



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

**FOR**

**VoIP MOBILE PHONE TERMINAL**

**MODEL NUMBER: WLPS3(E)-A**

**FCC ID: EW4-WLPS3**

**REPORT NUMBER: 06J10470-1, REVISION B**

**ISSUE DATE: SEPTEMBER 27, 2006**

*Prepared for*

**MITSUMI ELECTRIC CO., LTD.  
1601 SAKAI, ATSUGI-SHI  
KANAGAWA, 243-8533, JAPAN**

*Prepared by*

**COMPLIANCE CERTIFICATION SERVICES  
561F MONTEREY ROAD  
MORGAN HILL, CA 95037, USA  
TEL: (408) 463-0885  
FAX: (408) 463-0888**

**NVLAP<sup>®</sup>**

**LAB CODE:200065-0**

Revision History

<u>Rev.</u>	<u>Issue Date</u>	<u>Revisions</u>	<u>Revised By</u>
--	09/12/06	Initial Issue	Thu
B	09/27/06	Remove MPE section	Thu

## TABLE OF CONTENTS

<b>1. ATTESTATION OF TEST RESULTS</b>	<b>4</b>
<b>2. TEST METHODOLOGY</b>	<b>5</b>
<b>3. FACILITIES AND ACCREDITATION</b>	<b>5</b>
<b>4. CALIBRATION AND UNCERTAINTY</b>	<b>5</b>
4.1. MEASURING INSTRUMENT CALIBRATION	5
4.2. MEASUREMENT UNCERTAINTY	5
<b>5. EQUIPMENT UNDER TEST</b>	<b>6</b>
5.1. DESCRIPTION OF EUT	6
5.2. MAXIMUM OUTPUT POWER	6
5.3. DESCRIPTION OF AVAILABLE ANTENNAS	6
5.4. SOFTWARE AND FIRMWARE	6
5.5. WORST-CASE CONFIGURATION AND MODE	6
5.6. DESCRIPTION OF TEST SETUP	7
<b>6. TEST AND MEASUREMENT EQUIPMENT</b>	<b>9</b>
<b>7. LIMITS AND RESULTS</b>	<b>10</b>
7.1. CHANNEL TESTS FOR THE 2400 TO 2483.5 MHz BAND	10
7.1.1. 6 dB BANDWIDTH	10
7.1.2. 99% BANDWIDTH	14
7.1.3. PEAK OUTPUT POWER	18
7.1.4. AVERAGE POWER	23
7.1.5. PEAK POWER SPECTRAL DENSITY	24
7.1.6. CONDUCTED SPURIOUS EMISSIONS	28
7.2. RADIATED EMISSIONS	35
7.2.1. TRANSMITTER RADIATED SPURIOUS EMISSIONS	35
7.2.2. TRANSMITTER ABOVE 1 GHz	38
7.2.2.1 EUT STAND ALONE	38
7.2.2.2 EUT SITTING ON CRADLE	47
7.2.3. WORST-CASE RADIATED EMISSIONS BELOW 1 GHz	56
7.2.3.1 EUT STAND ALONE	56
7.2.3.2 EUT SITTING ON CRADLE	60
7.3. POWERLINE CONDUCTED EMISSIONS	64
<b>8. SETUP PHOTOS</b>	<b>70</b>

# 1. ATTESTATION OF TEST RESULTS

**COMPANY NAME:** MITSUMI ELECTRIC CO., LTD.  
1601 SAKAI, ATSUGI-SHI  
KANAGAWA, 243-8533, JAPAN

**EUT DESCRIPTION:** VoIP MOBILE PHONE TERMINAL

**MODEL:** WLPS3(E)-A

**DATE TESTED:** AUGUST 29-31, 2006

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:



---

THU CHAN  
EMC SUPERVISOR  
COMPLIANCE CERTIFICATION SERVICES

---

CHIN PANG  
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 EUT

The EUT is an 802.11b VoIP Mobile Phone Terminal.

The radio module is manufactured by MITSUMI ELECTRIC CO., LTD.

### 5.2. 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	13.07	20.28

### 5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes two monopole antennas, main port antenna with a maximum gain of 0.6dBi & aux port antenna with a maximum gain of -1.7dBi.

### 5.4. SOFTWARE AND FIRMWARE

The EUT driver software installed in the host support equipment during testing was TeraTerm\_utf.8-4.44

The test utility software used during testing was KS7010-AN001 (1-5)

### 5.5. WORST-CASE CONFIGURATION AND MODE

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

The worst-case data rate for this channel is determined to be 11Mbps.

Thus all emissions tests were made in the 802.11b mode, 2412-2462 MHz, 11Mbps, and with higher antenna gain at the main port, with EUT sitting on cradle and also X, Y, Z portable positions.

## 5.6. DESCRIPTION OF TEST SETUP

### SUPPORT EQUIPMENT

PERIPHERAL SUPPORT EQUIPMENT LIST				
Description	Manufacturer	Model	Serial Number	FCC ID
EUT AC Adpter	NEC	WLP53	CBG-002535--004	DoC
Laptop	Toshiba	Satellite	9161793	DoC
Test Kit	Mitsumi	NA	NA	NA

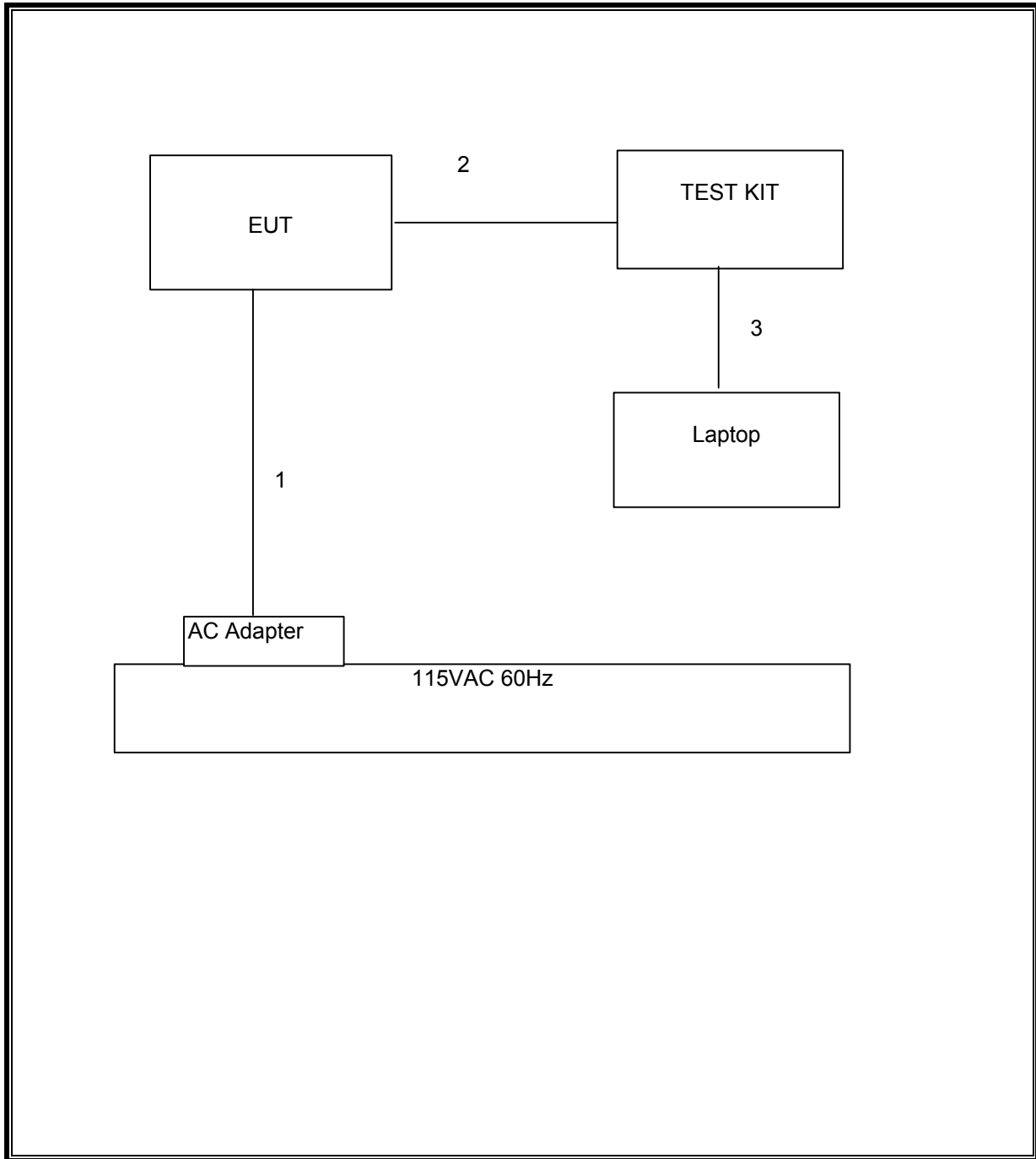
### I/O CABLES

I/O CABLE LIST						
Cable No.	Port	# of Identical Ports	Connector Type	Cable Type	Cable Length	Remarks
1	DC	1	DC	Un-shielded	2m	NA
2	6-pins	1	Ribbon Cable	Un-shielded	2m	NA
3	USB	1	USB	Un-shielded	2m	Connected to Laptop

### TEST SETUP

The EUT is connected to a test kit via a ribbon cable and laptop; the 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	Serial Number	Cal Due
Antenna, Horn 1 ~ 18 GHz	EMCO	3115	2238	4/22/2007
Preamplifier, 1 ~ 26.5 GHz	Agilent / HP	8449B	3008A00369	8/17/2007
Antenna, Bilog 30 MHz ~ 2 Ghz	Sunol Sciences	JB1	A121003	9/3/2006
EMI Receiver, 9 kHz ~ 2.9 GHz	Agilent / HP	8542E	3942A00286	2/4/2007
RF Filter Section	Agilent / HP	85420E	3705A00256	2/4/2007
EMI Test Receiver	R & S	ESHS 20	827129/006	9/3/2006
LISN, 10 kHz ~ 30 MHz	FCC	LISN-50/250-25-2	2023	12/30/2006
Spectrum Analyzer 3 Hz ~ 44 GHz	Agilent / HP	E4446A	MY45300064	12/19/2006
Peak Power Meter	Agilent / HP	E4416A	GB41291160	12/2/2007
Peak / Average Power Sensor	Agilent	E9327A	US40440755	12/2/2007

## 7. LIMITS AND RESULTS

### 7.1. CHANNEL TESTS FOR THE 2400 TO 2483.5 MHz BAND

#### 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.

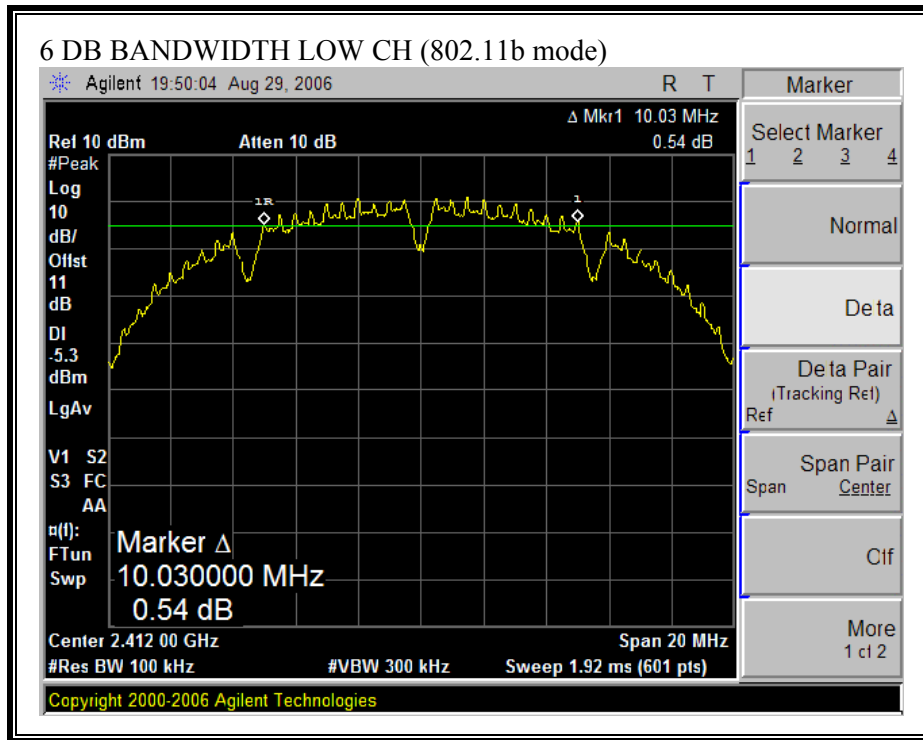
##### RESULTS

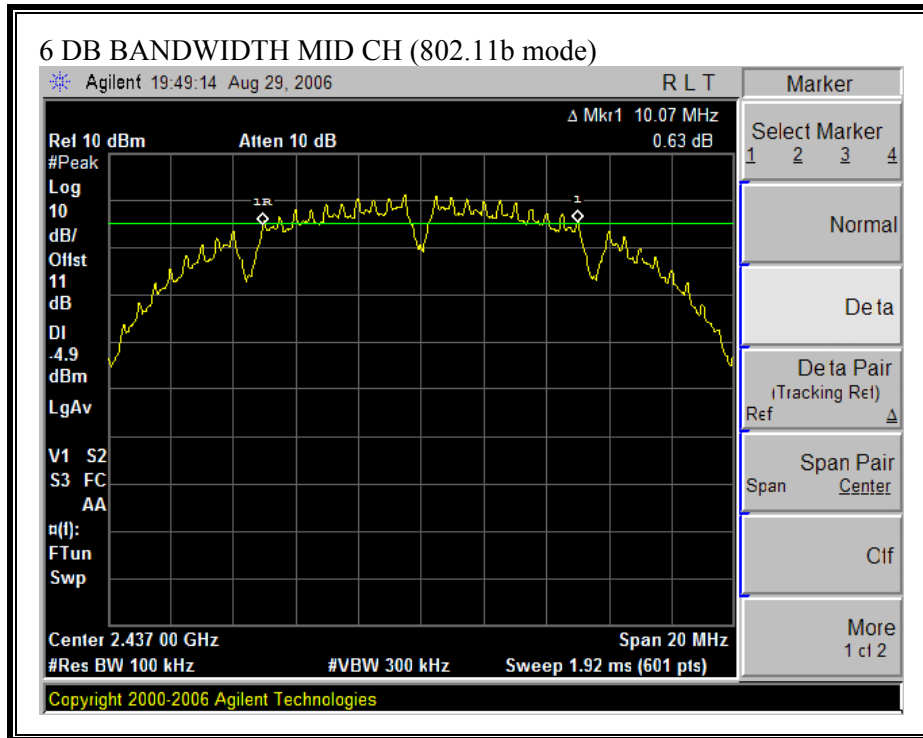
No non-compliance noted:

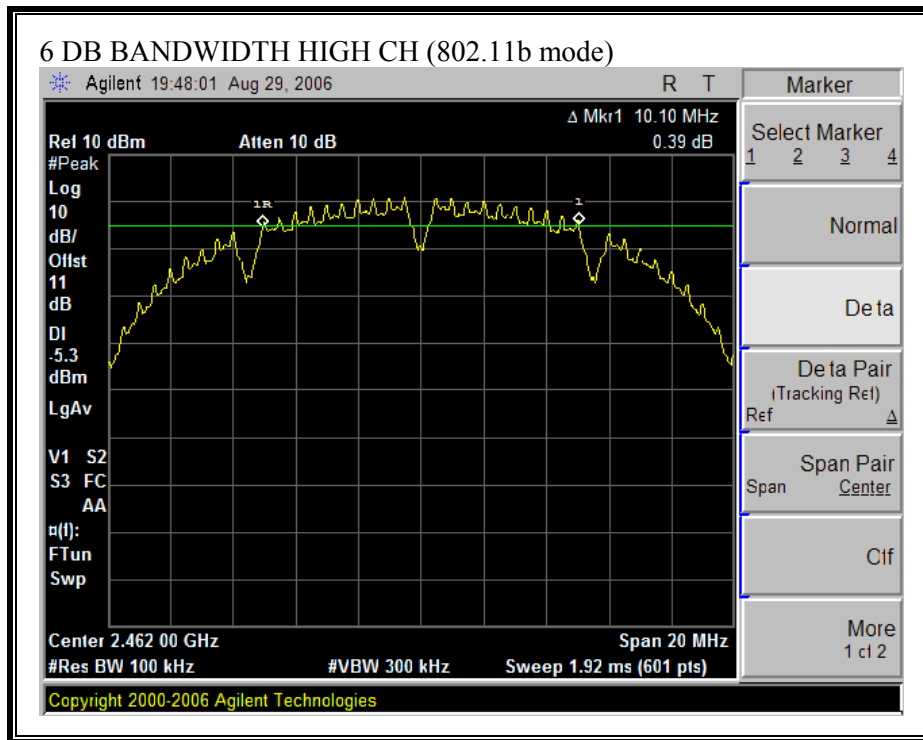
802.11b Mode

Channel	Frequency (MHz)	6 dB Bandwidth (kHz)	Minimum Limit (kHz)	Margin (kHz)
Low	2412	10030	500	9530
Middle	2437	10070	500	9570
High	2462	10100	500	9600

**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.

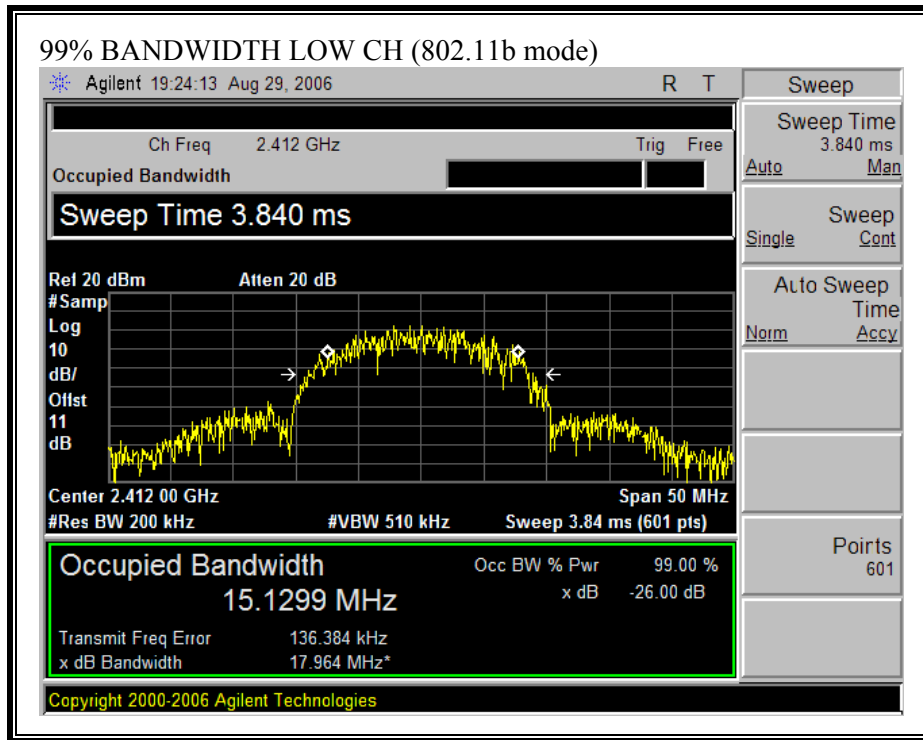
#### RESULTS

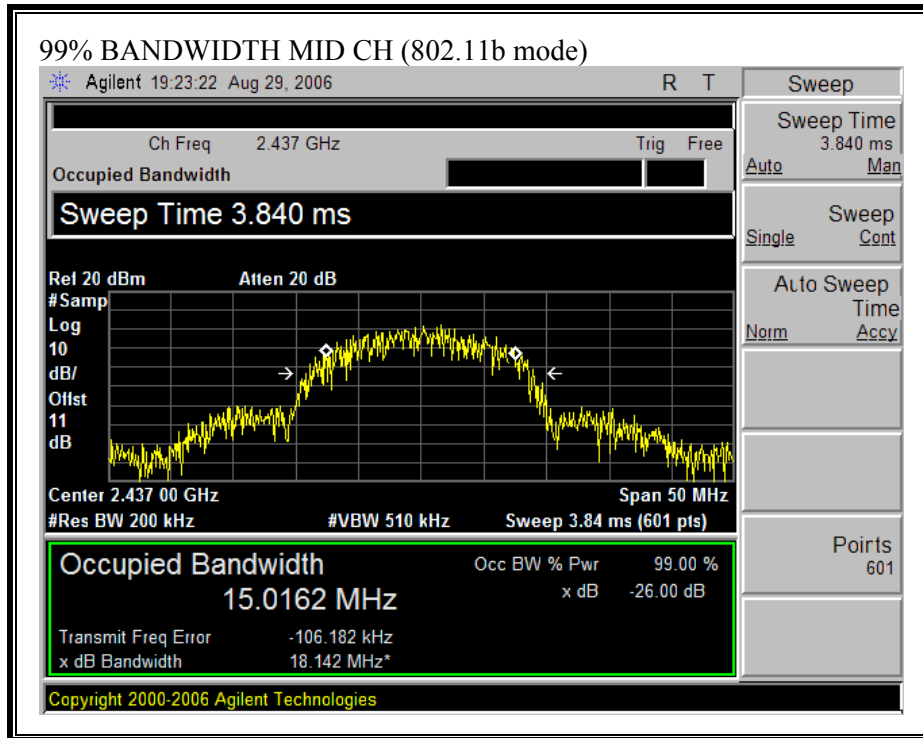
No non-compliance noted:

802.11b Mode

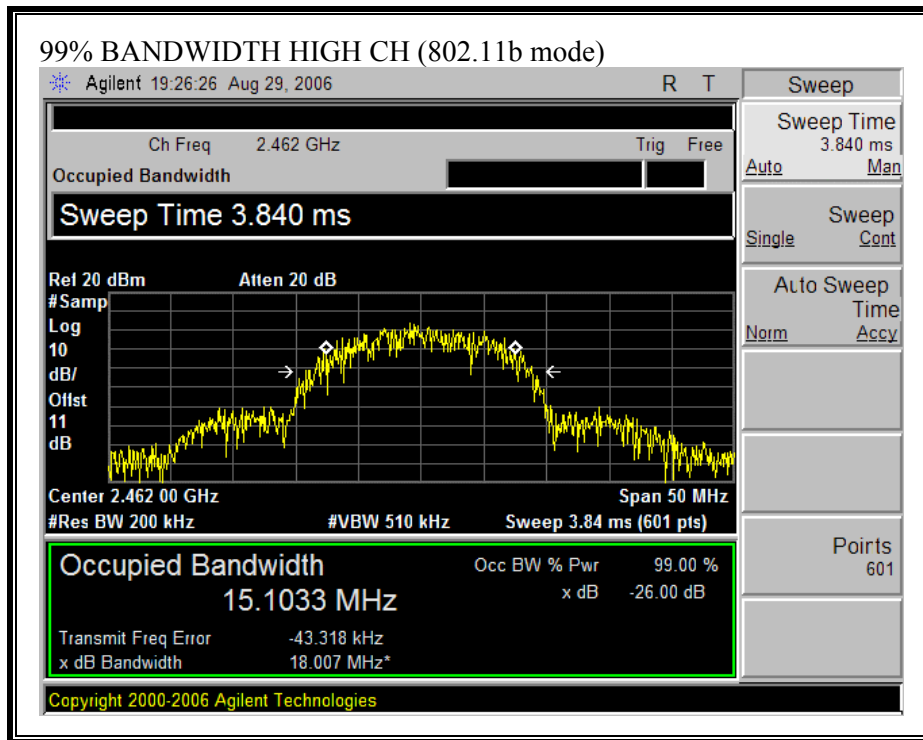
Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	2412	15.1299
Middle	2437	15.0162
High	2462	15.1033

**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**

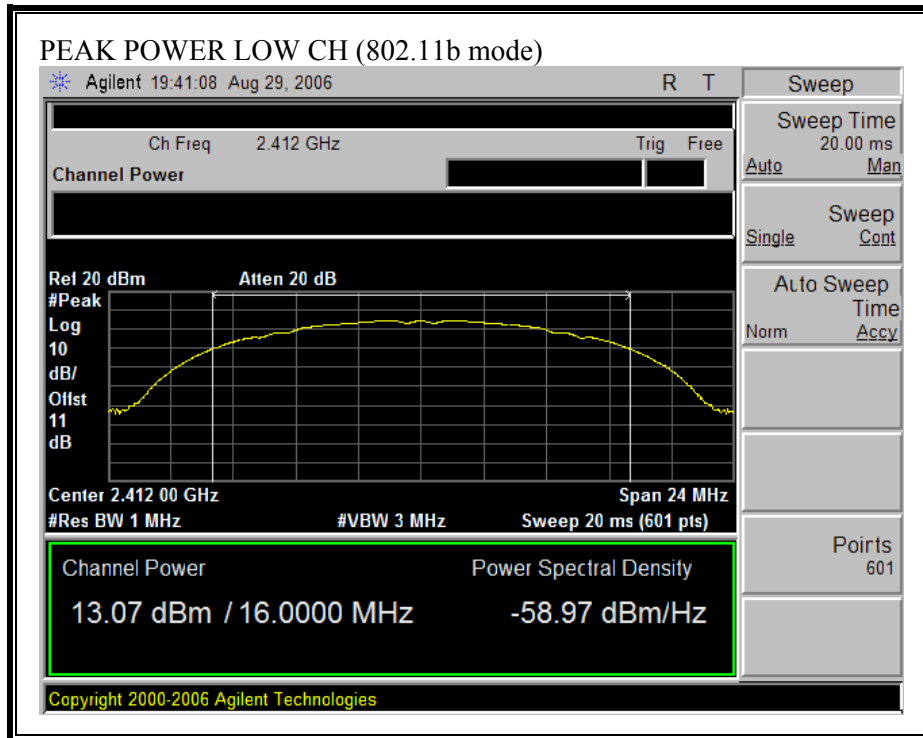
The maximum antenna gain is 0.6 dBi for other than fixed, point-to-point operations, therefore the limit is 30 dBm.

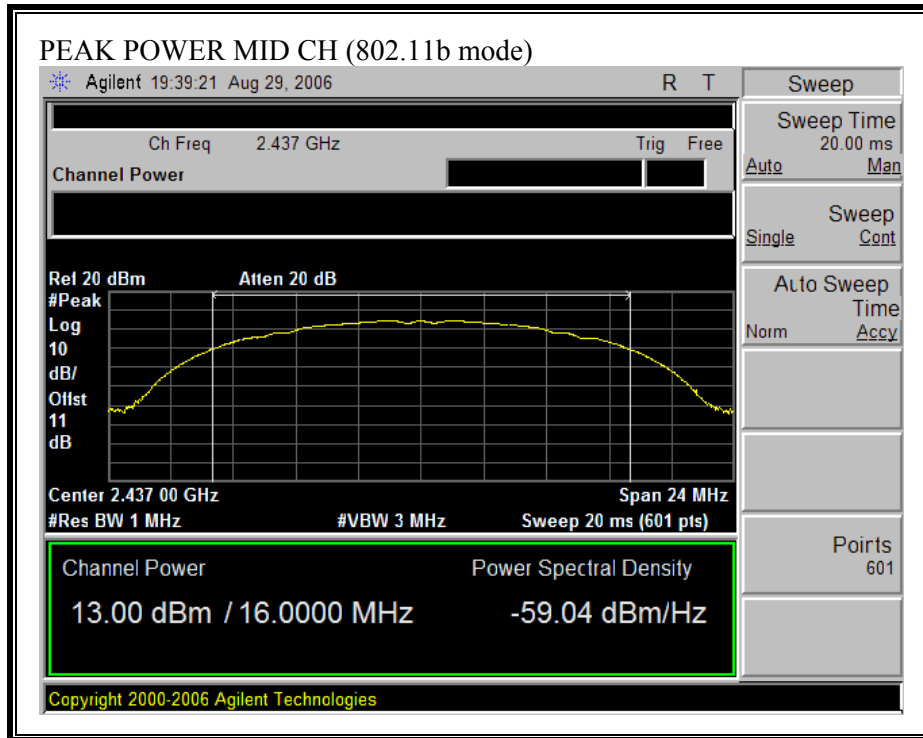
No non-compliance noted:

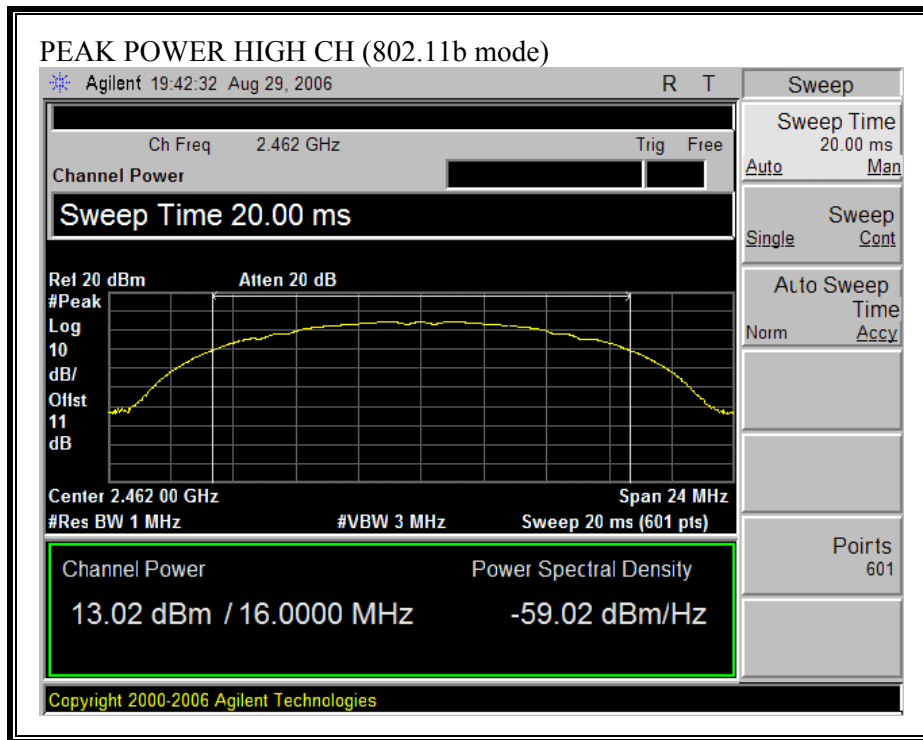
802.11b Mode

<b>Channel</b>	<b>Frequency (MHz)</b>	<b>Peak Power (dBm)</b>	<b>Limit (dBm)</b>	<b>Margin (dB)</b>
Low	2412	13.07	30	-16.93
Middle	2437	13.00	30	-17.00
High	2462	13.02	30	-16.98

**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 11 dB (including 10 dB pad and 1 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	10.20
Middle	2437	10.15
High	2462	10.10

### 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

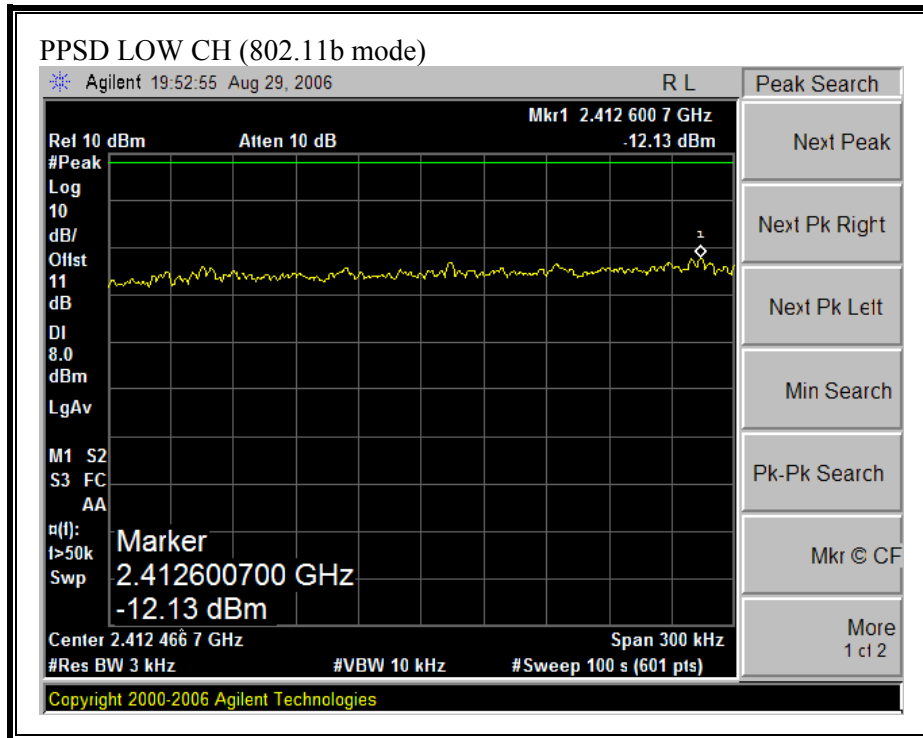
No non-compliance noted:

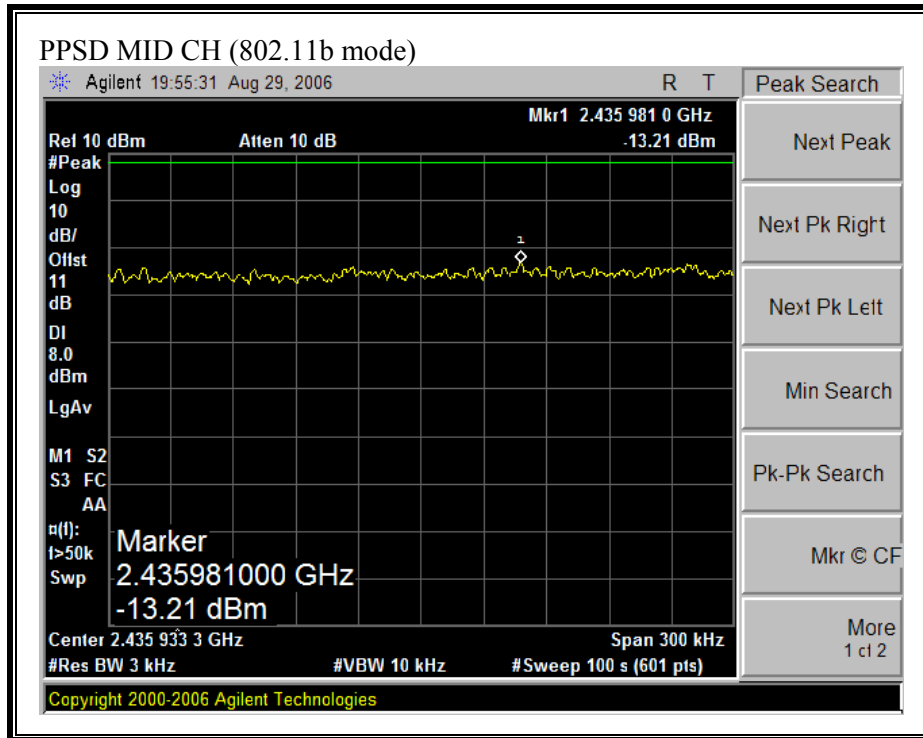
802.11b Mode

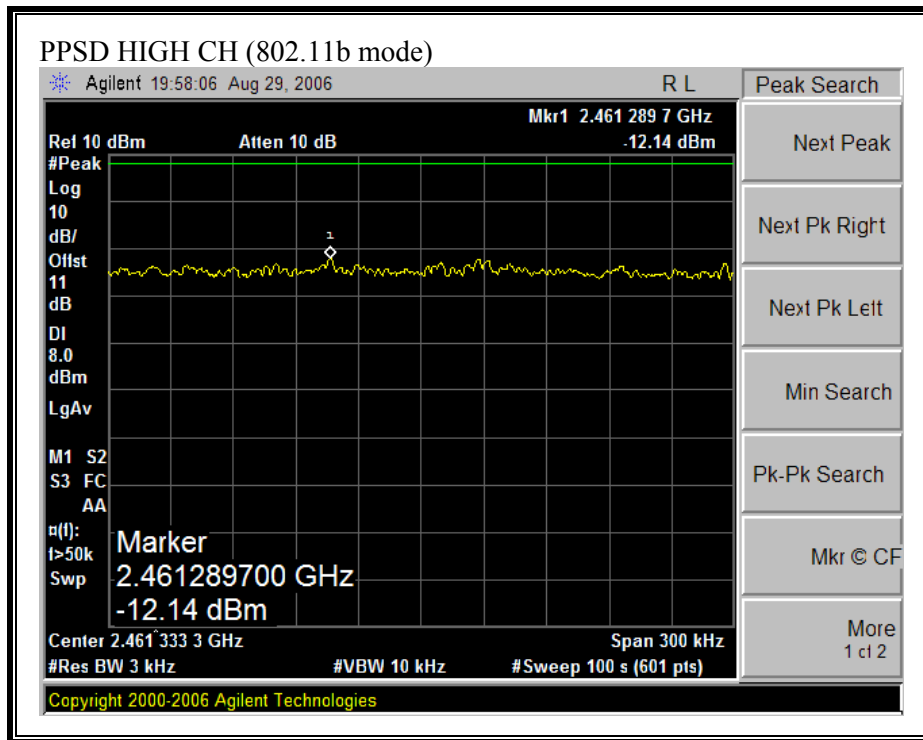
Channel	Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Margin (dB)
Low	2412	-12.13	8	-20.13
Middle	2437	-13.21	8	-21.21
High	2462	-12.14	8	-20.14



**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)).

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

### TEST PROCEDURE

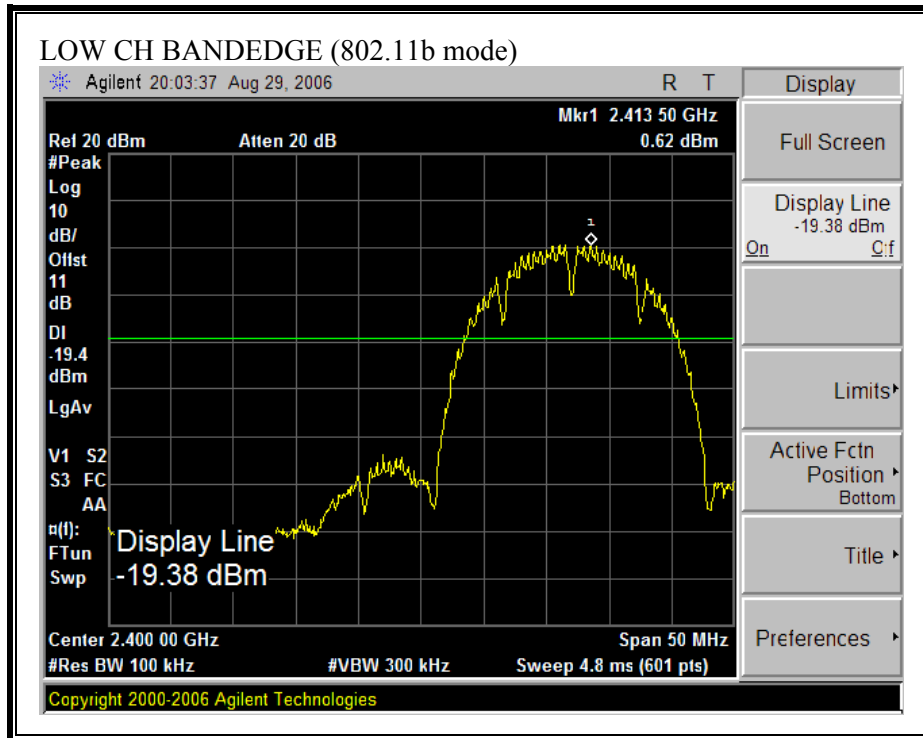
The transmitter output is connected to a spectrum analyzer. The resolution bandwidth is set to 100 kHz. The video bandwidth is set to 300 kHz.

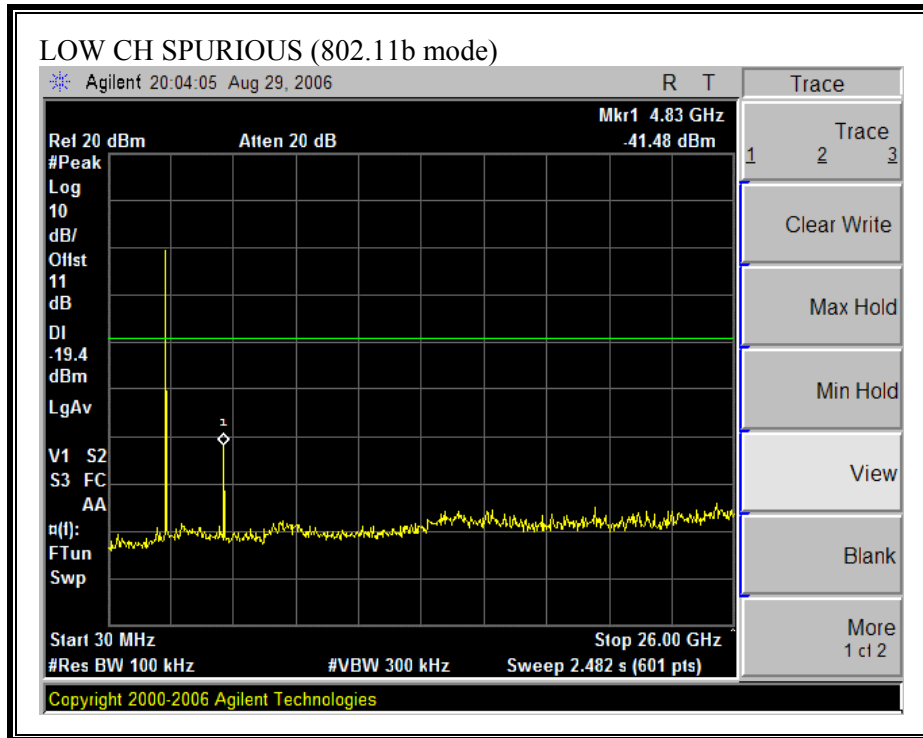
The spectrum from 30 MHz to 26 GHz is investigated with the transmitter set to the lowest, middle, and highest channels.

### RESULTS

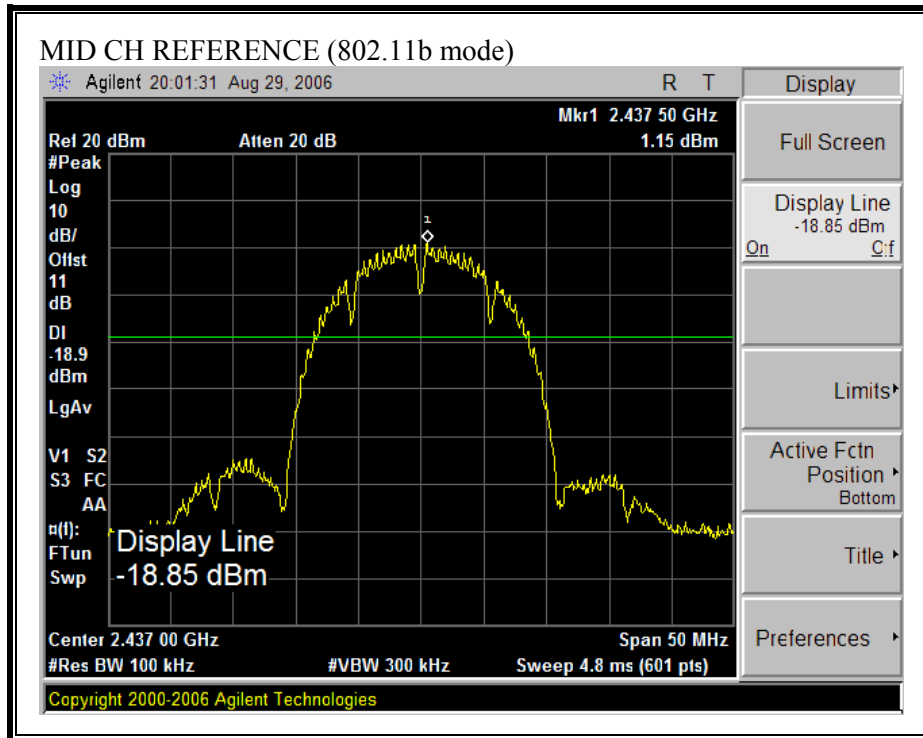
No non-compliance noted:

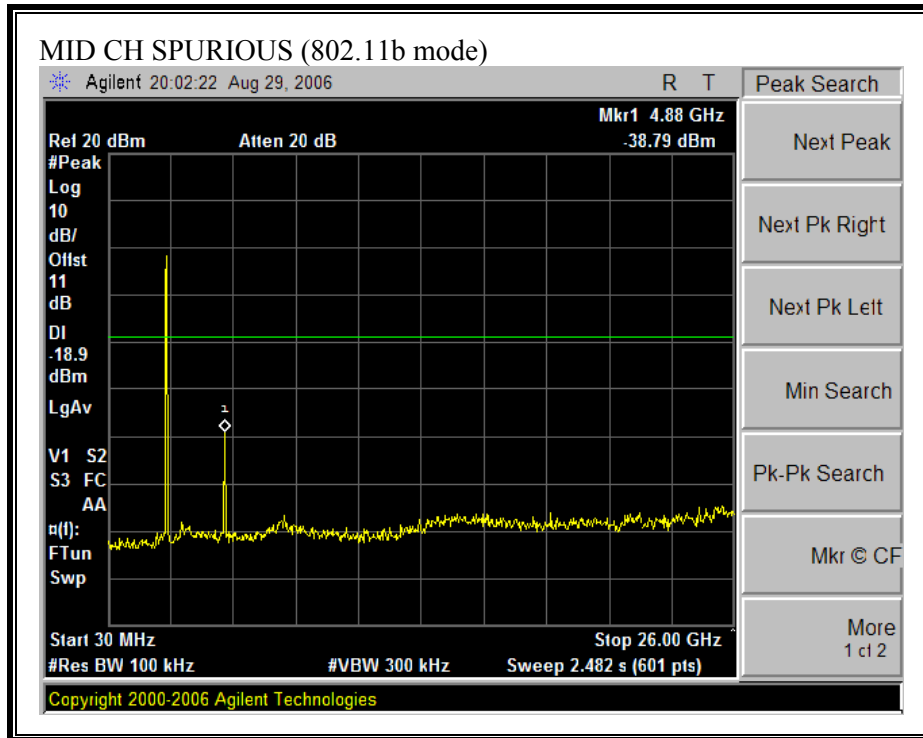
**SPURIOUS EMISSIONS, LOW CHANNEL (802.11b MODE)**





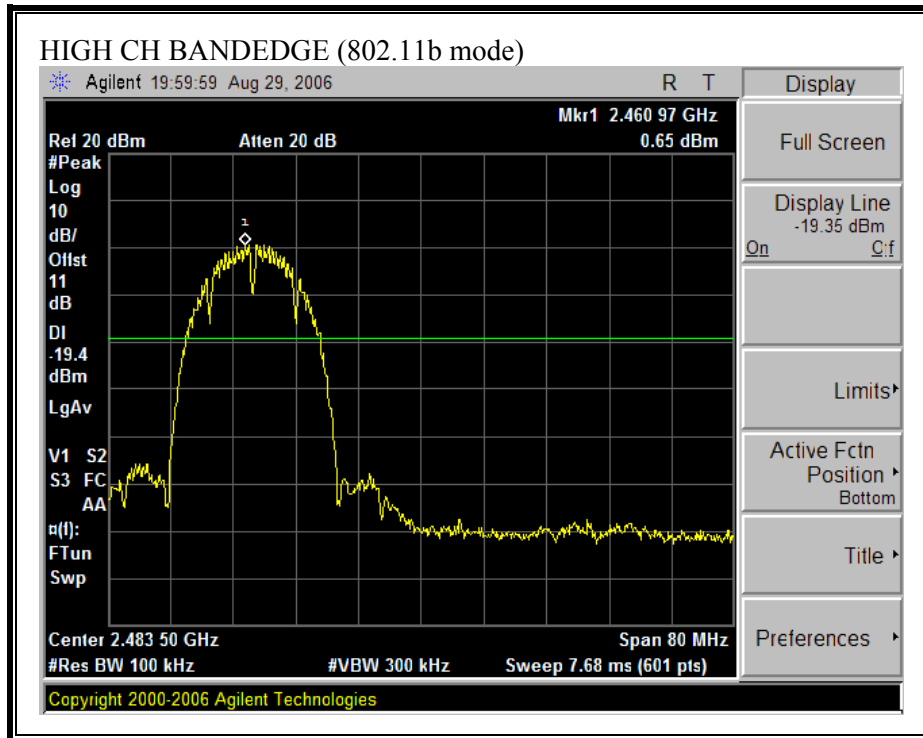
**SPURIOUS EMISSIONS, MID CHANNEL (802.11b MODE)**

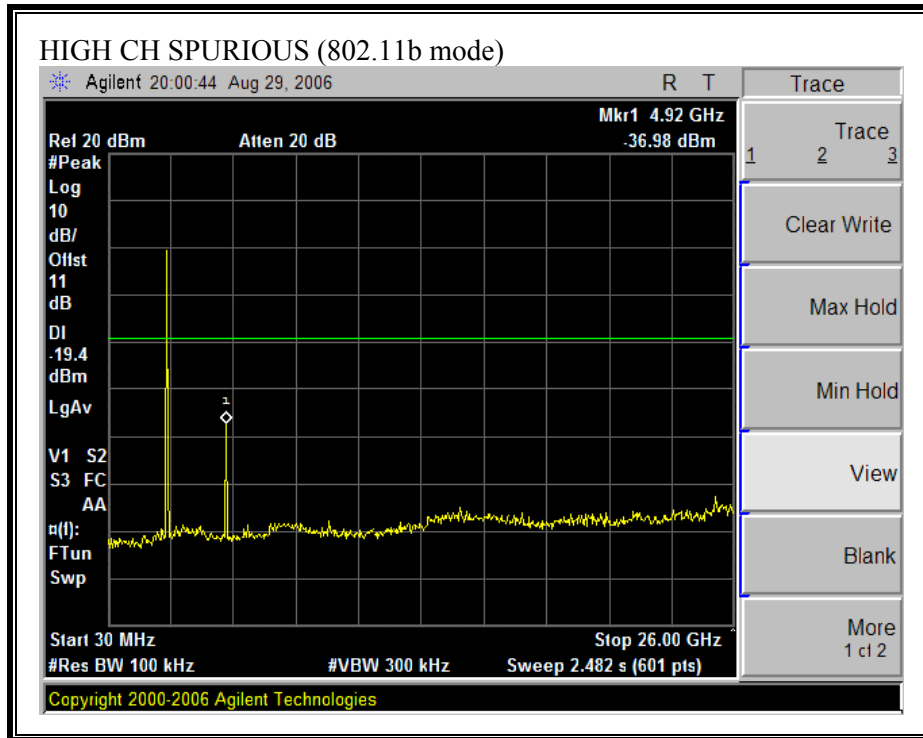






**SPURIOUS EMISSIONS, HIGH CHANNEL (802.11b MODE)**





## 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
<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 in the 2.4 GHz band.

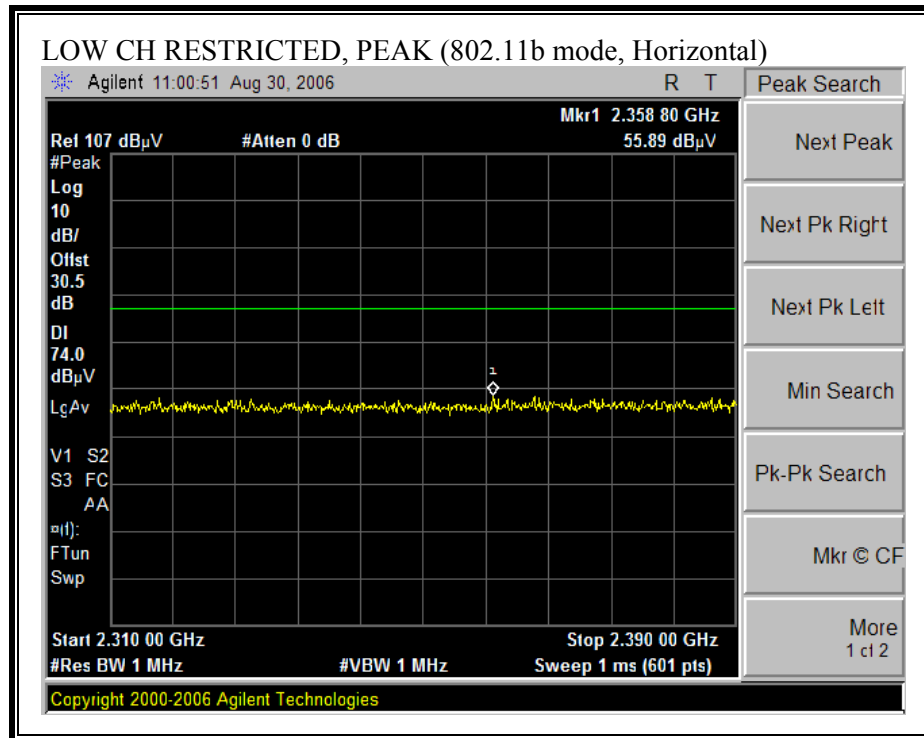
The spectrum from 30 MHz to 40 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in each 5 GHz band.

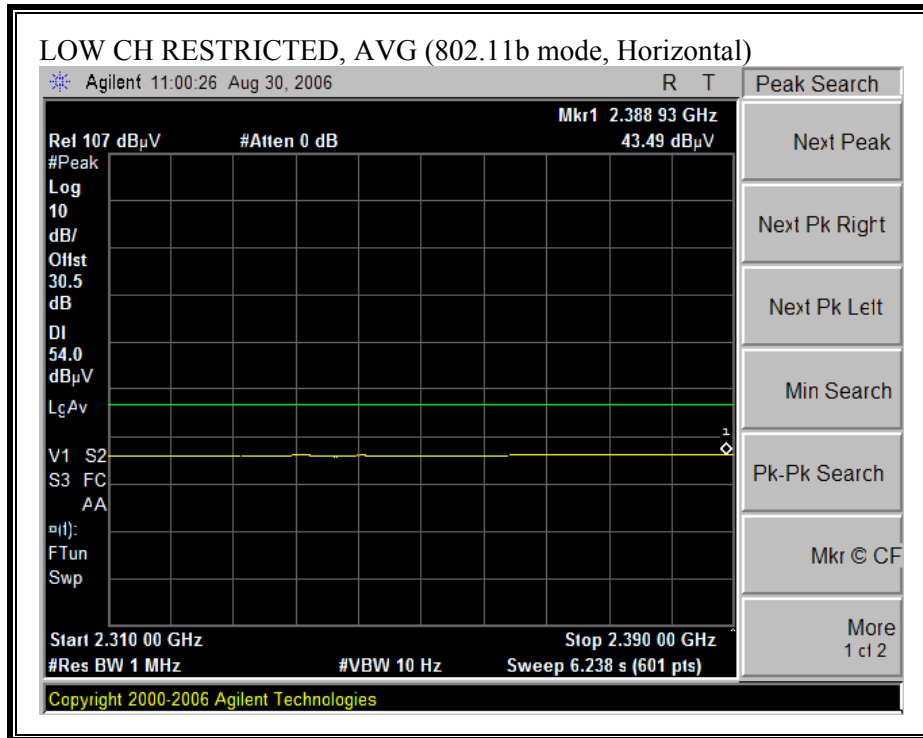
The frequency range of interest is monitored at a fixed antenna height and EUT azimuth. The EUT is rotated through 360 degrees to maximize emissions received. The antenna is scanned from 1 to 4 meters above the ground plane to further maximize the emission. Measurements are made with the antenna polarized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

## 7.2.2. TRANSMITTER ABOVE 1 GHz

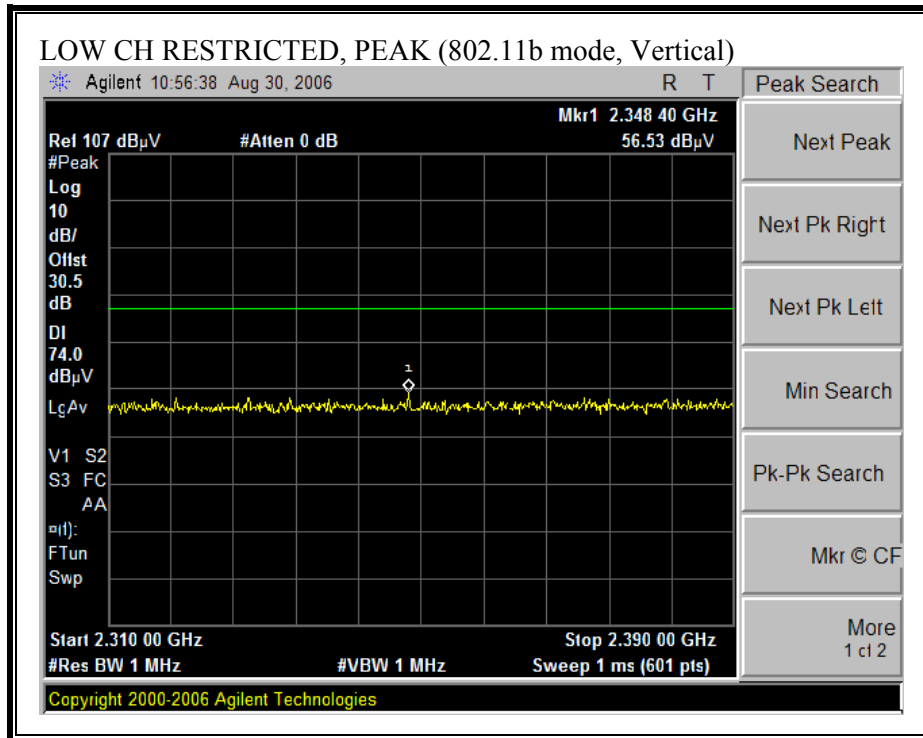
### 7.2.2.1 EUT STAND ALONE

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

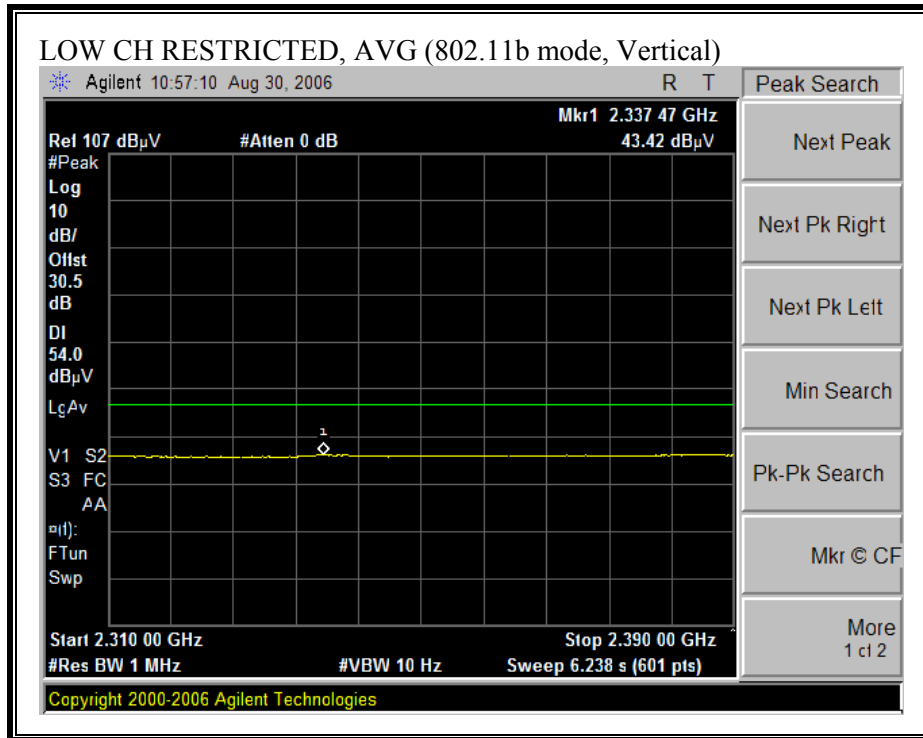




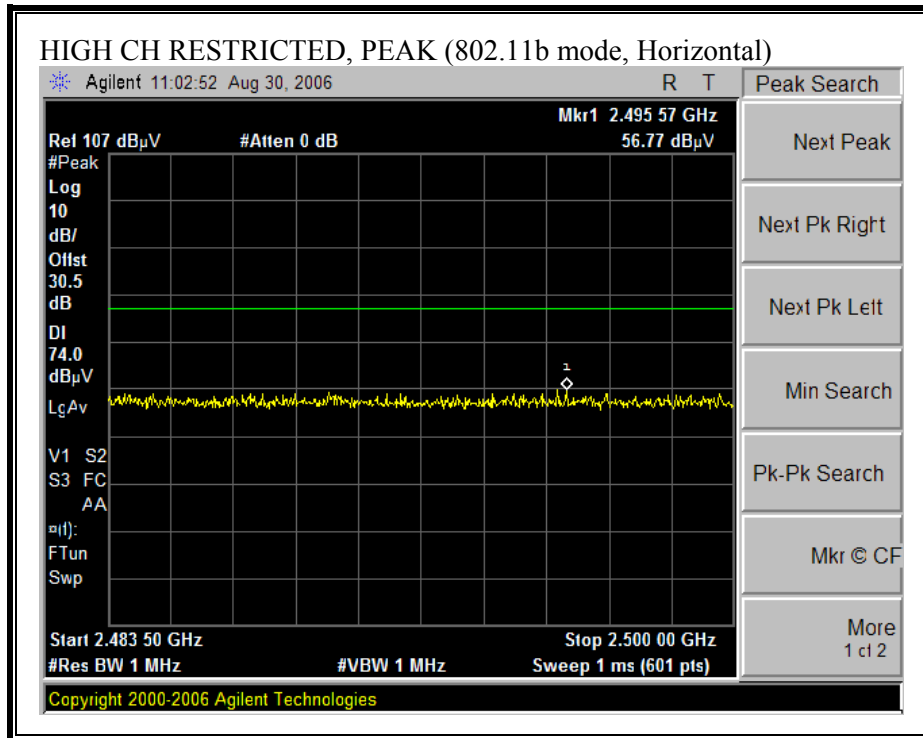
**RESTRICTED BANDEDGE (b MODE, LOW CHANNEL, VERTICAL)**

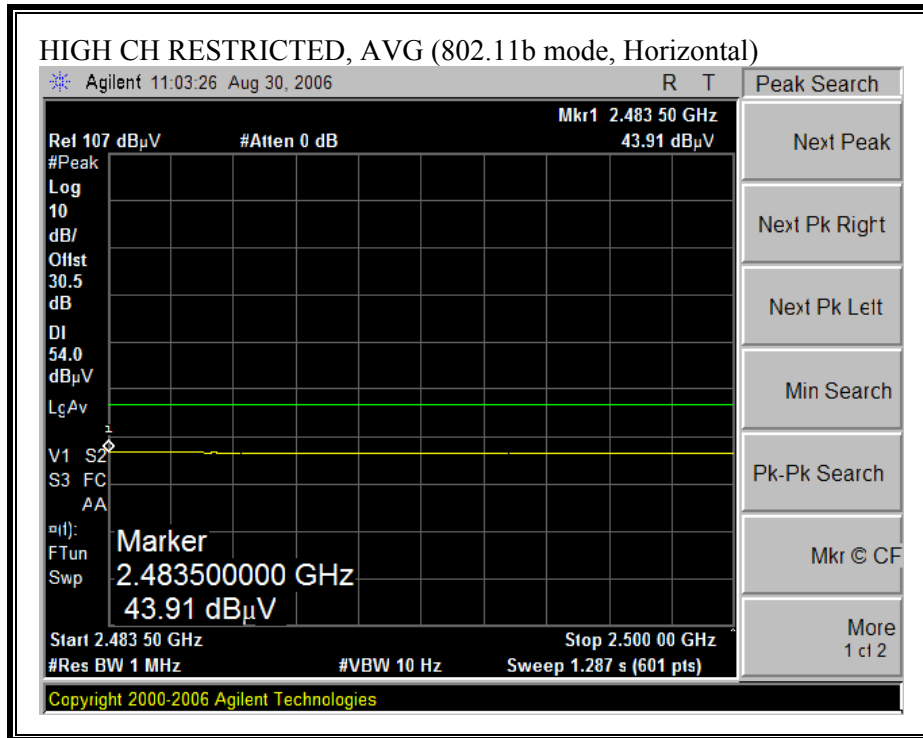




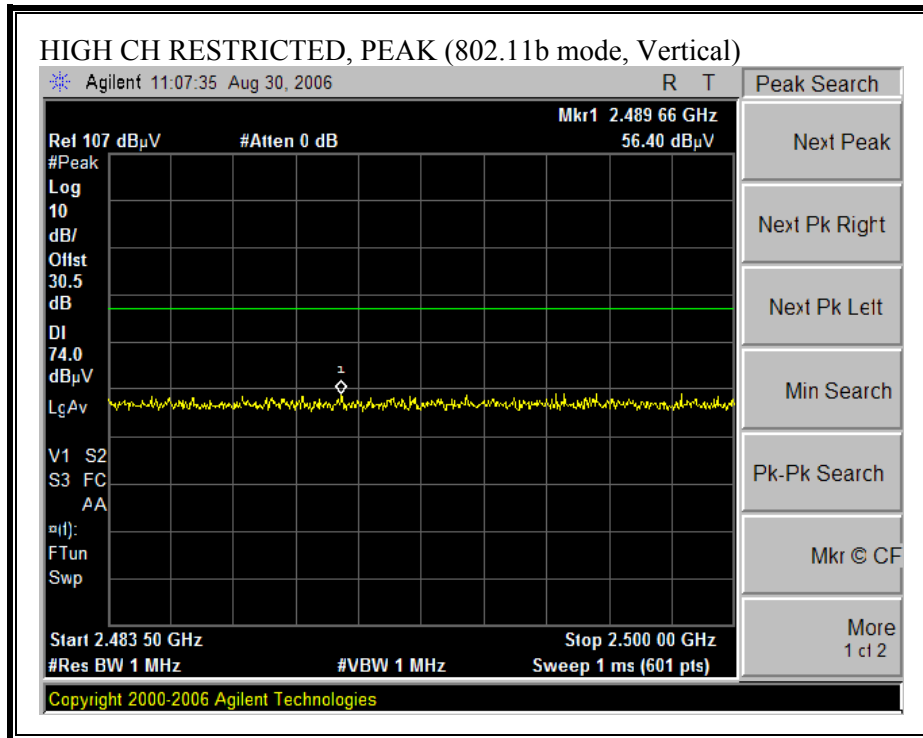


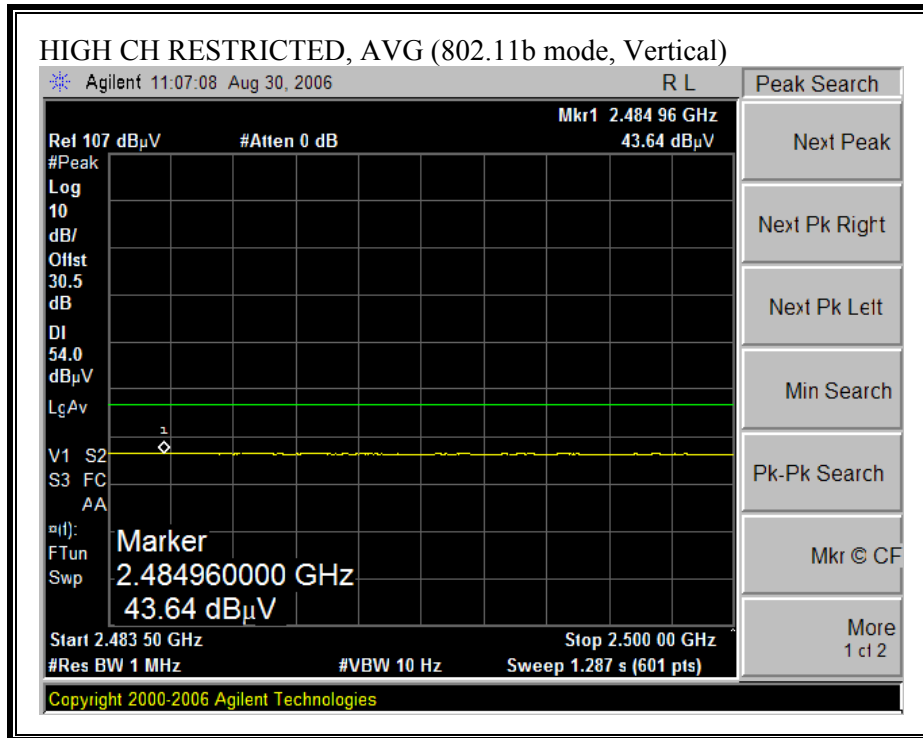
**RESTRICTED BANDEDGE (b MODE, HIGH CHANNEL, HORIZONTAL)**





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





**HARMONICS AND SPURIOUS EMISSIONS (b MODE)**

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

Company: Mitsumi  
 Project #: 06J10470-1  
 Date: August 30, 2006  
 Test Engineer: Chin Pang  
 Configuration: EUT Only  
 Mode: TX ( Worst Position )

**Test Equipment:**

Horn 1-18GHz	Pre-amplifier 1-26GHz	Pre-amplifier 26-40GHz	Horn > 18GHz	Limit
T60; S/N: 2238 @3m	T34 HP 8449B			FCC 15.205

Hi Frequency Cables

2 foot cable	3 foot cable	12 foot cable	HPF	Reject Filter	Peak Measurements RBW=VBW=1MHz
	Chin 197538001	Chin 200354001		R_001	Average Measurements RBW=1MHz ; VBW=10Hz

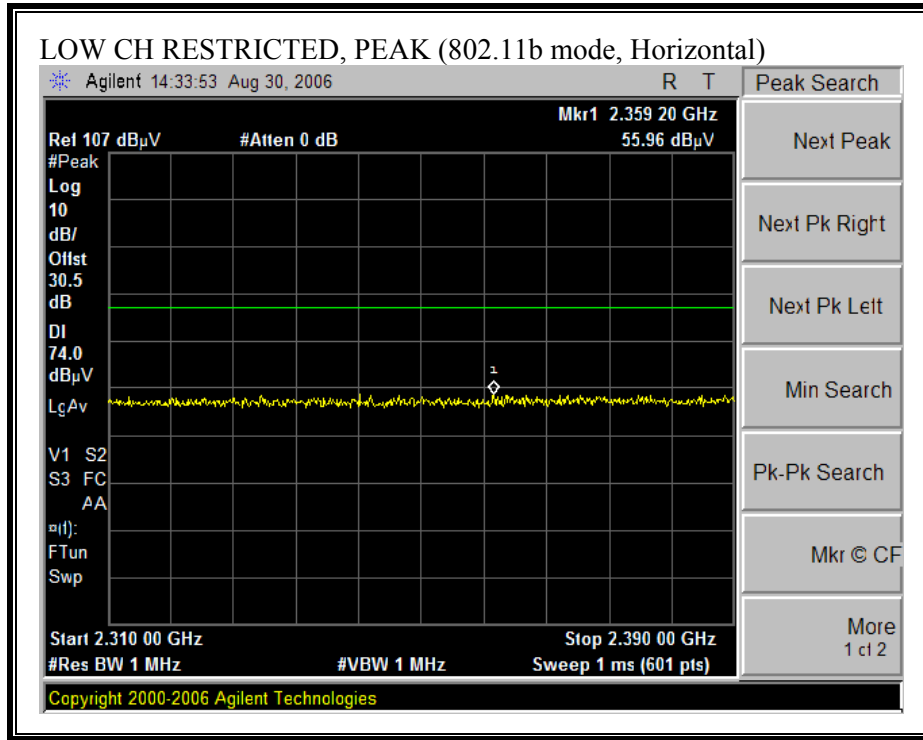
f GHz	Dist (m)	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Filtr dB	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes (V/H)
<b>Low Ch, 2412MHz</b>															
4.824	3.0	49.0	35.3	33.0	3.2	-34.8	0.0	0.0	50.4	36.7	74	54	-23.6	-17.3	V
4.824	3.0	54.0	40.0	33.0	3.2	-34.8	0.0	0.0	55.4	41.4	74	54	-18.6	-12.6	H
<b>Mid Ch, 2437MHz</b>															
4.874	3.0	51.0	37.4	33.1	3.2	-34.8	0.0	0.0	52.5	38.9	74	54	-21.5	-15.1	V
7.311	3.0	43.0	28.5	35.5	3.6	-34.1	0.0	0.0	48.0	33.5	74	54	-26.0	-20.5	V
4.874	3.0	54.0	41.6	33.1	3.2	-34.8	0.0	0.0	55.5	43.1	74	54	-18.5	-10.9	H
7.311	3.0	42.0	28.0	35.5	3.6	-34.1	0.0	0.0	47.0	33.0	74	54	-27.0	-21.0	H
<b>High Ch, 2462MHz</b>															
4.924	3.0	52.6	39.6	33.1	3.2	-34.8	0.0	0.0	54.1	41.1	74	54	-19.9	-12.9	V
7.386	3.0	45.0	30.0	35.6	3.6	-34.1	0.0	0.0	50.1	35.1	74	54	-23.9	-18.9	V
4.924	3.0	55.5	43.2	33.1	3.2	-34.8	0.0	0.0	57.0	44.7	74	54	-17.0	-9.3	H
7.386	3.0	42.0	29.0	35.6	3.6	-34.1	0.0	0.0	47.1	34.1	74	54	-26.9	-19.9	H

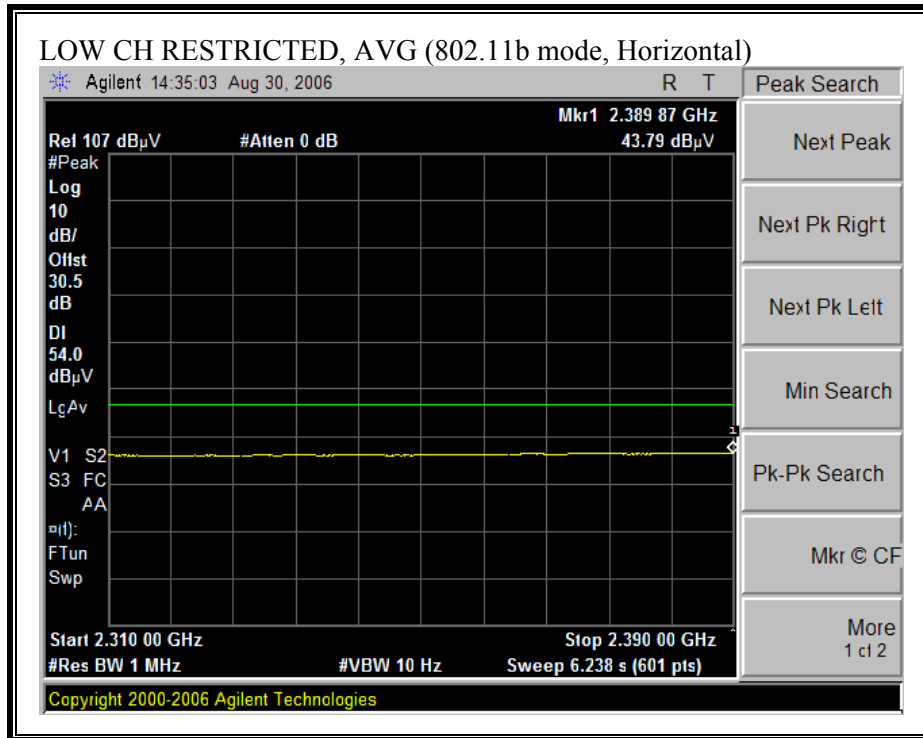
Rev. 5.1.6  
 Note: No other emissions were detected above the system noise floor.

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		

### 7.2.2.2 EUT SITTING ON CRADLE

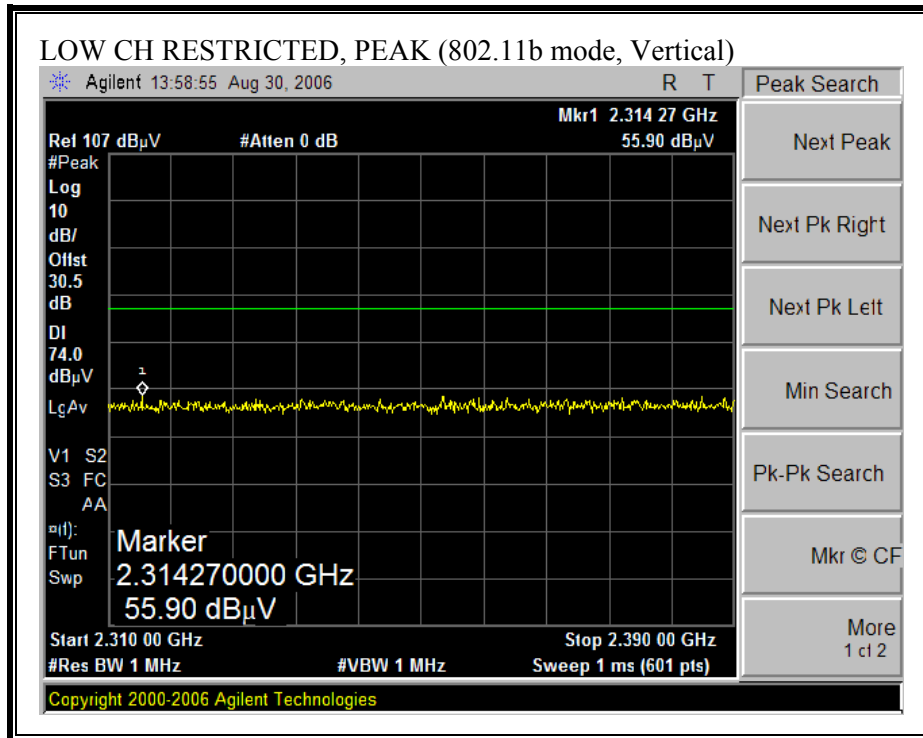
#### RESTRICTED BANDEDGE (b MODE, LOW CHANNEL, HORIZONTAL)

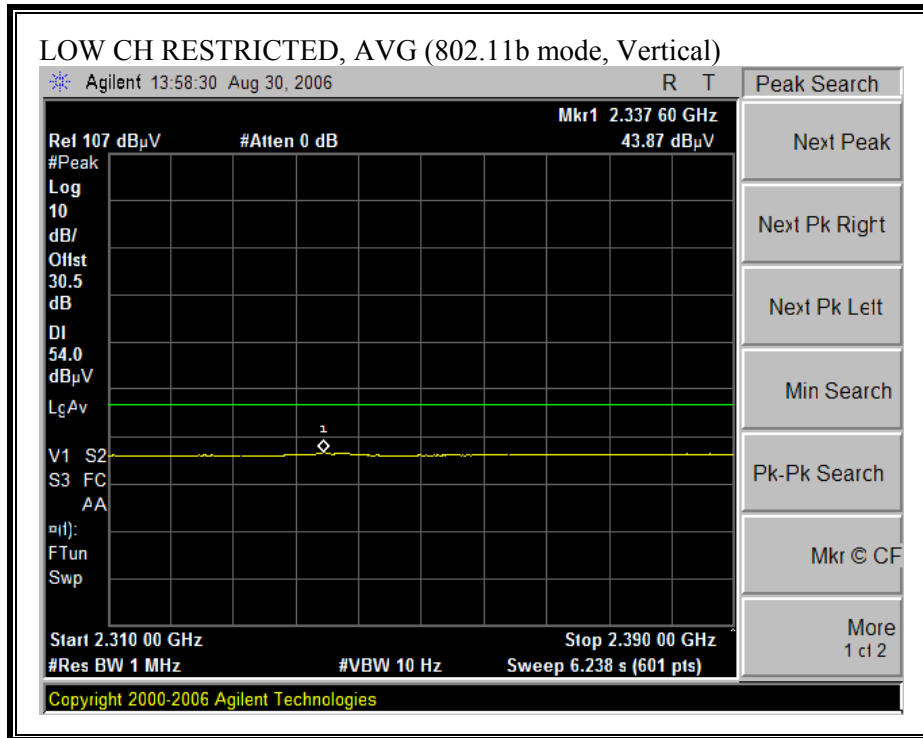




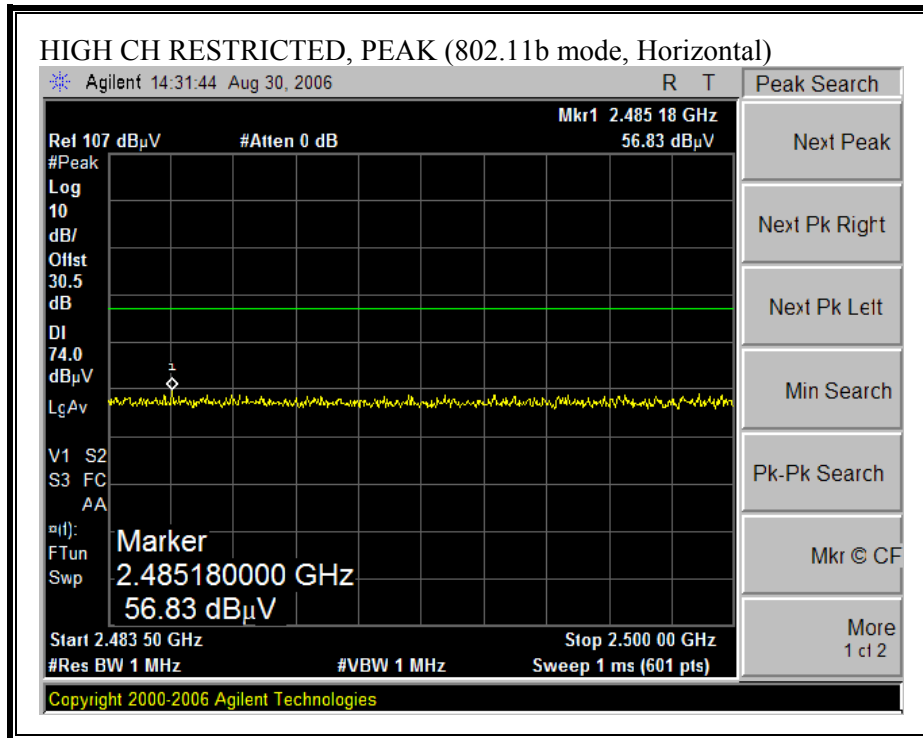


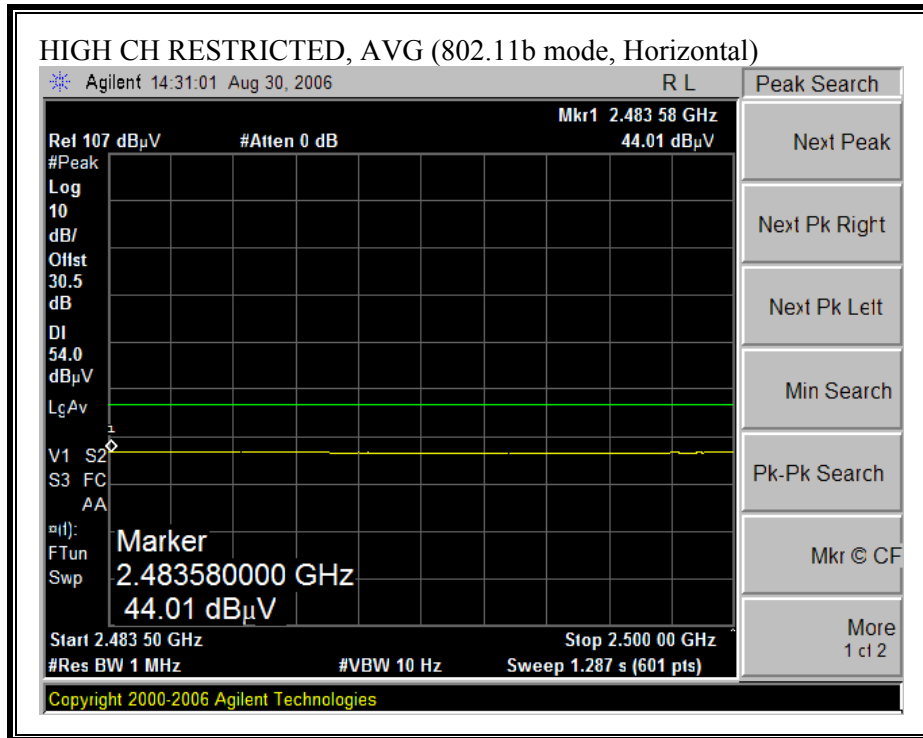
**RESTRICTED BANDEGE (b MODE, LOW CHANNEL, VERTICAL)**



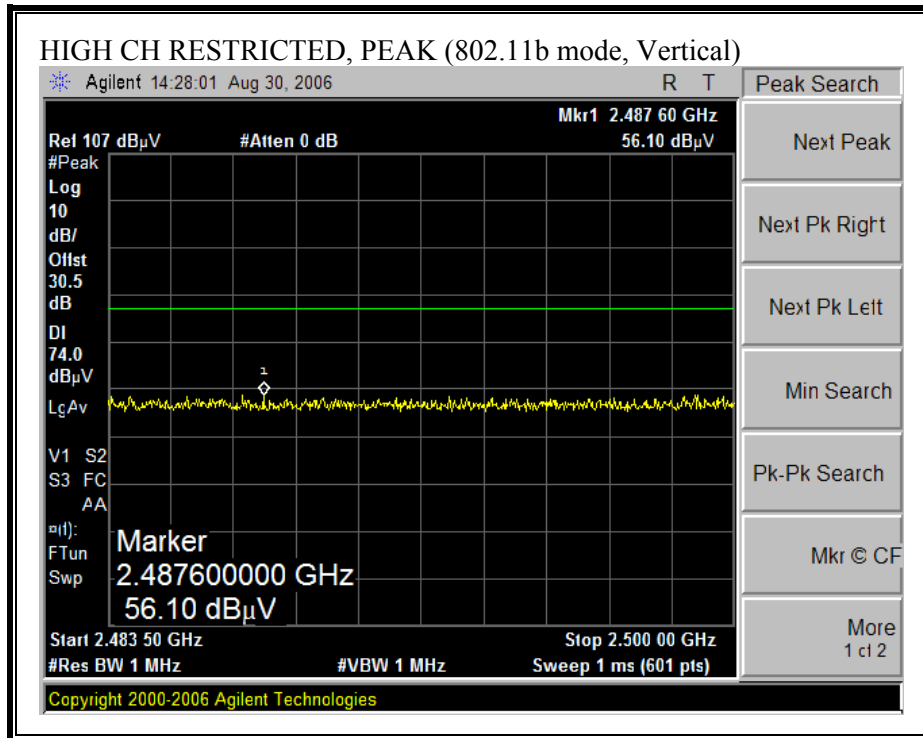


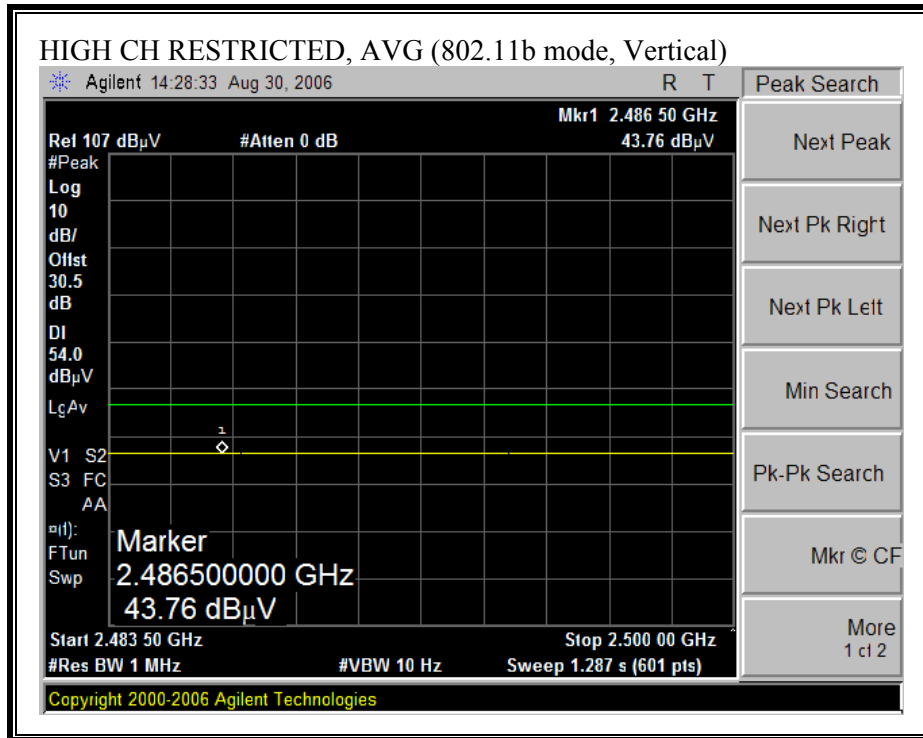
**RESTRICTED BANDEDGE (b MODE, HIGH CHANNEL, HORIZONTAL)**





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





**HARMONICS AND SPURIOUS EMISSIONS (b MODE)**

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

Company: Mitsumi  
 Project #: 06J10470-1  
 Date: August 30, 2006  
 Test Engineer: Chin Pang  
 Configuration: EUT with Cradle  
 Mode: TX

**Test Equipment:**

Horn 1-18GHz	Pre-amplifier 1-26GHz	Pre-amplifier 26-40GHz	Horn > 18GHz	Limit
T60; S/N: 2238 @3m	T34 HP 8449B			FCC 15.205

Hi Frequency Cables

2 foot cable	3 foot cable	12 foot cable	HPF	Reject Filter	Peak Measurements RBW=VBW=1MHz
	Chin 197538001	Chin 200354001		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	Filtr 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, 2412MHz</b>															
4.824	3.0	52.0	39.0	33.0	3.2	-34.8	0.0	0.0	53.4	40.4	74	54	-20.6	-13.6	V
4.824	3.0	54.5	41.4	33.0	3.2	-34.8	0.0	0.0	55.9	42.8	74	54	-18.1	-11.2	H
<b>Mid Ch, 2437MHz</b>															
4.874	3.0	54.0	41.0	33.1	3.2	-34.8	0.0	0.0	55.5	42.5	74	54	-18.5	-11.5	V
7.311	3.0	43.6	29.0	35.5	3.6	-34.1	0.0	0.0	48.6	34.0	74	54	-25.4	-20.0	V
4.874	3.0	55.0	42.5	33.1	3.2	-34.8	0.0	0.0	56.5	44.0	74	54	-17.5	-10.0	H
7.311	3.0	44.0	39.0	35.5	3.6	-34.1	0.0	0.0	49.0	44.0	74	54	-25.0	-10.0	H
<b>High Ch, 2462MHz</b>															
4.924	3.0	54.7	42.0	33.1	3.2	-34.8	0.0	0.0	56.2	43.5	74	54	-17.8	-10.5	V
7.386	3.0	43.0	30.0	35.6	3.6	-34.1	0.0	0.0	48.1	35.1	74	54	-25.9	-18.9	V
4.924	3.0	57.0	44.4	33.1	3.2	-34.8	0.0	0.0	58.5	45.9	74	54	-15.5	-8.1	H
7.386	3.0	45.0	30.2	35.6	3.6	-34.1	0.0	0.0	50.1	35.3	74	54	-23.9	-18.7	H

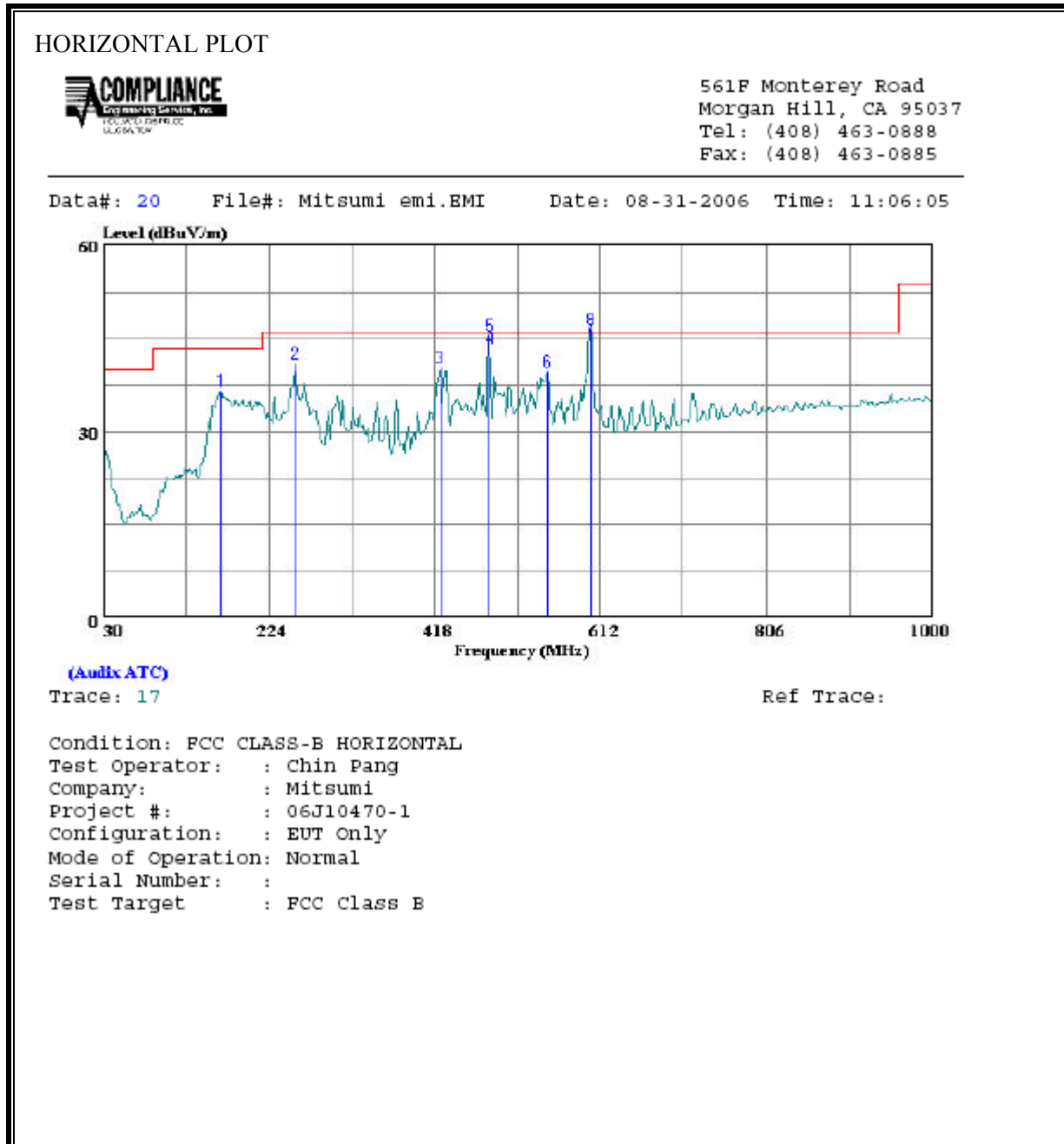
Rev. 5.1.6  
 Note: No other emissions were detected above the system noise floor.

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		

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

#### 7.2.3.1 EUT STAND ALONE

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



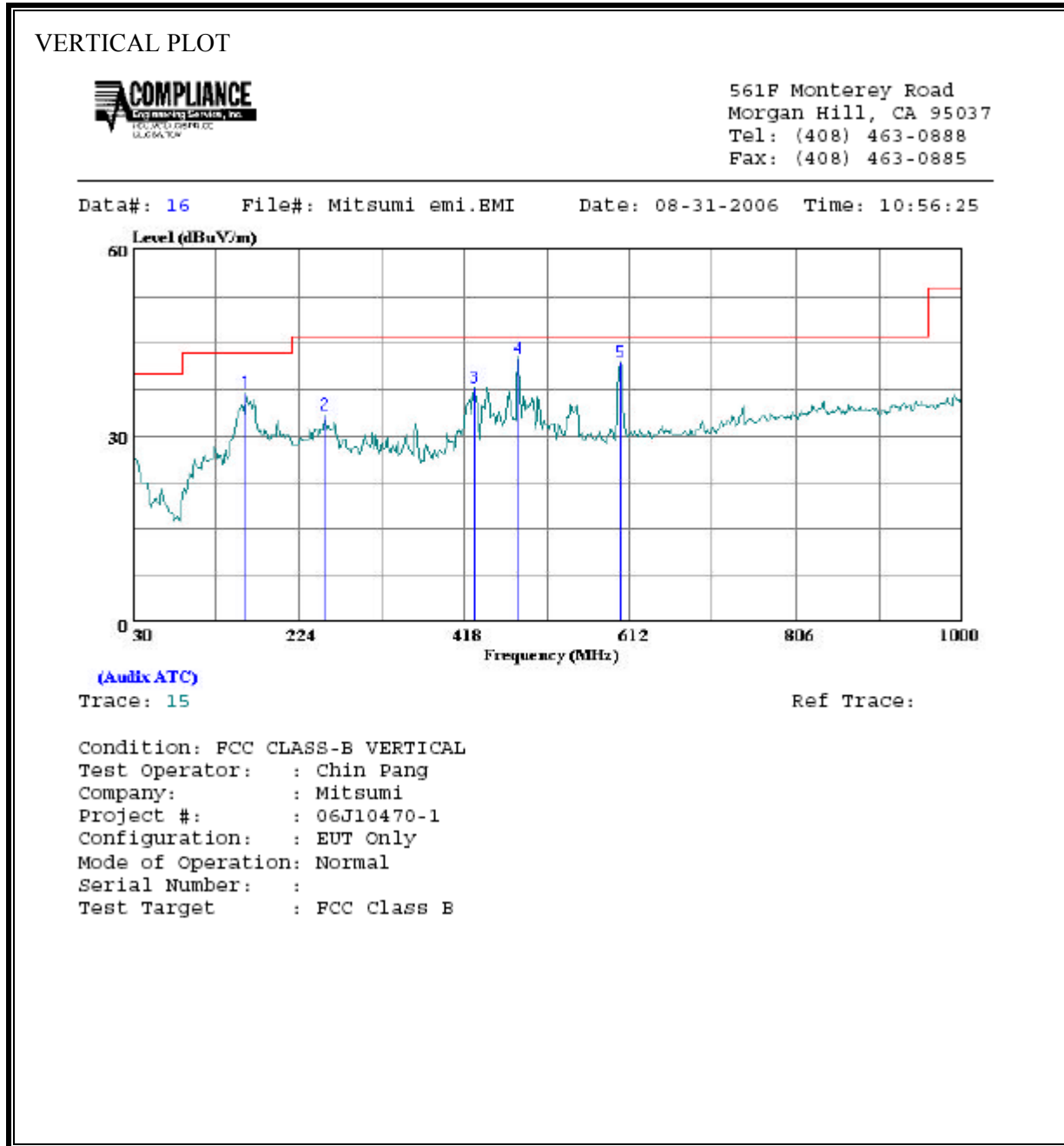


HORIZONTAL DATA

Page: 1

	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
1	167.740	23.05	13.51	36.56	43.50	-6.94	Peak
2	255.040	26.80	14.09	40.89	46.00	-5.11	Peak
3	424.790	21.68	18.64	40.32	46.00	-5.68	Peak
4	482.900	23.50	19.87	43.37	46.00	-2.63	QP
5	482.990	25.63	19.89	45.52	46.00	-0.48	Peak
6	550.890	18.67	20.90	39.57	46.00	-6.43	Peak
7	601.330	24.00	21.50	45.50	46.00	-0.50	QP
8 *	601.330	25.00	21.50	46.50	46.00	0.50	Peak

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



VERTICAL DATA

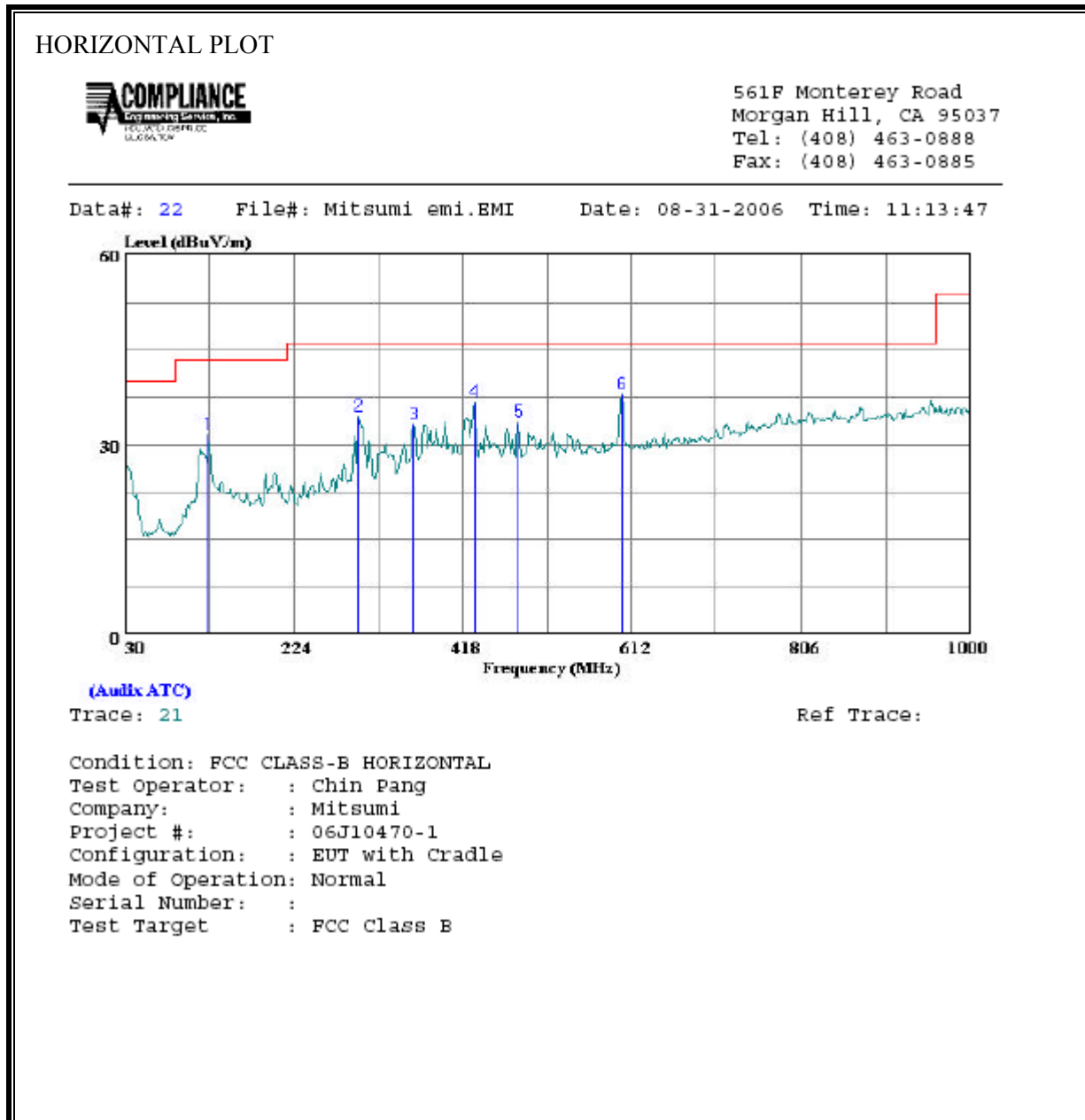
Page: 1

	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
1	162.890	23.19	13.68	36.87	43.50	-6.63	Peak
2	255.040	19.25	14.09	33.34	46.00	-12.66	Peak
3	429.640	19.01	18.74	37.75	46.00	-8.25	Peak
4	481.050	22.82	19.84	42.66	46.00	-3.34	Peak
5	601.330	20.52	21.50	42.02	46.00	-3.98	Peak

### 7.2.3.2 EUT SITTING ON CRADLE

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

#### EUT WITH CRADLE

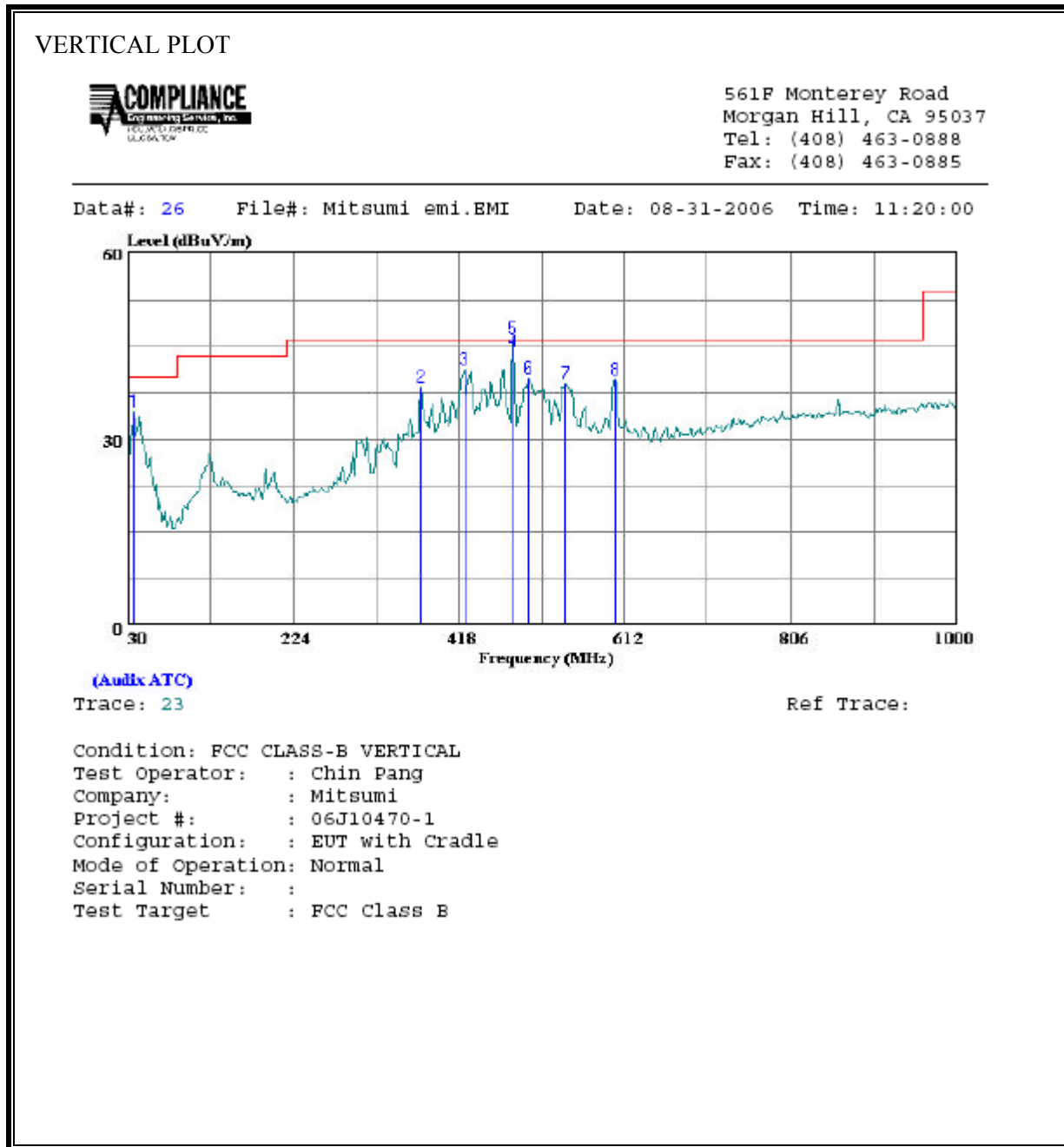


HORIZONTAL DATA

Page: 1

	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
1	126.030	16.23	15.25	31.48	43.50	-12.02	Peak
2	298.690	18.80	15.63	34.43	46.00	-11.57	Peak
3	361.740	16.02	17.20	33.22	46.00	-12.78	Peak
4	431.580	17.94	18.75	36.69	46.00	-9.31	Peak
5	482.990	13.75	19.89	33.64	46.00	-12.36	Peak
6	601.330	16.48	21.50	37.98	46.00	-8.02	Peak

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



VERTICAL DATA

Page: 1

	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
1	36.790	17.09	17.44	34.53	40.00	-5.47	Peak
2	373.380	20.91	17.46	38.37	46.00	-7.63	Peak
3	424.790	22.70	18.64	41.34	46.00	-4.66	Peak
4	481.050	24.40	19.84	44.24	46.00	-1.76	QP
5 *	481.050	26.38	19.84	46.22	46.00	0.22	Peak
6	499.480	19.57	20.22	39.79	46.00	-6.21	Peak
7	543.130	18.20	20.79	38.99	46.00	-7.01	Peak
8	601.330	18.13	21.50	39.63	46.00	-6.37	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  $\mu$ 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 - EUT STAND ALONE**

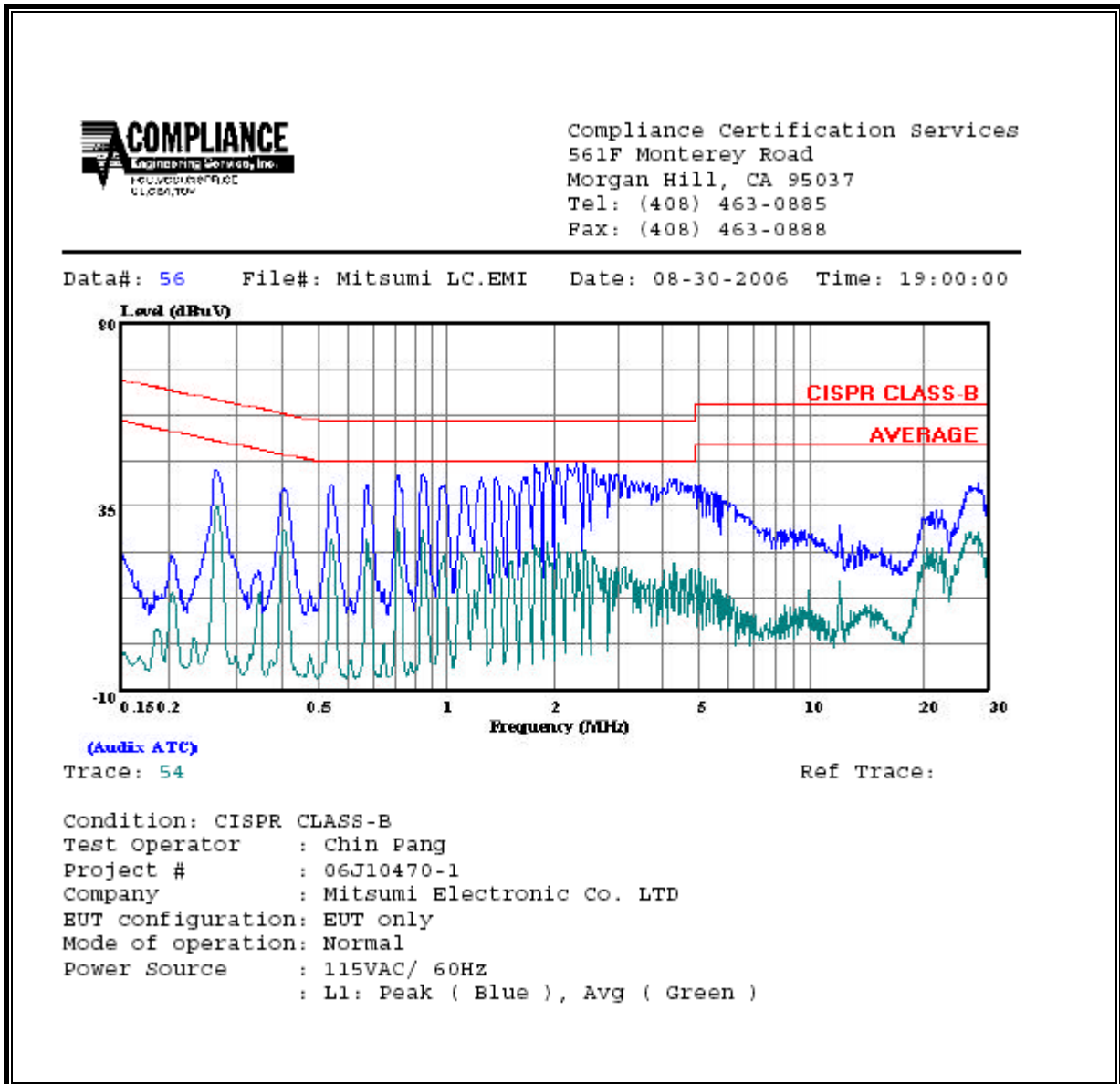
CONDUCTED EMISSIONS DATA (115VAC 60Hz)									
Freq.	Reading			Closs	Limit	EN B	Margin		Remark
(MHz)	PK (dBuV)	QP (dBuV)	AV (dBuV)	(dB)	QP	AV	QP (dB)	AV (dB)	L1 / L2
0.81	42.58	--	29.20	0.00	56.00	46.00	-13.42	-16.80	L1
1.87	45.44	--	25.00	0.00	56.00	46.00	-10.56	-21.00	L1
2.54	45.86	--	25.98	0.00	56.00	46.00	-10.14	-20.02	L1
0.44	44.90	--	33.57	0.00	57.02	47.02	-12.12	-13.45	L2
2.22	54.32	--	35.80	0.00	56.00	46.00	-1.68	-10.20	L2
2.42	54.88	--	35.11	0.00	56.00	46.00	-1.12	-10.89	L2
6 Worst Data EUT only									

**6 WORST EMISSIONS - EUT SITTING ON CRADLE**

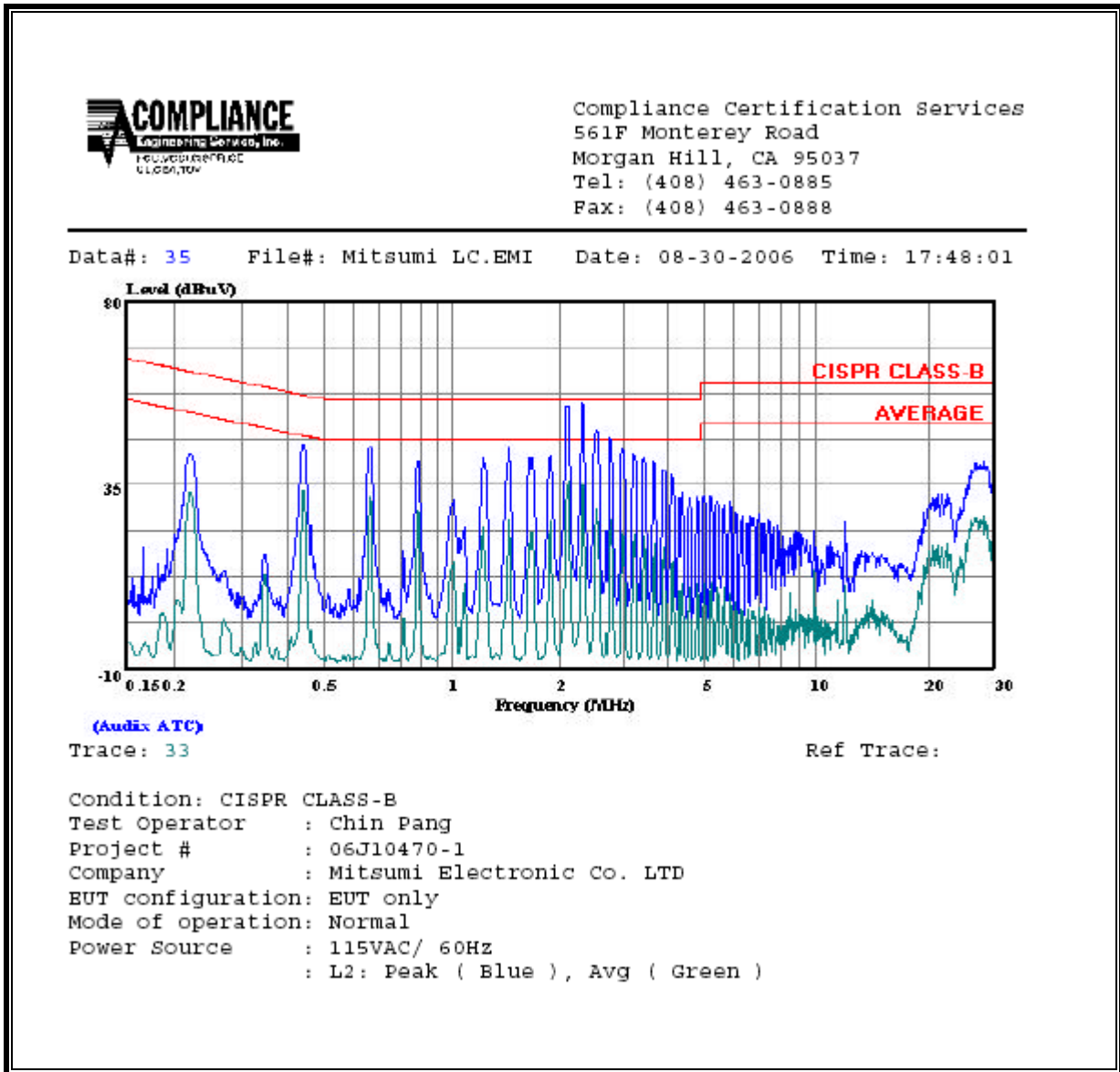
CONDUCTED EMISSIONS DATA (115VAC 60Hz)									
Freq.	Reading			Closs	Limit	EN B	Margin		Remark
(MHz)	PK (dBuV)	QP (dBuV)	AV (dBuV)	(dB)	QP	AV	QP (dB)	AV (dB)	L1 / L2
0.82	44.42	--	35.19	0.00	56.00	46.00	-11.58	-10.81	L1
0.22	55.57	--	41.04	0.00	62.89	52.89	-7.32	-11.85	L1
2.42	54.96	--	38.28	0.00	56.00	46.00	-1.04	-7.72	L1
0.82	44.66	--	30.49	0.00	56.00	46.00	-11.34	-15.51	L2
1.49	47.42	--	28.58	0.00	56.00	46.00	-8.58	-17.42	L2
2.13	47.14	--	29.00	0.00	56.00	46.00	-8.86	-17.00	L2
6 Worst Data EUT With Cradle									

**LINE 1 RESULTS**

**EUT ONLY**

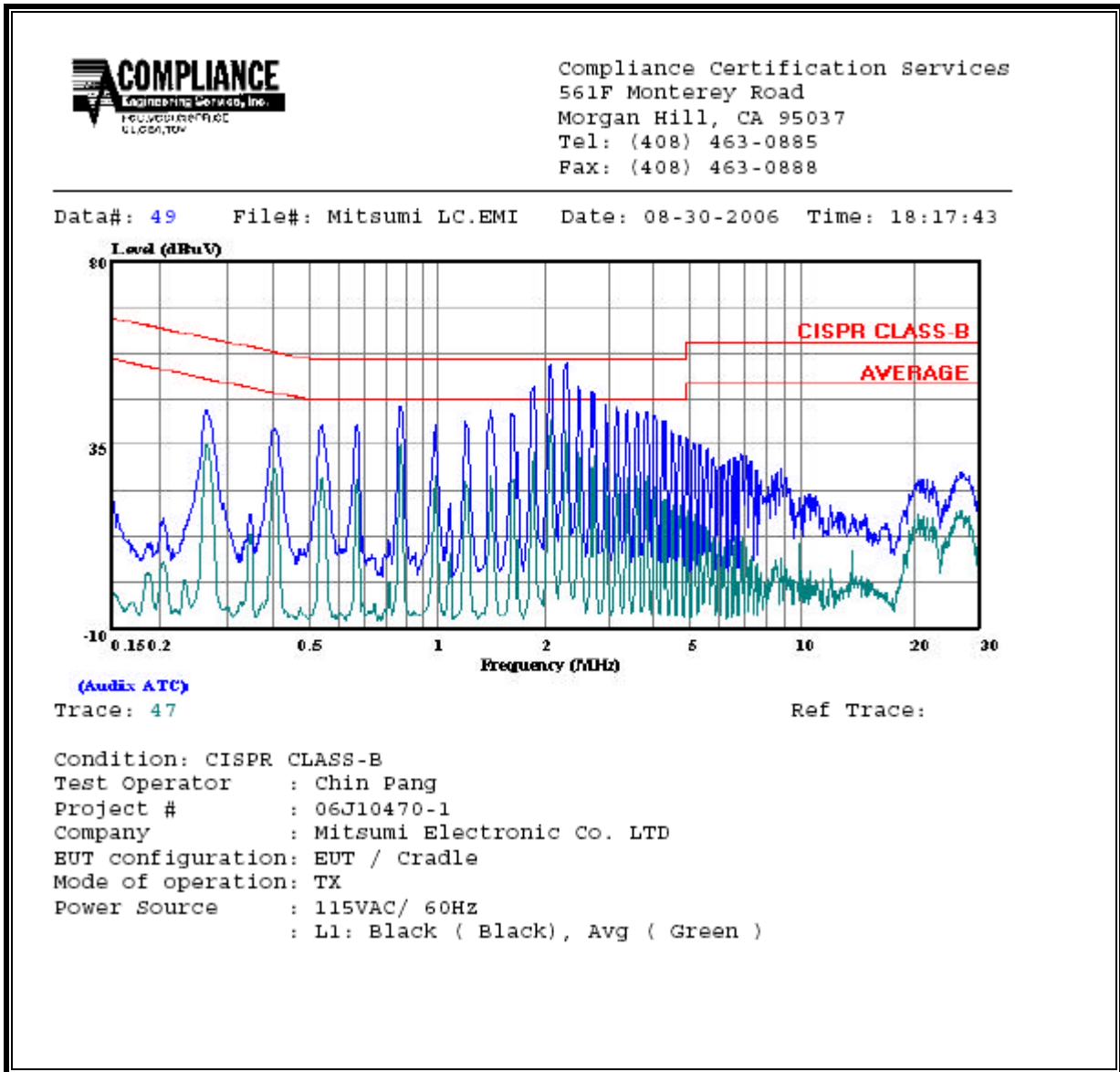


**LINE 2 RESULTS**

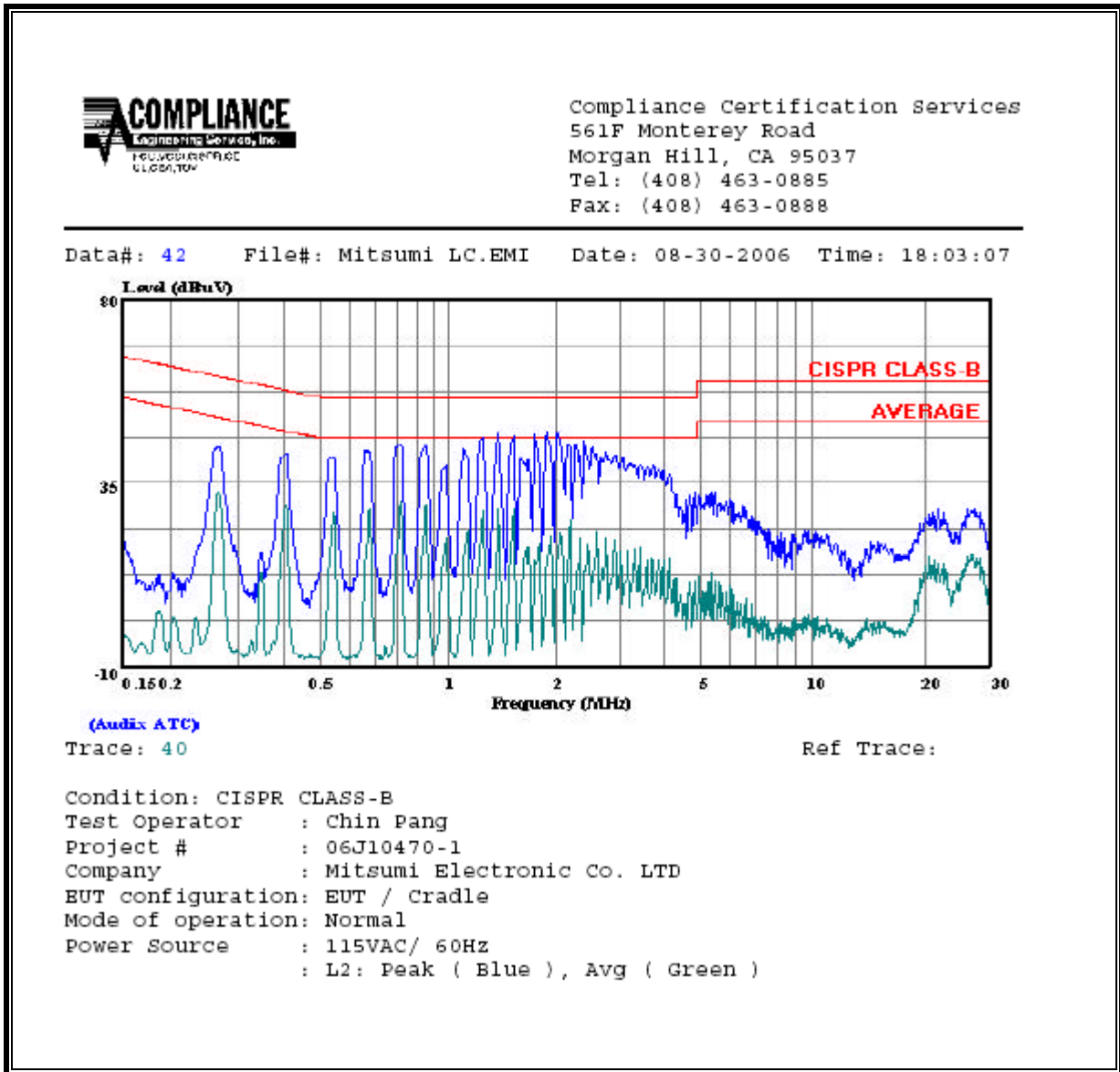


**LINE 1 RESULTS**

**EUT SITTING ON CRADLE**

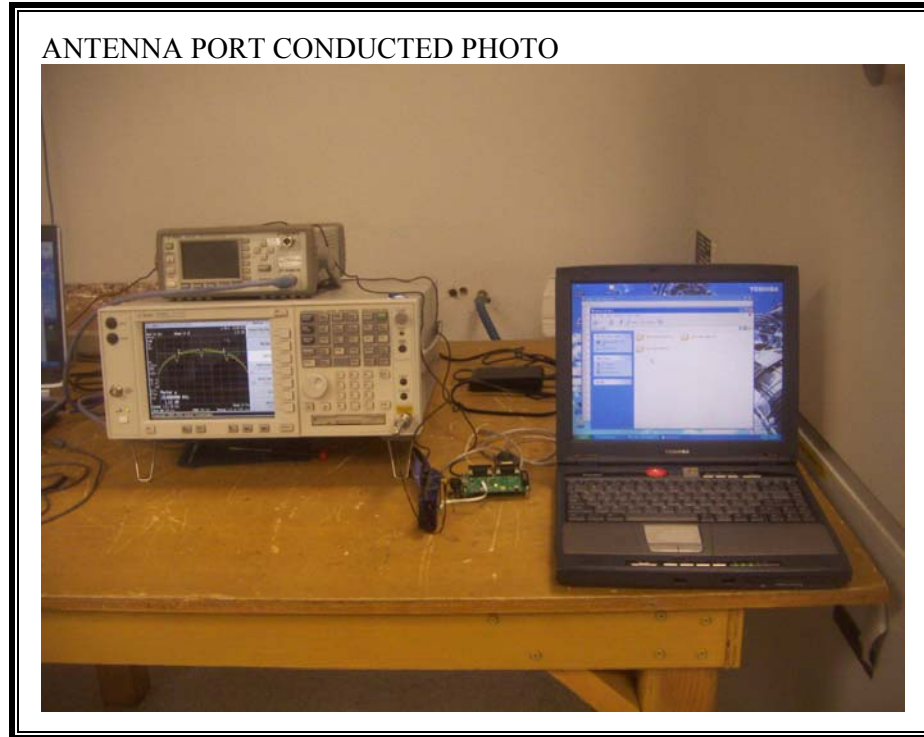


**LINE 2 RESULTS**



## 8 SETUP PHOTOS

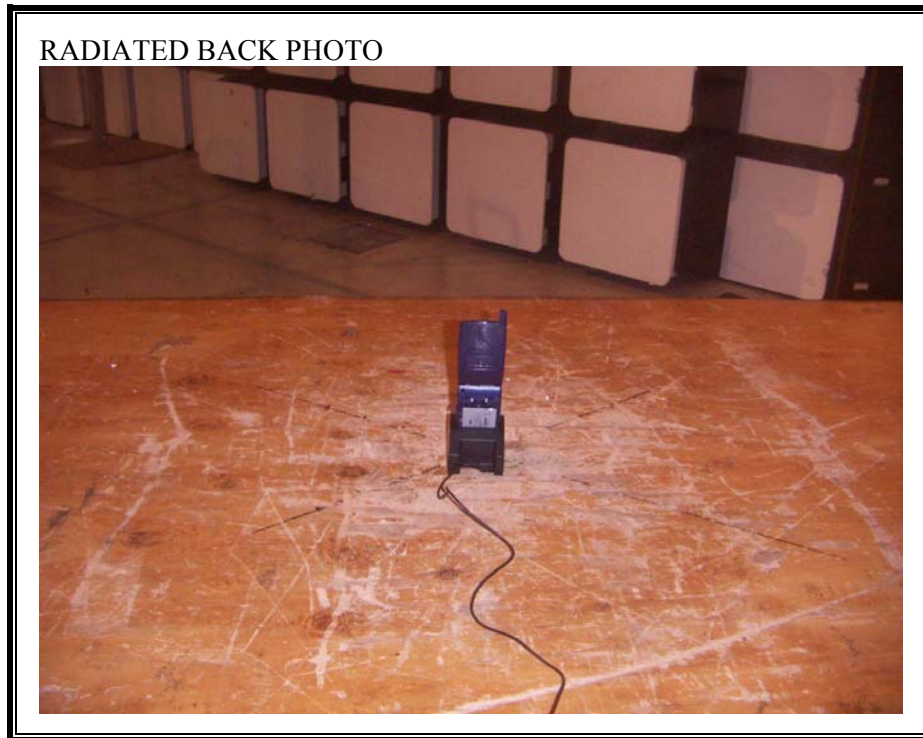
### ANTENNA PORT CONDUCTED RF MEASUREMENT SETUP



**RADIATED RF MEASUREMENT – EUT SITTING ON CRADLE**

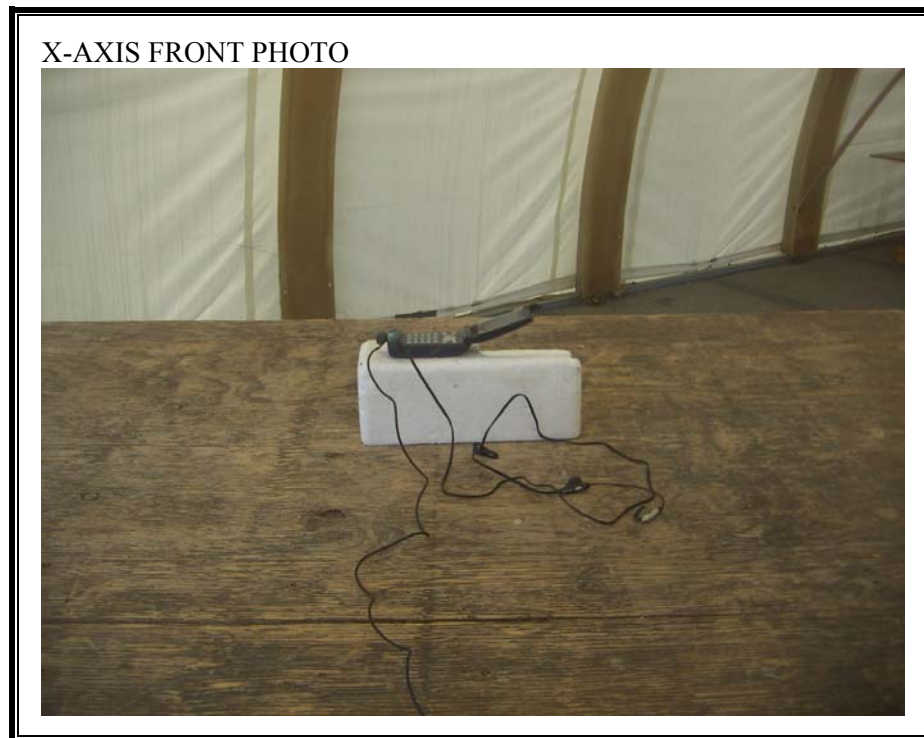




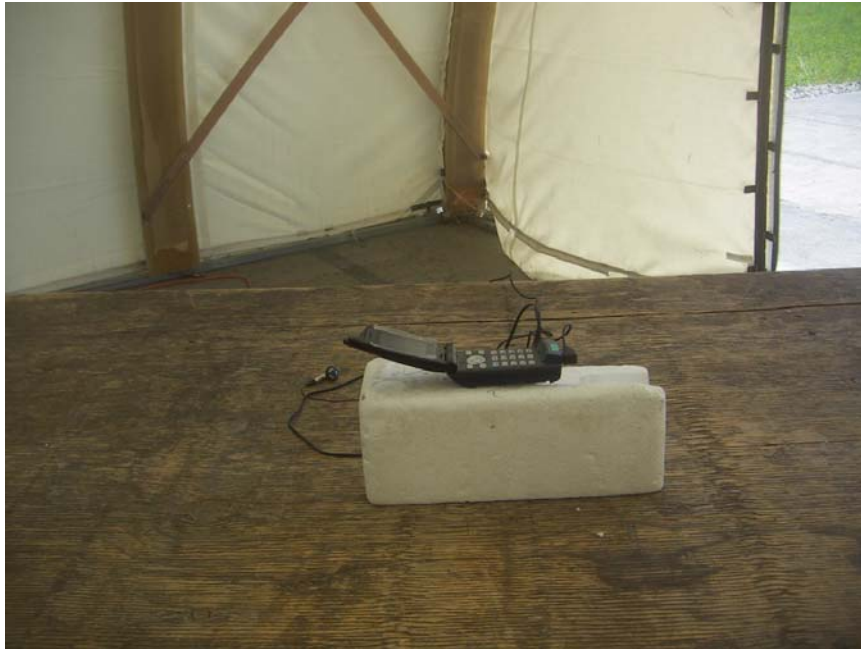




**RADIATED RF MEASUREMENT SETUP FOR PORTABLE CONFIGURATION**



X-AXIS BACK PHOTO



Y-AXIS FRONT PHOTO



Y-AXIS BACK PHOTO



Z-AXIS FRONT PHOTO

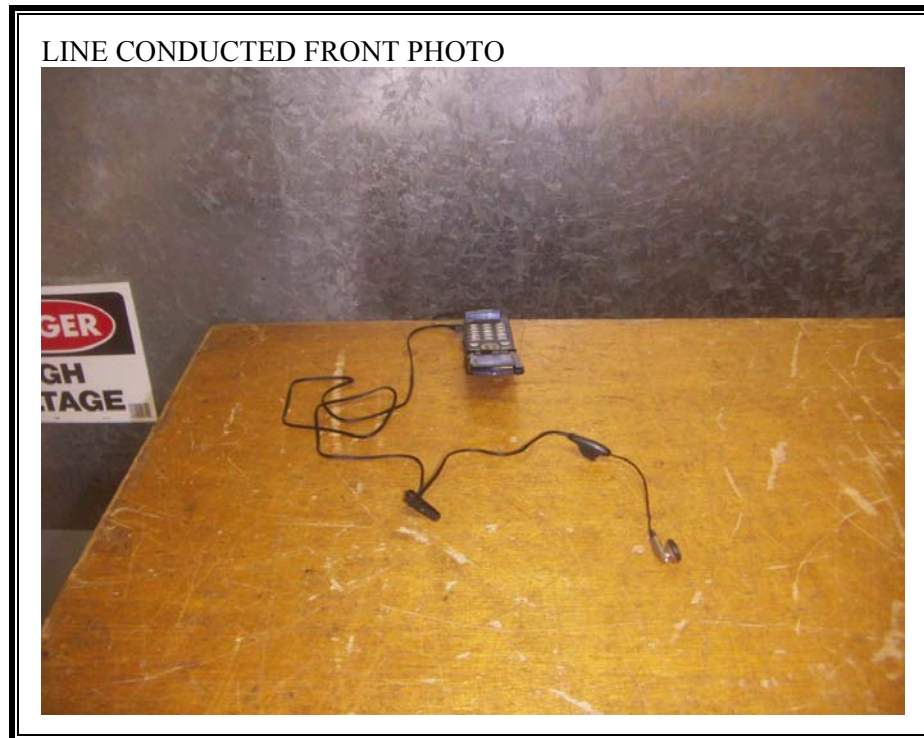


Z-AXIS BACK PHOTO





**POWERLINE CONDUCTED EMISSIONS MEASUREMENT SETUP – EUT STAND ALONE**



LINE CONDUCTED BACK PHOTO





**POWERLINE CONDUCTED EMISSIONS MEASUREMENT SETUP – EUT SITTING ON CRADLE**





**END OF REPORT**