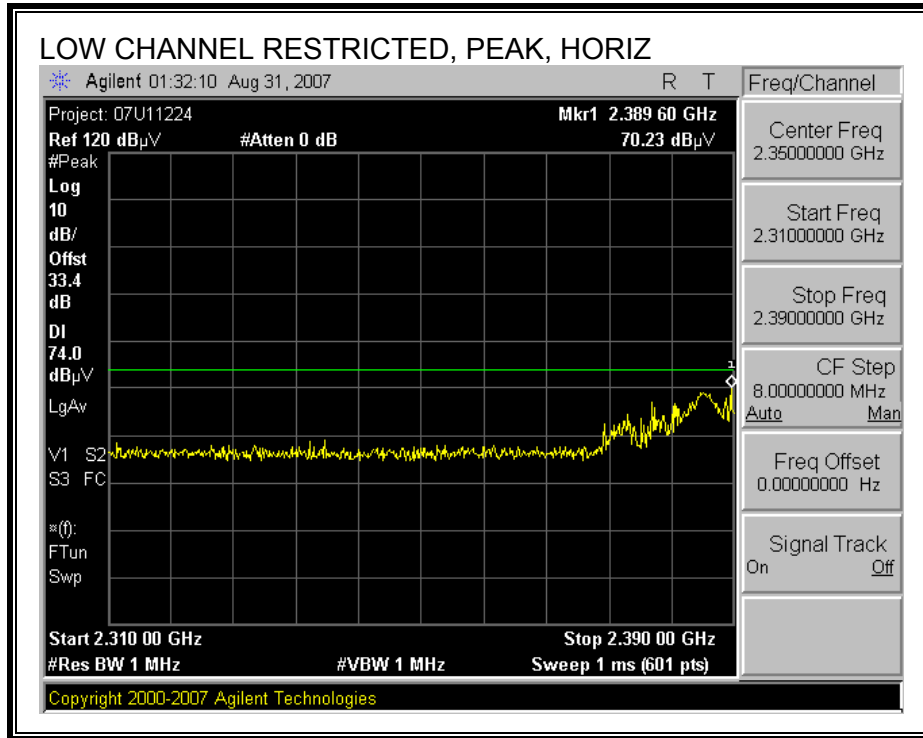




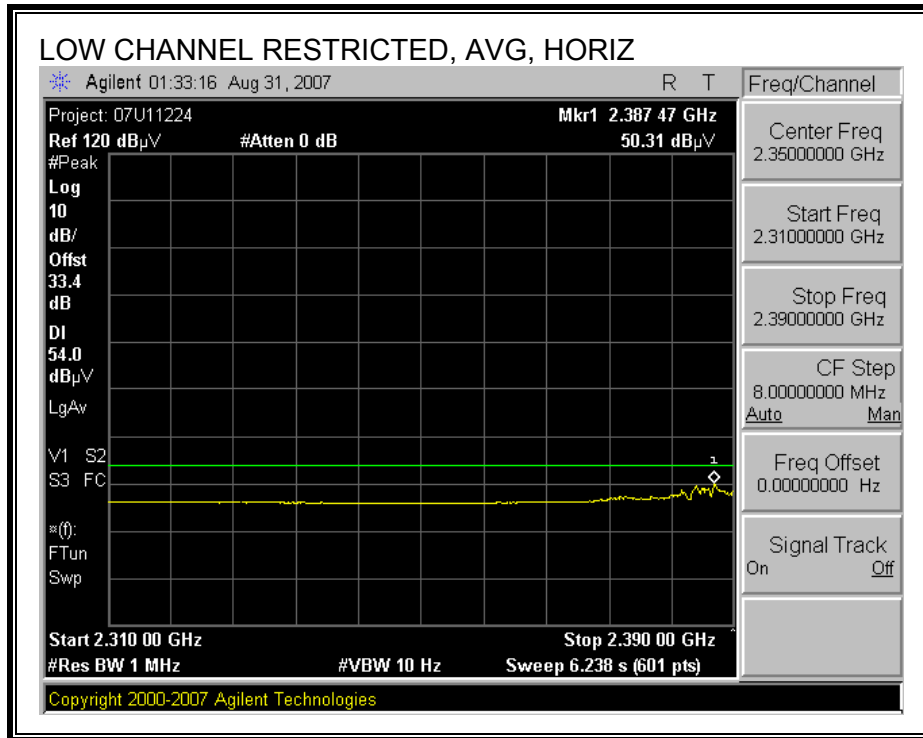


### 8.3 TRANSMITTER ABOVE 1 GHz

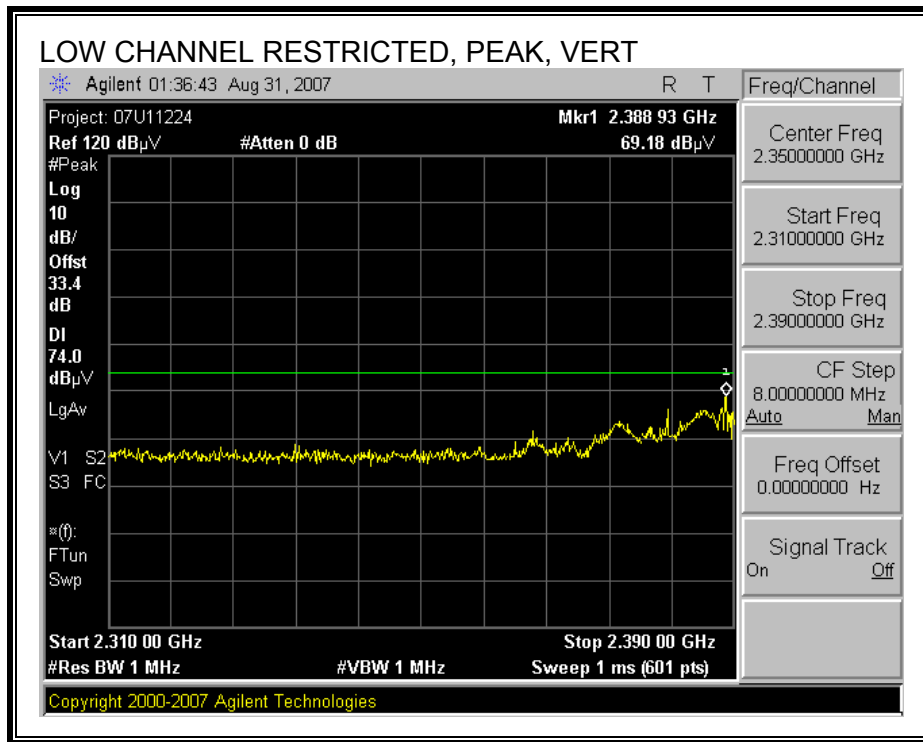
#### RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)

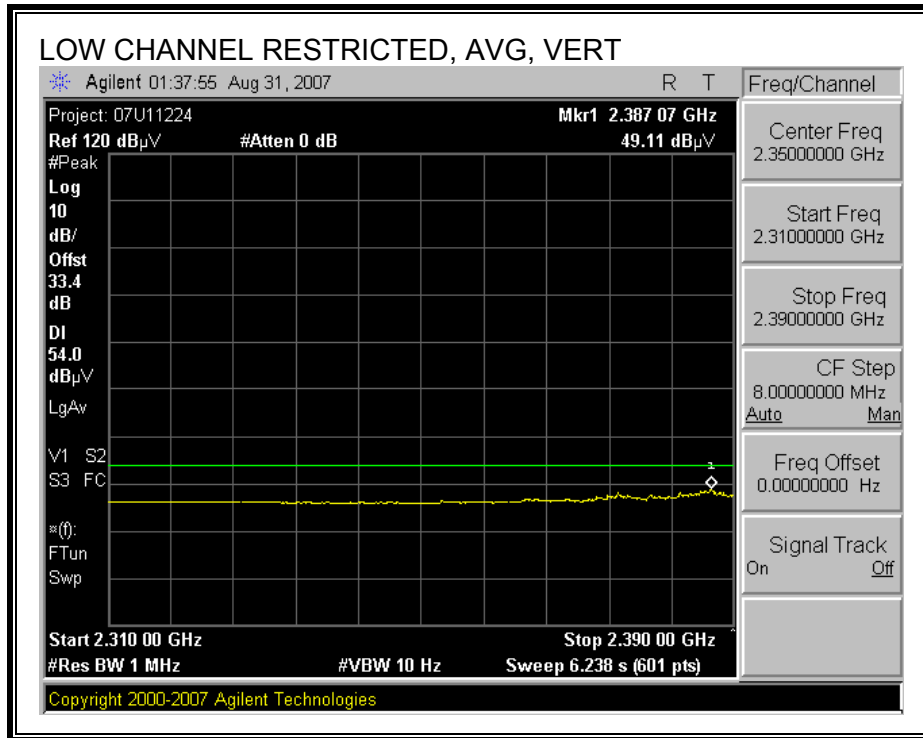




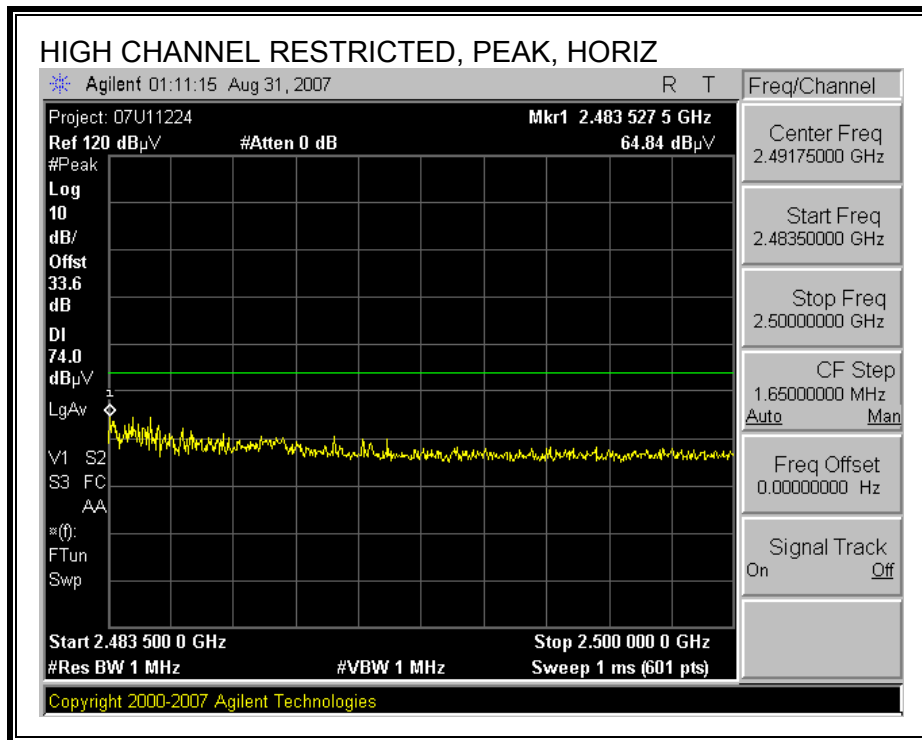


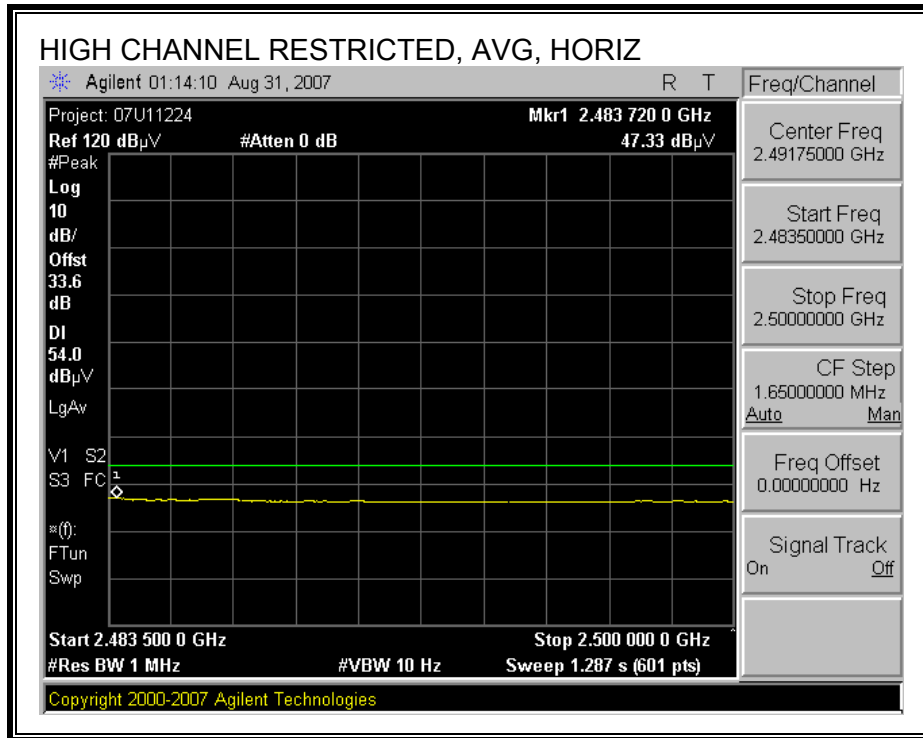
**RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)**



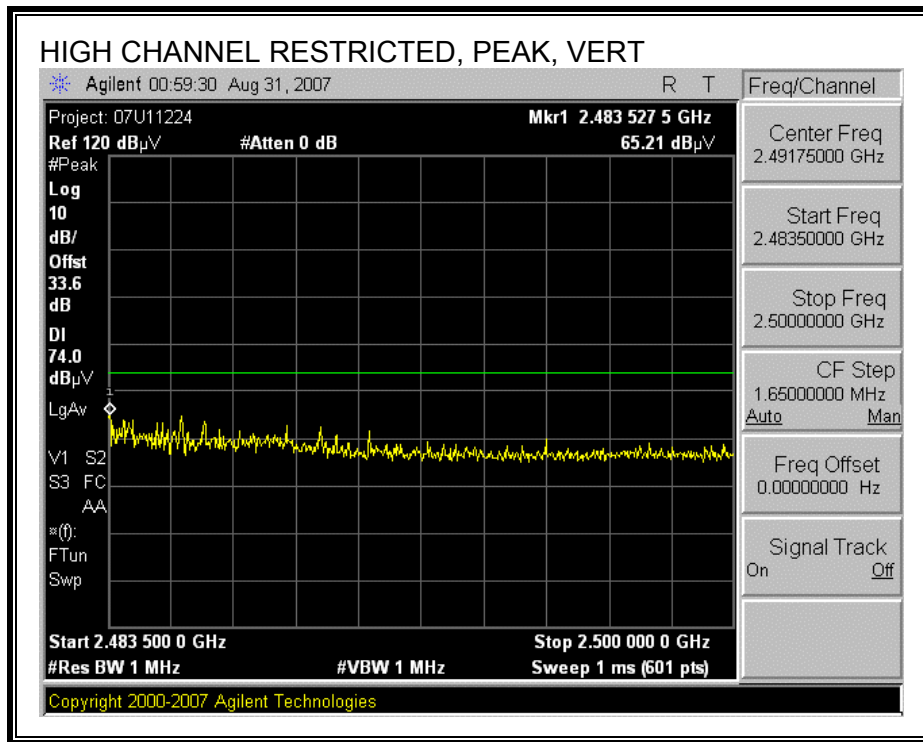


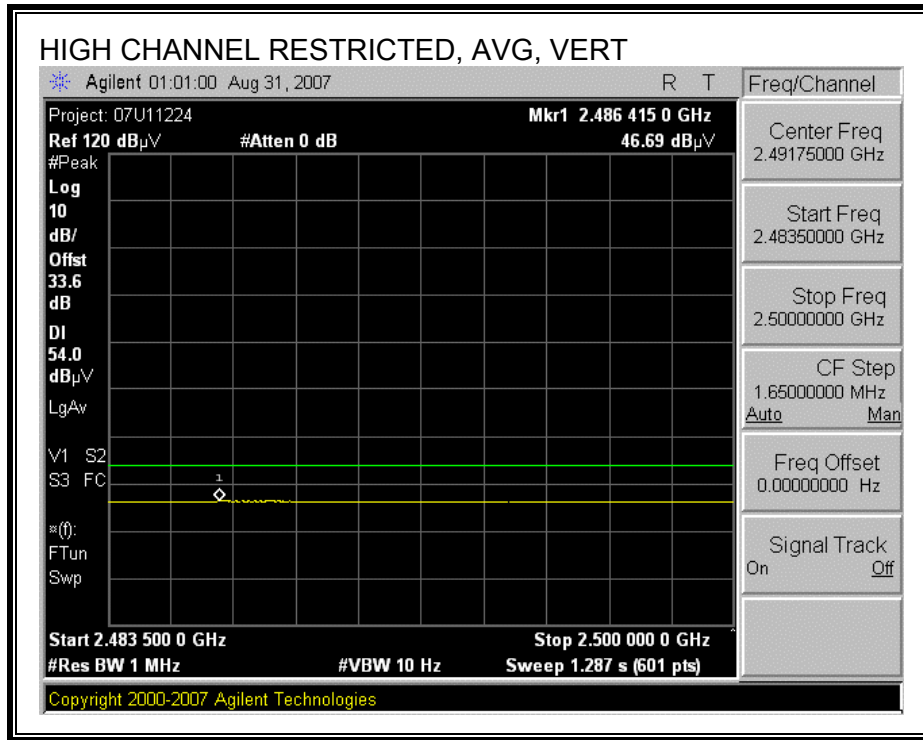
**RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)**





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





**HARMONICS AND SPURIOUS EMISSIONS**

**High Frequency Measurement**  
 Compliance Certification Services, Morgan Hill Open Field Site

Company: Eye-Fi  
 Project #: 07U11324  
 Date: 09/20/07  
 Test Engineer: Can Ming Chung  
 Configuration: EUT inserted into a host Digital Camera  
 Mode: Transmitting

**Test Equipment:**

Horn 1-18GHz	Pre-amplifier 1-26GHz	Pre-amplifier 26-40GHz	Horn > 18GHz	Limit
T73; S/N: 6717 @3m	T144 Miteq 3008A00931			FCC 15.209

Hi Frequency Cables

2 foot cable	3 foot cable	12 foot cable	HPF	Reject Filter	Peak Measurements RBW=VBW=1MHz
		Gordon 203134001		R_001	Average Measurements RBW=1MHz ; VBW=10Hz

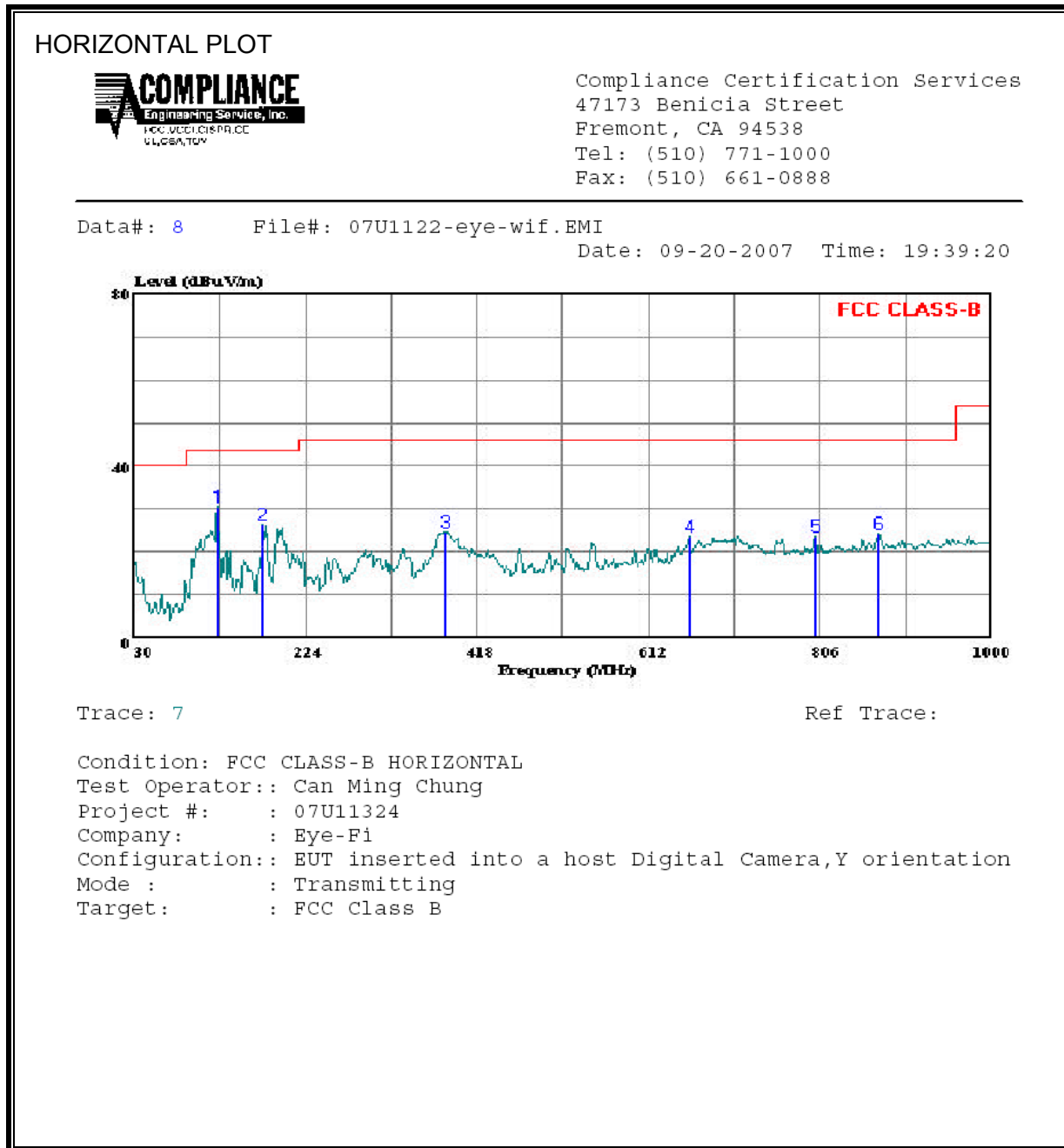
f GHz	Dist (m)	Read Pk dBuV	Read Avg dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Filt dB	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes (V/H)
<b>Low CH</b>															
4826	3.0	57.0	37.8	33.3	6.9	-36.5	0.0	0.0	60.7	41.5	74	54	-13.3	-12.5	H
7237	3.0	62.2	41.2	34.9	8.4	-36.2	0.0	0.0	69.3	48.3	74	54	-4.7	-5.7	H
4824	3.0	52.7	35.0	33.3	6.9	-36.5	0.0	0.0	56.4	38.7	74	54	-17.6	-15.3	V
7238	3.0	62.7	41.4	34.9	8.4	-36.2	0.0	0.0	69.8	48.5	74	54	-4.2	-5.5	V
<b>Mid CH</b>															
4873	3.0	56.4	35.8	33.4	6.9	-36.5	0.0	0.0	60.2	39.6	74	54	-13.8	-14.4	H
7313	3.0	57.3	38.2	35.0	8.4	-36.2	0.0	0.0	64.5	45.4	74	54	-9.5	-8.6	H
4873	3.0	53.3	34.6	33.4	6.9	-36.5	0.0	0.0	57.1	38.4	74	54	-16.9	-15.6	V
7311	3.0	59.6	38.2	35.0	8.4	-36.2	0.0	0.0	66.8	45.4	74	54	-7.2	-8.6	V
<b>High CH</b>															
4923	3.0	59.6	37.9	33.4	7.0	-36.5	0.0	0.0	63.5	41.8	74	54	-10.5	-12.2	H
7393	3.0	54.5	36.1	35.0	8.4	-36.2	0.0	0.0	61.7	43.4	74	54	-12.3	-10.6	H
4924	3.0	55.9	35.6	33.4	7.0	-36.5	0.0	0.0	59.8	39.5	74	54	-14.2	-14.5	H
7374	3.0	57.1	37.0	35.0	8.4	-36.2	0.0	0.0	64.3	44.3	74	54	-9.7	-9.7	H

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		



### 8.4 RADIATED SPURIOUS EMISSION BELOW 1 GHz

#### SPURIOUS EMISSIONS 30 TO 1000 MHz (HORIZONTAL)



HORIZONTAL DATA

	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
1	124.090	47.07	-16.52	30.55	43.50	-12.95	Peak
2	174.530	44.80	-18.49	26.31	43.50	-17.19	Peak
3	382.110	38.35	-13.72	24.63	46.00	-21.37	Peak
4	657.590	32.50	-9.03	23.47	46.00	-22.53	Peak
5	800.180	30.47	-6.88	23.59	46.00	-22.41	Peak
6	872.930	29.89	-5.56	24.33	46.00	-21.67	Peak

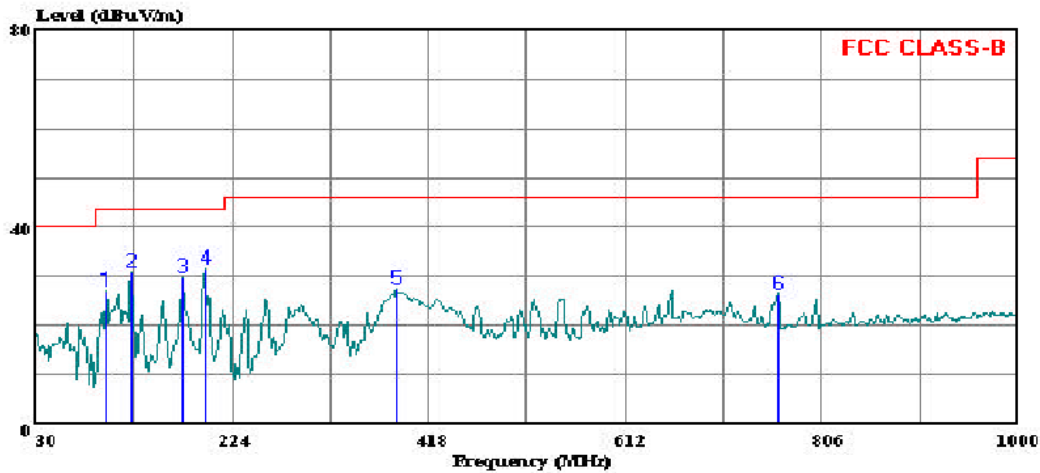
**SPURIOUS EMISSIONS 30 TO 1000 MHz (VERTICAL)**

VERTICAL PLOT



Compliance Certification Services  
47173 Benicia Street  
Fremont, CA 94538  
Tel: (510) 771-1000  
Fax: (510) 661-0888

Data#: 6 File#: 07U1122-eye-wif.EMI Date: 09-20-2007 Time: 19:29:55



Trace: 5

Ref Trace:

Condition: FCC CLASS-B VERTICAL  
Test Operator:: Can Ming Chung  
Project #: : 07U11324  
Company: : Eye-Fi  
Configuration:: EUT inserted into a host Digital Camera, Y orientation  
Mode : : Transmitting  
Target: : FCC Class B

VERTICAL DATA

	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
1	99.840	47.65	-20.75	26.90	43.50	-16.60	Peak
2	124.090	47.42	-16.52	30.90	43.50	-12.60	Peak
3	174.530	48.38	-18.49	29.89	43.50	-13.61	Peak
4	196.840	48.93	-17.52	31.41	43.50	-12.09	Peak
5	385.990	41.09	-13.76	27.33	46.00	-18.67	Peak
6	763.320	33.82	-7.37	26.44	46.00	-19.56	Peak

## 9. AC POWER LINE CONDUCTED EMISSIONS

### LIMITS

FCC §15.207 (a)

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 receiver is set to a resolution bandwidth of 9 kHz. Peak detection is used unless otherwise noted as quasi-peak or average.

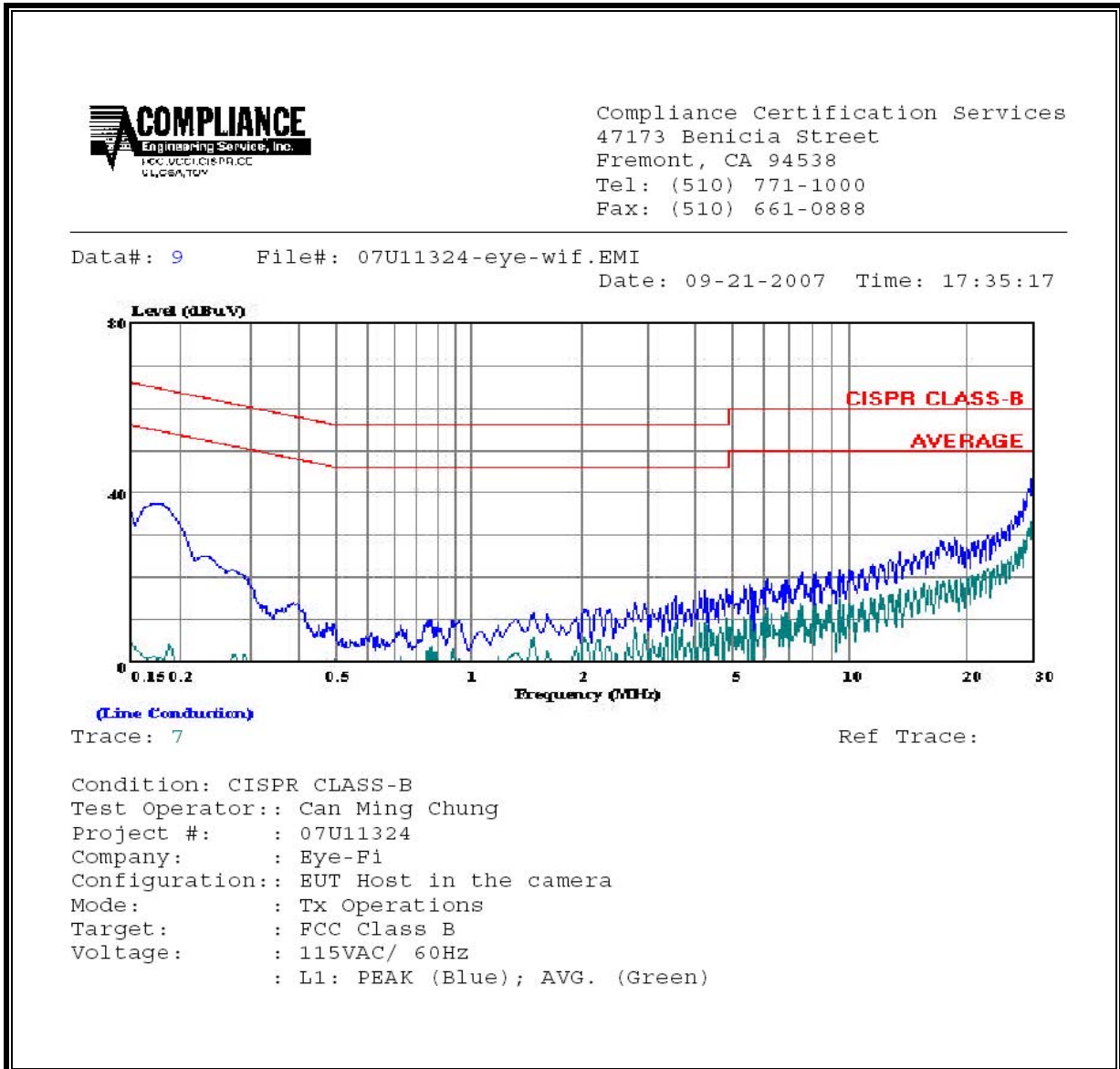
Line conducted data is recorded for both NEUTRAL and HOT lines.

**RESULTS**

**6 WORST EMISSIONS**

CONDUCTED EMISSIONS DATA (115VAC 60Hz)										
Freq. (MHz)	Reading			Class (dB)	Limit QP	EN B		Margin		Remark L1 / L2
	PK (dBuV)	QP (dBuV)	AV (dBuV)			AV	QP (dB)	AV (dB)		
0.18	37.38	--	3.54	0.00	64.67	54.67	-27.29	-51.13	L1	
3.64	15.50	--	7.36	0.00	56.00	46.00	-40.50	-38.64	L1	
29.53	44.48	--	34.92	0.00	60.00	50.00	-15.52	-15.08	L1	
0.19	39.08	--	5.64	0.00	64.04	54.04	-24.96	-48.40	L2	
4.20	17.50	--	10.52	0.00	56.00	46.00	-38.50	-35.48	L2	
29.68	46.48	--	35.45	0.00	60.00	50.00	-13.52	-14.55	L2	
6 Worst Data										

**LINE 1 RESULTS**

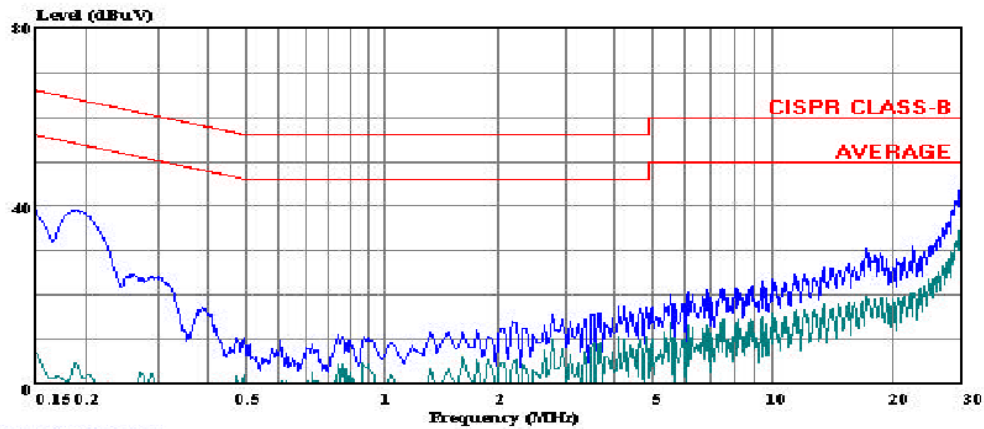


**LINE 2 RESULTS**



Compliance Certification Services  
47173 Benicia Street  
Fremont, CA 94538  
Tel: (510) 771-1000  
Fax: (510) 661-0888

Data#: 16 File#: 07U11324-eye-wif.EMI  
Date: 09-21-2007 Time: 17:56:20



(Line Conduction)

Trace: 14

Ref Trace:

Condition: CISPR CLASS-B  
Test Operator:: Can Ming Chung  
Project #: : 07U11324  
Company: : Eye-Fi  
Configuration:: EUT Host in the camera  
Mode: : Tx Operations  
Target: : FCC Class B  
Voltage: : 115VAC/ 60Hz  
: L2: PEAK (Blue); AVG. (Green)



## 10. MAXIMUM PERMISSIBLE EXPOSURE

### FCC RULES

§1.1310 The criteria listed in Table 1 shall be used to evaluate the environmental impact of human exposure to radio-frequency (RF) radiation as specified in §1.1307(b), except in the case of portable devices which shall be evaluated according to the provisions of §2.1093 of this chapter.

TABLE 1—LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm <sup>2</sup> )	Averaging time (minutes)
(A) Limits for Occupational/Controlled Exposures				
0.3–3.0 .....	614	1.63	*(100)	6
3.0–30 .....	1842/f	4.89/f	*(900/f <sup>2</sup> )	6
30–300 .....	61.4	0.163	1.0	6
300–1500 .....	.....	.....	f/300	6
1500–100,000 .....	.....	.....	5	6
(B) Limits for General Population/Uncontrolled Exposure				
0.3–1.34 .....	614	1.63	*(100)	30
1.34–30 .....	824/f	2.19/f	*(180/f <sup>2</sup> )	30

TABLE 1—LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)—Continued

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm <sup>2</sup> )	Averaging time (minutes)
30–300 .....	27.5	0.073	0.2	30
300–1500 .....	.....	.....	f/1500	30
1500–100,000 .....	.....	.....	1.0	30

f = frequency in MHz

\* = Plane-wave equivalent power density

NOTE 1 TO TABLE 1: Occupational/controlled limits apply in situations in which persons are exposed as a consequence of their employment provided those persons are fully aware of the potential for exposure and can exercise control over their exposure. Limits for occupational/controlled exposure also apply in situations when an individual is transient through a location where occupational/controlled limits apply provided he or she is made aware of the potential for exposure.

NOTE 2 TO TABLE 1: General population/uncontrolled exposures apply in situations in which the general public may be exposed, or in which persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or can not exercise control over their exposure.

## CALCULATIONS

Given

$$E = \sqrt{(30 * P * G) / d}$$

and

$$S = E^2 / 3770$$

where

E = Field Strength in Volts/meter

P = Power in Watts

G = Numeric antenna gain

d = Distance in meters

S = Power Density in milliwatts/square centimeter

Combining equations, rearranging the terms to express the distance as a function of the remaining variables, changing to units of Power to mW and Distance to cm, and substituting the logarithmic form of power and gain yields:

$$d = 0.282 * 10^{((P + G) / 20)} / \sqrt{S}$$

where

d = MPE distance in cm

P = Power in dBm

G = Antenna Gain in dBi

S = Power Density Limit in mW/cm<sup>2</sup>

Rearranging terms to calculate the power density at a specific distance yields

$$S = 0.0795 * 10^{((P + G) / 10)} / (d^2)$$

The power density in units of mW/cm<sup>2</sup> is converted to units of W/m<sup>2</sup> by multiplying by a factor of 10.

**LIMITS**

From FCC §1.1310 Table 1 (B), the maximum value of  $S = 1.0 \text{ mW/cm}^2$

**RESULTS**

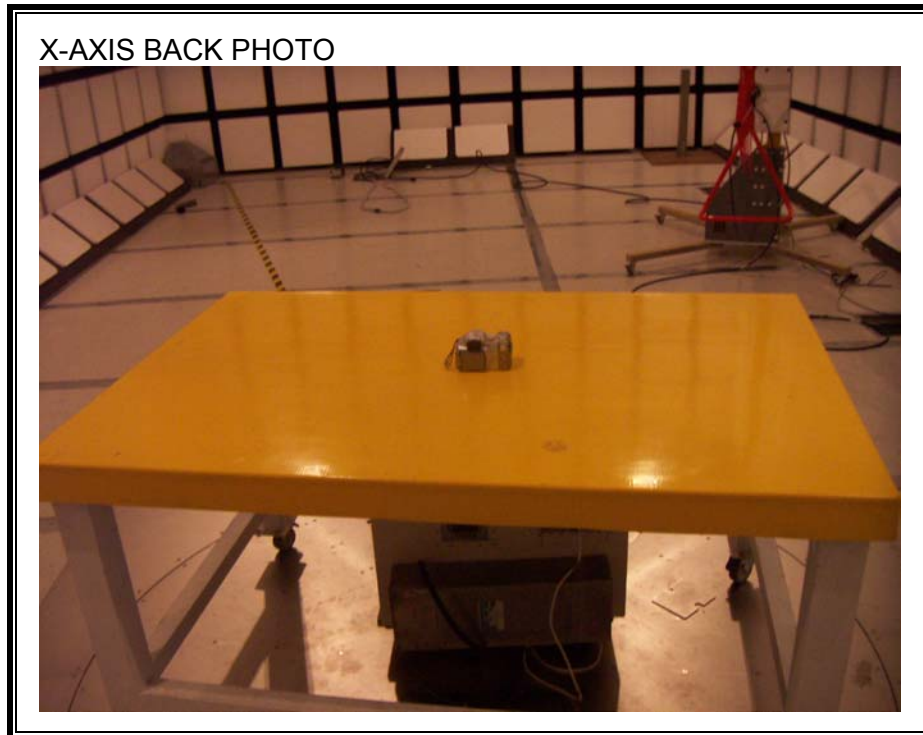
Mode	Band	MPE Distance (cm)	Output Power (dBm)	Antenna Gain (dBi)	FCC Power Density (mW/cm <sup>2</sup> )	IC Power Density (W/m <sup>2</sup> )
WLAN	2.4 GHz	20.0	11.64	1.50	0.0041	0.0410

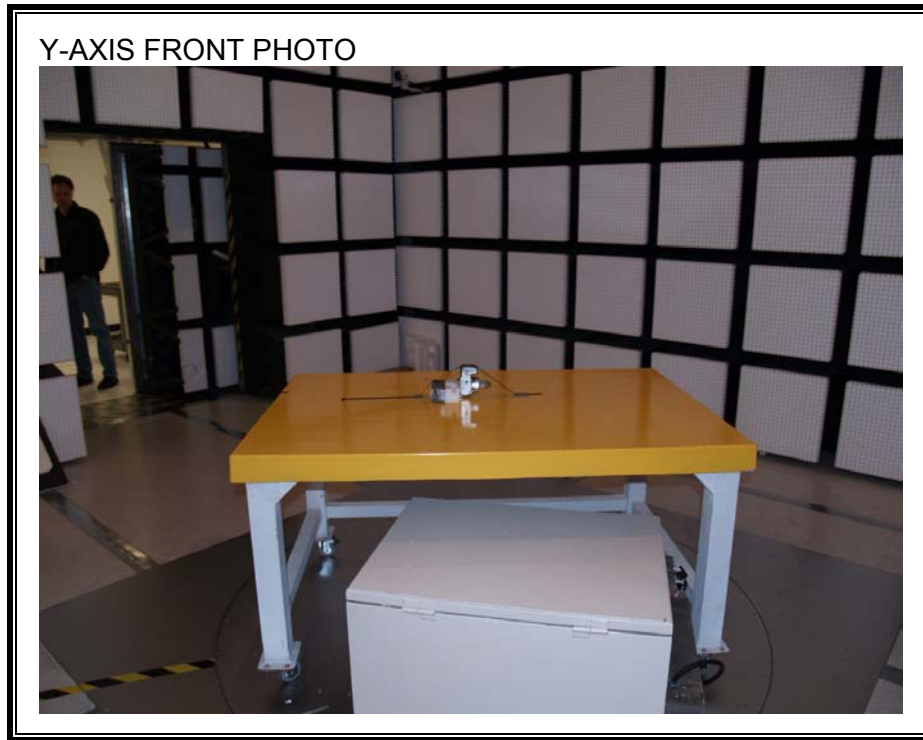
NOTE: For mobile or fixed location transmitters, the minimum separation distance is 20 cm, even if calculations indicate that the MPE distance would be less.

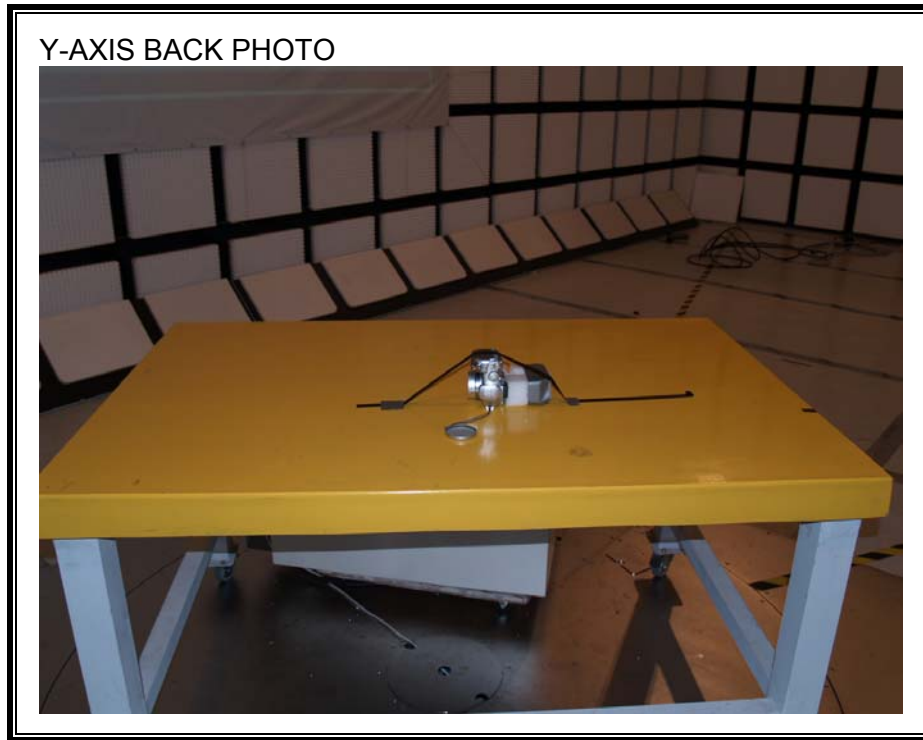
## 11. SETUP PHOTOS

### RADIATED RF MEASUREMENT SETUP FOR PORTABLE CONFIGURATION



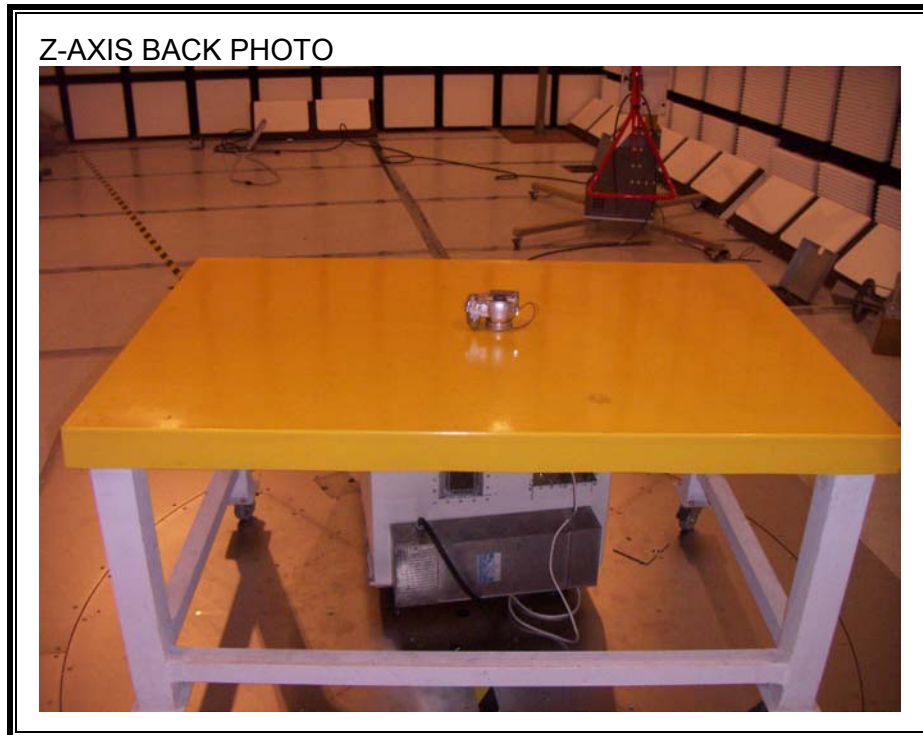






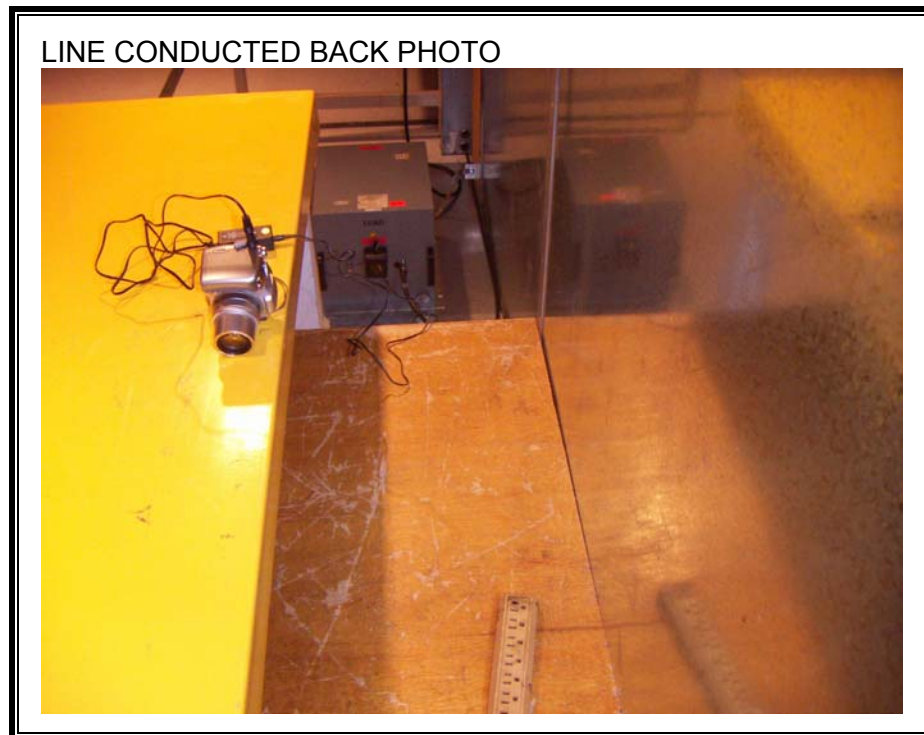






**POWERLINE CONDUCTED EMISSIONS MEASUREMENT SETUP**





**END OF REPORT**