**FCC CFR47 PART 15 SUBPART C**
**INDUSTRY CANADA RSS-210 ISSUE 7**

# CERTIFICATION TEST REPORT

**FOR**

**O3 WIFI MODULE**

**MODEL NUMBER: J27H020**

**FCC ID: MCLJ27H020**
**IC: 2878D-J27H020**

**REPORT NUMBER: 10J13094-1, Revision A**

**ISSUE DATE: MARCH 22, 2010**

*Prepared for*
**HON HAI PRECISION IND. CO., LTD.**
**5F-1, 5 HSIN-AN ROAD**
**HSINCHU SCIENCE-BASED INDUSTRIAL PARK**
**TAIWAN, R.O.C.**

*Prepared by*
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NVLAP LAB CODE 200065-0

Revision History

| Rev. | Issue Date | Revisions | Revised By |
|---|---|---|---|
| -- | 03/10/10 | Initial Issue | T. Chan |
| A | 03/22/10 | Revised Section 5.3 by adding Mitsumi antenna information and Section 5.5 to “EUT stand-alone host, no laptop connection” instead of “EUT stand-alone”; Also added “EUT stand-alone host” into Setup Photo Section. | T. Chan |

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# 1. ATTESTATION OF TEST RESULTS

**COMPANY NAME:** HON HAI PRECISION IND. CO., LTD.
5F-1, 5 HSIN-AN ROAD
HSINCHU SCIENCE-BASED INDUSTRIAL PARK
TAIWAN, R.O.C.

**EUT DESCRIPTION:** O3 WIFI MODULE

**MODEL:** J27H020

**SERIAL NUMBER:** For Antenna Port: 002659822AE4
For Radiated Emission:
TJF116694773; TWL-001 (Tyco antenna)
TJF116694775; TWL-001 (Foxconn antenna)
WJF100027495; UTL-001 (Foxconn antenna)

**DATE TESTED:** MARCH 03 – 10, 2010

| APPLICABLE STANDARDS | |
|---|---|
| **STANDARD** | **TEST RESULTS** |
| CFR 47 Part 15 Subpart C | Pass |
| INDUSTRY CANADA RSS-210 Issue 7 Annex 8 | Pass |
| INDUSTRY CANADA RSS-GEN Issue 2 | Pass |

Compliance Certification Services, Inc. (CCS) tested the above equipment in accordance with the requirements set forth in the above standards. All indications of Pass/Fail in this report are opinions expressed by CCS based on interpretations and/or observations of test results. Measurement Uncertainties were not taken into account and are published for informational purposes only. 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 CCS and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by CCS will constitute fraud and shall nullify the document. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, any agency of the Federal Government, or any agency of any government.

Approved & Released For CCS By:

THU CHAN
EMC MANAGER
COMPLIANCE CERTIFICATION SERVICES

Tested By:

VIEN TRAN
EMC ENGINEER
COMPLIANCE CERTIFICATION SERVICES

# 2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.10-2009, FCC CFR 47 Part 2, FCC CFR 47 Part 15, RSS-GEN Issue 2, and RSS-210 Issue 7.

# 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. SAMPLE CALCULATION

Where relevant, the following sample calculation is provided:

Field Strength (dBuV/m) = Measured Voltage (dBuV) + Antenna Factor (dB/m) + Cable Loss (dB) – Preamp Gain (dB)
36.5 dBuV + 18.7 dB/m + 0.6 dB – 26.9 dB = 28.9 dBuV/m

## 4.3. MEASUREMENT UNCERTAINTY

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

| PARAMETER | UNCERTAINTY |
|---|---|
| Conducted Disturbance, 0.15 to 30 MHz | 3.52 dB |
| Radiated Disturbance, 30 to 1000 MHz | 4.94 dB |

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

# 5. EQUIPMENT UNDER TEST

## 5.1. DESCRIPTION OF EUT

The EUT is WIFI Module with 802.11 (1 – 13 channel) + 802.11b/g (1 – 11 channel).

The radio module is manufactured by Hon Hai Precision.

## 5.2. MAXIMUM OUTPUT POWER

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

| Frequency Range (MHz) | Mode | Output Power (dBm) | Output Power (mW) |
|---|---|---|---|
| 2412 - 2472 | 802.11 | 1.70 | 1.48 |
| 2412 - 2462 | 802.11b | 7.72 | 5.92 |
| 2412 - 2462 | 802.11g | 12.47 | 17.66 |

## 5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes 802.11 and 802.11b/g antennas, with maximum gains as table shown below,

| Antenna Brand | Antenna type | Antenna Model No. | Max. Peak Antenna Gain (dBi) | Host Name | Remark |
|---|---|---|---|---|---|
| Mitsumi | PIFA | DCA-P08 | -1.91 | TWL-001 | No Test |
| Tyco | **PIFA** | 2013780-1 | 0.80 | **TWL-001** | **Full Test on Radiated Emissions (Due to different of Antenna Type)** |
| Foxconn | **Dipole** | 361.00093.005 | 0.88 | TWL-001 | **Full Test (RF Conducted & Radiated Emissions)** |
| Foxconn | Dipole | 361.00147.005 | 0.75 | **UTL-001** | **Full Test on Radiated Emissions (Due to different Host)** |

## 5.4. SOFTWARE AND FIRMWARE

The EUT test utility software installed in the host computer during testing was Atheros Radio Test (ART) 6000, revision 1.5.1, BUILD MnM.

## 5.5. WORST-CASE CONFIGURATION AND MODE

The worst-case data rate for each mode is determined to be as follows, based on preliminary tests of the chipset utilized in this radio.

All final tests in the 802.11 mode were made at 2 Mb/s.
All final tests in the 802.11b mode were made at 1 Mb/s.
All final tests in the 802.11g mode were made at 6 Mb/s.

For 802.11 Mode: EUT is stand alone host, no laptop connection.
For 802.11b & g Modes: The EUT host is connected to a host laptop computer via USB adapter board for configuration setup and the laptop can be removed during the test.

The worst-position was the EUT host with highest emissions. To determine the worst-case, the EUT host was investigated for X, Y positions for both TWL-001 & UTL-001 hosts; the worst-position was turned out to be at X position.

For Radiated Emissions below 1 GHz:
The battery and the Mitsumi / Tabuchi AC/DC adapters were using to conduct the test with different types of antennas (Tyco & Foxconn) of TWL-001 host and Foxconn antenna of UTL-001 host.

For AC Line Conducted:
The Mitsumi and Tabuchi AC/DC adapters were using to conduct the test with different types of antennas (Tyco & Foxconn) of TWL-001 host and Foxconn antenna of UTL-001 host.

## 5.6. DESCRIPTION OF TEST SETUP

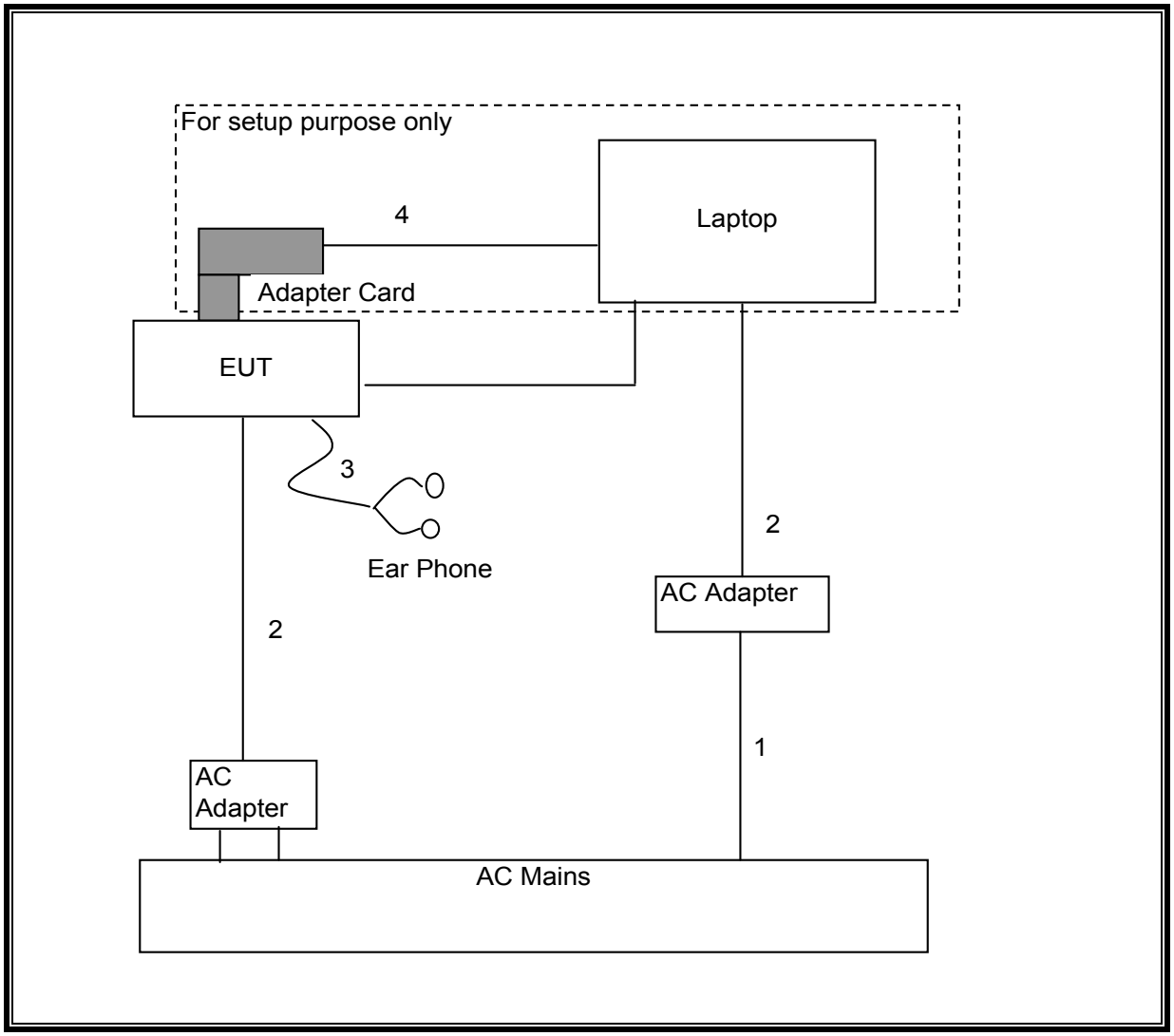
**SUPPORT EQUIPMENT**

| PERIPHERAL SUPPORT EQUIPMENT LIST | | | | |
|---|---|---|---|---|
| **Description** | **Manufacturer** | **Model** | **Serial Number** | **FCC ID** |
| Laptop | Lenovo | ThinkVantange | L3-A1589 | DoC |
| AC Adapter | Lenovo | PA-1650-171 | 11S92P1160Z1ZBGH74LH2 | DoC |
| EUT AC Adapter | Mitsumi | WAP-002( USA) | NA | DoC |
| EUT AC Adapter | Tabuchi | WAP-002( USA) | NA | DoC |
| USB Adapter Board | NA | NA | NA | NA |
| Ear Phone | NA | NA | NA | NA |

**I/O CABLES**

| I/O CABLE LIST | | | | | | |
|---|---|---|---|---|---|---|
| **Cable No.** | **Port** | **# of Identical Ports** | **Connector Type** | **Cable Type** | **Cable Length** | **Remarks** |
| 1 | AC | 1 | US 115V | Un-shielded | 2m | NA |
| 2 | DC | 2 | DC | Un-shielded | 2m | NA |
| 3 | Mic | 1 | Ear Phone | Un-shielded | 2m | NA |
| 4 | USB | 1 | USB | Un-shielded | 2m | NA |

**SETUP DIAGRAM**




**TEST SETUP**

The EUT host is connected to a host laptop computer via USB adapter board for configuration setup (11b/g modes) and the laptop can be removed during the test.

# 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** | **Asset** | **Cal Date** | **Cal Due** |
| Spectrum Analyzer, 26.5 GHz | Agilent / HP | E4440A | C01179 | 08/24/09 | 08/24/10 |
| Antenna, Bilog, 2 GHz | Sunol Sciences | JB1 | C01016 | 01/14/09 | 07/14/10 |
| Preamplifier, 26.5 GHz | Agilent / HP | 8449B | C01052 | 02/04/09 | 08/04/10 |
| Preamplifier, 1300 MHz | Agilent / HP | 8447D | C00778 | 01/06/10 | 07/06/10 |
| Peak Power Meter | Agilent / HP | E4416A | C00963 | 12/04/09 | 12/04/11 |
| Peak / Average Power Sensor | Agilent / HP | E9327A | C00964 | 01/07/10 | 01/07/12 |
| Antenna, Horn, 18 GHz | EMCO | 3115 | C00945 | 01/29/09 | 07/29/10 |
| LISN, 30 MHz | FCC | LISN-50/250-25-2 | N02625 | 11/06/09 | 11/06/10 |
| EMI Test Receiver, 30 MHz | R & S | ESHS 20 | N02396 | 08/06/09 | 05/06/11 |
| Reject Filter, 2.4-2.5 GHz | Micro-Tronics | BRM50702 | N02685 | 01/00/00 | CNR |

# 7. ANTENNA PORT TEST RESULTS

## 7.1. 802.11 MODE IN THE 2.4 GHz BAND

### 7.1.1. 6 dB BANDWIDTH

**LIMITS**

FCC §15.247 (a) (2)

IC RSS-210 A8.2 (a)

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

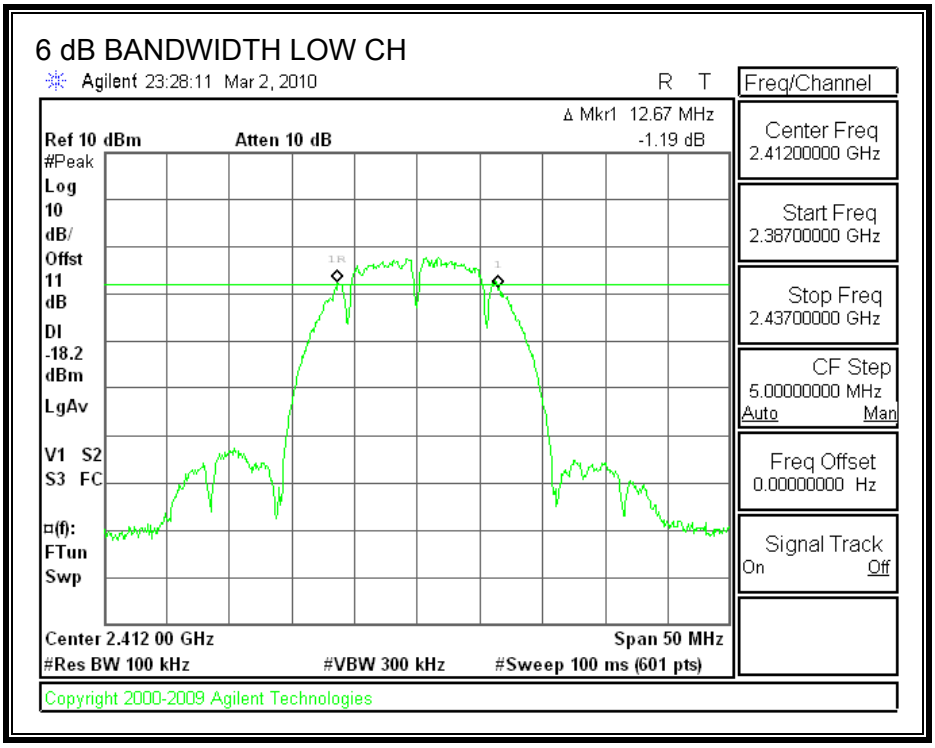
**TEST PROCEDURE**

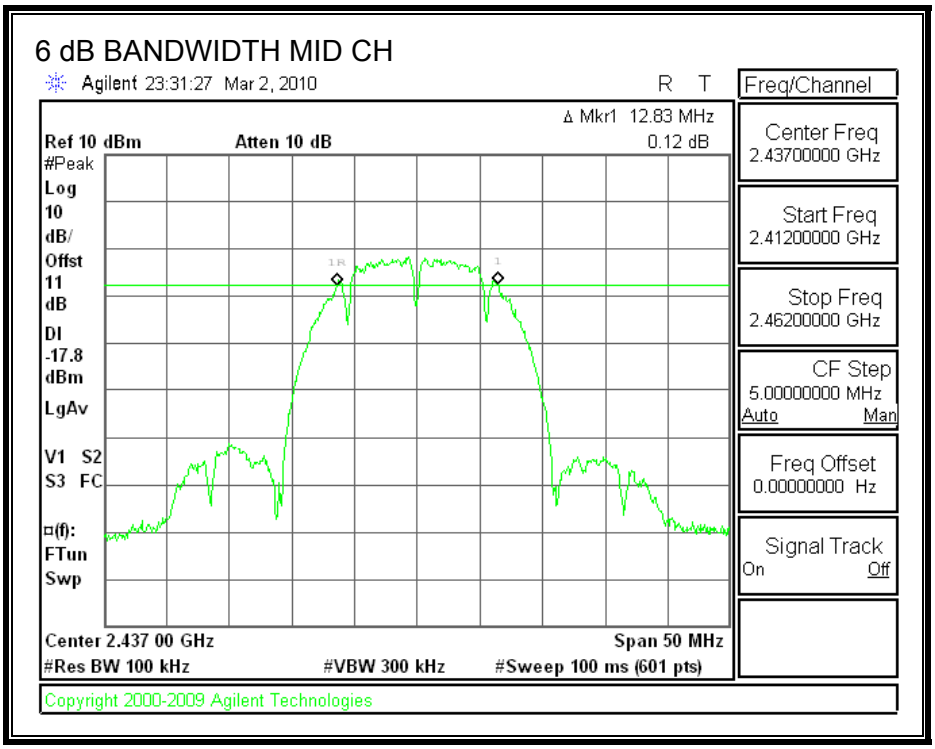
The transmitter output is connected to a spectrum analyzer. The RBW is set to 100 kHz and the VBW is set to 300 kHz. The sweep time is coupled.

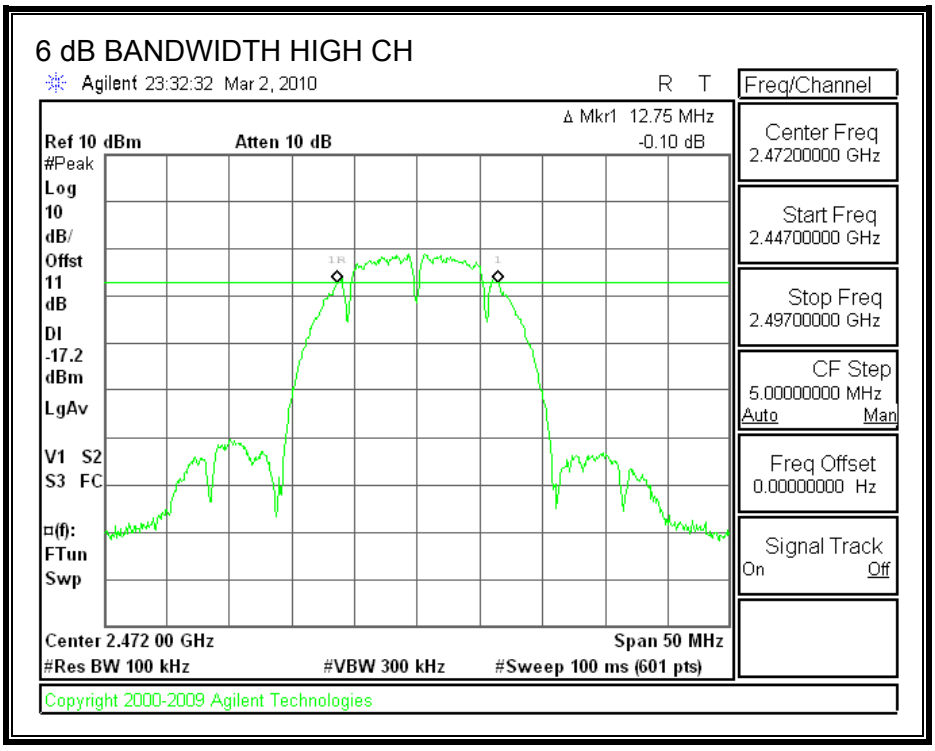
**RESULTS**

| Channel | Frequency (MHz) | 6 dB Bandwidth (MHz) | Minimum Limit (MHz) |
|---|---|---|---|
| Low | 2412 | 12.67 | 0.5 |
| Middle | 2437 | 12.83 | 0.5 |
| High | 2472 | 12.75 | 0.5 |

**6 dB BANDWIDTH**





### 7.1.2. 99% BANDWIDTH

**LIMITS**

None; for reporting purposes only.

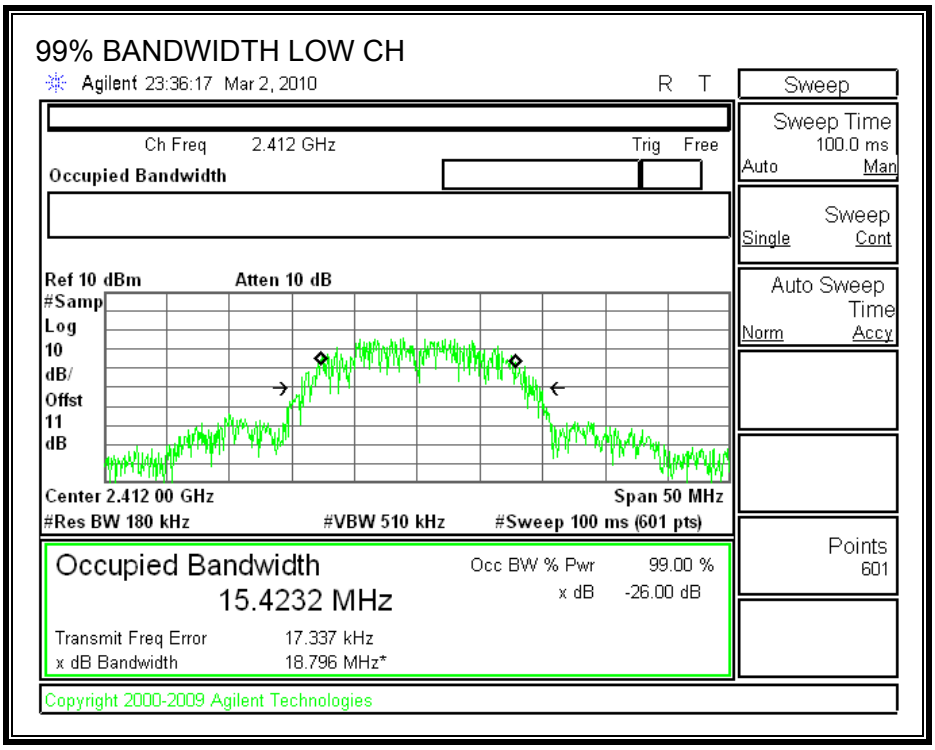
**TEST PROCEDURE**

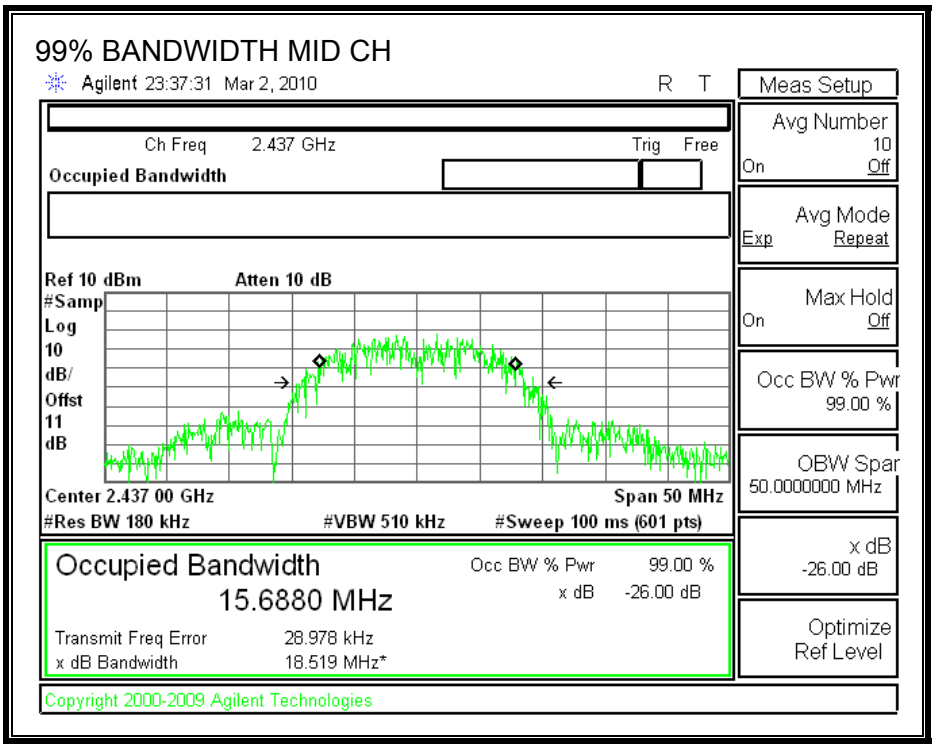
The transmitter output is connected to the spectrum analyzer. The RBW is set to 1% to 3% of the 99 % bandwidth. The VBW is set to 3 times the RBW. The sweep time is coupled. The spectrum analyzer internal 99% bandwidth function is utilized.

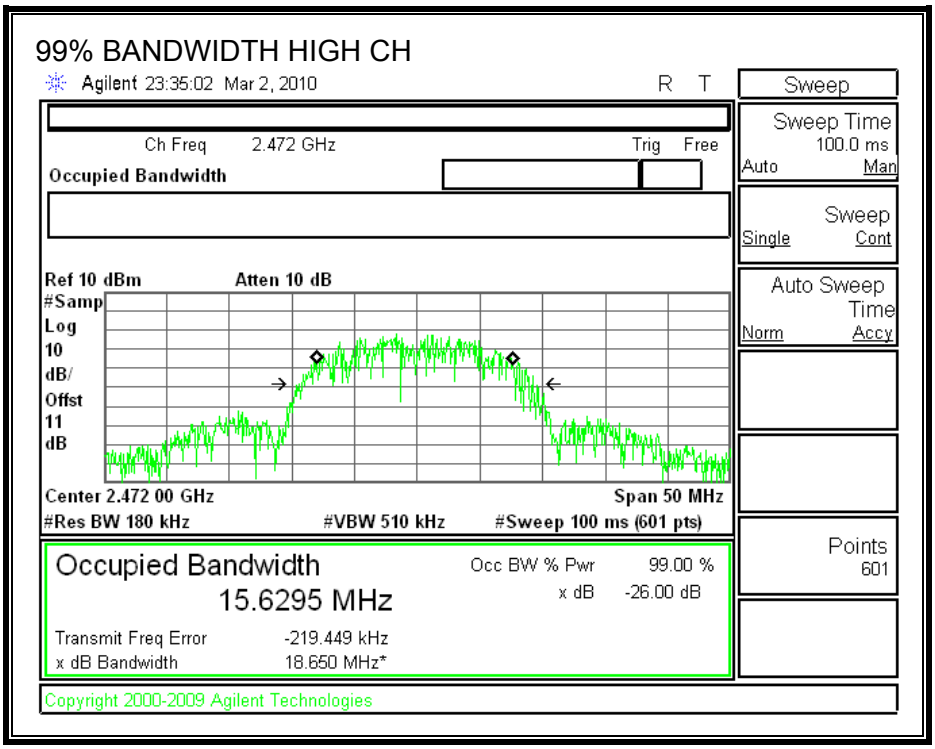
**RESULTS**

| Channel | Frequency (MHz) | 99% Bandwidth (MHz) |
|---|---|---|
| Low | 2412 | 15.4232 |
| Middle | 2437 | 15.6880 |
| High | 2472 | 15.6295 |

**99% BANDWIDTH**





### 7.1.3. OUTPUT POWER

**LIMITS**

FCC §15.247 (b)

IC RSS-210 A8.4

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

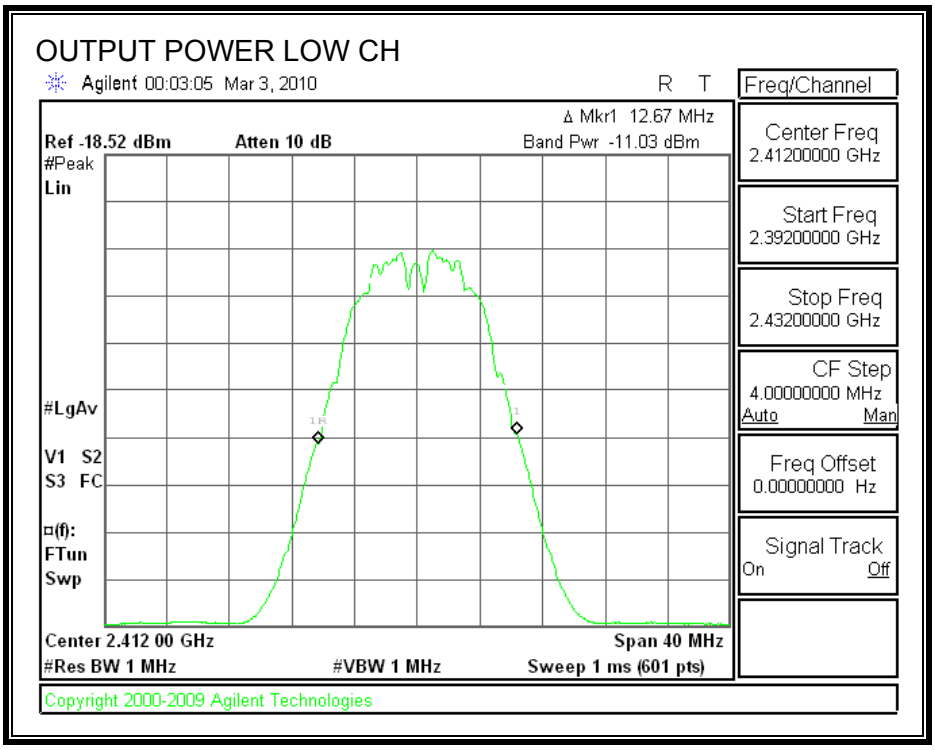
**TEST PROCEDURE**

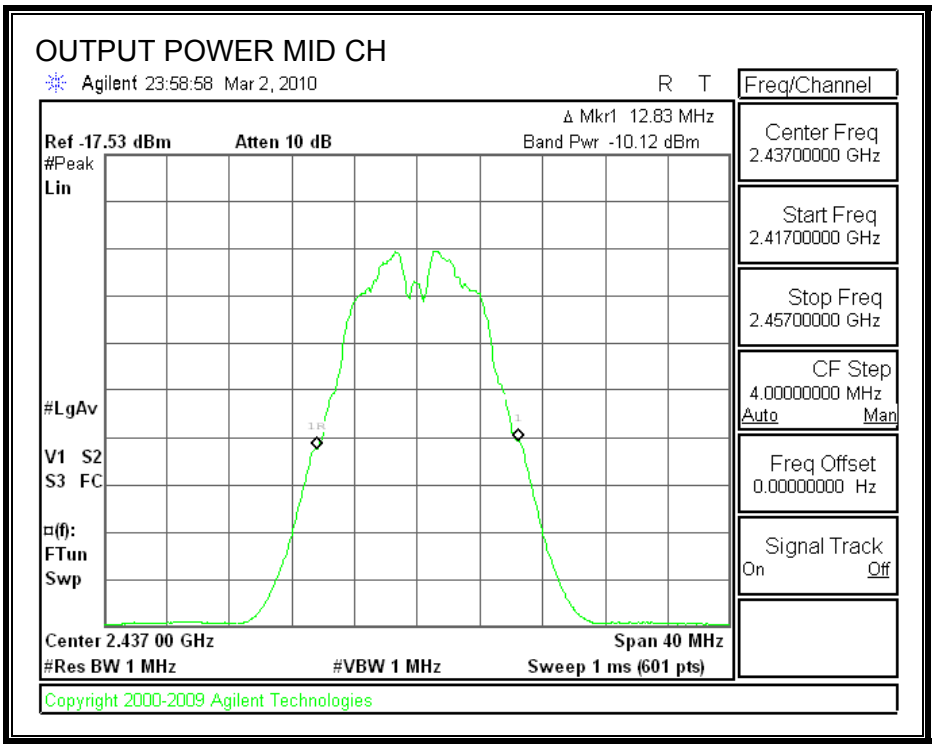
Peak power is measured using the Channel bandwidth Alternative peak output power procedure specified in "TCB Training for Devices covered under Scopes A1 - A4" by Joe Dichoso, May 2003.

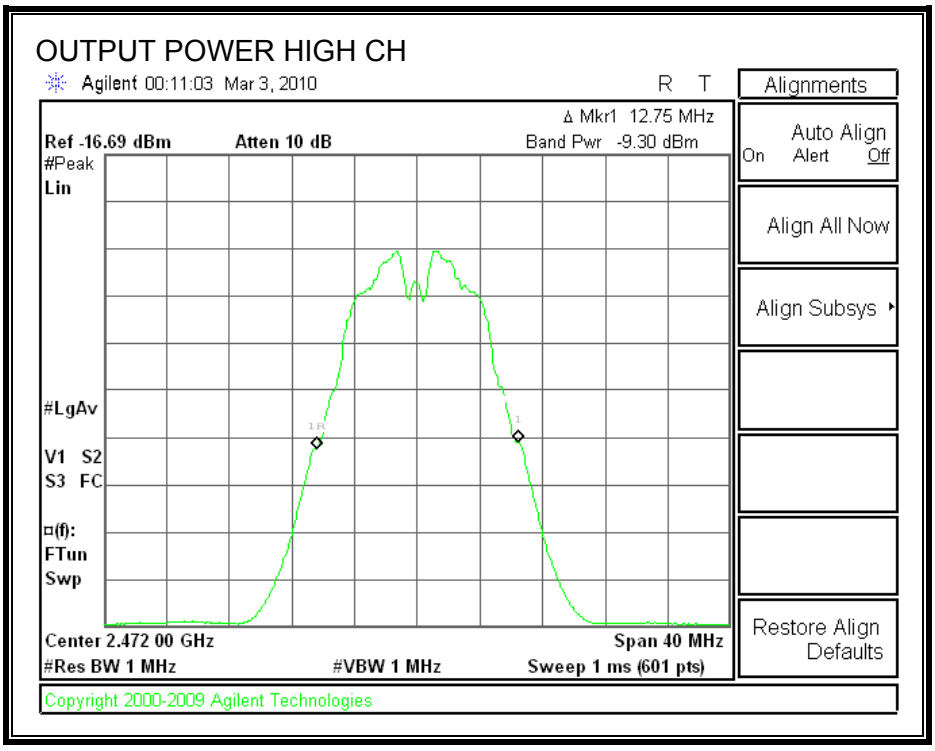
**RESULTS**

| Channel | Frequency (MHz) | Spectrum Analyzer Reading (dBm) | Attenuator and Cable Offset (dB) | Output Power (dBm) | Limit (dBm) | Margin (dB) |
|---|---|---|---|---|---|---|
| Low | 2412 | -11.03 | 11 | -0.03 | 30 | -30.03 |
| Middle | 2437 | -10.12 | 11 | 0.88 | 30 | -29.12 |
| High | 2472 | -9.30 | 11 | 1.70 | 30 | -28.30 |

**OUTPUT POWER**





## 7.1.4. AVERAGE POWER

**LIMITS**

None; for reporting purposes only.

**TEST PROCEDURE**

The transmitter output is connected to a power meter.

**RESULTS**

The cable assembly insertion loss of 11 dB (including 10 dB pad and 1.0 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

| Channel | Frequency (MHz) | Power (dBm) |
|---|---|---|
| Low | 2412 | -1.05 |
| Middle | 2437 | -0.85 |
| High | 2472 | -0.26 |

## 7.1.5. POWER SPECTRAL DENSITY

**LIMITS**

FCC §15.247 (e)

IC RSS-210 A8.2 (b)

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.

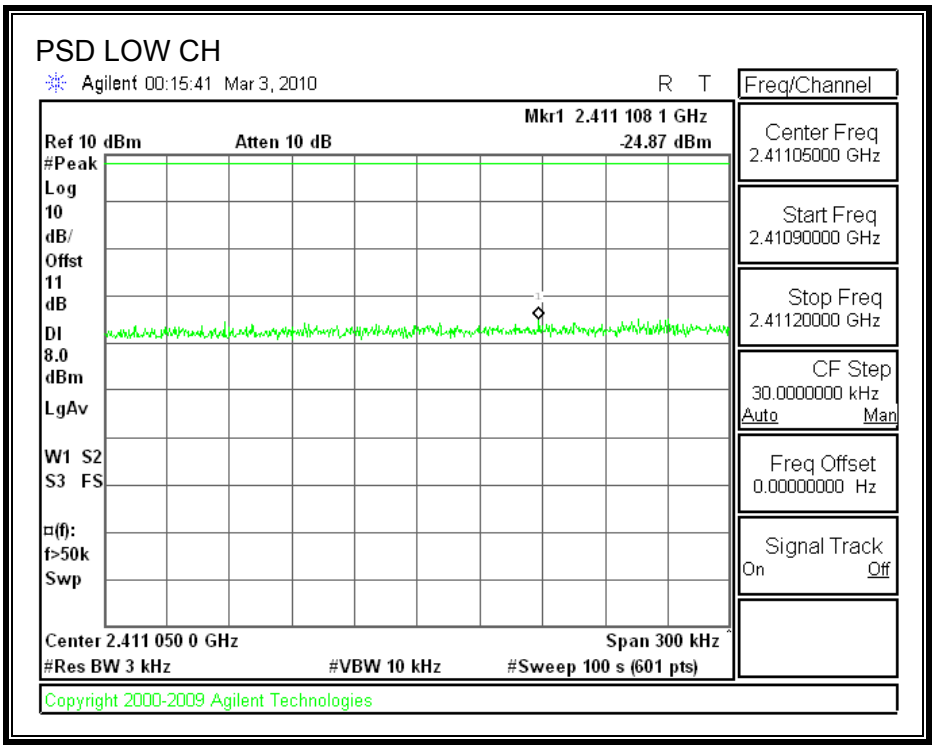
**TEST PROCEDURE**

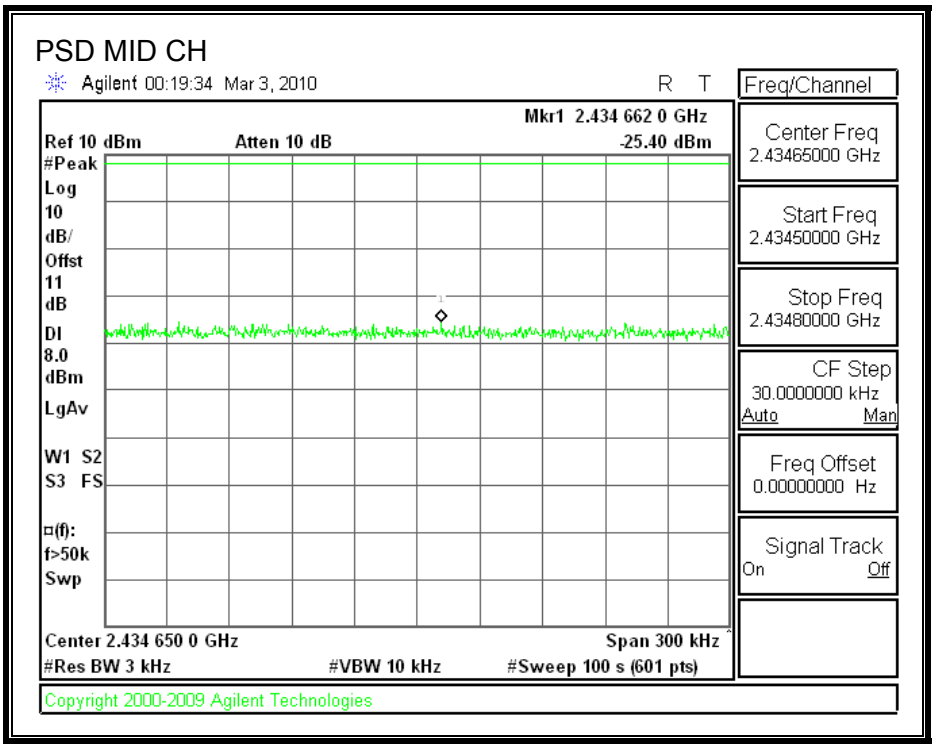
Output power was measured based on the use of a peak measurement, therefore the power spectral density was measured using PSD Option 1 in accordance with FCC document "Measurement of Digital Transmission Systems Operating under Section 15.247", March 23, 2005.

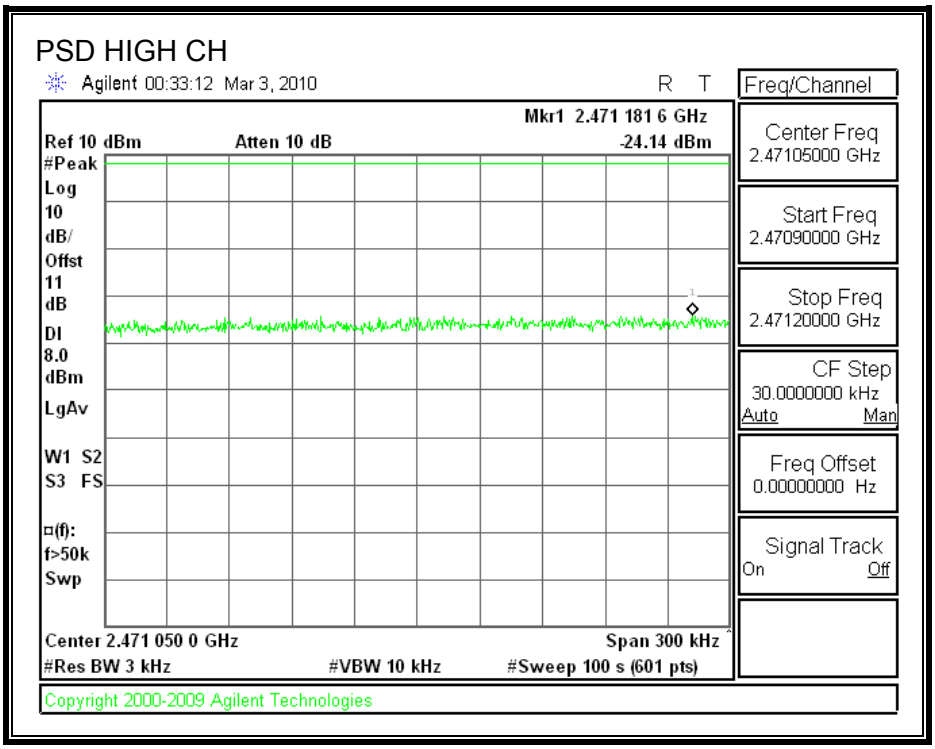
**RESULTS**

| Channel | Frequency (MHz) | PPSD (dBm) | Limit (dBm) | Margin (dB) |
|---|---|---|---|---|
| Low | 2412 | -24.87 | 8 | -32.87 |
| Middle | 2437 | -25.40 | 8 | -33.40 |
| High | 2472 | -24.14 | 8 | -32.14 |

**POWER SPECTRAL DENSITY**





## 7.1.6. CONDUCTED SPURIOUS EMISSIONS

**LIMITS**

FCC §15.247 (d)

IC RSS-210 A8.5

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

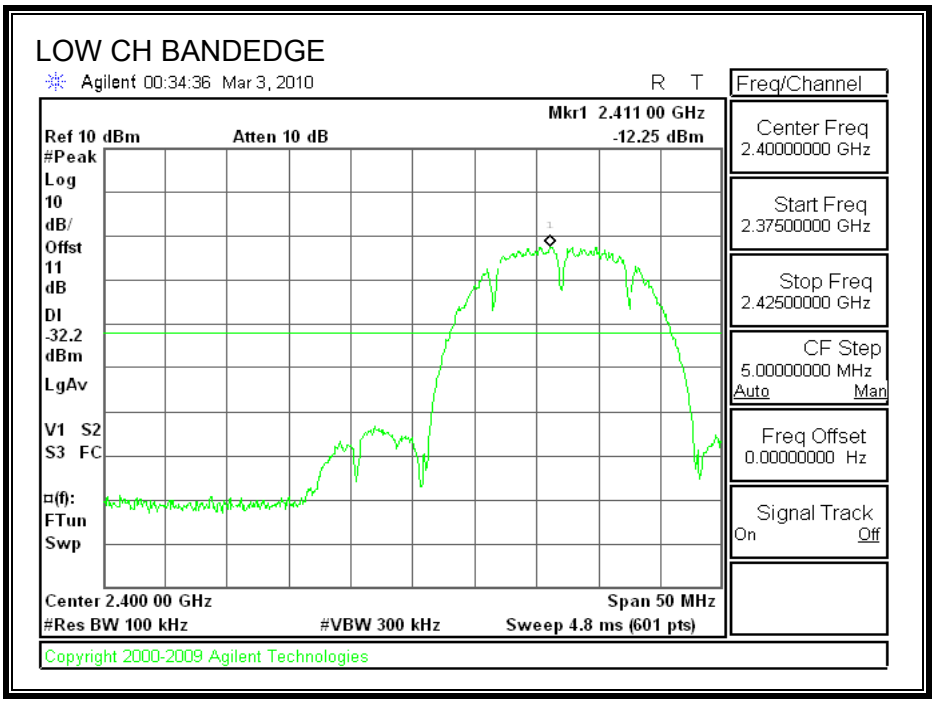
**TEST PROCEDURE**

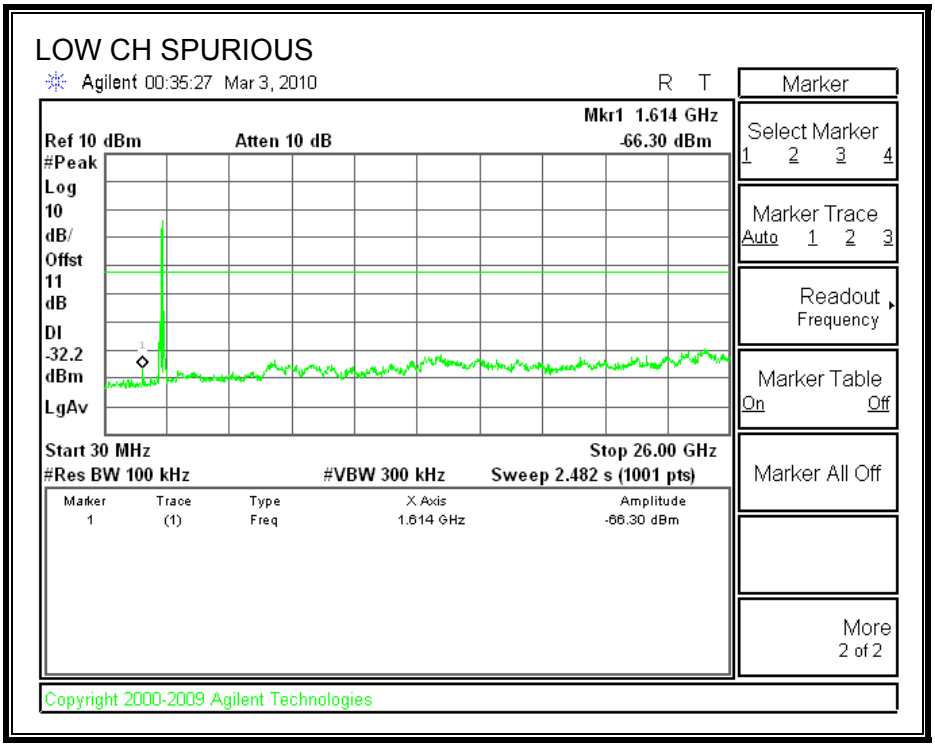
The transmitter output is connected to a spectrum analyzer. The resolution bandwidth is set to 100 kHz. The video bandwidth is set to 300 kHz.

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

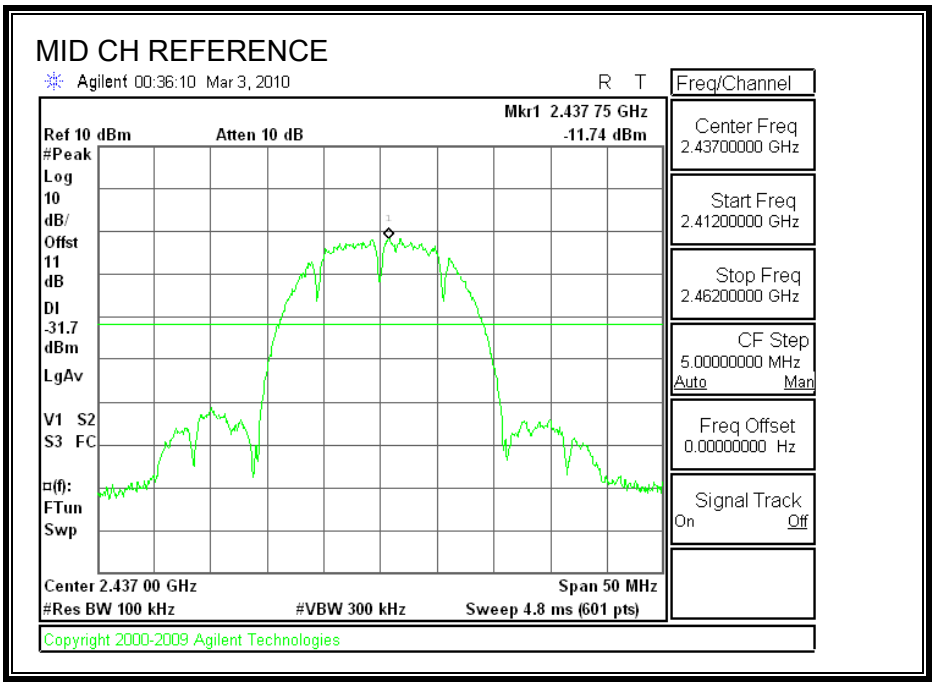
## RESULTS

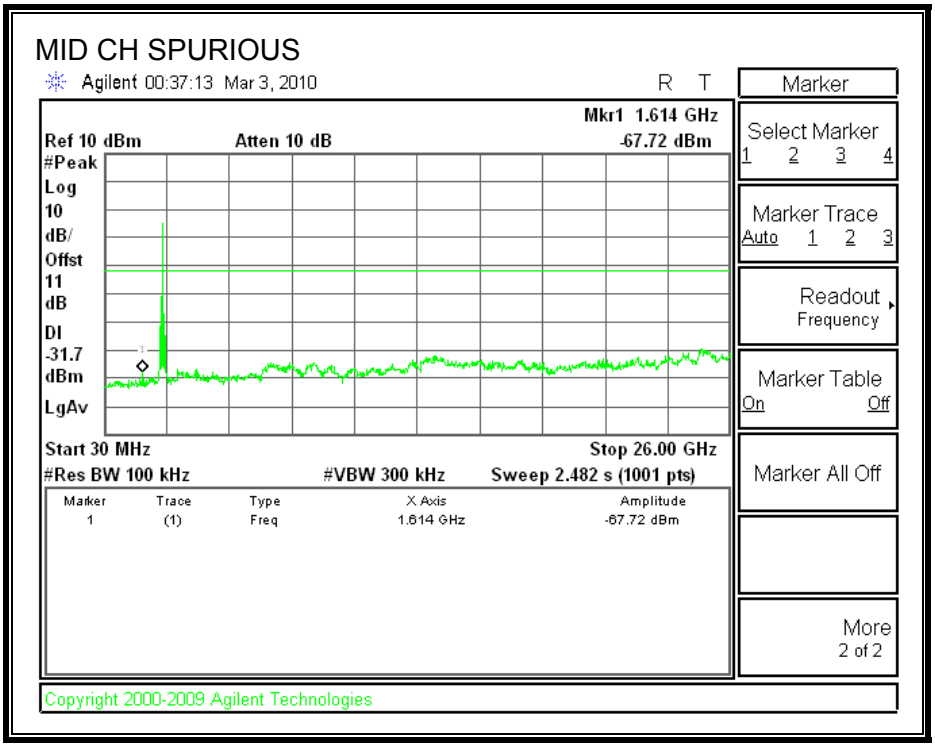
## SPURIOUS EMISSIONS, LOW CHANNEL



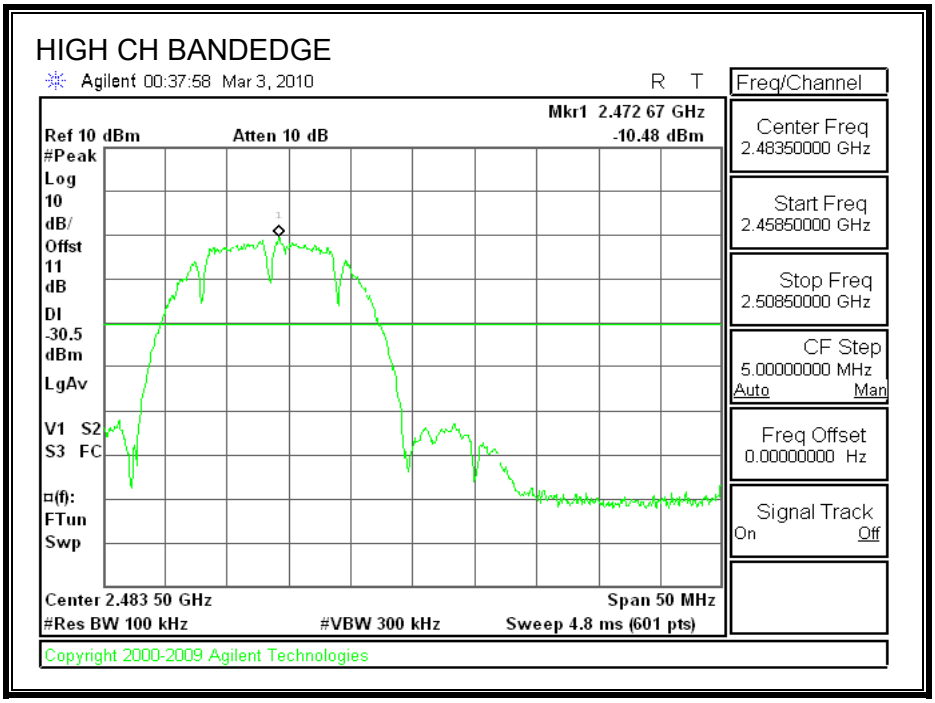



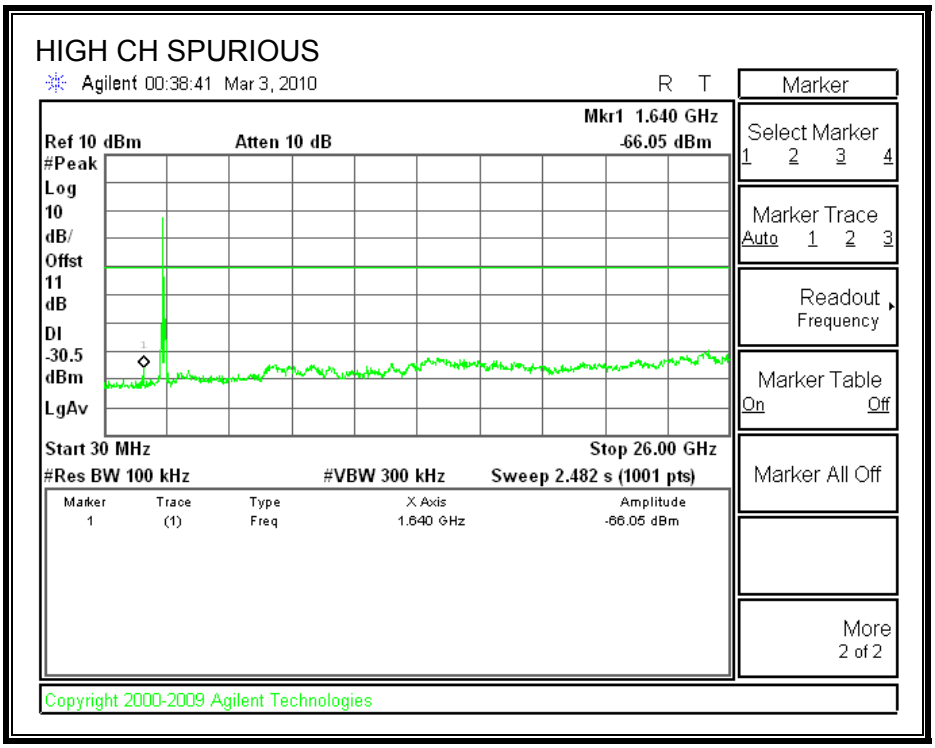
**SPURIOUS EMISSIONS, MID CHANNEL**



**SPURIOUS EMISSIONS, HIGH CHANNEL**



# 7.2. 802.11b MODE IN THE 2.4 GHz BAND

## 7.2.1. 6 dB BANDWIDTH

**LIMITS**

FCC §15.247 (a) (2)

IC RSS-210 A8.2 (a)

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

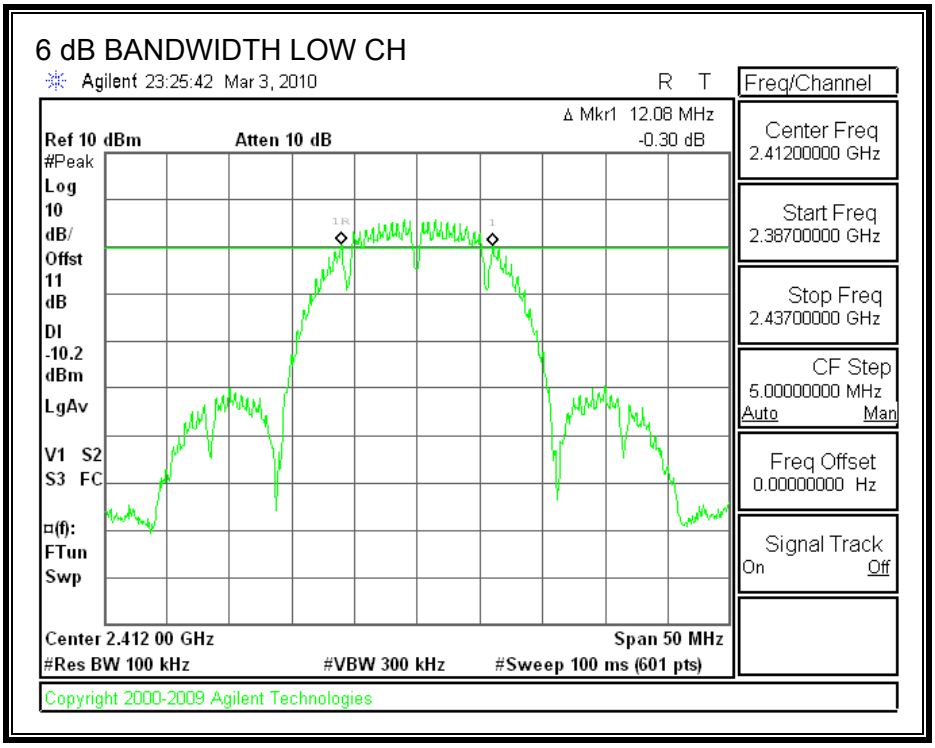
**TEST PROCEDURE**

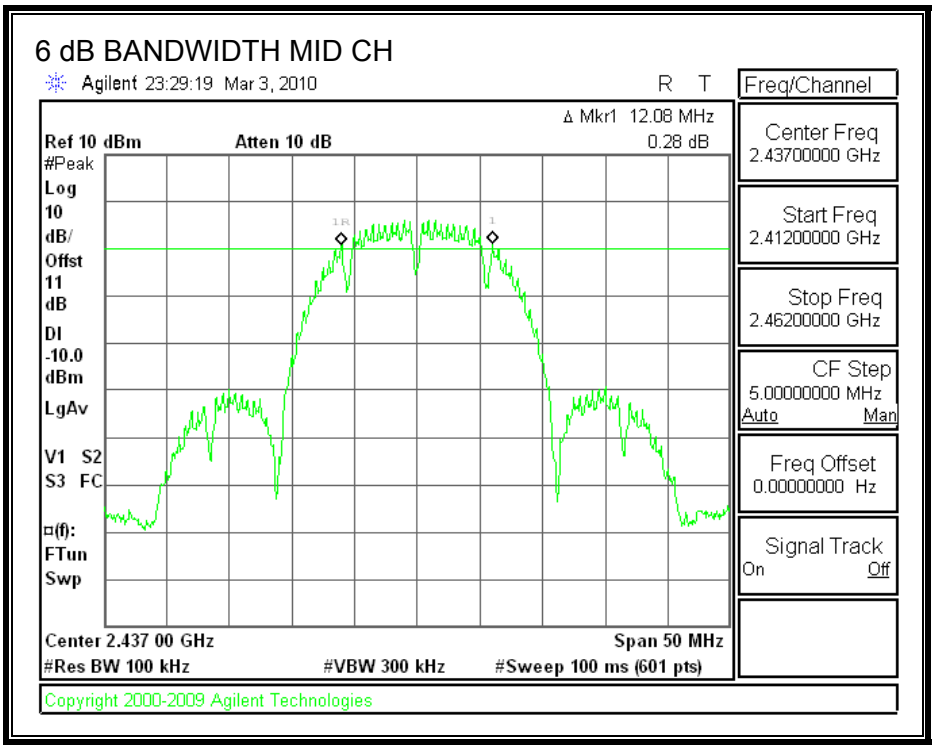
The transmitter output is connected to a spectrum analyzer. The RBW is set to 100 kHz and the VBW is set to 300 kHz. The sweep time is coupled.

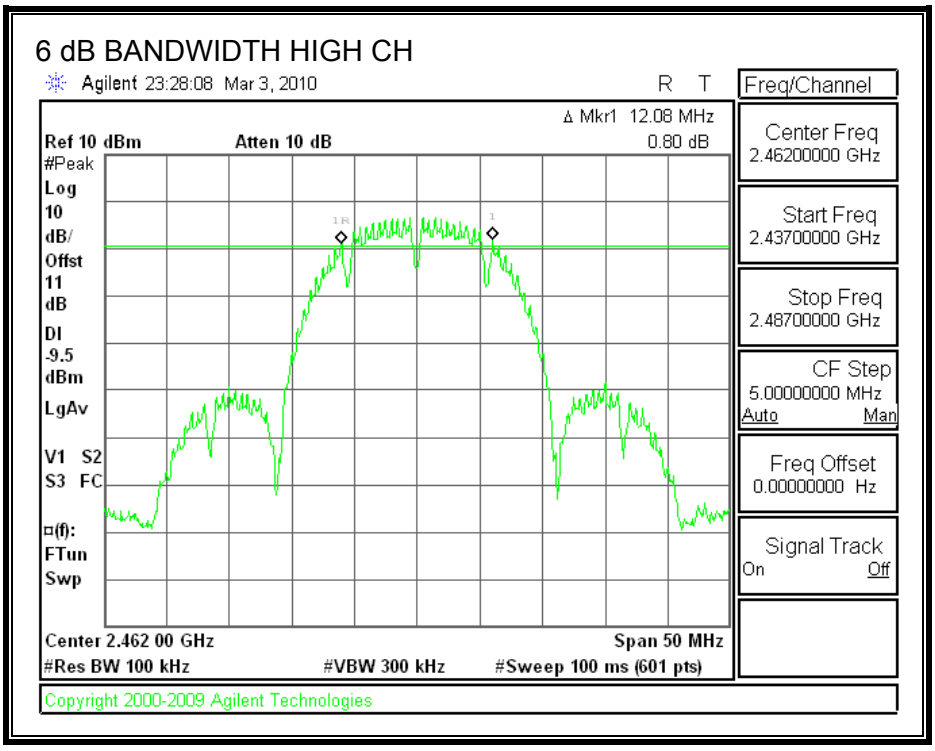
**RESULTS**

| Channel | Frequency (MHz) | 6 dB Bandwidth (MHz) | Minimum Limit (MHz) |
|---|---|---|---|
| Low | 2412 | 12.08 | 0.5 |
| Middle | 2437 | 12.08 | 0.5 |
| High | 2462 | 12.08 | 0.5 |

**6 dB BANDWIDTH**





### 7.2.2. 99% BANDWIDTH

**LIMITS**

None; for reporting purposes only.

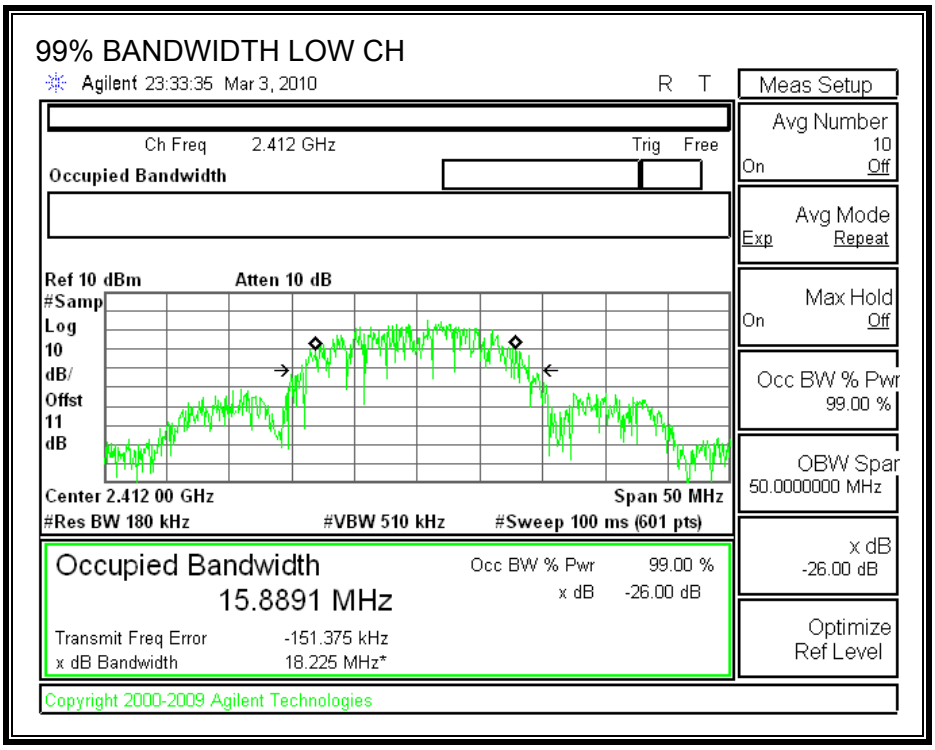
**TEST PROCEDURE**

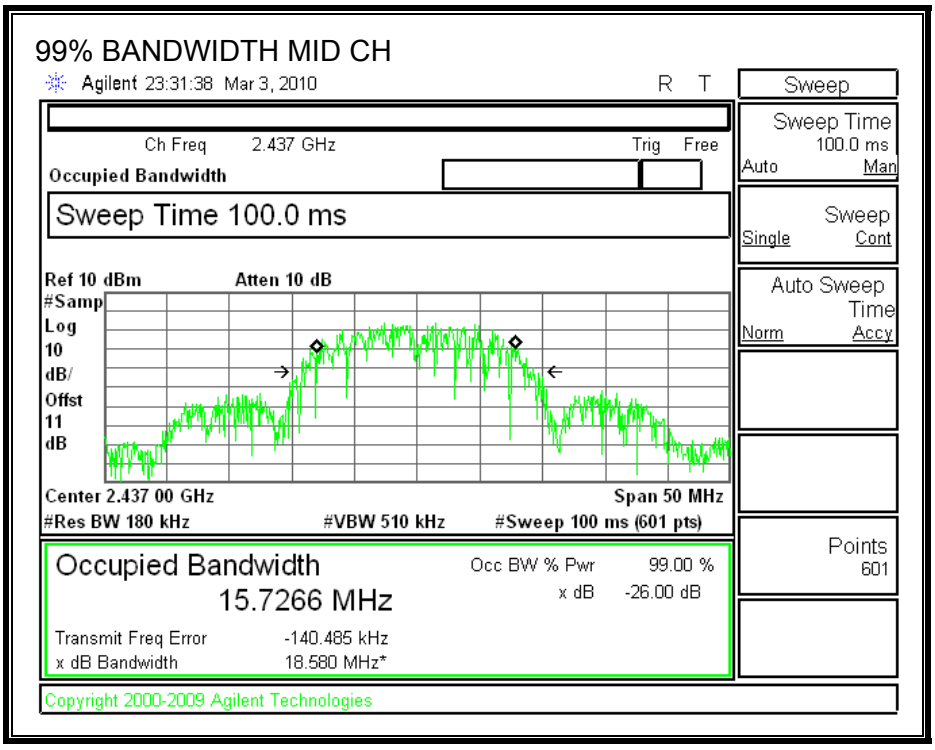
The transmitter output is connected to the spectrum analyzer. The RBW is set to 1% to 3% of the 99 % bandwidth. The VBW is set to 3 times the RBW. The sweep time is coupled. The spectrum analyzer internal 99% bandwidth function is utilized.

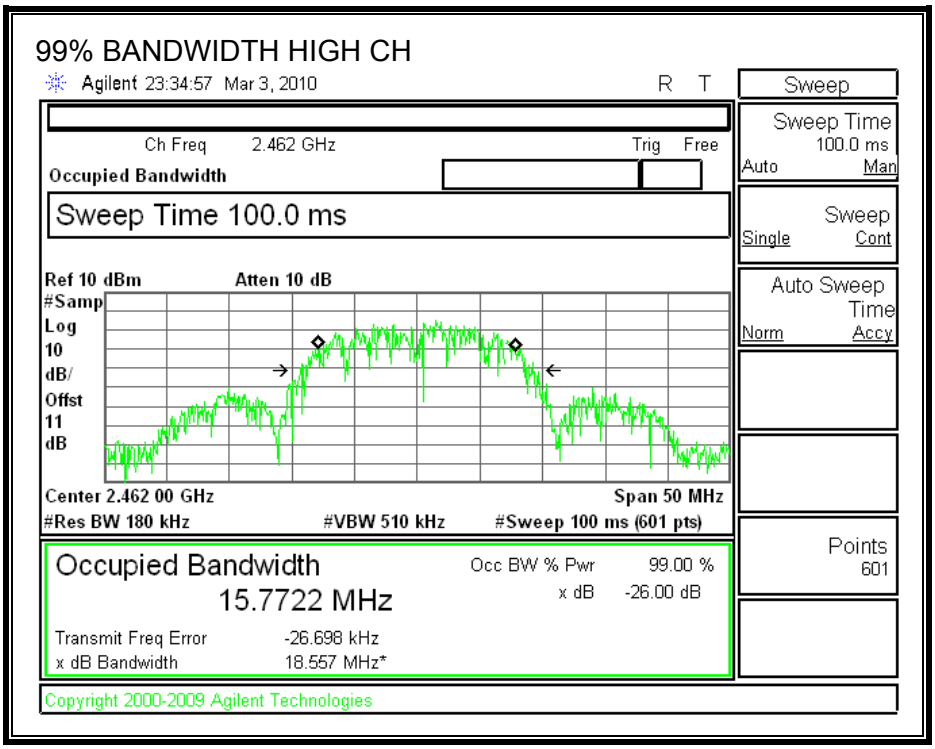
**RESULTS**

| Channel | Frequency (MHz) | 99% Bandwidth (MHz) |
|---|---|---|
| Low | 2412 | 15.8891 |
| Middle | 2437 | 15.7266 |
| High | 2462 | 15.7722 |

**99% BANDWIDTH**





## 7.2.3. OUTPUT POWER

**LIMITS**

FCC §15.247 (b)

IC RSS-210 A8.4

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

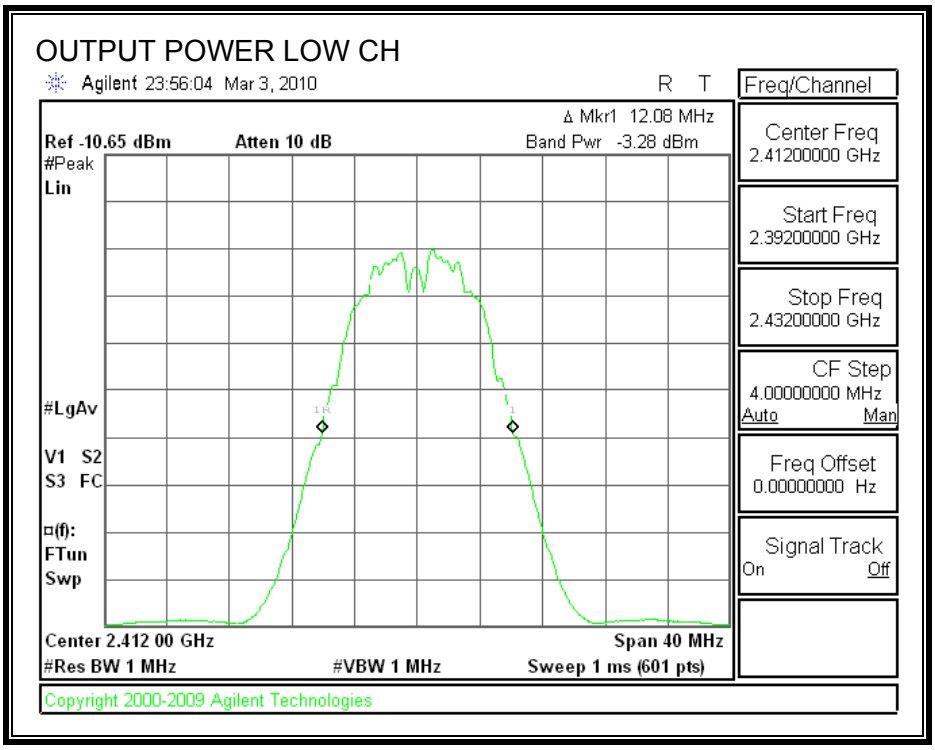
**TEST PROCEDURE**

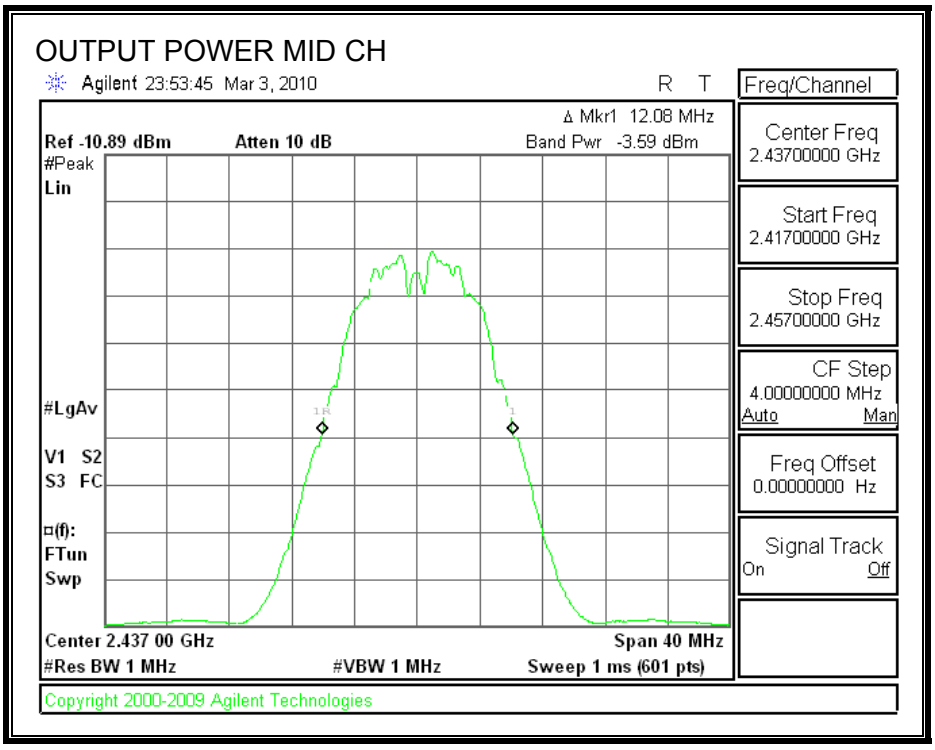
Peak power is measured using the Channel bandwidth Alternative peak output power procedure specified in "TCB Training for Devices covered under Scopes A1 - A4" by Joe Dichoso, May 2003.

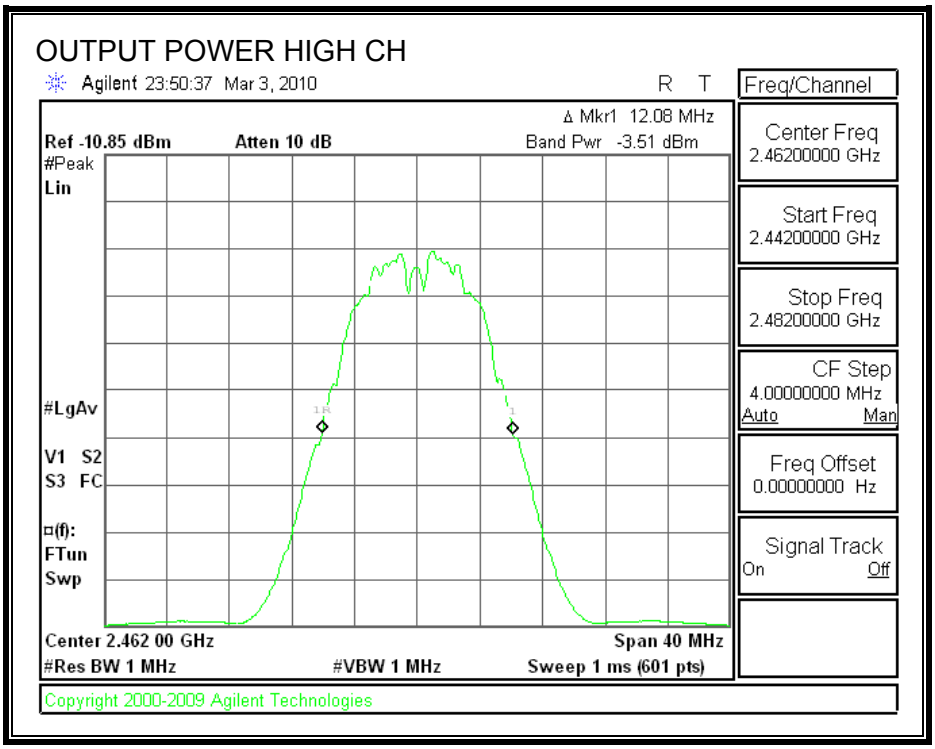
**RESULTS**

| Channel | Frequency (MHz) | Spectrum Analyzer Reading (dBm) | Attenuator and Cable Offset (dB) | Output Power (dBm) | Limit (dBm) | Margin (dB) |
|---|---|---|---|---|---|---|
| Low | 2412 | -3.28 | 11 | 7.72 | 30 | -22.28 |
| Middle | 2437 | -3.59 | 11 | 7.41 | 30 | -22.59 |
| High | 2462 | -3.51 | 11 | 7.49 | 30 | -22.51 |

**OUTPUT POWER**





## 7.2.4. AVERAGE POWER

**LIMITS**

None; for reporting purposes only.

**TEST PROCEDURE**

The transmitter output is connected to a power meter.

**RESULTS**

The cable assembly insertion loss of 11dB (including 10 dB pad and 1dB cable) was entered as an offset in the power meter to allow for direct reading of power.

| Channel | Frequency (MHz) | Power (dBm) |
|---|---|---|
| Low | 2412 | 5.70 |
| Middle | 2437 | 5.45 |
| High | 2462 | 5.50 |

## 7.2.5. POWER SPECTRAL DENSITY

**LIMITS**

FCC §15.247 (e)

IC RSS-210 A8.2 (b)

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.

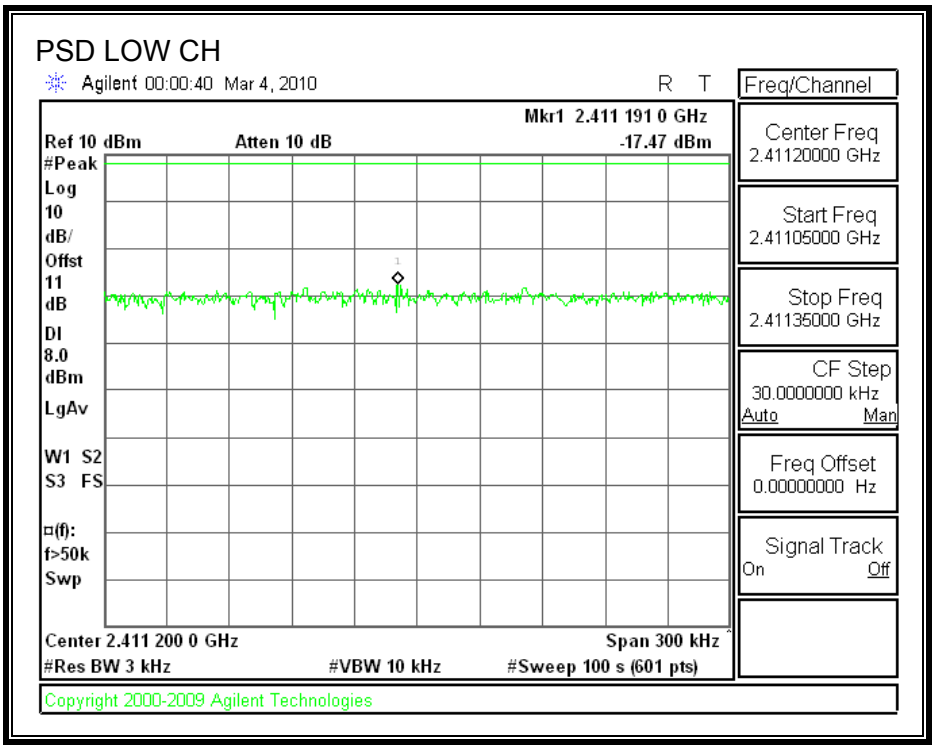
**TEST PROCEDURE**

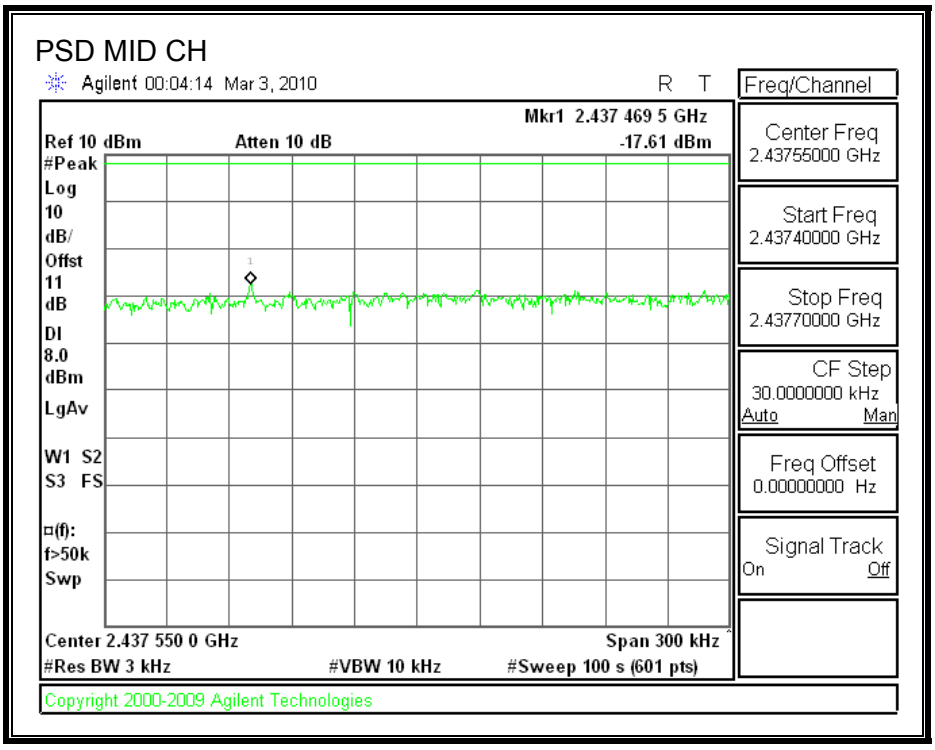
Output power was measured based on the use of a peak measurement, therefore the power spectral density was measured using PSD Option 1 in accordance with FCC document "Measurement of Digital Transmission Systems Operating under Section 15.247", March 23, 2005.

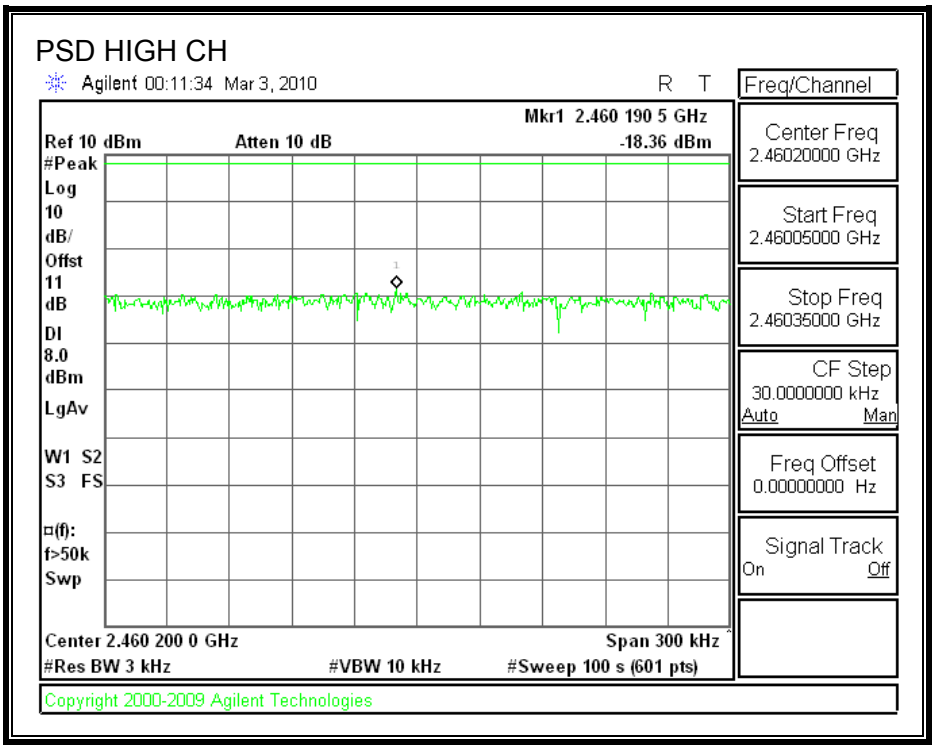
**RESULTS**

| Channel | Frequency (MHz) | PPSD (dBm) | Limit (dBm) | Margin (dB) |
|---|---|---|---|---|
| Low | 2412 | -17.47 | 8 | -25.47 |
| Middle | 2437 | -17.61 | 8 | -25.61 |
| High | 2462 | -18.36 | 8 | -26.36 |

**POWER SPECTRAL DENSITY**





## 7.2.6. CONDUCTED SPURIOUS EMISSIONS

**LIMITS**

FCC §15.247 (d)

IC RSS-210 A8.5

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

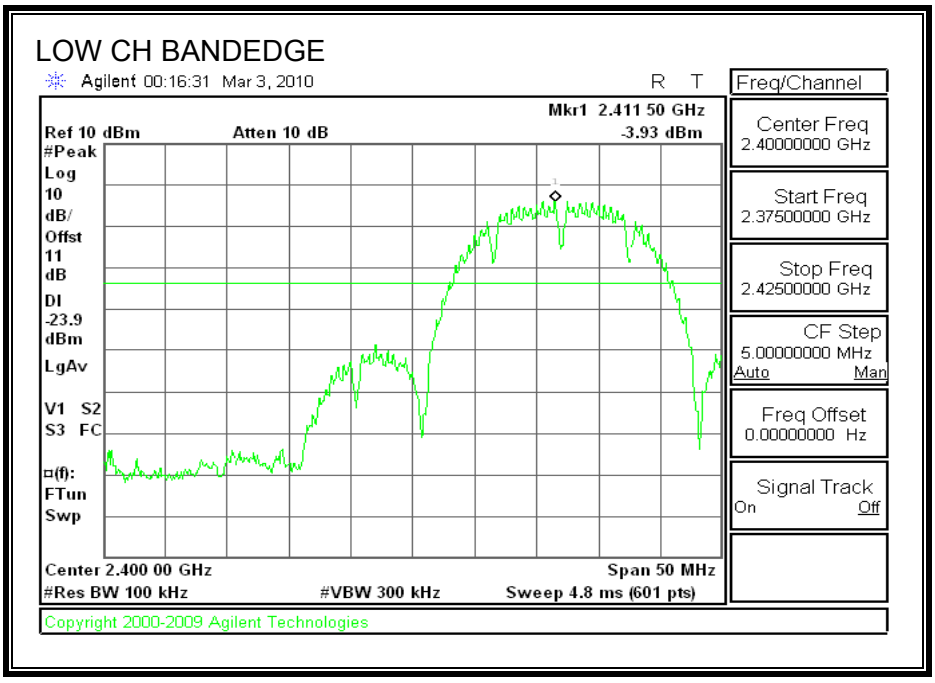
**TEST PROCEDURE**

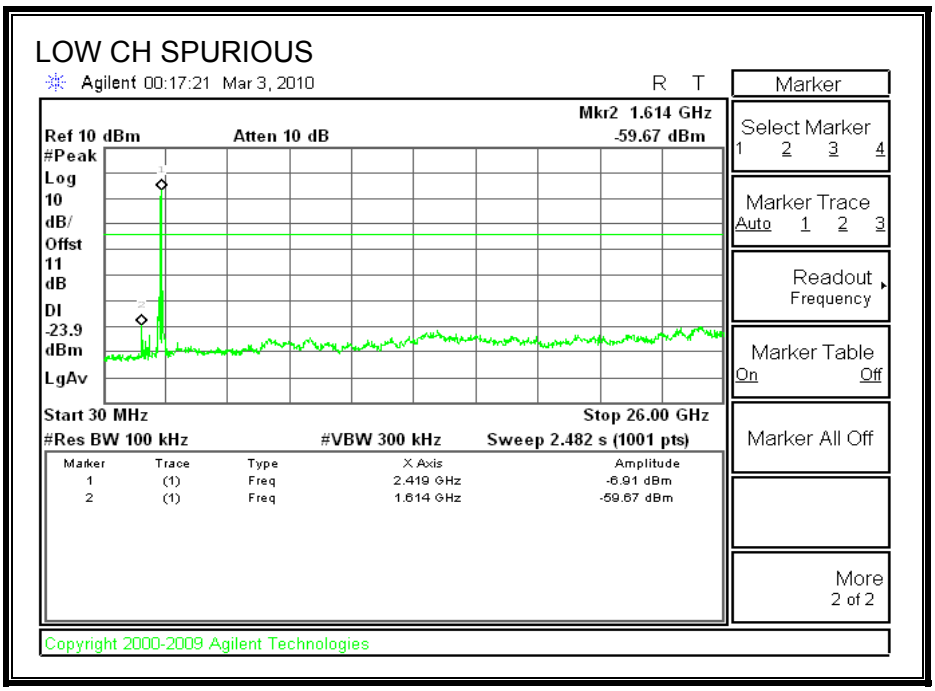
The transmitter output is connected to a spectrum analyzer. The resolution bandwidth is set to 100 kHz. The video bandwidth is set to 300 kHz.

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

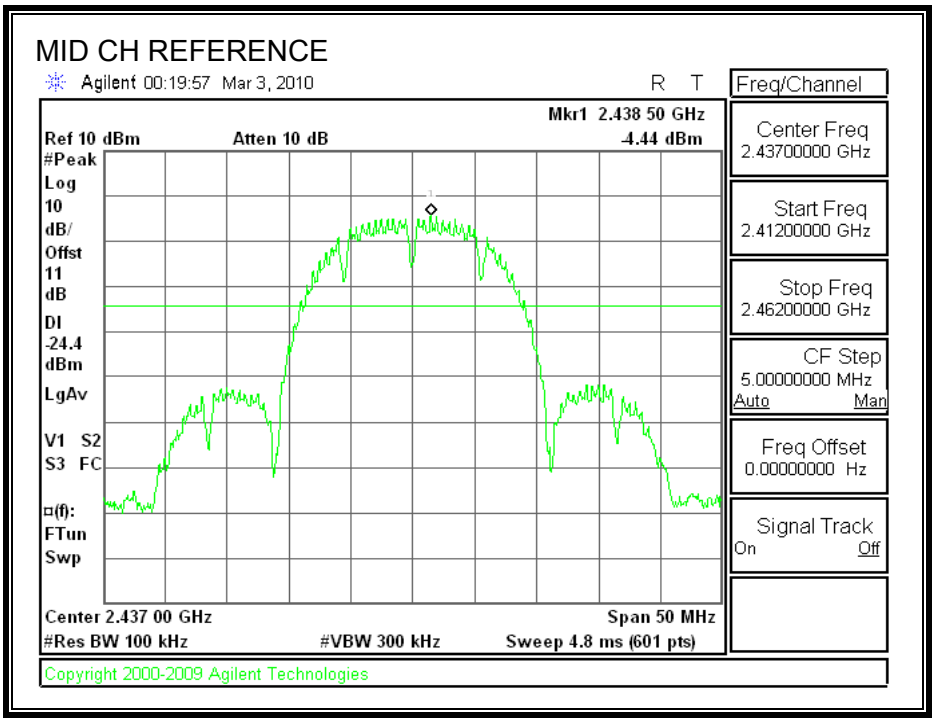
## RESULTS

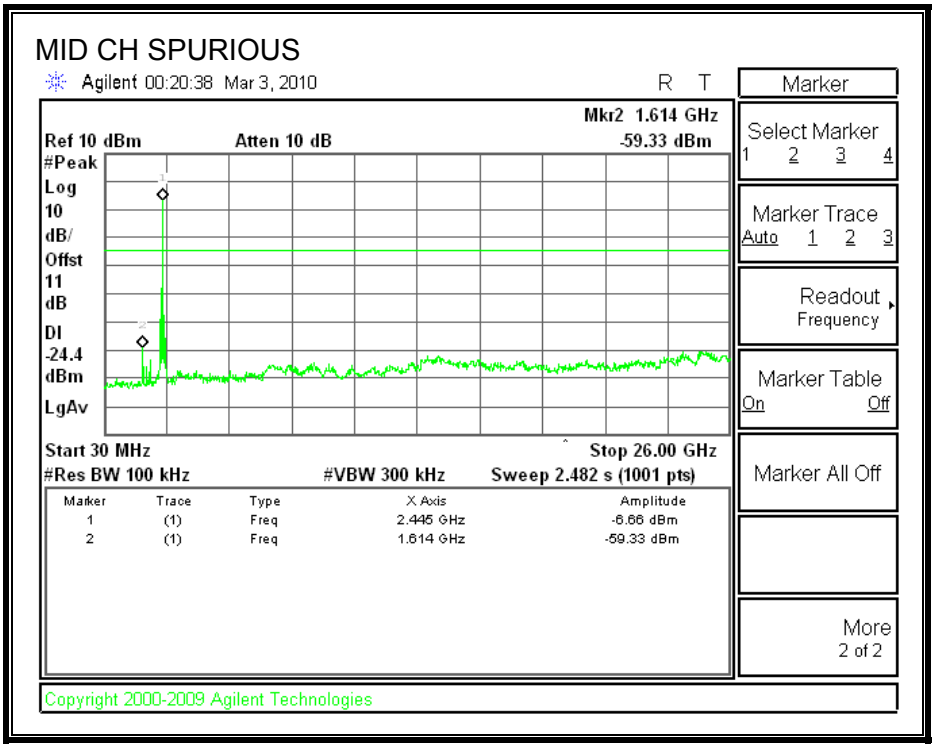
## SPURIOUS EMISSIONS, LOW CHANNEL



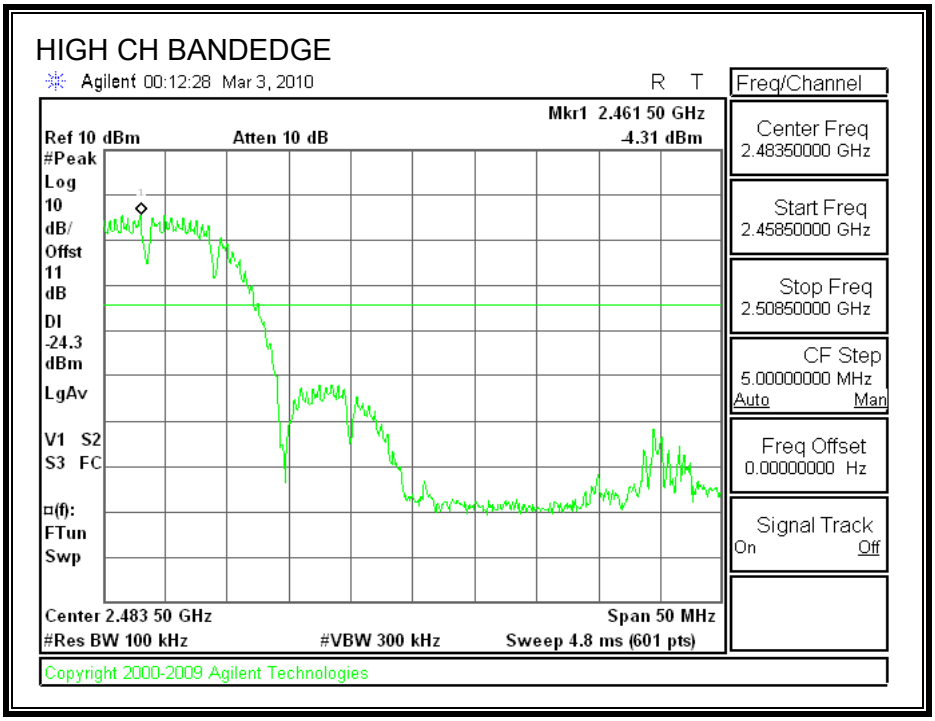



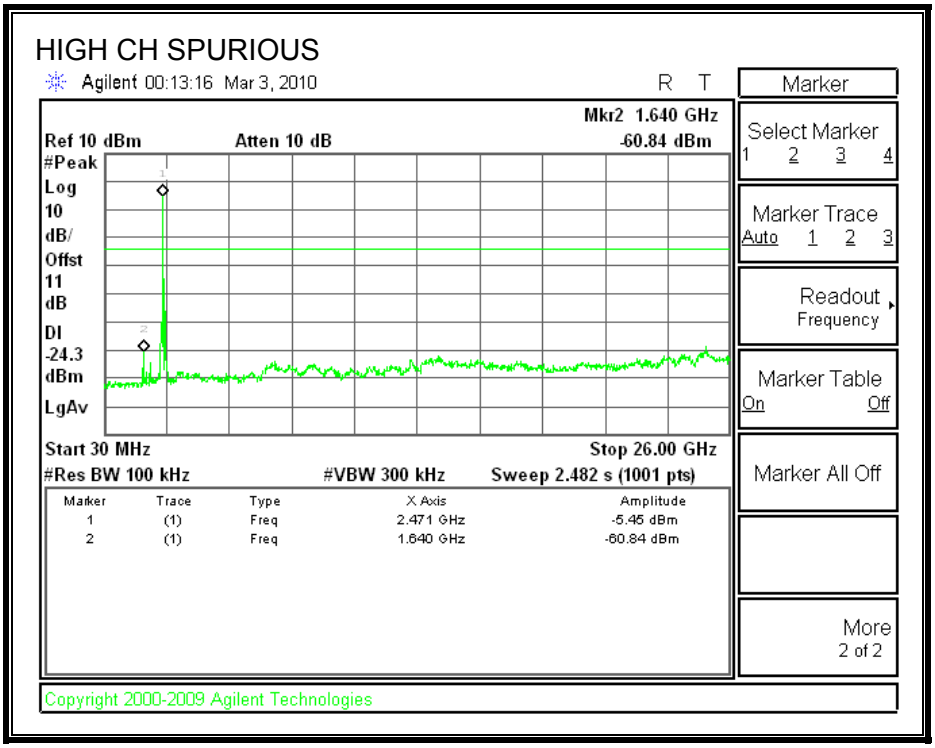
**SPURIOUS EMISSIONS, MID CHANNEL**



**SPURIOUS EMISSIONS, HIGH CHANNEL**



# 7.3. 802.11g MODE IN THE 2.4 GHz BAND

## 7.3.1. 6 dB BANDWIDTH

**LIMITS**

FCC §15.247 (a) (2)

IC RSS-210 A8.2 (a)

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

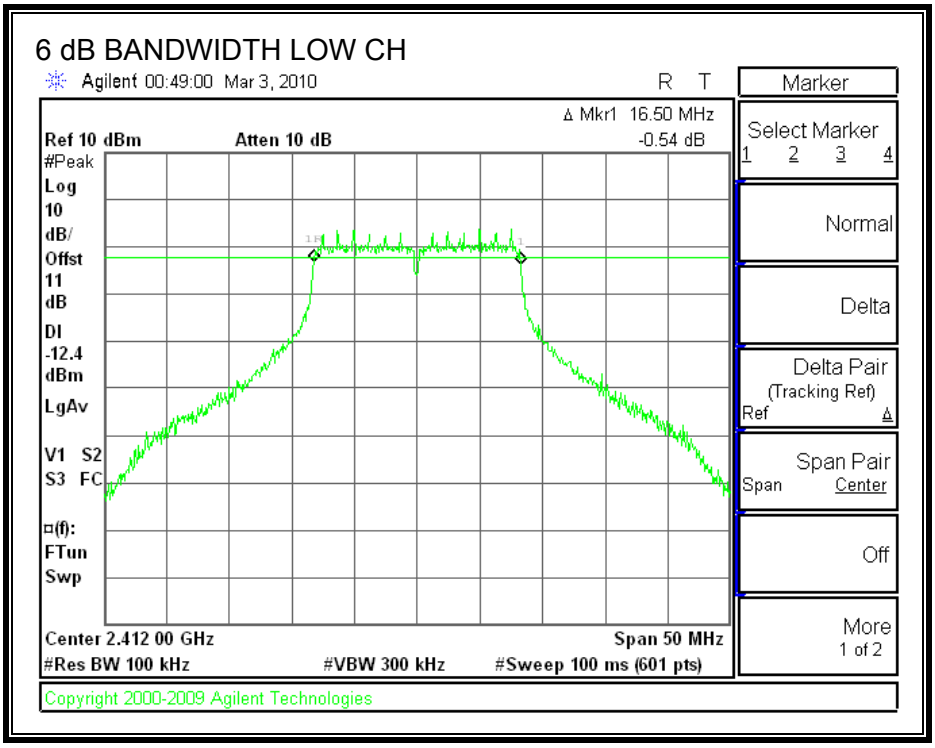
**TEST PROCEDURE**

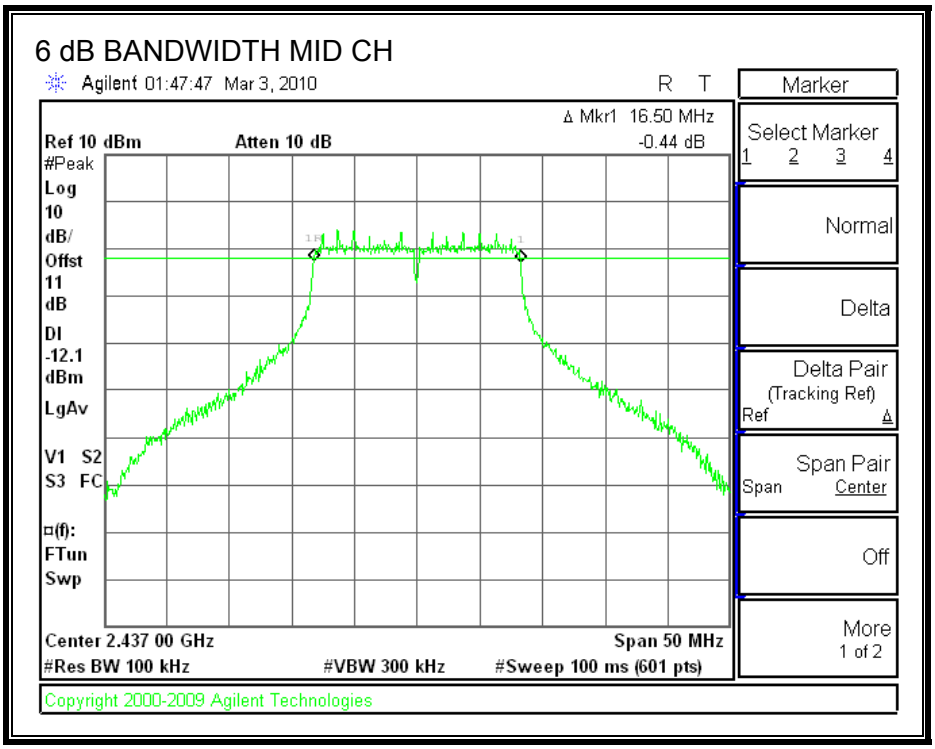
The transmitter output is connected to a spectrum analyzer. The RBW is set to 100 kHz and the VBW is set to 300 kHz. The sweep time is coupled.

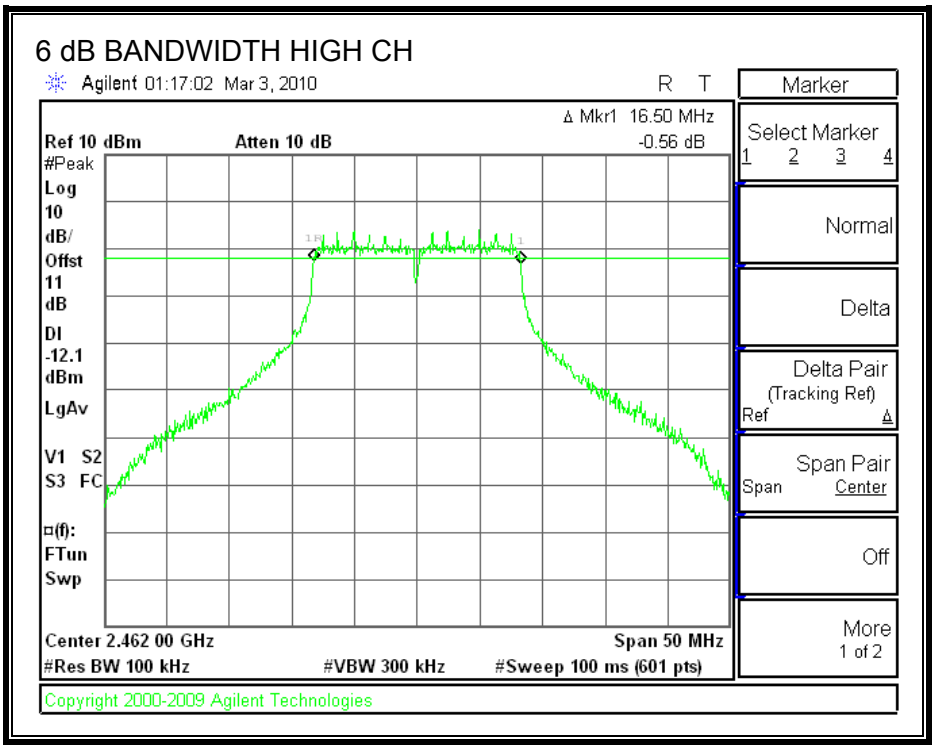
**RESULTS**

| Channel | Frequency (MHz) | 6 dB Bandwidth (MHz) | Minimum Limit (MHz) |
|---|---|---|---|
| Low | 2412 | 16.5 | 0.5 |
| Middle | 2437 | 16.5 | 0.5 |
| High | 2462 | 16.5 | 0.5 |

**6 dB BANDWIDTH**





### 7.3.2. 99% BANDWIDTH

**LIMITS**

None; for reporting purposes only.

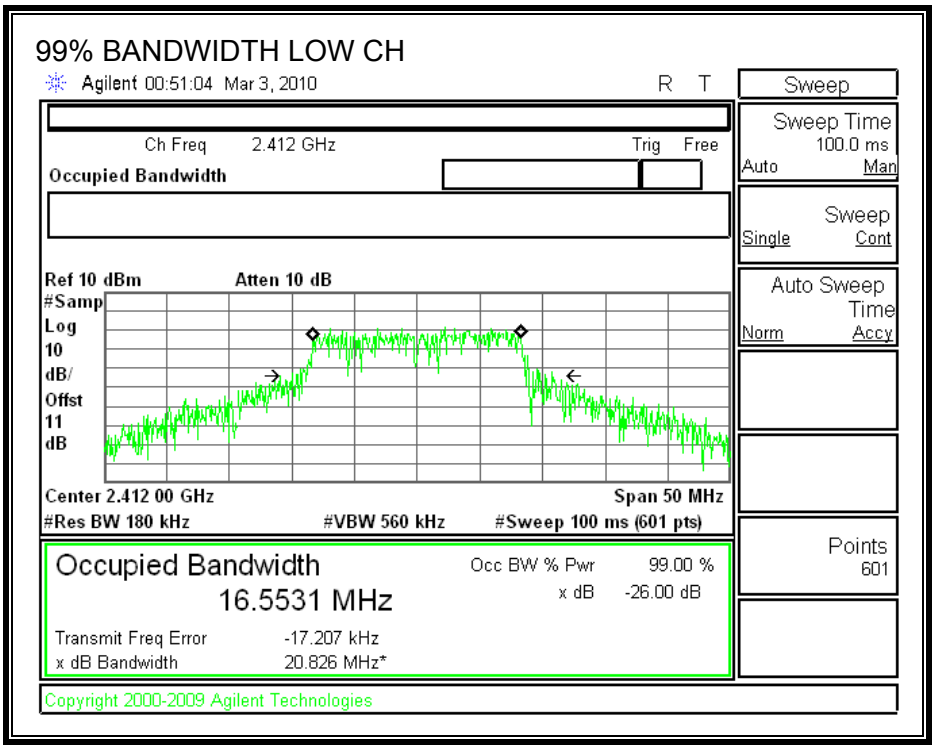
**TEST PROCEDURE**

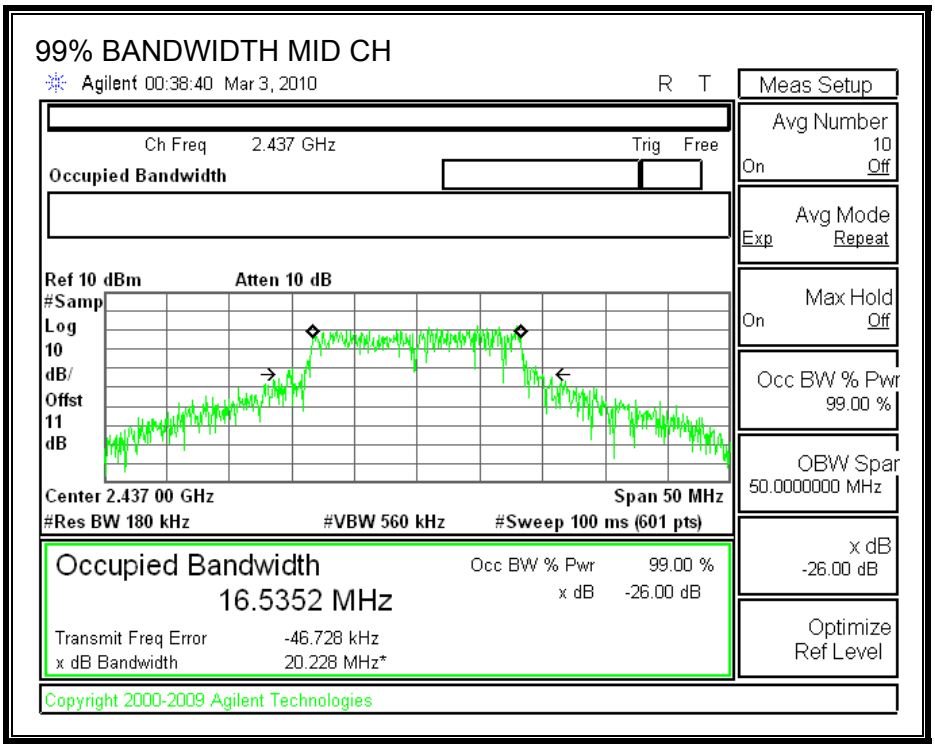
The transmitter output is connected to the spectrum analyzer. The RBW is set to 1% to 3% of the 99 % bandwidth. The VBW is set to 3 times the RBW. The sweep time is coupled. The spectrum analyzer internal 99% bandwidth function is utilized.

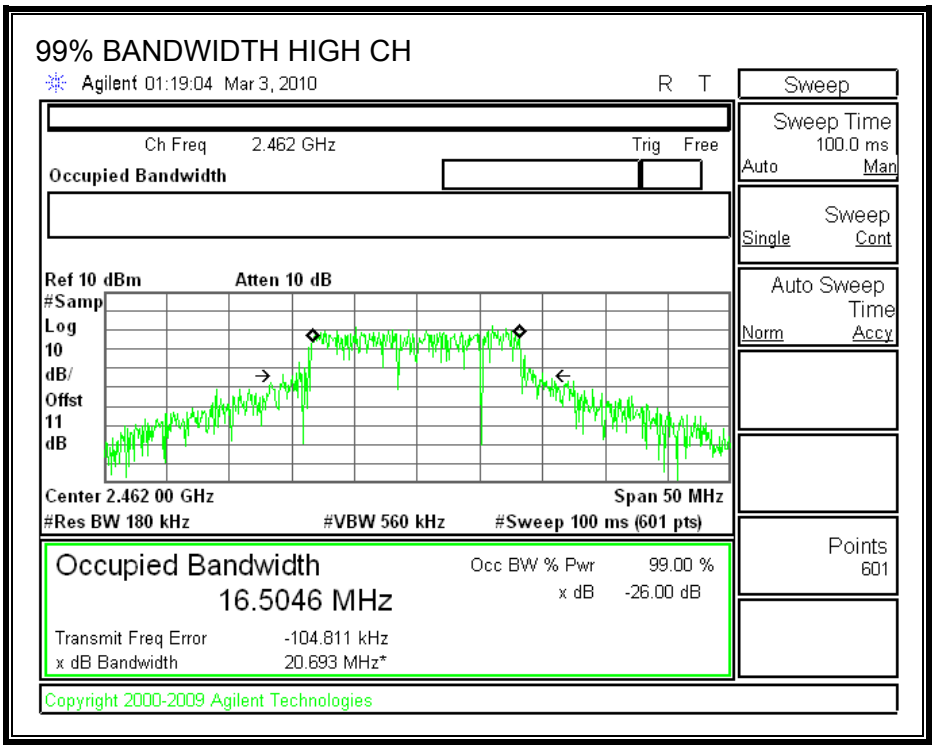
**RESULTS**

| Channel | Frequency (MHz) | 99% Bandwidth (MHz) |
|---|---|---|
| Low | 2412 | 16.5531 |
| Middle | 2437 | 16.5352 |
| High | 2462 | 16.5046 |

**99% BANDWIDTH**





## 7.3.3. OUTPUT POWER

**LIMITS**

FCC §15.247 (b)

IC RSS-210 A8.4

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

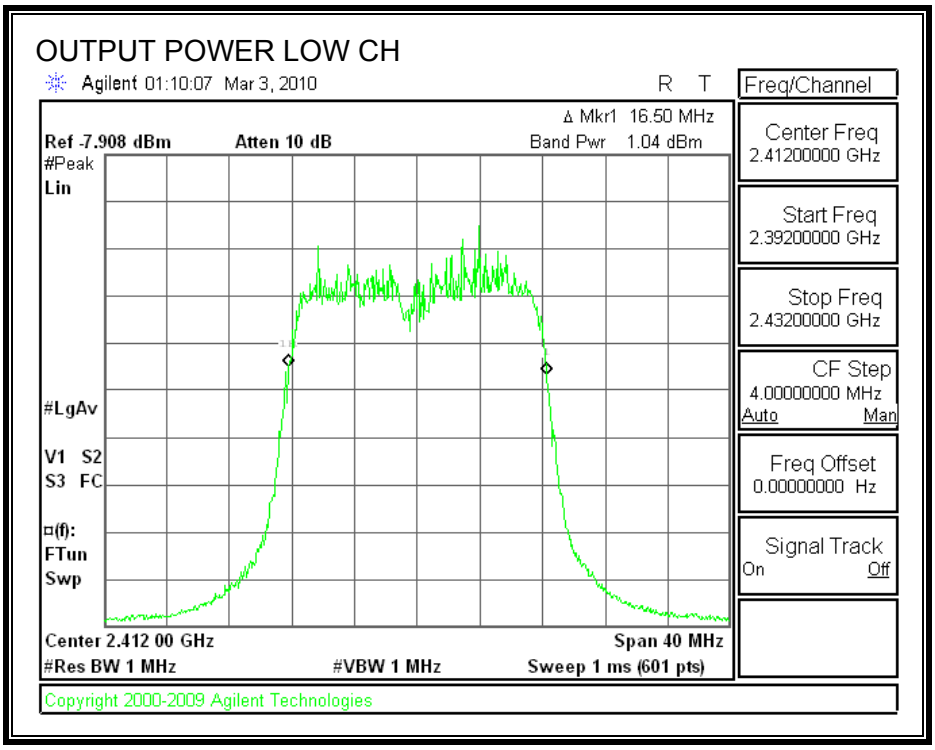
**TEST PROCEDURE**

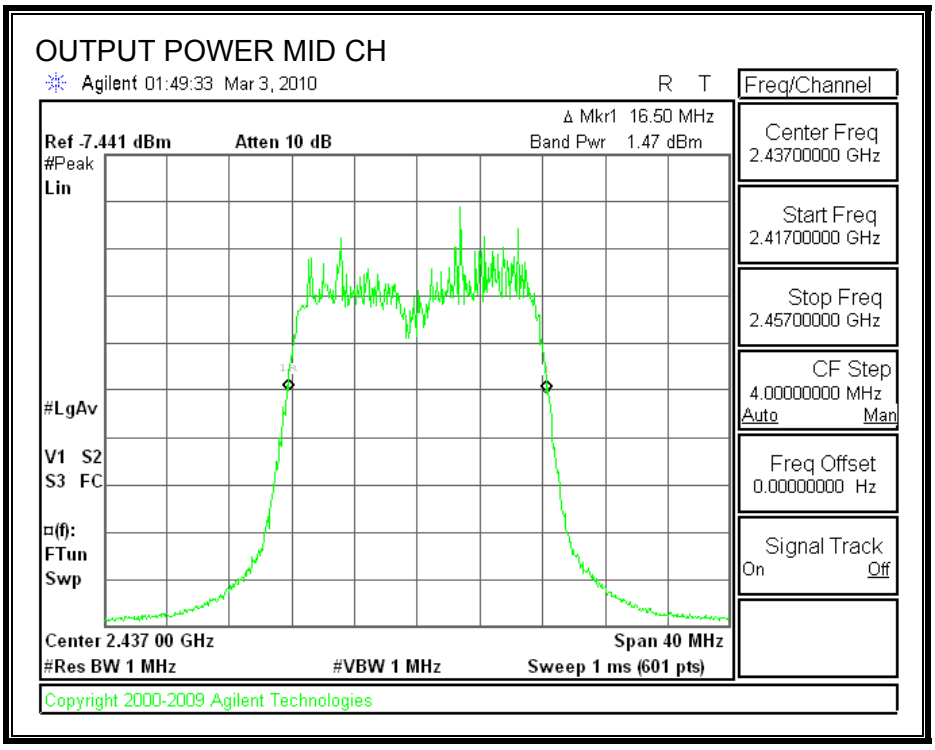
Peak power is measured using the Channel bandwidth Alternative peak output power procedure specified in "TCB Training for Devices covered under Scopes A1 - A4" by Joe Dichoso, May 2003.

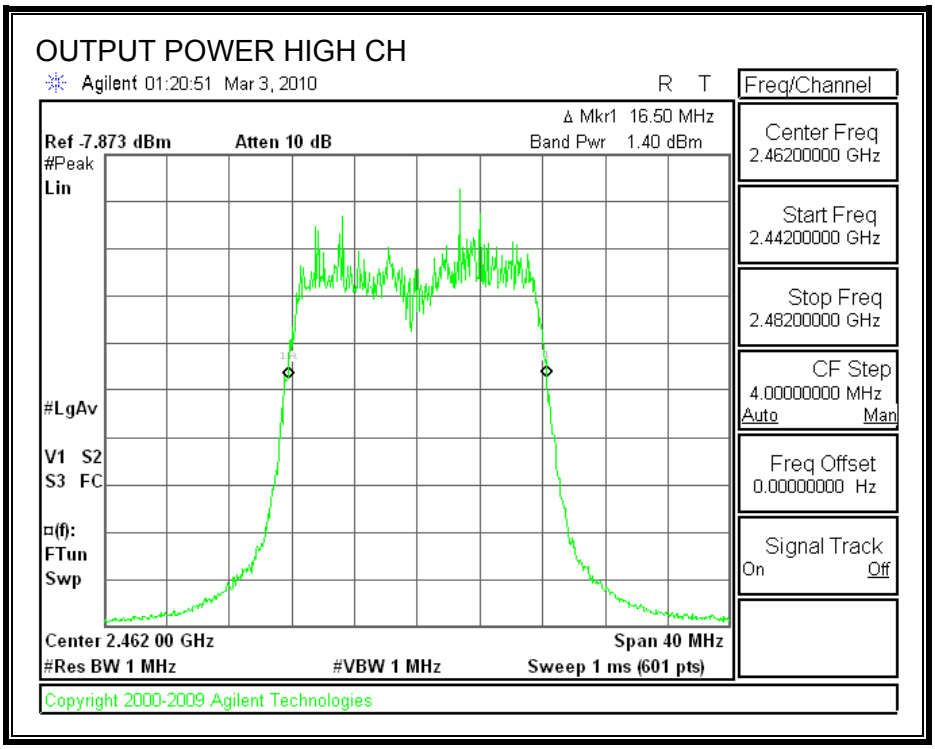
**RESULTS**

| Channel | Frequency (MHz) | Spectrum Analyzer Reading (dBm) | Attenuator and Cable Offset (dB) | Output Power (dBm) | Limit (dBm) | Margin (dB) |
|---|---|---|---|---|---|---|
| Low | 2412 | 1.04 | 11 | 12.04 | 30 | -17.96 |
| Middle | 2437 | 1.47 | 11 | 12.47 | 30 | -17.53 |
| High | 2462 | 1.40 | 11 | 12.40 | 30 | -17.60 |

**OUTPUT POWER**





## 7.3.4. AVERAGE POWER

**LIMITS**

None; for reporting purposes only.

**TEST PROCEDURE**

The transmitter output is connected to a power meter.

**RESULTS**

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.

| Channel | Frequency (MHz) | Power (dBm) |
|---|---|---|
| Low | 2412 | 4.92 |
| Middle | 2437 | 5.25 |
| High | 2462 | 5.15 |

## 7.3.5. POWER SPECTRAL DENSITY

**LIMITS**

FCC §15.247 (e)

IC RSS-210 A8.2 (b)

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.

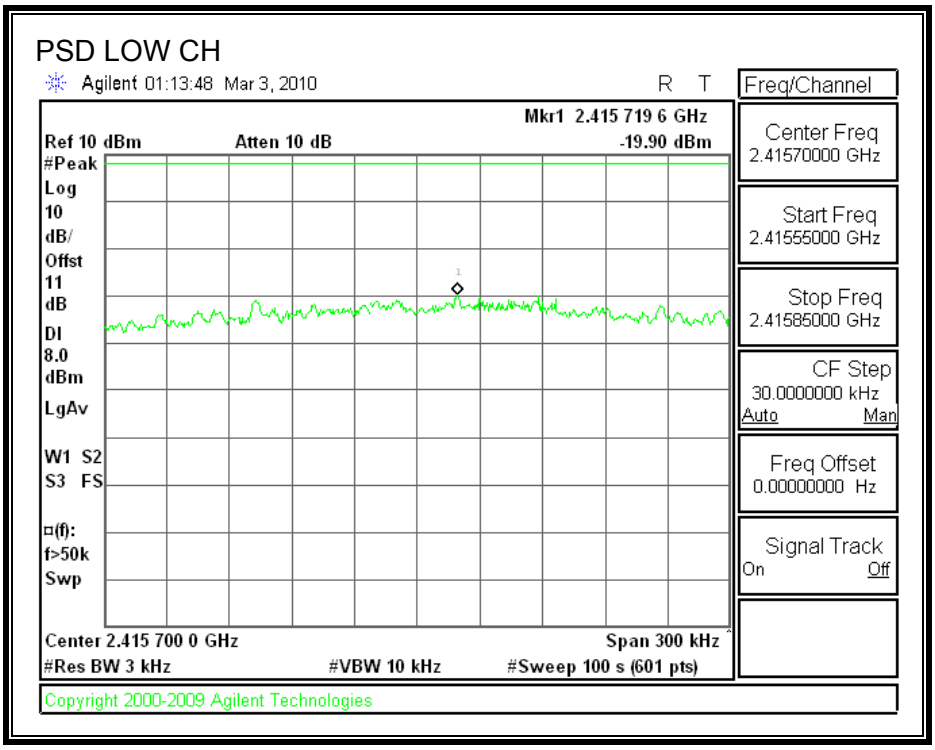
**TEST PROCEDURE**

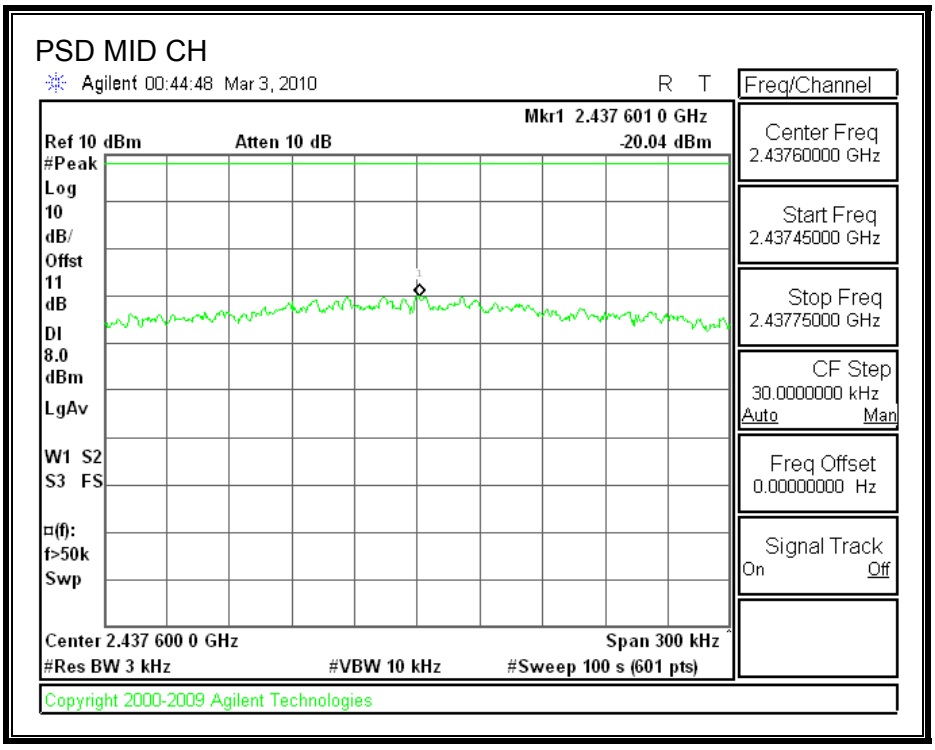
Output power was measured based on the use of a peak measurement, therefore the power spectral density was measured using PSD Option 1 in accordance with FCC document "Measurement of Digital Transmission Systems Operating under Section 15.247", March 23, 2005.

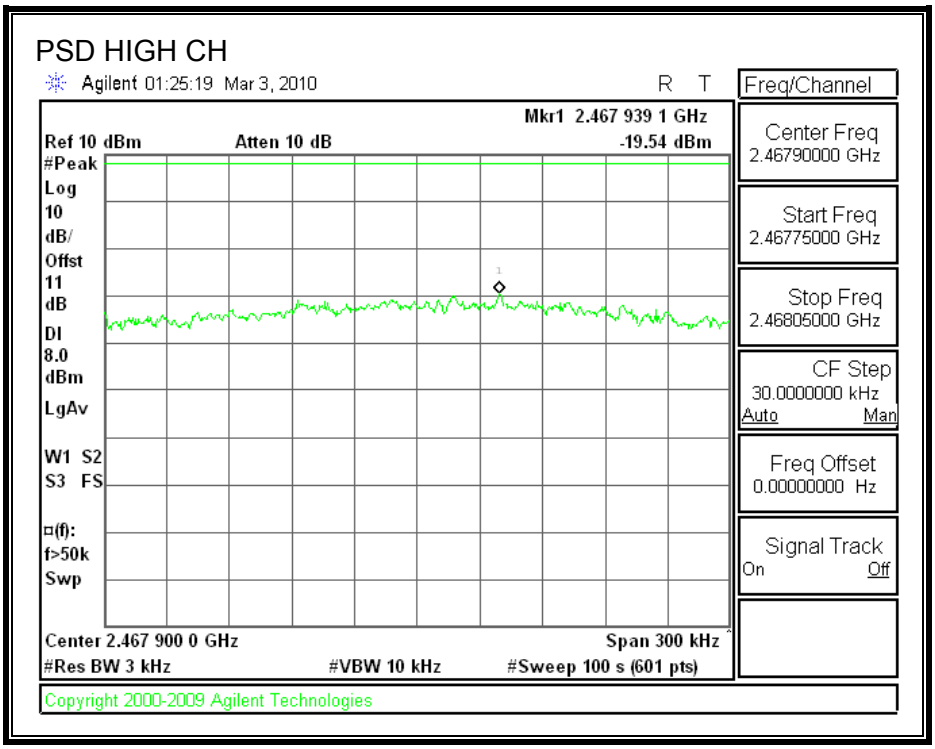
**RESULTS**

| Channel | Frequency (MHz) | PPSD (dBm) | Limit (dBm) | Margin (dB) |
|---|---|---|---|---|
| Low | 2412 | -19.90 | 8 | -27.90 |
| Middle | 2437 | -20.04 | 8 | -28.04 |
| High | 2462 | -19.54 | 8 | -27.54 |

**POWER SPECTRAL DENSITY**





## 7.3.6. CONDUCTED SPURIOUS EMISSIONS

**LIMITS**

FCC §15.247 (d)

IC RSS-210 A8.5

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

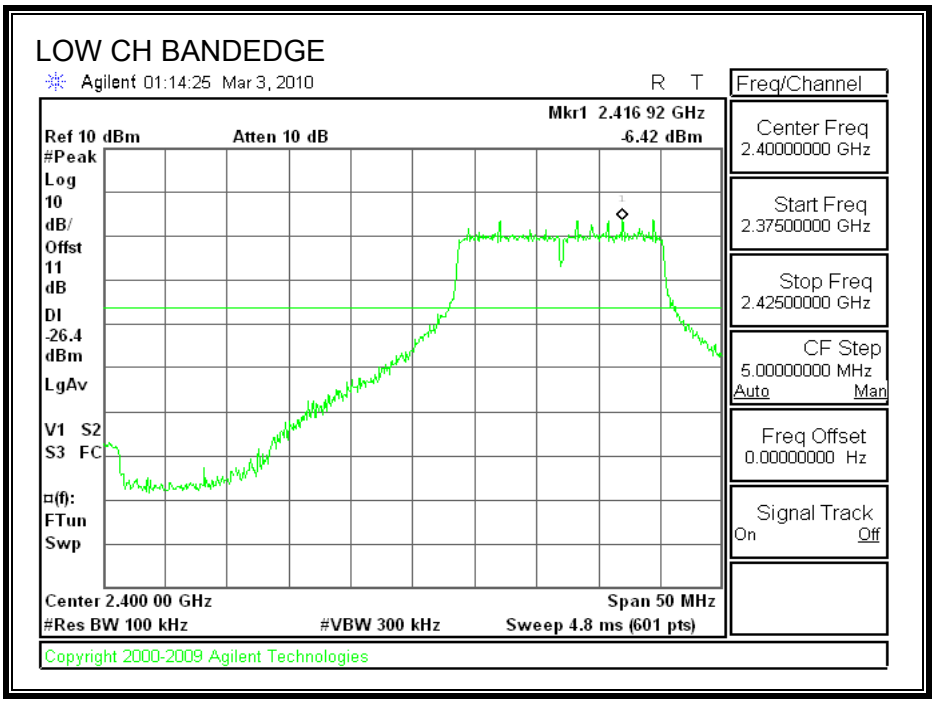
**TEST PROCEDURE**

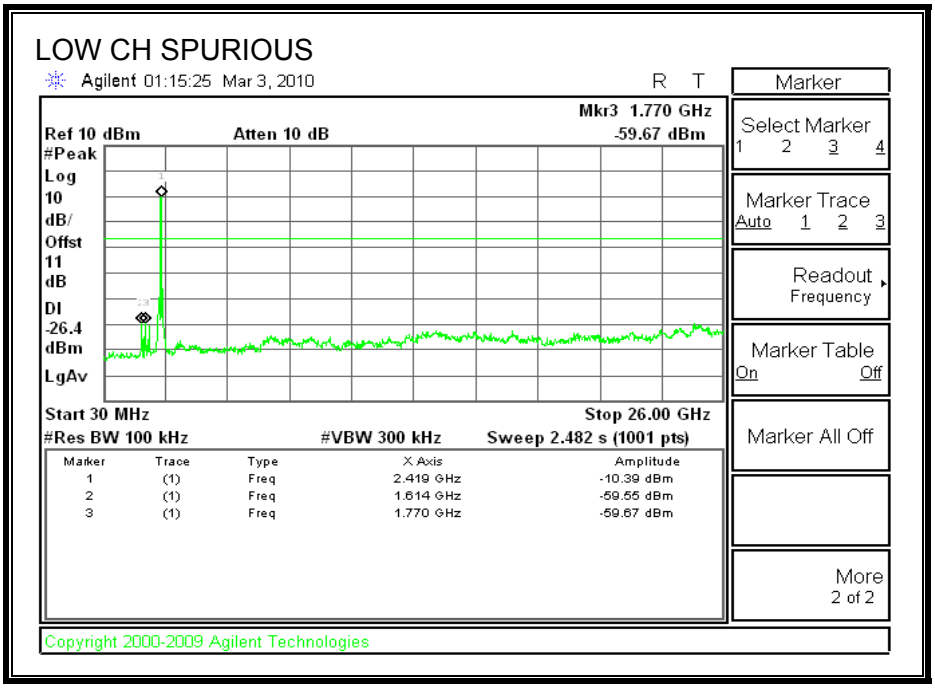
The transmitter output is connected to a spectrum analyzer. The resolution bandwidth is set to 100 kHz. The video bandwidth is set to 300 kHz.

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

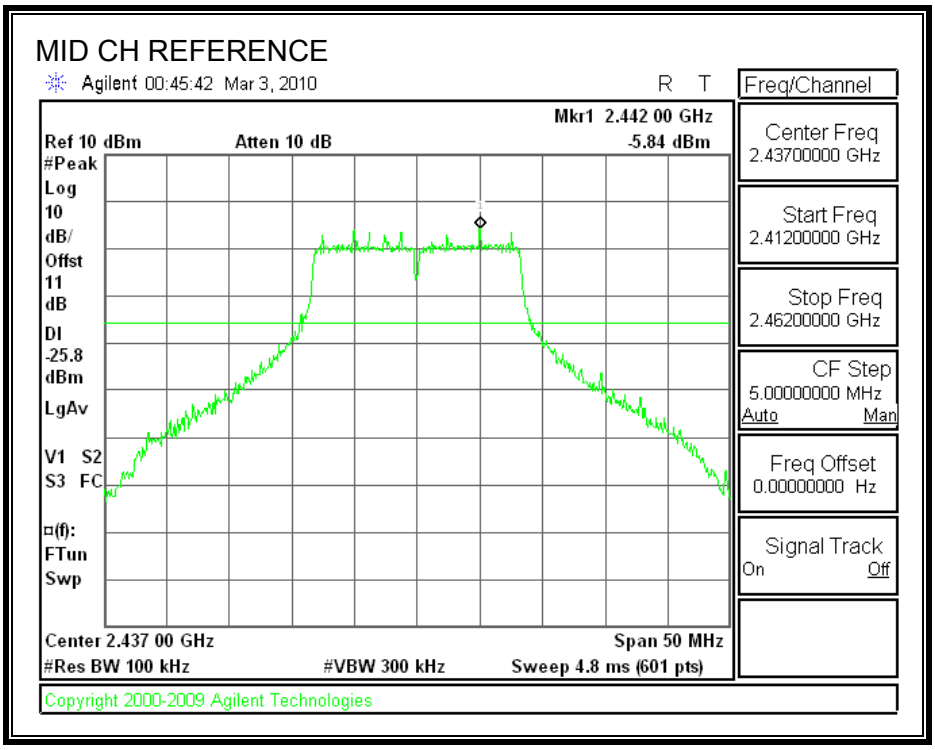
## RESULTS

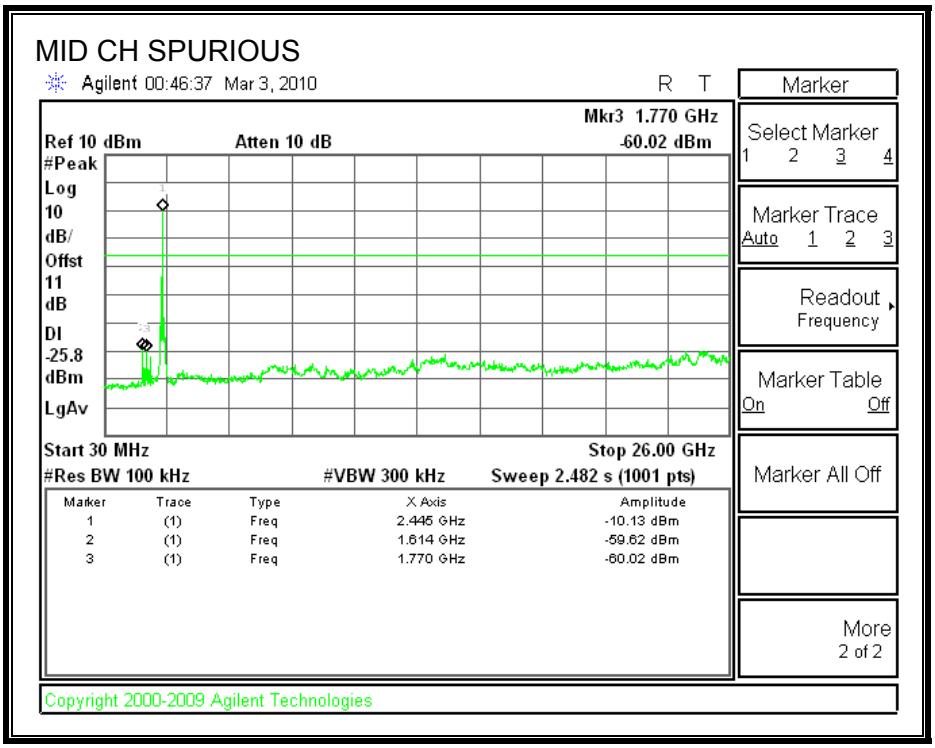
## SPURIOUS EMISSIONS, LOW CHANNEL



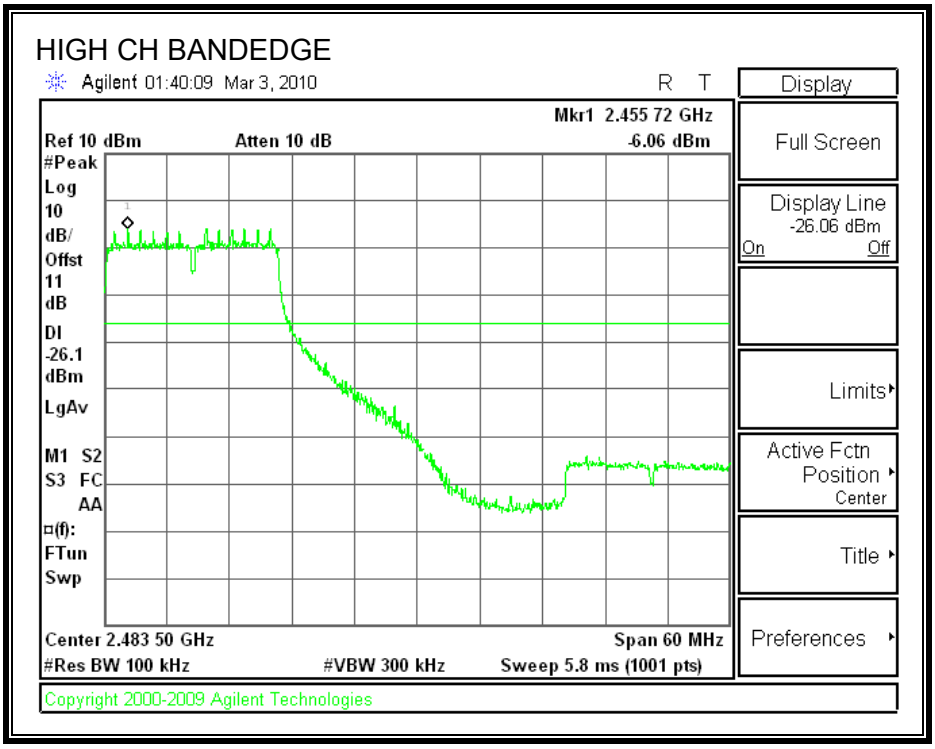



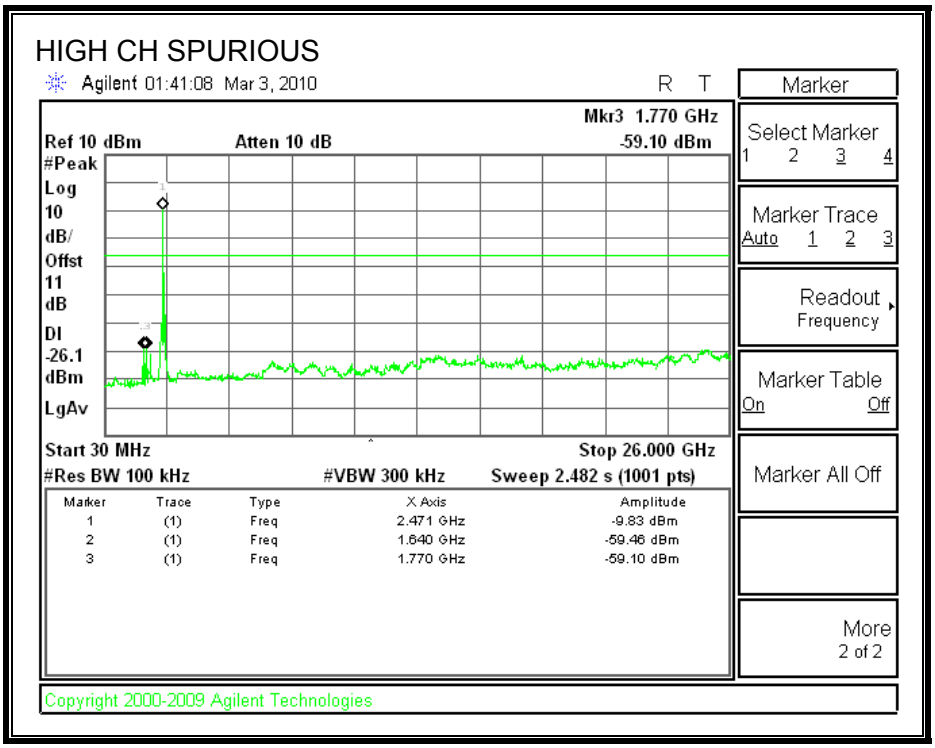
**SPURIOUS EMISSIONS, MID CHANNEL**



**SPURIOUS EMISSIONS, HIGH CHANNEL**



# 8. RADIATED TEST RESULTS

## 8.1. LIMITS AND PROCEDURE

**LIMITS**

FCC §15.205 and §15.209

IC RSS-210 Clause 2.6 (Transmitter)

IC RSS-GEN Clause 6 (Receiver)

| 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.

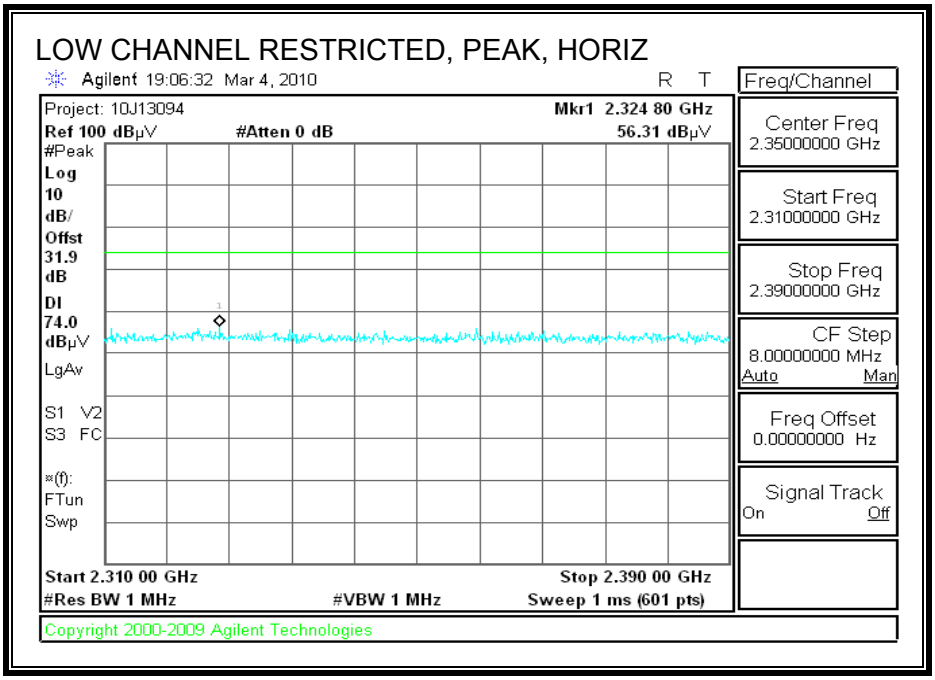
# 8.2. TRANSMITTER ABOVE 1 GHz

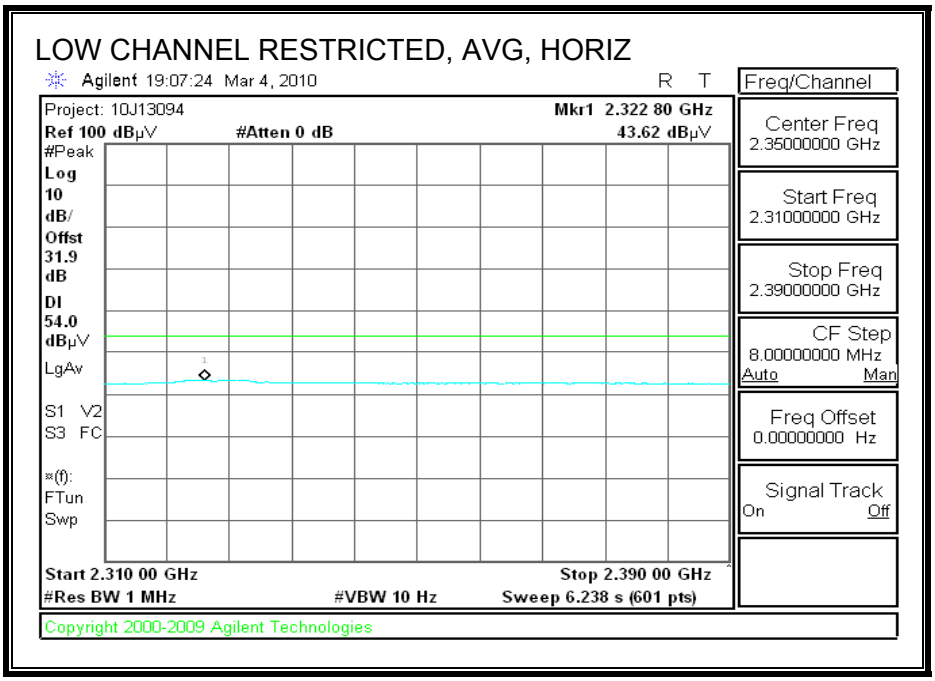
## 8.2.1. 802.11 MODE IN THE 2.4 GHz BAND

***TWL-001 HOST***

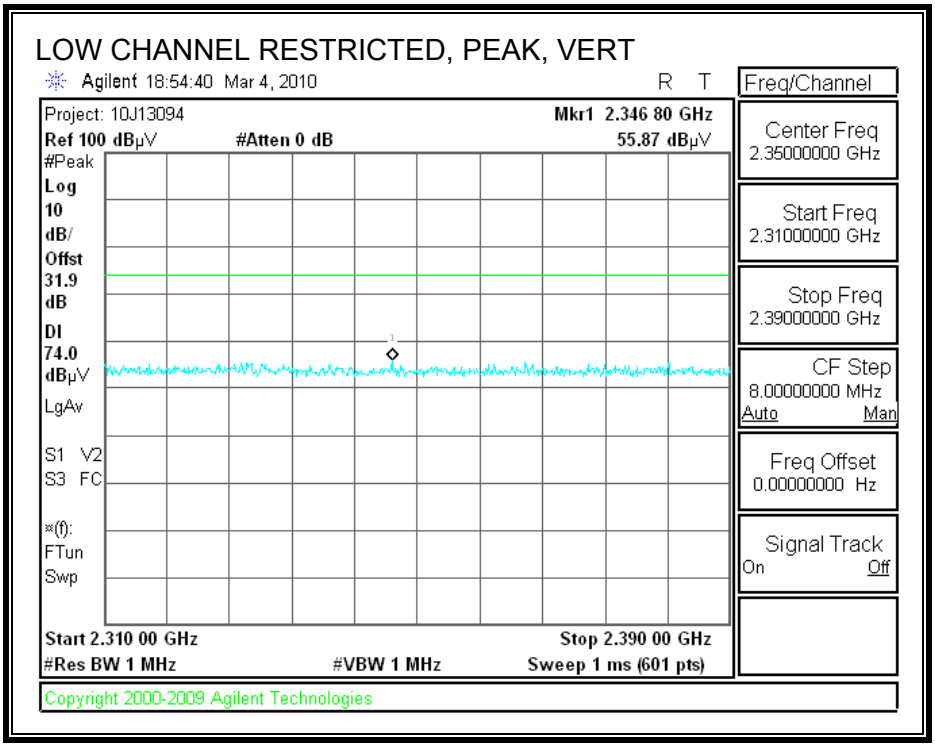
**Foxconn Antenna**

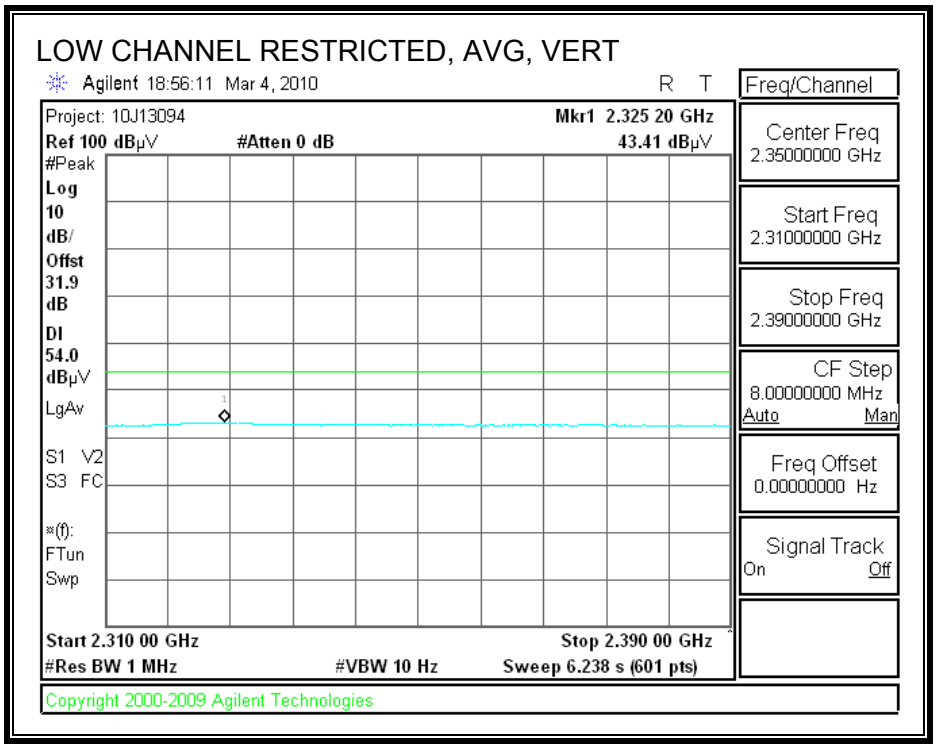
**RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)**



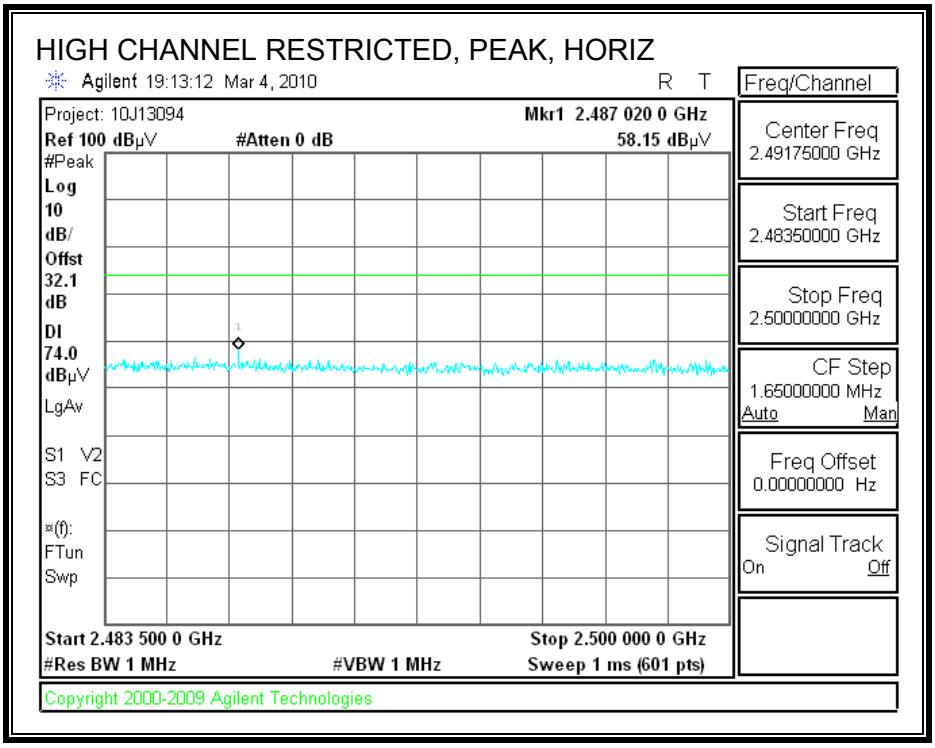



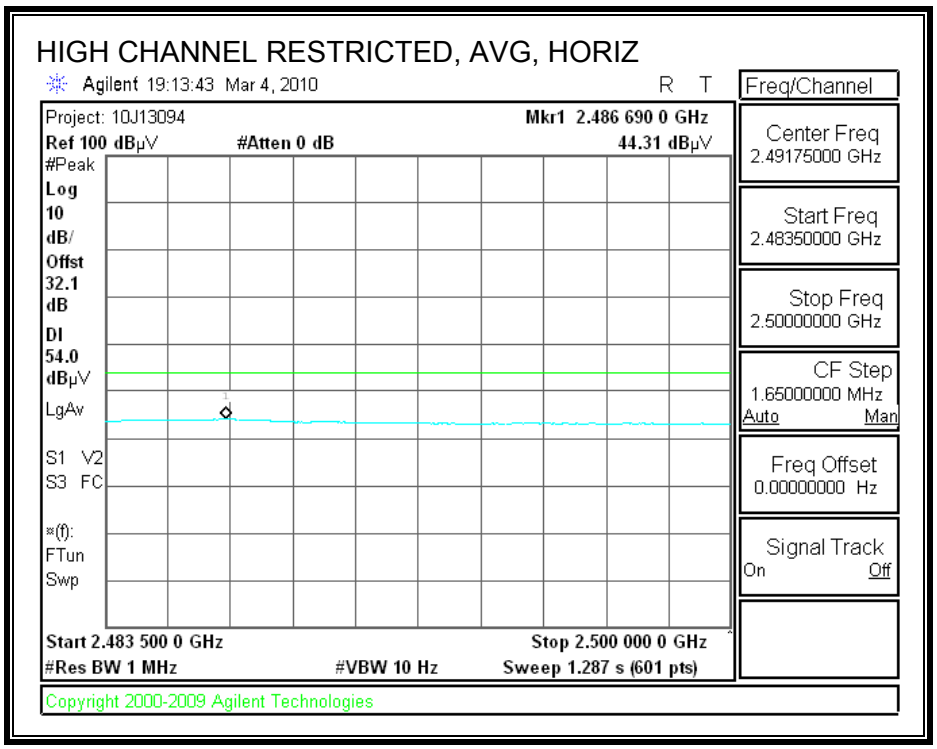
**RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)**



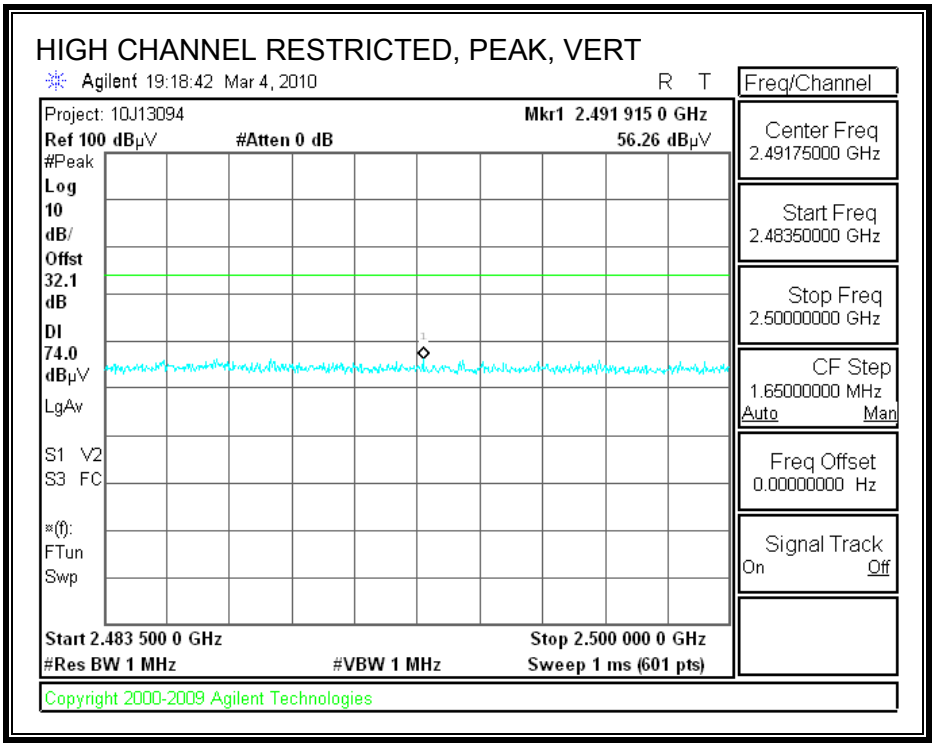



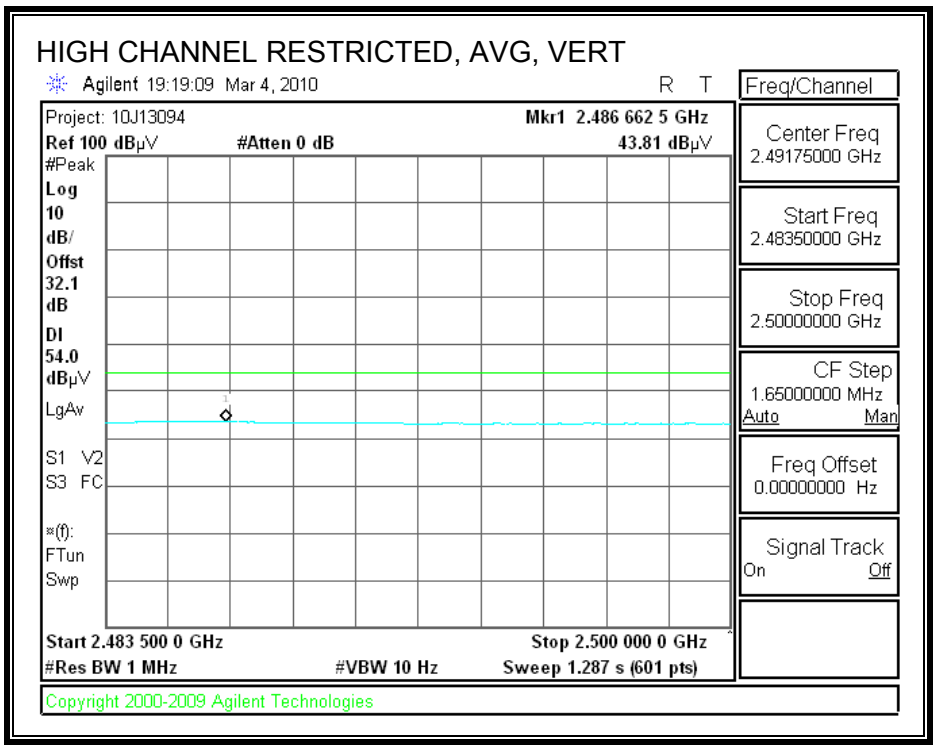
**RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)**



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



## HARMONICS AND SPURIOUS EMISSIONS

**High Frequency Measurement**
**Compliance Certification Services, Fremont 5m Chamber**

**Company:** Hon Hai Precision
**Project #:** 10J13094
**Date:** 03/03/10
**Test Engineer:** Thanh Nguyen
**Configuration:** EUT TWL-001 Foxconn Antenna.
**Mode:** Transmit 802. 11

**Test Equipment:**

| Horn 1-18GHz | Pre-amplifer 1-26GHz | Pre-amplifer 26-40GHz | Horn > 18GHz | Limit |
|---|---|---|---|---|
| T60; S/N: 2238 @3m | T34 HP 8449B | | | FCC 15.209 |

Hi Frequency Cables

| 3' cable 22807700 | 12' cable 22807600 | 20' cable 22807500 | HPF | Reject Filter |
|---|---|---|---|---|
| 3' cable 22807700 | 12' cable 22807600 | 20' cable 22807500 | | R_001 |

**Peak Measurements**
RBW=VBW=1MHz
**Average Measurements**
RBW=1MHz ; VBW=10Hz

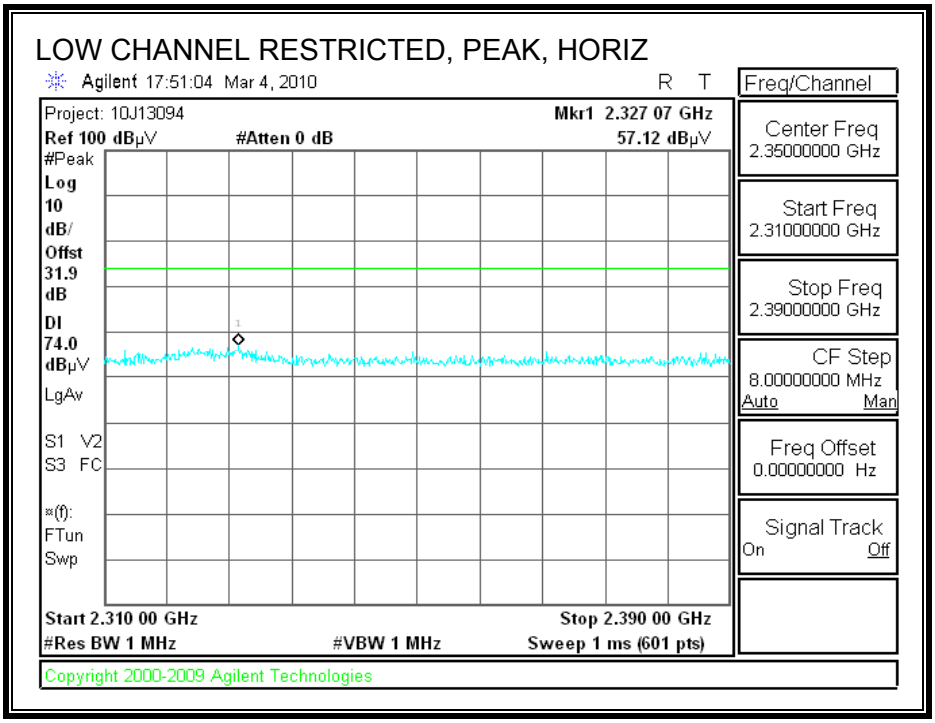
| f GHz | Dist (m) | Read Pk dBuV | Read Avg. dBuV | AF dB/m | CL dB | Amp dB | D Corr dB | Fltr dB | Peak dBuV/m | Avg dBuV/m | Pk Lim dBuV/m | Avg Lim dBuV/m | Pk Mar dB | Avg Mar dB | Notes (V/H) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Low Channel** | | | | | | | | | | | | | | | |
| 4.824 | 3.0 | 38.2 | 24.2 | 32.7 | 5.8 | -34.8 | | 0.0 | 41.8 | 27.8 | 74 | 54 | -32.2 | -26.2 | V/Noise floor |
| 4.824 | 3.0 | 38.3 | 27.7 | 32.7 | 5.8 | -34.8 | | 0.0 | 42.0 | 31.4 | 74 | 54 | -32.0 | -22.6 | H/Noise floor |
| **Mid Channel** | | | | | | | | | | | | | | | |
| 4.874 | 3.0 | 37.2 | 24.4 | 32.7 | 5.8 | -34.8 | | 0.0 | 40.9 | 28.1 | 74 | 54 | -33.1 | -25.9 | Noise floor |
| **High Channel** | | | | | | | | | | | | | | | |
| 4.944 | 3.0 | 37.9 | 24.9 | 32.8 | 5.9 | -34.8 | | 0.0 | 41.7 | 28.7 | 74 | 54 | -32.3 | -25.3 | Noise floor |
| **No other emissions were detected above system noise floor** | | | | | | | | | | | | | | | |

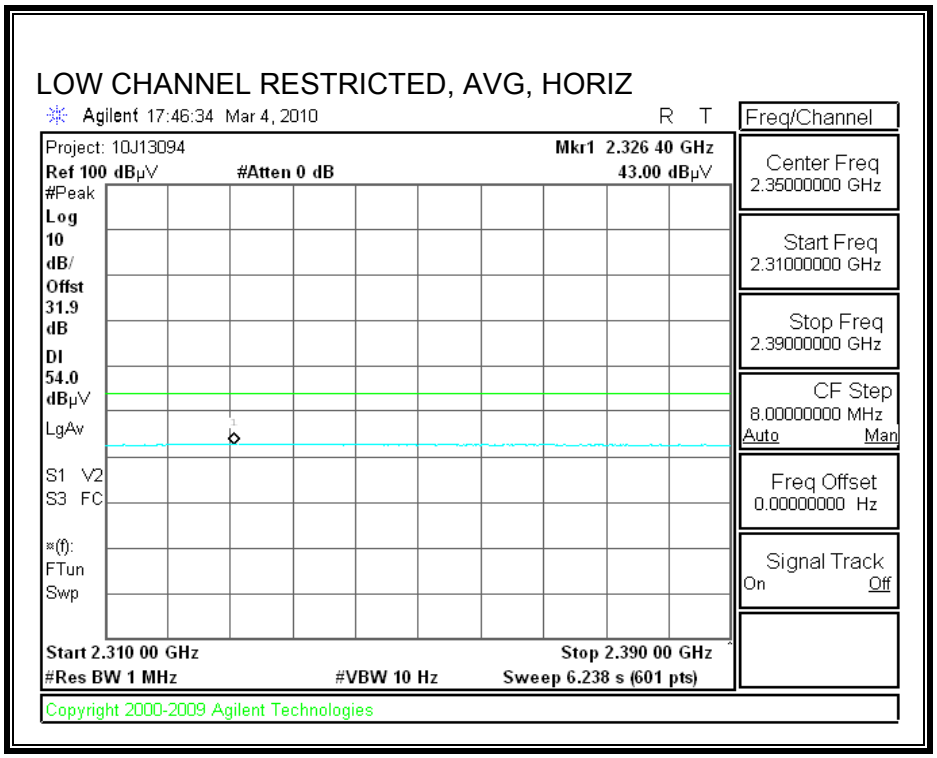
Rev. 11.10.08

| | | | | | |
|---|---|---|---|---|---|
| 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 | | |

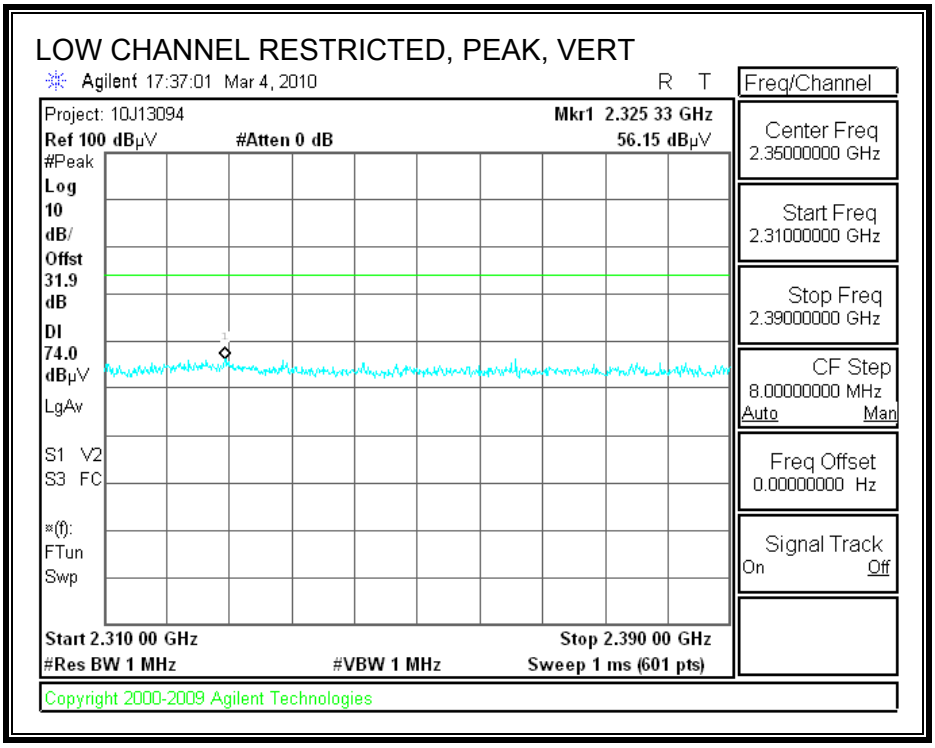
**Tyco Antenna**

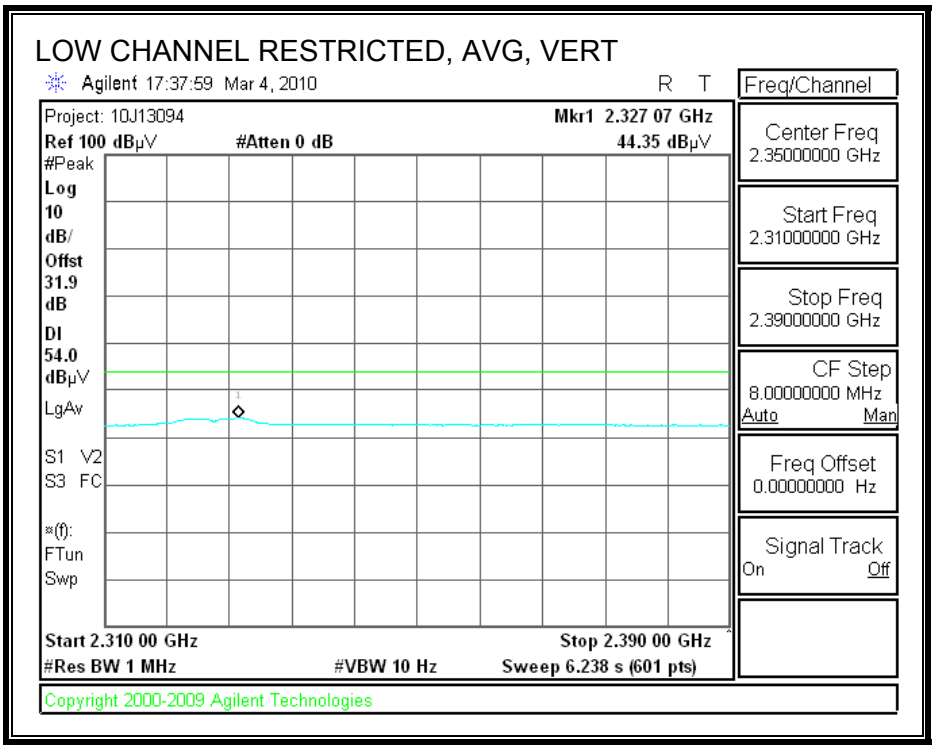
**RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)**



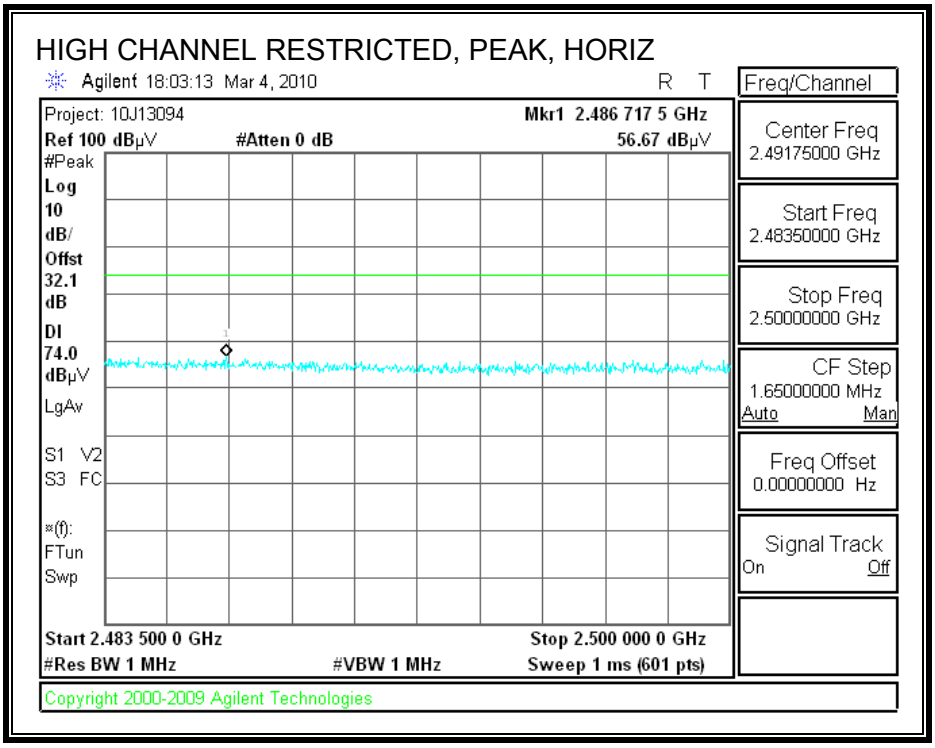



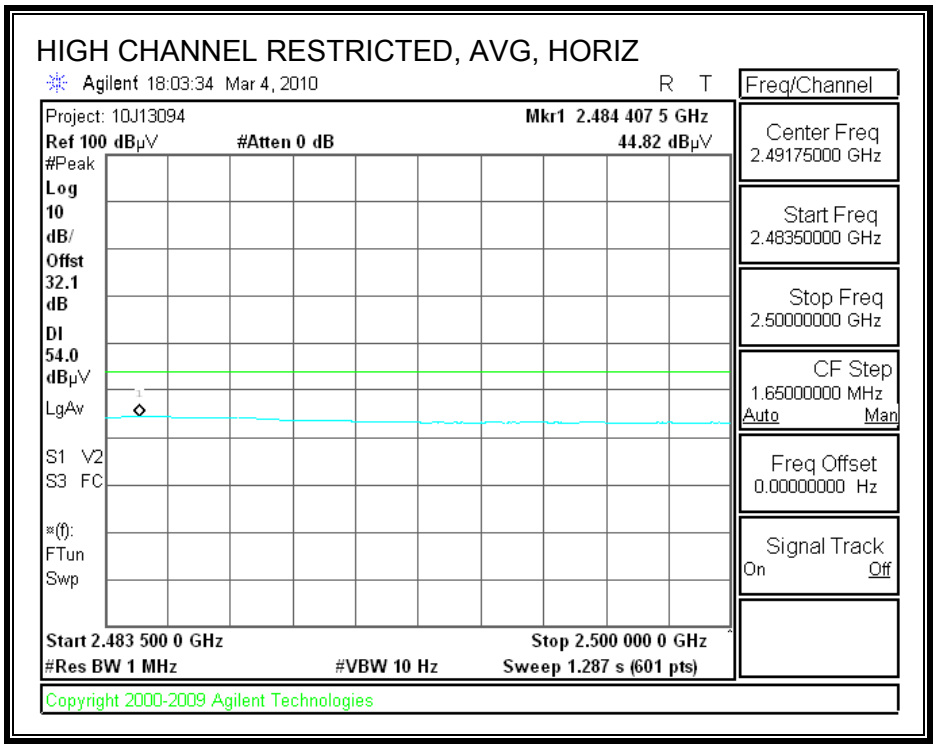
**RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)**



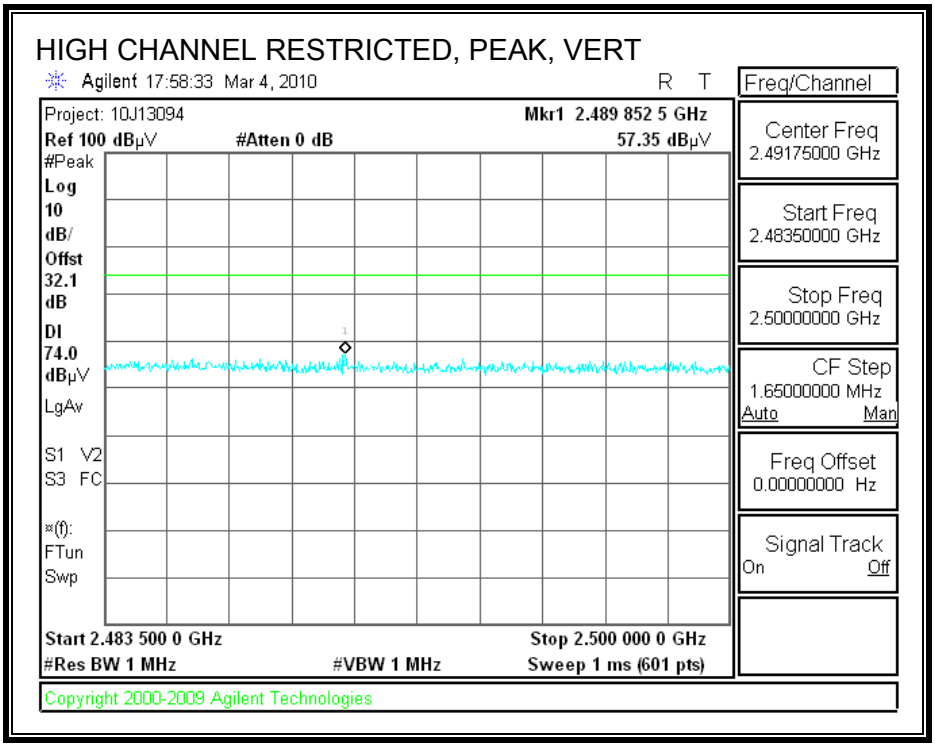



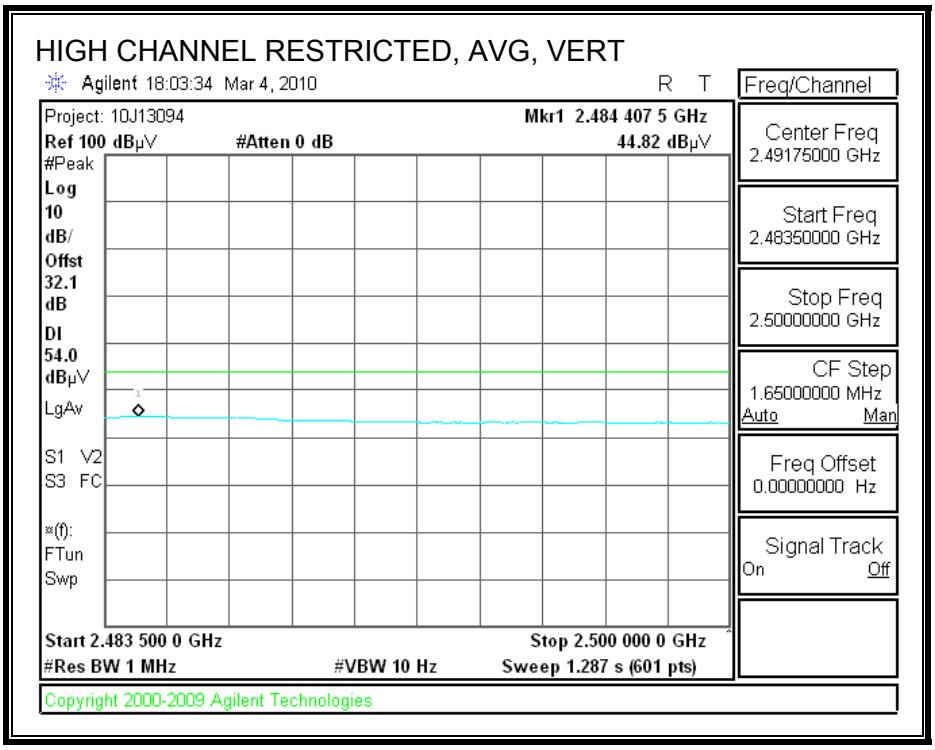
**RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)**



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



## HARMONICS AND SPURIOUS EMISSIONS

**High Frequency Measurement**
**Compliance Certification Services, Fremont 5m Chamber**

| | |
|---|---|
| **Company:** | Hon Hai Precision |
| **Project #:** | 10J13094 |
| **Date:** | 03/03/10 |
| **Test Engineer:** | Thanh Nguyen |
| **Configuration:** | EUT TWL Tyco Antenna |
| **Mode:** | Transmit 802. 11 |

**Test Equipment:**

| Horn 1-18GHz | Pre-amplifer 1-26GHz | Pre-amplifer 26-40GHz | Horn > 18GHz | Limit |
|---|---|---|---|---|
| T60; S/N: 2238 @3m | T34 HP 8449B | | | FCC 15.209 |

Hi Frequency Cables

| 3' cable 22807700 | 12' cable 22807600 | 20' cable 22807500 | HPF | Reject Filter |
|---|---|---|---|---|
| 3' cable 22807700 | 12' cable 22807600 | 20' cable 22807500 | | R_001 |

**Peak Measurements**
RBW=VBW=1MHz
**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 | Fltr dB | Peak dBuV/m | Avg dBuV/m | Pk Lim dBuV/m | Avg Lim dBuV/m | Pk Mar dB | Avg Mar dB | Notes (V/H) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Low Channel** | | | | | | | | | | | | | | | |
| 4.824 | 3.0 | 38.9 | 25.2 | 32.7 | 5.8 | -34.8 | | 0.0 | 42.6 | 28.9 | 74 | 54 | -31.4 | -25.1 | V/Noise floor |
| **Mid Channel** | | | | | | | | | | | | | | | |
| 4.874 | 3.0 | 38.3 | 24.3 | 32.7 | 5.8 | -34.8 | | 0.0 | 42.0 | 28.0 | 74 | 54 | -32.0 | -26.0 | Noise floor |
| **High Channel** | | | | | | | | | | | | | | | |
| 4.944 | 3.0 | 38.7 | 24.4 | 32.8 | 5.9 | -34.8 | | 0.0 | 42.5 | 28.2 | 74 | 54 | -31.5 | -25.8 | Noise floor |
| **No other emissions were detected above system noise floor** | | | | | | | | | | | | | | | |

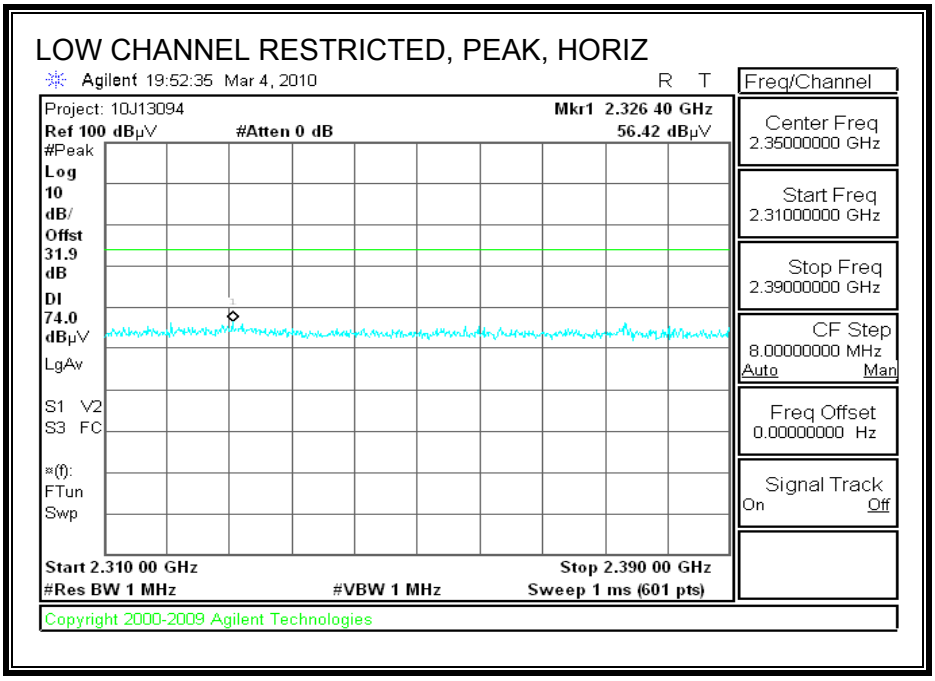
Rev. 11.10.08

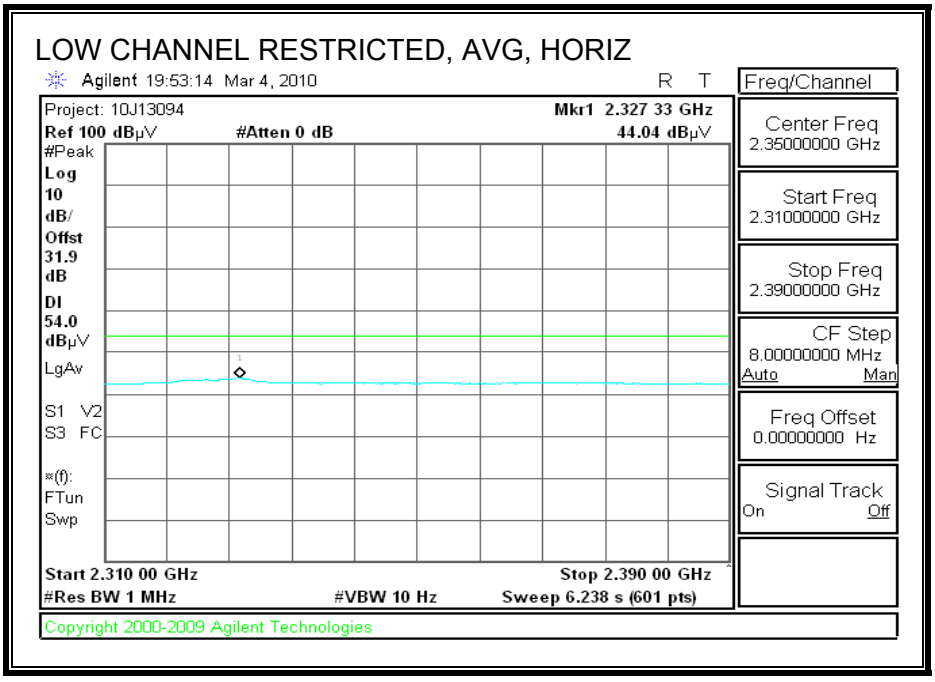
| | | | | | |
|---|---|---|---|---|---|
| f | Measurement Frequency | Amp | Preamp Gain | Avg Lim | Average Field Strength Limit |
| Dist | Distance to Antenna | D Corr | Distance Correct to 3 meters | Pk Lim | Peak Field Strength Limit |
| Read | Analyzer Reading | Avg | Average Field Strength @ 3 m | 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 | | |

***UTL-001 HOST***

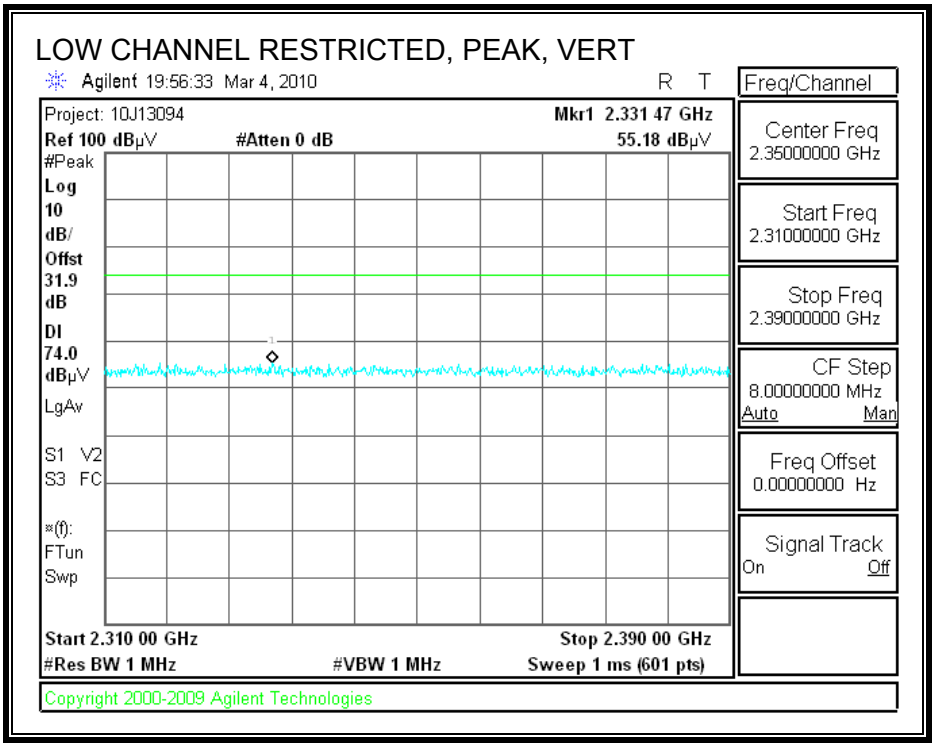
**Foxconn Antenna**

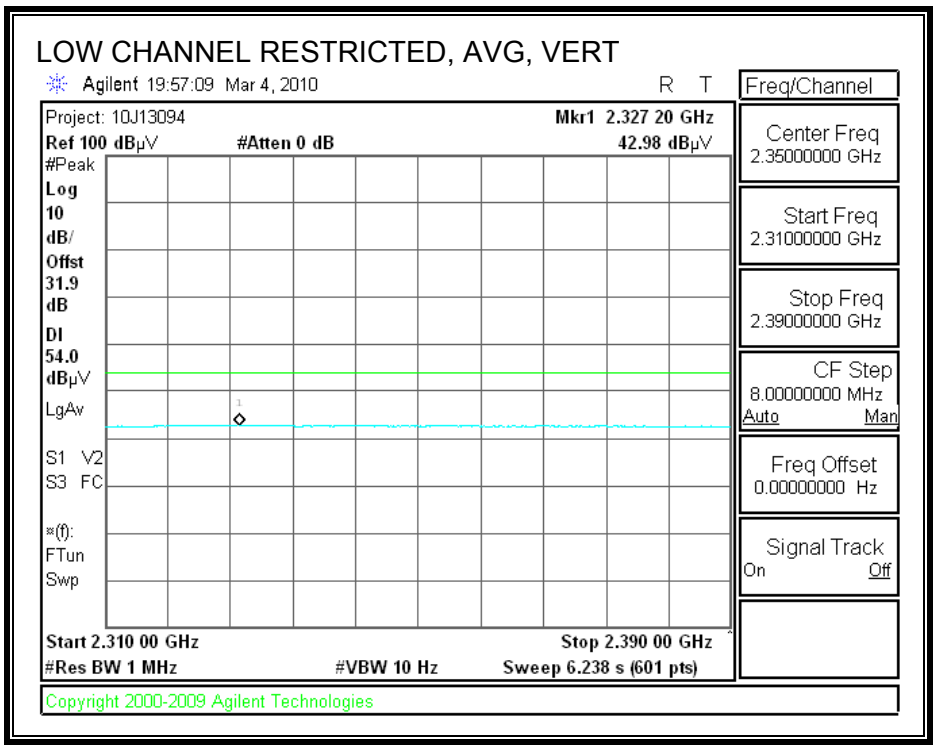
**RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)**



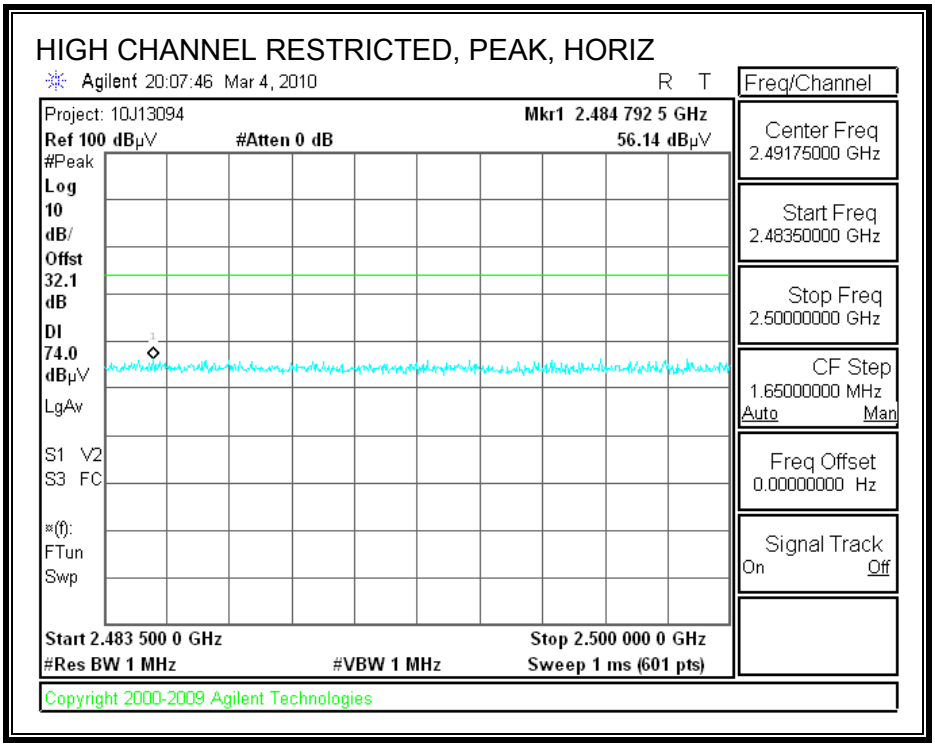



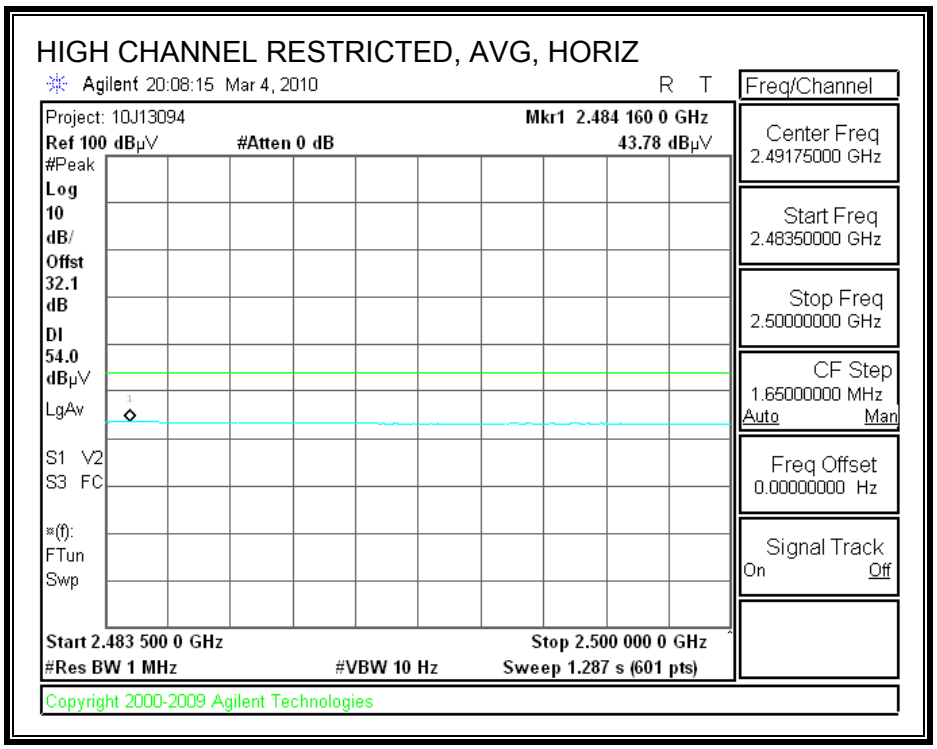
**RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)**



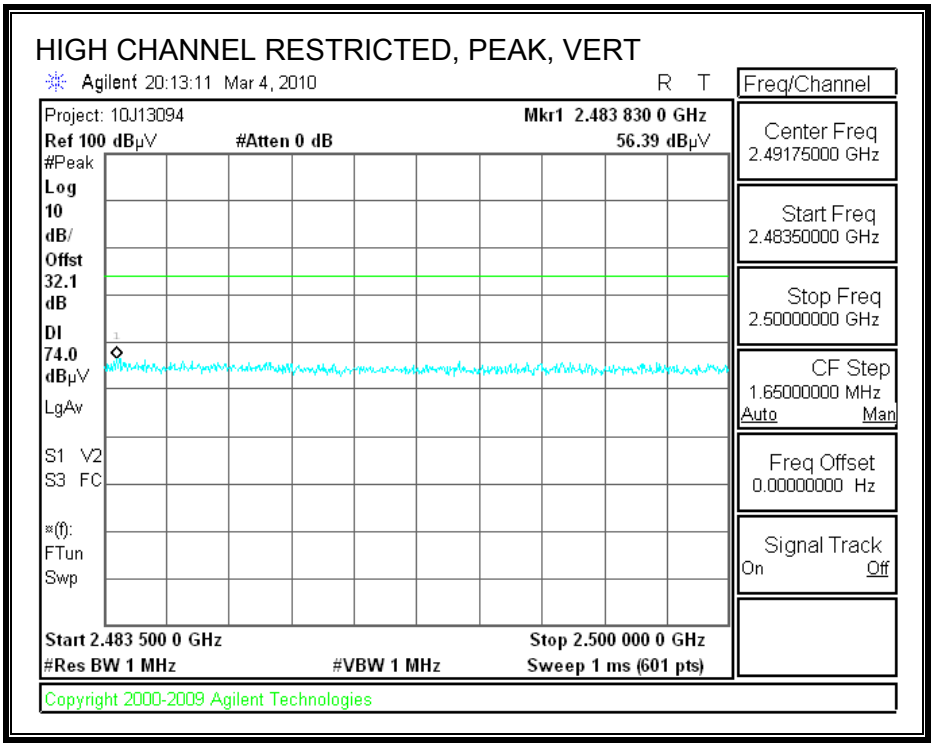



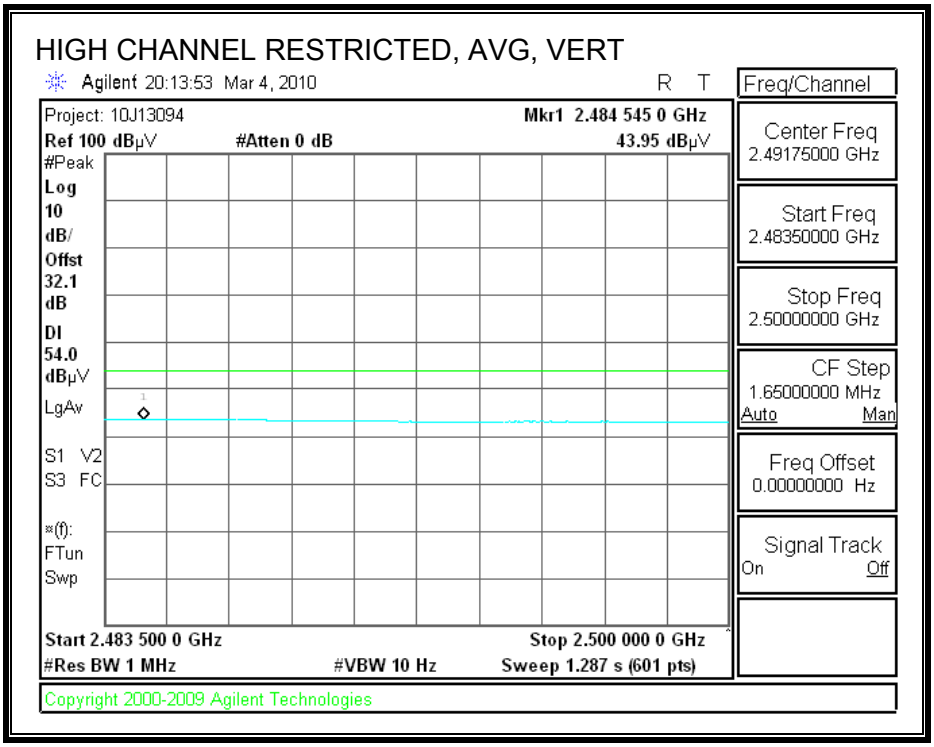
**RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)**



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



## HARMONICS AND SPURIOUS EMISSIONS

**High Frequency Measurement**
**Compliance Certification Services, Fremont 5m Chamber**

**Company:** Hon Hai Precision
**Project #:** 10J13094
**Date:** 03/04/10
**Test Engineer:** Thanh Nguyen
**Configuration:** EUT UTL-001 Foxconn Antenna.
**Mode:** Transmit 802. 11

**Test Equipment:**

| Horn 1-18GHz | Pre-amplifer 1-26GHz | Pre-amplifer 26-40GHz | Horn > 18GHz | Limit |
|---|---|---|---|---|
| T60; S/N: 2238 @3m | T34 HP 8449B | | | FCC 15.209 |

Hi Frequency Cables

| 3' cable 22807700 | 12' cable 22807600 | 20' cable 22807500 | HPF | Reject Filter |
|---|---|---|---|---|
| 3' cable 22807700 | 12' cable 22807600 | 20' cable 22807500 | | R_001 |

**Peak Measurements**
RBW=VBW=1MHz
**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 | Fltr dB | Peak dBuV/m | Avg dBuV/m | Pk Lim dBuV/m | Avg Lim dBuV/m | Pk Mar dB | Avg Mar dB | Notes (V/H) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Low Channel** | | | | | | | | | | | | | | | |
| 4.824 | 3.0 | 37.7 | 24.3 | 32.7 | 5.8 | -34.8 | | 0.0 | 41.4 | 28.0 | 74 | 54 | -32.6 | -26.0 | V/Noise floor |
| 4.824 | 3.0 | 37.4 | 23.8 | 32.7 | 5.8 | -34.8 | | 0.0 | 41.0 | 27.5 | 74 | 54 | -33.0 | -26.5 | H/Noise floor |
| **Mid Channel** | | | | | | | | | | | | | | | |
| 4.874 | 3.0 | 37.6 | 24.3 | 32.7 | 5.8 | -34.8 | | 0.0 | 41.3 | 28.1 | 74 | 54 | -32.7 | -25.9 | Noise floor |
| **High Channel** | | | | | | | | | | | | | | | |
| 4.944 | 3.0 | 37.5 | 24.4 | 32.8 | 5.9 | -34.8 | | 0.0 | 41.3 | 28.2 | 74 | 54 | -32.7 | -25.8 | Noise floor |
| **No other emissions were detected above system noise floor** | | | | | | | | | | | | | | | |

Rev. 11.10.08

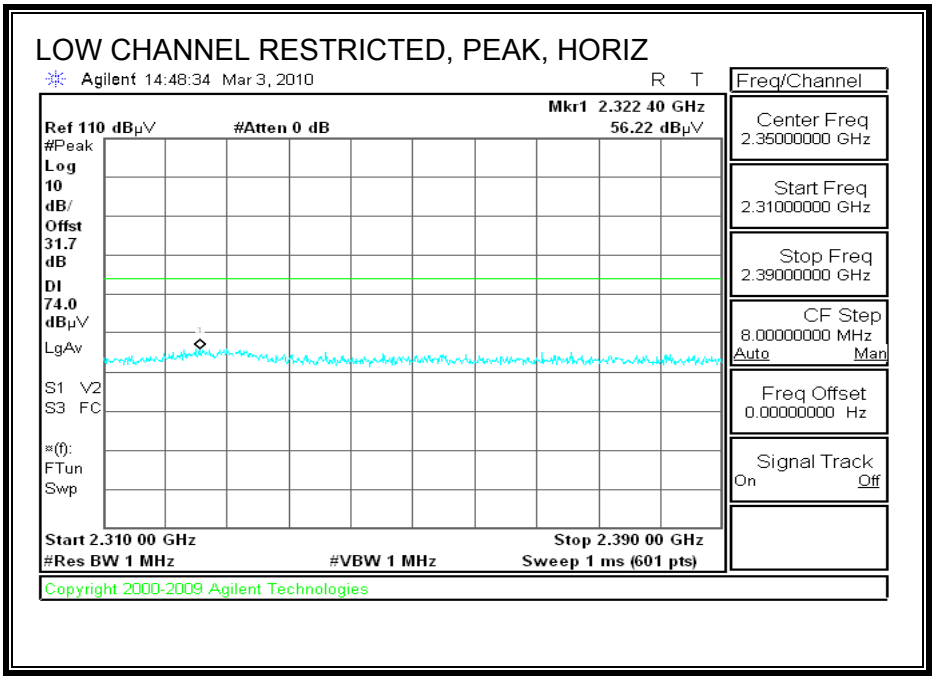
| | | | | | |
|---|---|---|---|---|---|
| f | Measurement Frequency | Amp | Preamp Gain | Avg Lim | Average Field Strength Limit |
| Dist | Distance to Antenna | D Corr | Distance Correct to 3 meters | Pk Lim | Peak Field Strength Limit |
| Read | Analyzer Reading | Avg | Average Field Strength @ 3 m | 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 | | |

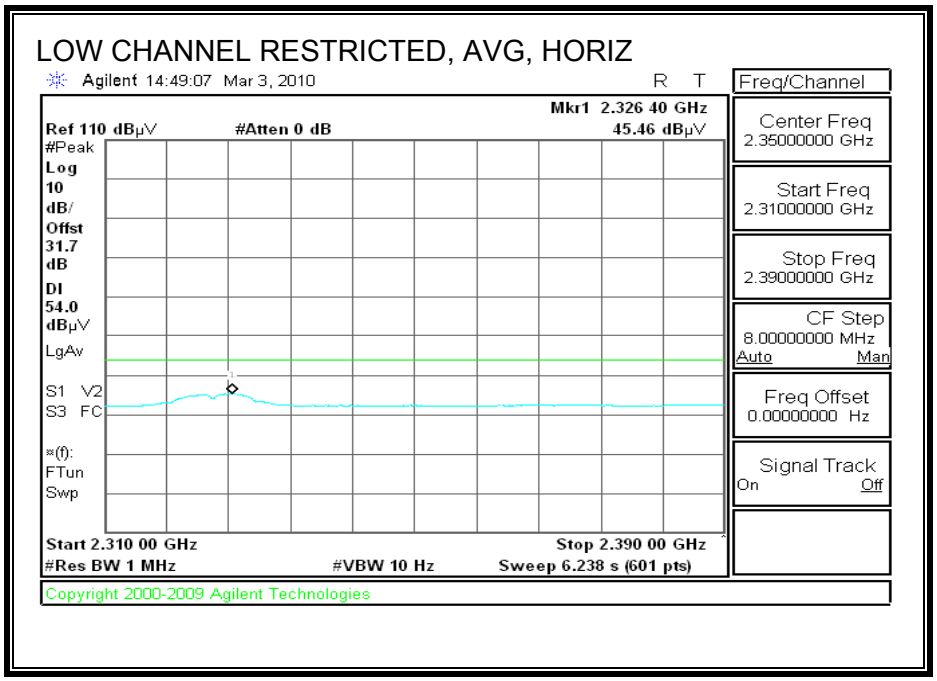
## 8.2.2. 802.11b MODE IN THE 2.4 GHz BAND

***TWL-001 HOST***

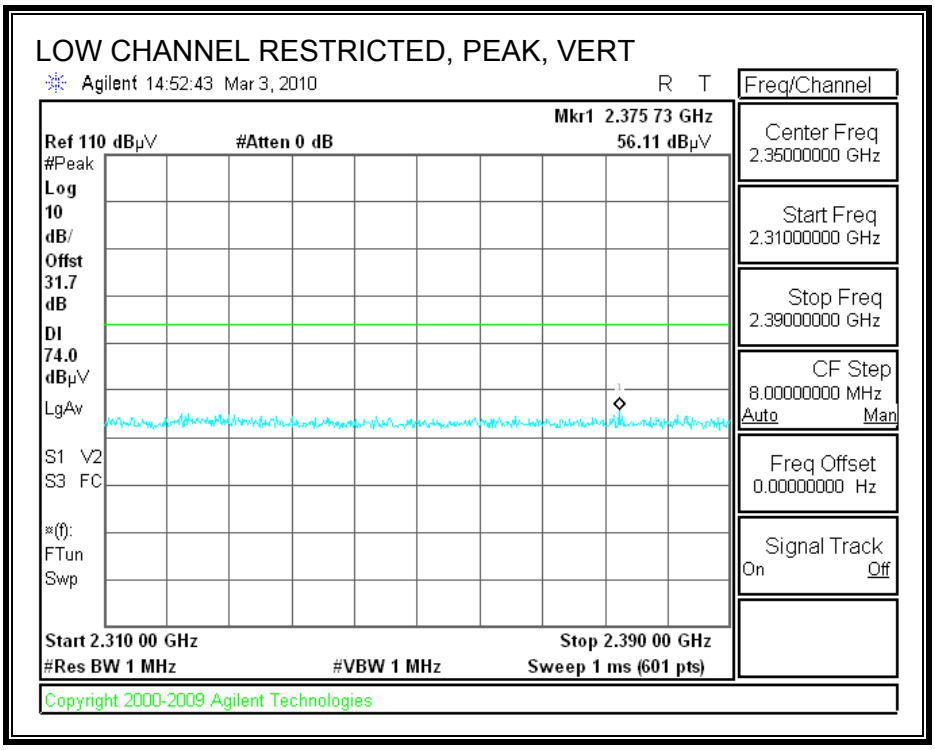
**Foxconn antenna**

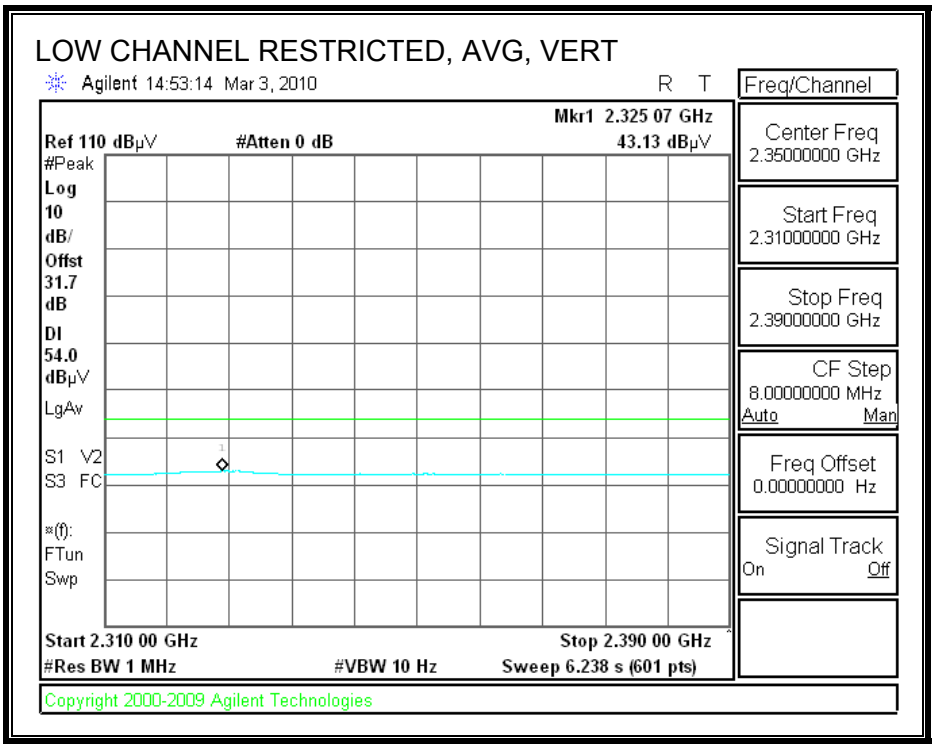
**RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)**



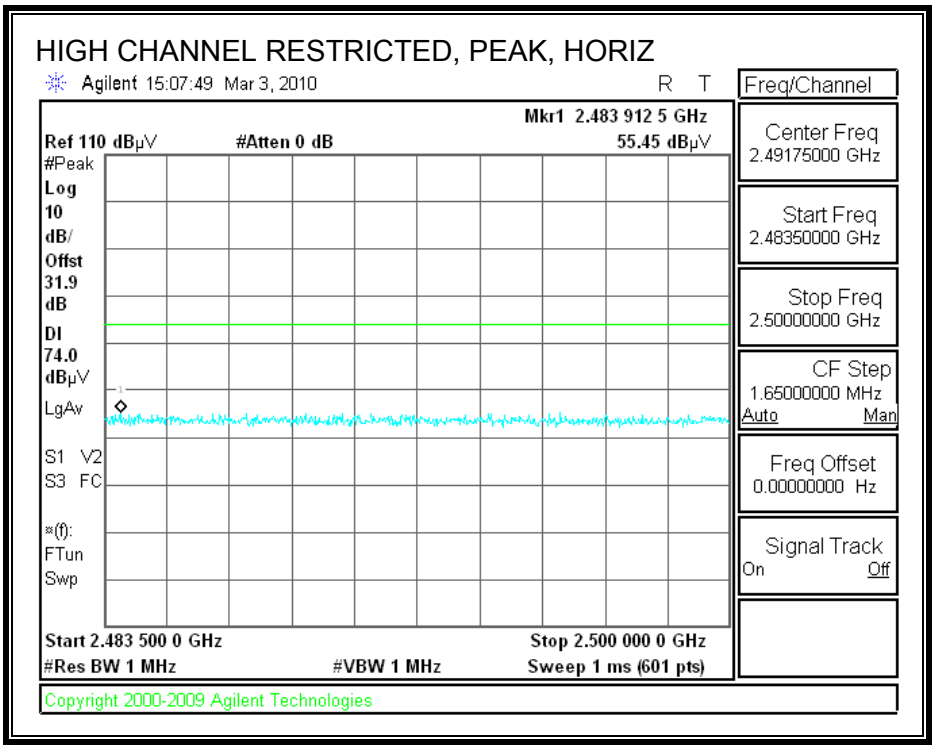



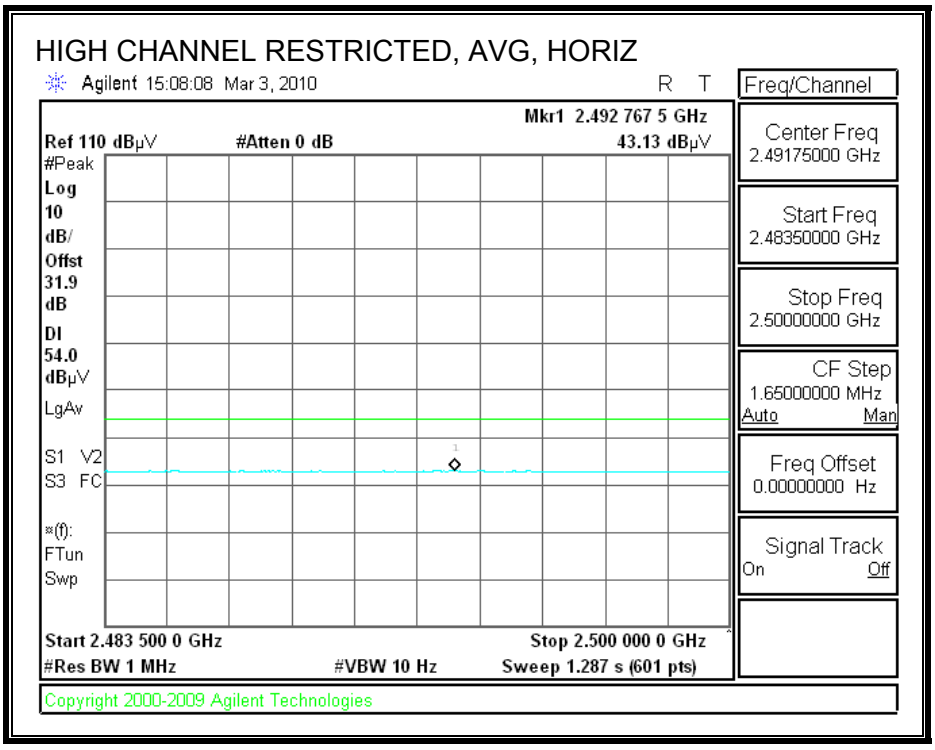
**RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)**



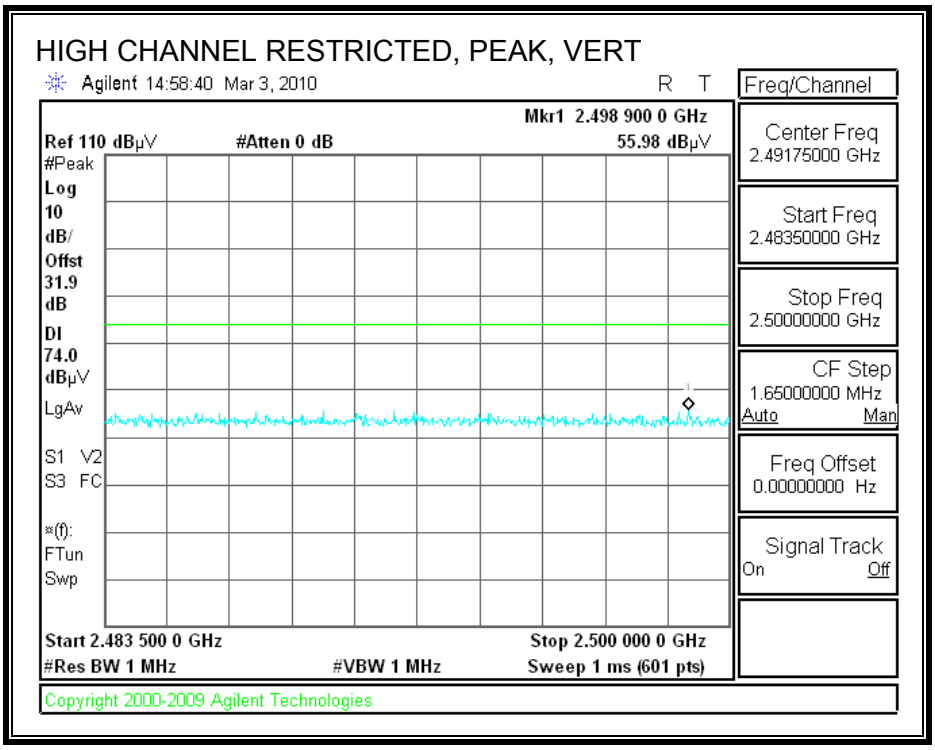



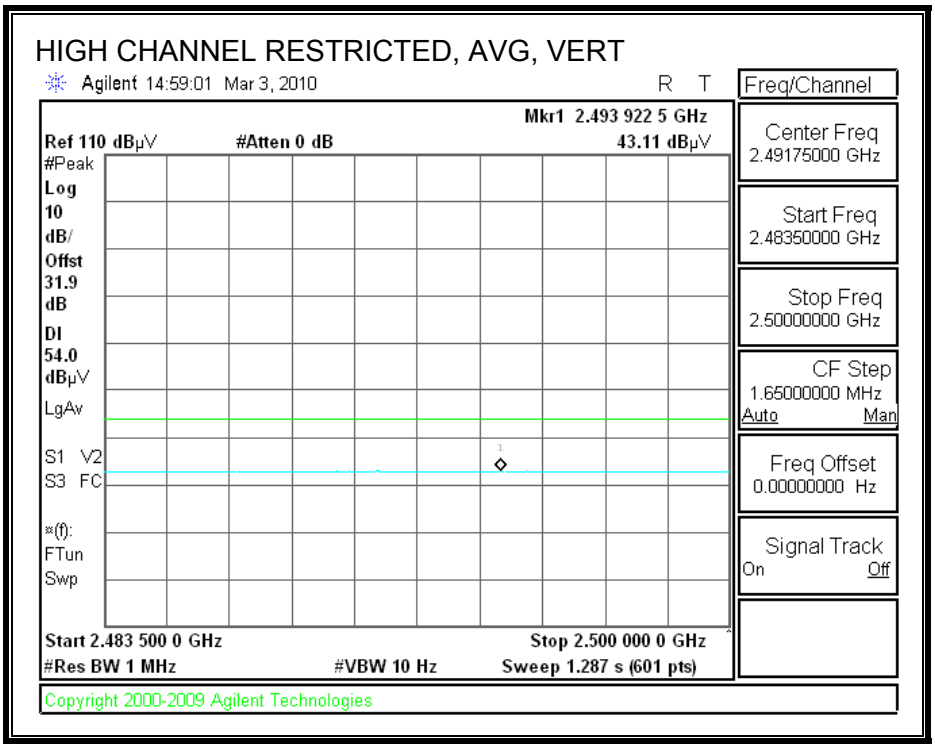
**RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)**



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



## HARMONICS AND SPURIOUS EMISSIONS

**High Frequency Measurement**
**Compliance Certification Services, Fremont 5m Chamber**

**Test Engr:** Oliver Su
**Date:** 03/08/10
**Project #:** 10J13094
**Company:** Hon Hai Precision
**EUT Description:** Portable Game Machine
**EUT M/N:** TWL-001 with Foxconn Ant + Earphone
**Test Target:** FCC 15 Class B
**Mode Oper:** 802.11b, Tx

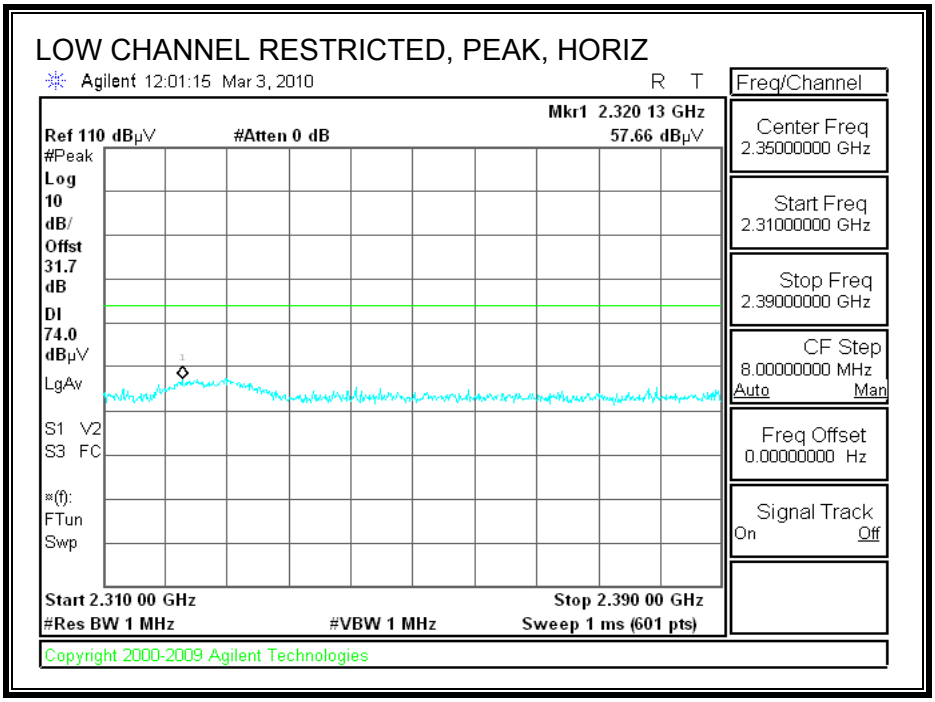
| | | | | | |
|---|---|---|---|---|---|
| f | Measurement Frequency | Amp | Preamp Gain | | Average Field Strength Limit |
| Dist | Distance to Antenna | D Corr | Distance Correct to 3 meters | | Peak Field Strength Limit |
| Read | Analyzer Reading | Avg | Average Field Strength @ 3 m | | Margin vs. Average Limit |
| AF | Antenna Factor | Peak | Calculated Peak Field Strength | | Margin vs. Peak Limit |
| CL | Cable Loss | HPF | High Pass Filter | | |

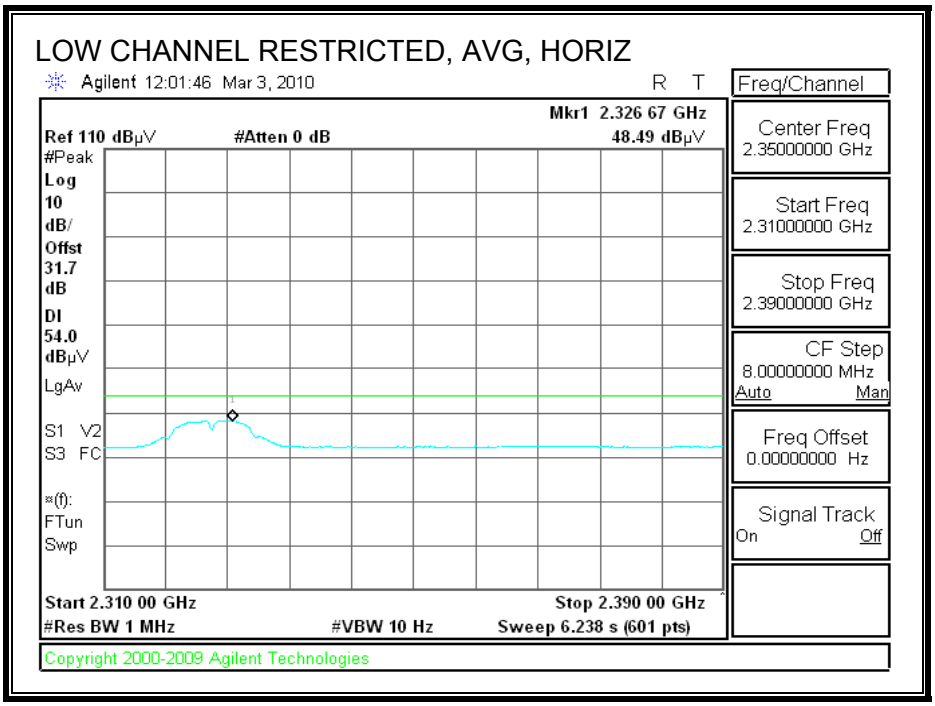
| f GHz | Dist (m) | Read dBuV | AF dB/m | CL dB | Amp dB | D Corr dB | Fltr dB | Corr. dBuV/m | Limit dBuV/m | Margin dB | Ant. Pol. V/H | Det. P/A/QP | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Low Ch, 2412MHz | | | | | | | | | | | | | |
| 4.824 | 3.0 | 38.8 | 32.8 | 5.8 | -34.8 | 0.0 | 0.0 | 42.5 | 74.0 | -31.5 | V | P | |
| 4.824 | 3.0 | 26.1 | 32.8 | 5.8 | -34.8 | 0.0 | 0.0 | 29.8 | 54.0 | -24.2 | V | A | |
| 12.060 | 3.0 | 36.1 | 38.5 | 9.8 | -32.4 | 0.0 | 0.0 | 52.0 | 74.0 | -22.0 | V | P | |
| 12.060 | 3.0 | 22.2 | 38.5 | 9.8 | -32.4 | 0.0 | 0.0 | 38.1 | 54.0 | -15.9 | V | A | |
| 4.824 | 3.0 | 38.5 | 32.8 | 5.8 | -34.8 | 0.0 | 0.0 | 42.2 | 74.0 | -31.8 | H | P | |
| 4.824 | 3.0 | 26.0 | 32.8 | 5.8 | -34.8 | 0.0 | 0.0 | 29.7 | 54.0 | -24.3 | H | A | |
| 12.060 | 3.0 | 34.4 | 38.5 | 9.8 | -32.4 | 0.0 | 0.0 | 50.2 | 74.0 | -23.8 | H | P | |
| 12.060 | 3.0 | 22.2 | 38.5 | 9.8 | -32.4 | 0.0 | 0.0 | 38.1 | 54.0 | -15.9 | H | A | |
| Mid Ch, 2437MHz | | | | | | | | | | | | | |
| 4.874 | 3.0 | 38.2 | 32.8 | 5.8 | -34.9 | 0.0 | 0.0 | 41.9 | 74.0 | -32.1 | V | P | |
| 4.874 | 3.0 | 25.6 | 32.8 | 5.8 | -34.9 | 0.0 | 0.0 | 29.4 | 54.0 | -24.6 | V | A | |
| 7.311 | 3.0 | 37.2 | 35.2 | 7.3 | -34.7 | 0.0 | 0.0 | 45.0 | 74.0 | -29.0 | V | P | |
| 7.311 | 3.0 | 25.0 | 35.2 | 7.3 | -34.7 | 0.0 | 0.0 | 32.8 | 54.0 | -21.2 | V | A | |
| 12.185 | 3.0 | 35.1 | 38.6 | 9.8 | -32.4 | 0.0 | 0.0 | 51.1 | 74.0 | -22.9 | V | P | |
| 12.185 | 3.0 | 22.0 | 38.6 | 9.8 | -32.4 | 0.0 | 0.0 | 38.0 | 54.0 | -16.0 | V | A | |
| 4.874 | 3.0 | 38.1 | 32.8 | 5.8 | -34.9 | 0.0 | 0.0 | 41.8 | 74.0 | -32.2 | H | P | |
| 4.874 | 3.0 | 25.6 | 32.8 | 5.8 | -34.9 | 0.0 | 0.0 | 29.4 | 54.0 | -24.6 | H | A | |
| 7.311 | 3.0 | 37.2 | 35.2 | 7.3 | -34.7 | 0.0 | 0.0 | 45.0 | 74.0 | -29.0 | H | P | |
| 7.311 | 3.0 | 25.0 | 35.2 | 7.3 | -34.7 | 0.0 | 0.0 | 32.8 | 54.0 | -21.2 | H | A | |
| 12.185 | 3.0 | 34.0 | 38.6 | 9.8 | -32.4 | 0.0 | 0.0 | 50.0 | 74.0 | -24.0 | H | P | |
| 12.185 | 3.0 | 22.0 | 38.6 | 9.8 | -32.4 | 0.0 | 0.0 | 38.0 | 54.0 | -16.0 | H | A | |
| High Ch, 2462MHz | | | | | | | | | | | | | |
| 4.924 | 3.0 | 38.1 | 32.8 | 5.9 | -34.9 | 0.0 | 0.0 | 41.9 | 74.0 | -32.1 | V | P | |
| 4.924 | 3.0 | 25.8 | 32.8 | 5.9 | -34.9 | 0.0 | 0.0 | 29.7 | 54.0 | -24.3 | V | A | |
| 7.386 | 3.0 | 37.7 | 35.3 | 7.3 | -34.6 | 0.0 | 0.0 | 45.7 | 74.0 | -28.3 | V | P | |
| 7.386 | 3.0 | 24.8 | 35.3 | 7.3 | -34.6 | 0.0 | 0.0 | 32.8 | 54.0 | -21.2 | V | A | |
| 12.310 | 3.0 | 33.9 | 38.7 | 9.9 | -32.4 | 0.0 | 0.0 | 50.1 | 74.0 | -23.9 | V | P | |
| 12.310 | 3.0 | 22.1 | 38.7 | 9.9 | -32.4 | 0.0 | 0.0 | 38.2 | 54.0 | -15.8 | V | A | |
| 4.924 | 3.0 | 37.9 | 32.8 | 5.9 | -34.9 | 0.0 | 0.0 | 41.8 | 74.0 | -32.2 | H | P | |
| 4.924 | 3.0 | 25.8 | 32.8 | 5.9 | -34.9 | 0.0 | 0.0 | 29.7 | 54.0 | -24.3 | H | A | |
| 7.386 | 3.0 | 37.2 | 35.3 | 7.3 | -34.6 | 0.0 | 0.0 | 45.2 | 74.0 | -28.8 | H | P | |
| 7.386 | 3.0 | 24.8 | 35.3 | 7.3 | -34.6 | 0.0 | 0.0 | 32.8 | 54.0 | -21.2 | H | A | |
| 12.310 | 3.0 | 33.9 | 38.7 | 9.9 | -32.4 | 0.0 | 0.0 | 50.1 | 74.0 | -23.9 | H | P | |
| 12.310 | 3.0 | 22.1 | 38.7 | 9.9 | -32.4 | 0.0 | 0.0 | 38.2 | 54.0 | -15.8 | H | A | |

Rev. 4.1.2.7
Note: No other emissions were detected above the system noise floor.

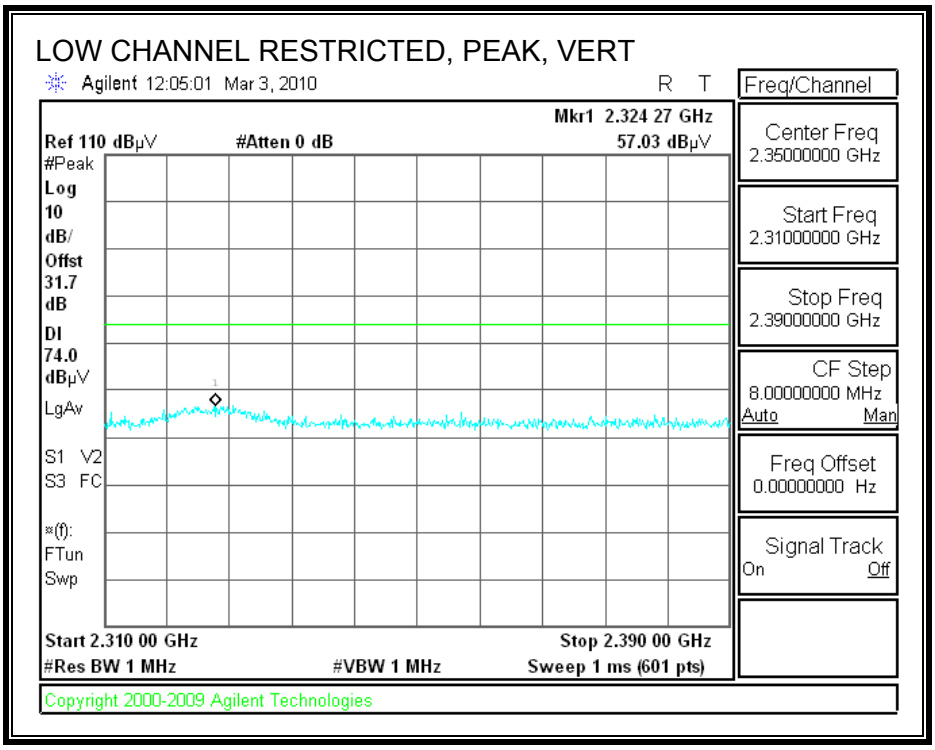
**Tyco antenna**

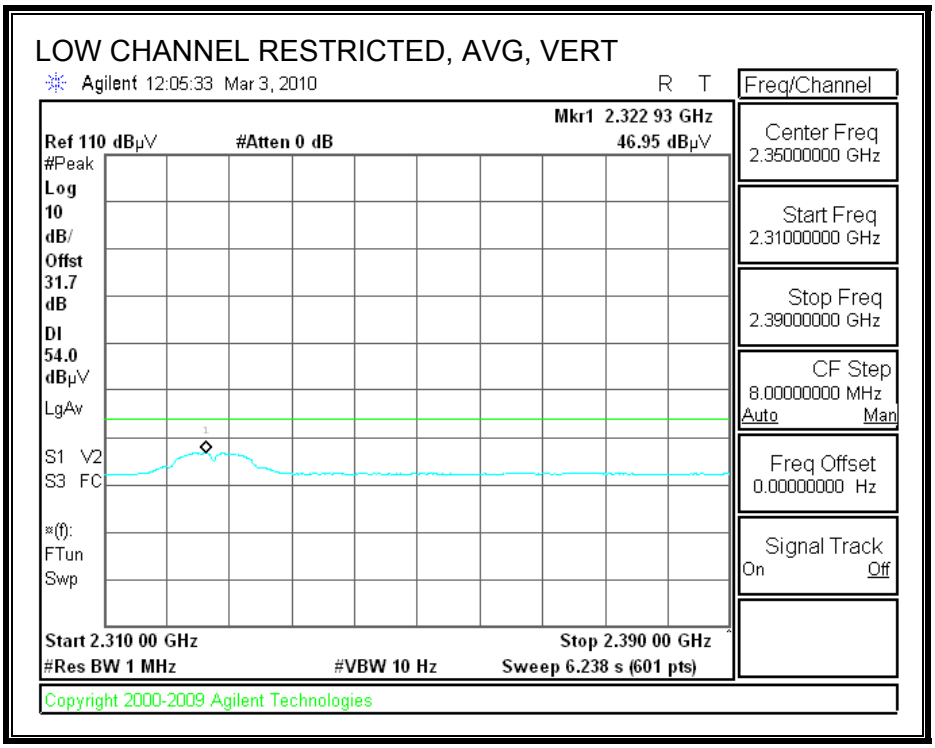
**RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)**



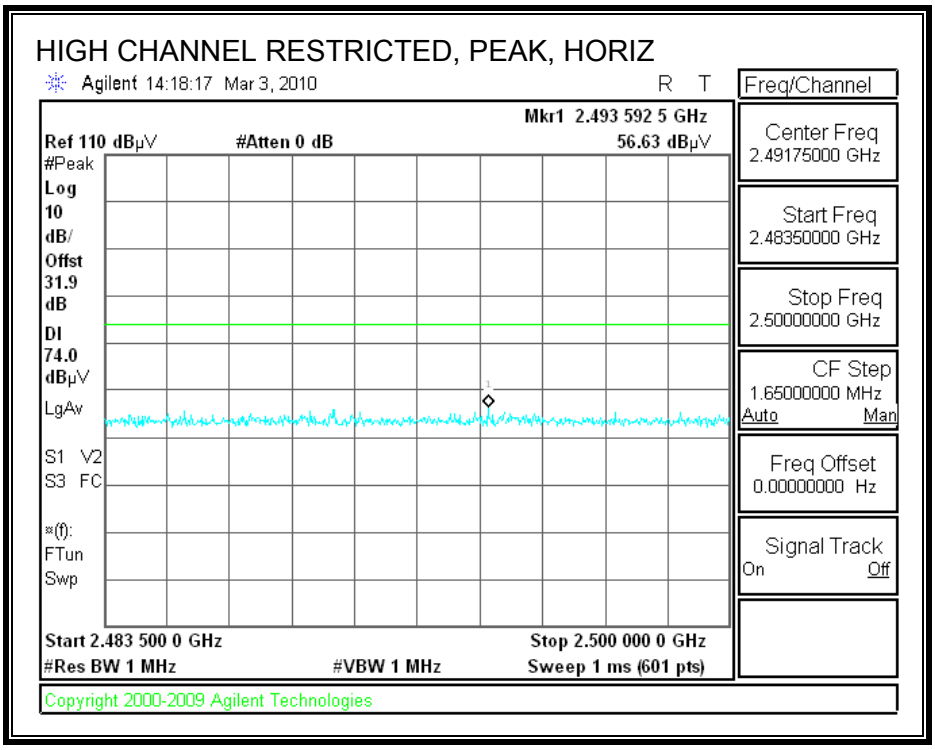



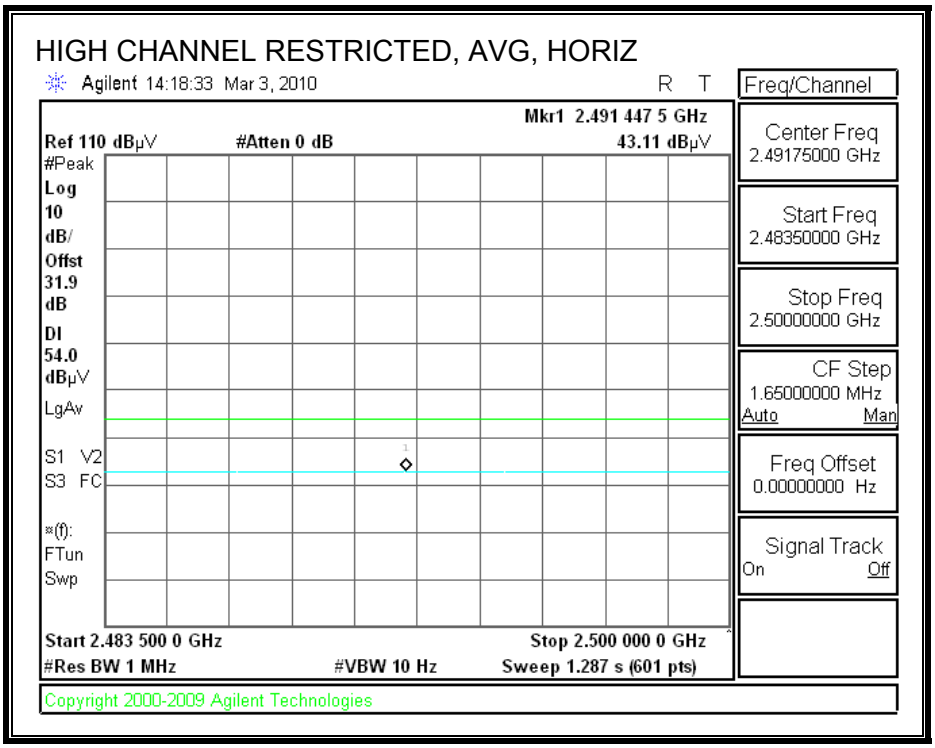
**RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)**



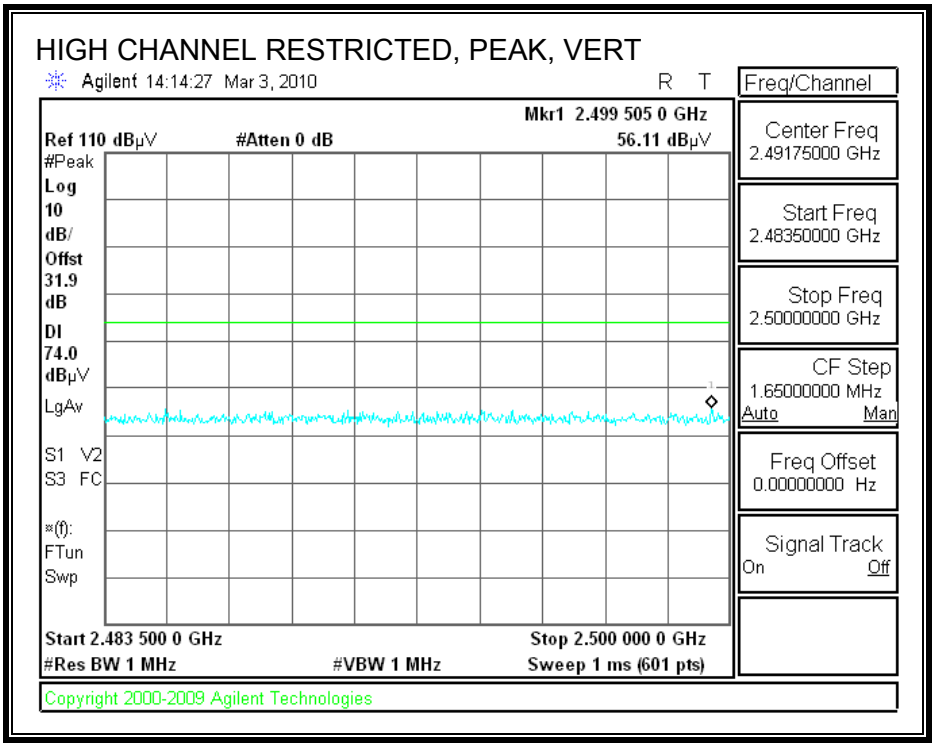



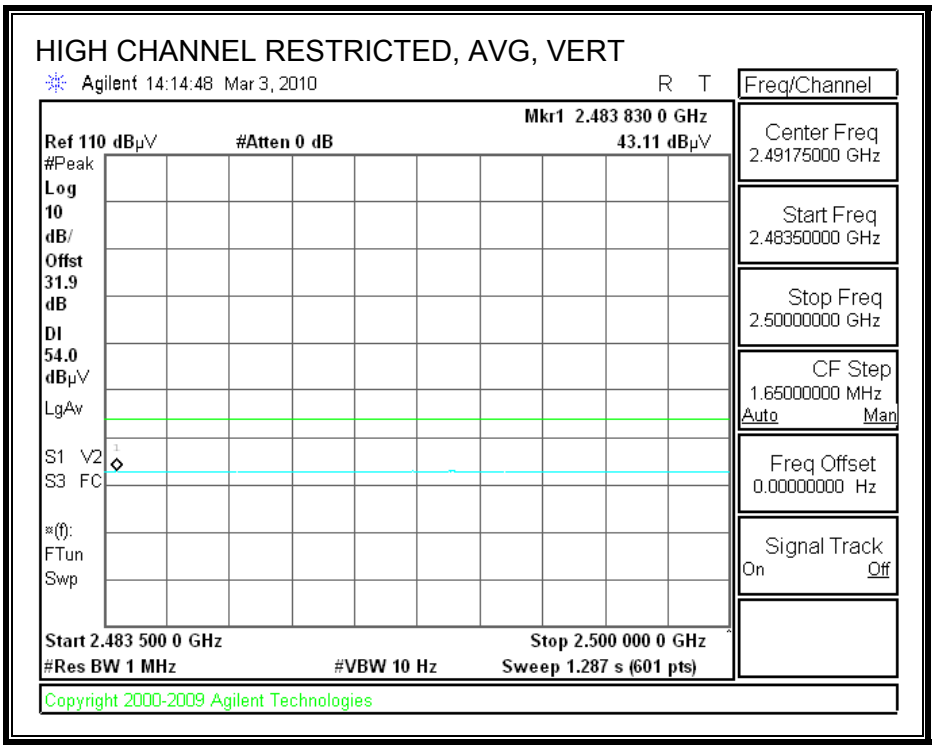
**RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)**



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



## HARMONICS AND SPURIOUS EMISSIONS

**High Frequency Measurement**
**Compliance Certification Services, Fremont 5m Chamber**

**Test Engr:** Oliver Su
**Date:** 03/04/10
**Project #:** 10J13094
**Company:** Hon Hai Precision
**EUT Description:** Portable Game Machine
**EUT M/N:** TWL-001 with Tyco Antenna + Earphone
**Test Target:** FCC 15 Class B
**Mode Oper:** TX, 801.11b mode

| | | | | | |
|---|---|---|---|---|---|
| f | Measurement Frequency | Amp | Preamp Gain | | Average Field Strength Limit |
| Dist | Distance to Antenna | D Corr | Distance Correct to 3 meters | | Peak Field Strength Limit |
| Read | Analyzer Reading | Avg | Average Field Strength @ 3 m | | Margin vs. Average Limit |
| AF | Antenna Factor | Peak | Calculated Peak Field Strength | | Margin vs. Peak Limit |
| CL | Cable Loss | HPF | High Pass Filter | | |

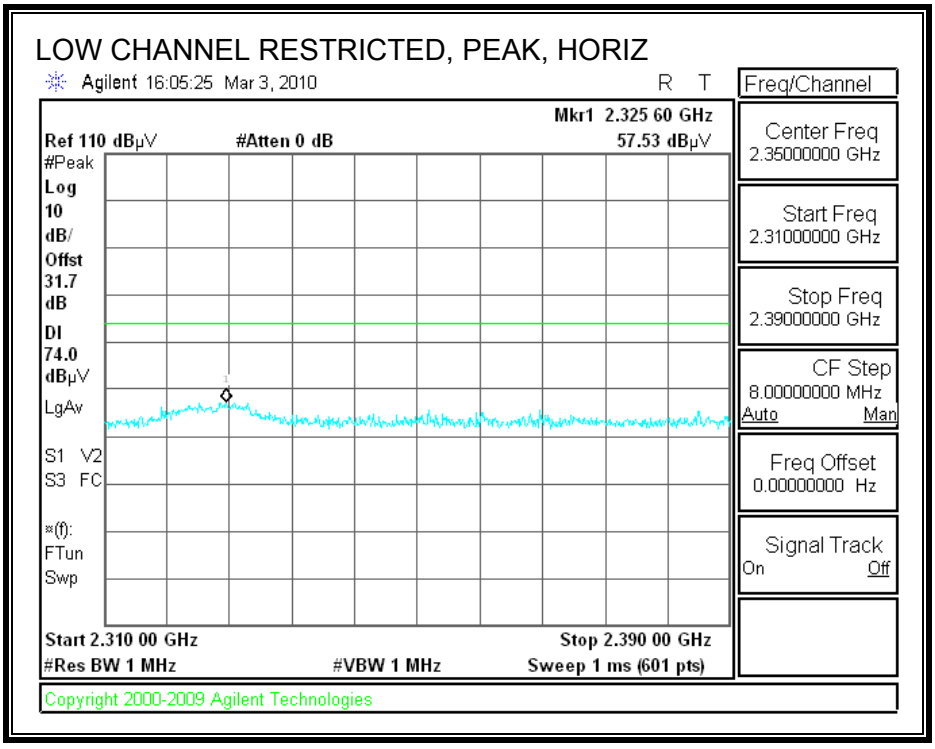
| f GHz | Dist (m) | Read dBuV | AF dB/m | CL dB | Amp dB | D Corr dB | Fltr dB | Corr. dBuV/m | Limit dBuV/m | Margin dB | Ant. Pol. V/H | Det. P/A/QP | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Low Ch, 2412MHz** | | | | | | | | | | | | | |
| 4.824 | 3.0 | 38.8 | 32.8 | 5.8 | -34.8 | 0.0 | 0.0 | 42.6 | 74.0 | -31.5 | V | P | |
| 4.824 | 3.0 | 26.0 | 32.8 | 5.8 | -34.8 | 0.0 | 0.0 | 29.7 | 54.0 | -24.3 | V | A | |
| 12.060 | 3.0 | 35.3 | 38.5 | 9.8 | -32.4 | 0.0 | 0.0 | 51.1 | 74.0 | -22.9 | V | P | |
| 12.060 | 3.0 | 22.2 | 38.5 | 9.8 | -32.4 | 0.0 | 0.0 | 38.1 | 54.0 | -15.9 | V | A | |
| 4.824 | 3.0 | 38.6 | 32.8 | 5.8 | -34.8 | 0.0 | 0.0 | 42.4 | 74.0 | -31.7 | H | P | |
| 4.824 | 3.0 | 26.1 | 32.8 | 5.8 | -34.8 | 0.0 | 0.0 | 29.8 | 54.0 | -24.2 | H | A | |
| 12.060 | 3.0 | 34.3 | 38.5 | 9.8 | -32.4 | 0.0 | 0.0 | 50.1 | 74.0 | -23.9 | H | P | |
| 12.060 | 3.0 | 22.3 | 38.5 | 9.8 | -32.4 | 0.0 | 0.0 | 38.1 | 54.0 | -15.9 | H | A | |
| | | | | | | | | | | | | | |
| **Mid Ch, 2437MHz** | | | | | | | | | | | | | |
| 4.874 | 3.0 | 38.2 | 32.8 | 5.8 | -34.9 | 0.0 | 0.0 | 42.0 | 74.0 | -32.0 | V | P | |
| 4.874 | 3.0 | 25.7 | 32.8 | 5.8 | -34.9 | 0.0 | 0.0 | 29.5 | 54.0 | -24.5 | V | A | |
| 7.311 | 3.0 | 37.1 | 35.2 | 7.3 | -34.7 | 0.0 | 0.0 | 44.9 | 74.0 | -29.1 | V | P | |
| 7.311 | 3.0 | 25.1 | 35.2 | 7.3 | -34.7 | 0.0 | 0.0 | 32.9 | 54.0 | -21.1 | V | A | |
| 12.185 | 3.0 | 34.2 | 38.6 | 9.8 | -32.4 | 0.0 | 0.0 | 50.2 | 74.0 | -23.8 | V | P | |
| 12.185 | 3.0 | 21.8 | 38.6 | 9.8 | -32.4 | 0.0 | 0.0 | 37.8 | 54.0 | -16.2 | V | A | |
| 4.874 | 3.0 | 38.1 | 32.8 | 5.8 | -34.9 | 0.0 | 0.0 | 41.9 | 74.0 | -32.1 | H | P | |
| 4.874 | 3.0 | 25.6 | 32.8 | 5.8 | -34.9 | 0.0 | 0.0 | 29.4 | 54.0 | -24.6 | H | A | |
| 7.311 | 3.0 | 38.5 | 35.2 | 7.3 | -34.7 | 0.0 | 0.0 | 46.3 | 74.0 | -27.7 | H | P | |
| 7.311 | 3.0 | 25.1 | 35.2 | 7.3 | -34.7 | 0.0 | 0.0 | 32.9 | 54.0 | -21.1 | H | A | |
| 12.185 | 3.0 | 34.7 | 38.6 | 9.8 | -32.4 | 0.0 | 0.0 | 50.7 | 74.0 | -23.3 | H | P | |
| 12.185 | 3.0 | 21.9 | 38.6 | 9.8 | -32.4 | 0.0 | 0.0 | 37.9 | 54.0 | -16.1 | H | A | |
| | | | | | | | | | | | | | |
| **High Ch, 2462MHz** | | | | | | | | | | | | | |
| 4.924 | 3.0 | 39.0 | 32.8 | 5.9 | -34.9 | 0.0 | 0.0 | 42.9 | 74.0 | -31.1 | H | P | |
| 4.924 | 3.0 | 25.8 | 32.8 | 5.9 | -34.9 | 0.0 | 0.0 | 29.7 | 54.0 | -24.3 | H | A | |
| 7.386 | 3.0 | 37.9 | 35.3 | 7.3 | -34.6 | 0.0 | 0.0 | 45.9 | 74.0 | -28.1 | H | P | |
| 7.386 | 3.0 | 24.9 | 35.3 | 7.3 | -34.6 | 0.0 | 0.0 | 32.8 | 54.0 | -21.2 | H | A | |
| 12.310 | 3.0 | 35.8 | 38.7 | 9.9 | -32.4 | 0.0 | 0.0 | 51.9 | 74.0 | -22.1 | H | P | |
| 12.310 | 3.0 | 22.0 | 38.7 | 9.9 | -32.4 | 0.0 | 0.0 | 38.1 | 54.0 | -15.9 | H | A | |
| 4.924 | 3.0 | 38.0 | 32.8 | 5.9 | -34.9 | 0.0 | 0.0 | 41.8 | 74.0 | -32.2 | V | P | |
| 4.924 | 3.0 | 25.9 | 32.8 | 5.9 | -34.9 | 0.0 | 0.0 | 29.7 | 54.0 | -24.3 | V | A | |
| 7.386 | 3.0 | 37.2 | 35.3 | 7.3 | -34.6 | 0.0 | 0.0 | 45.1 | 74.0 | -28.9 | V | P | |
| 7.386 | 3.0 | 24.9 | 35.3 | 7.3 | -34.6 | 0.0 | 0.0 | 32.8 | 54.0 | -21.2 | V | A | |
| 12.310 | 3.0 | 34.1 | 38.7 | 9.9 | -32.4 | 0.0 | 0.0 | 50.2 | 74.0 | -23.8 | V | P | |
| 12.310 | 3.0 | 21.9 | 38.7 | 9.9 | -32.4 | 0.0 | 0.0 | 38.1 | 54.0 | -15.9 | V | A | |

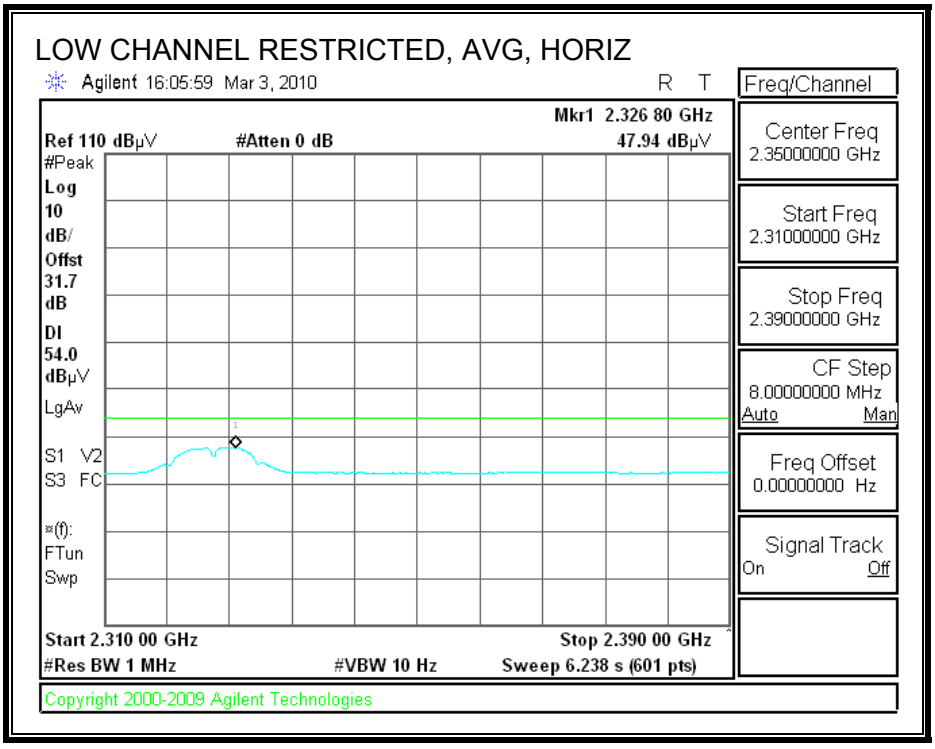
**Rev. 4.1.2.7**
**Note: No other emissions were detected above the system noise floor.**

***UTL-001 HOST***

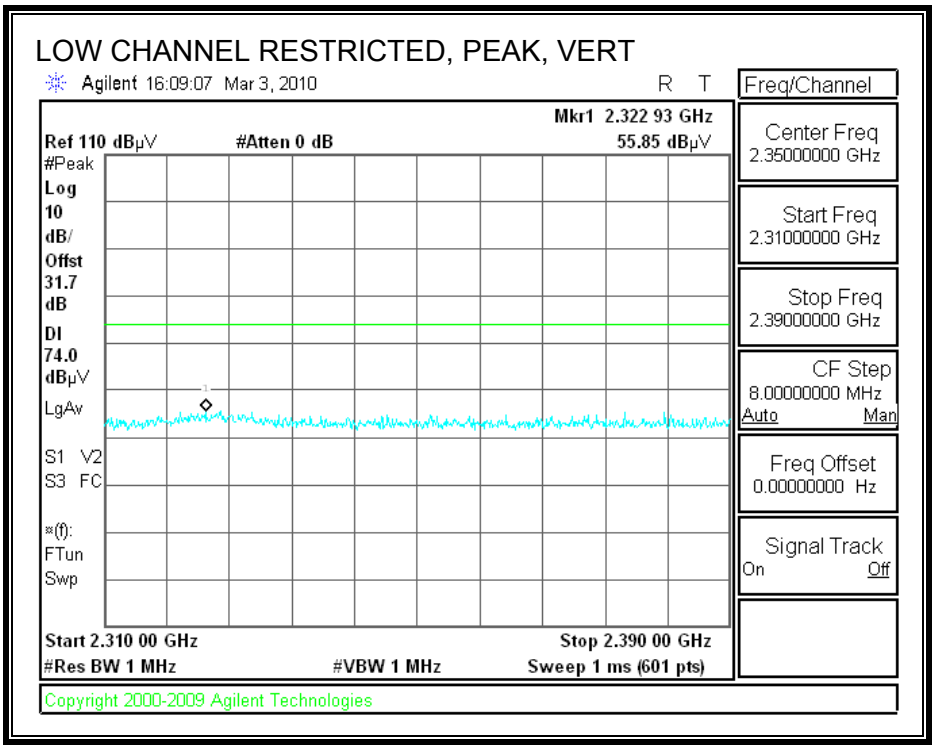
**Foxconn antenna**

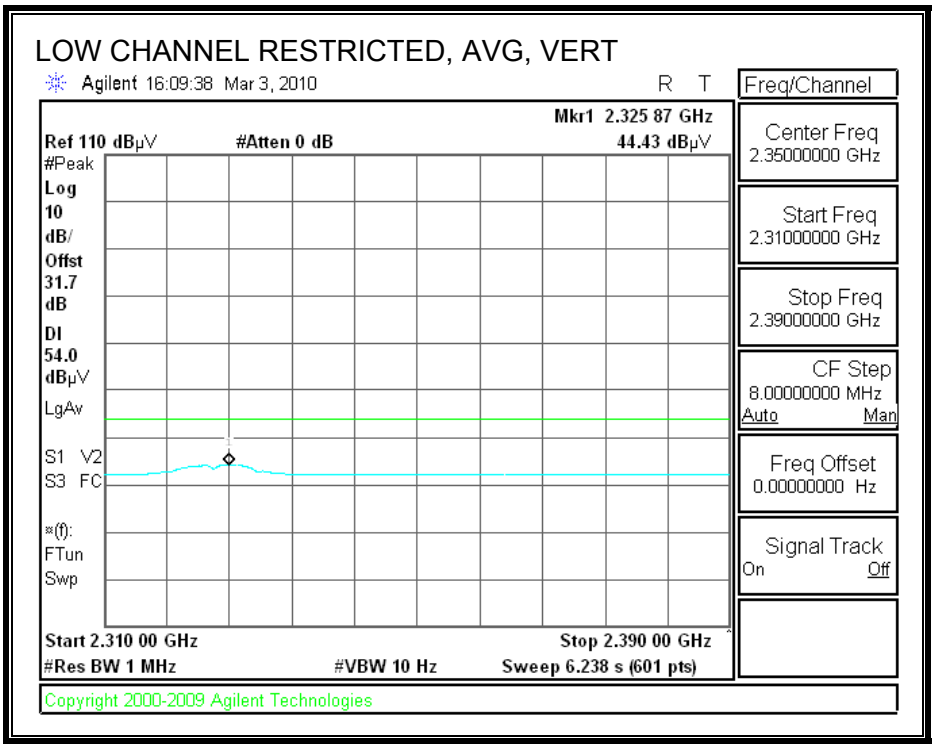
**RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)**



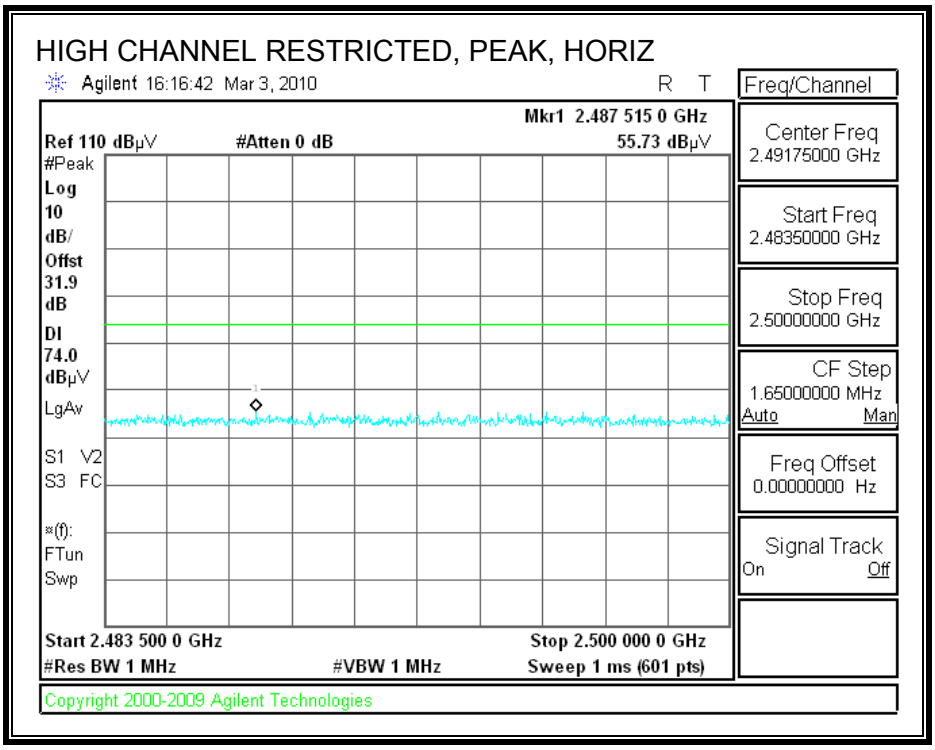



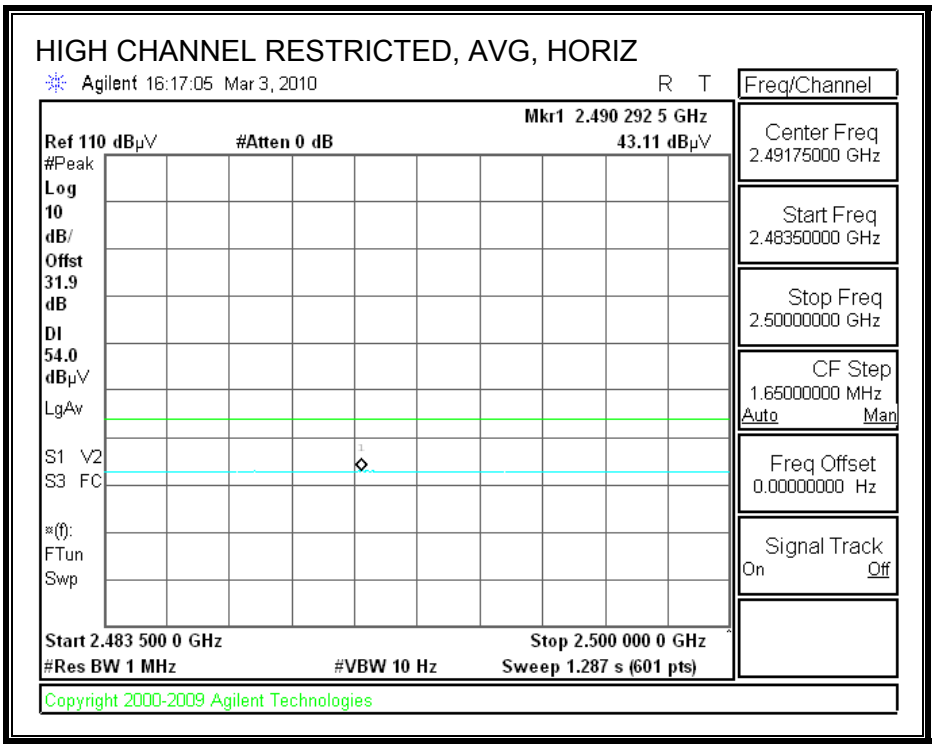
**RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)**



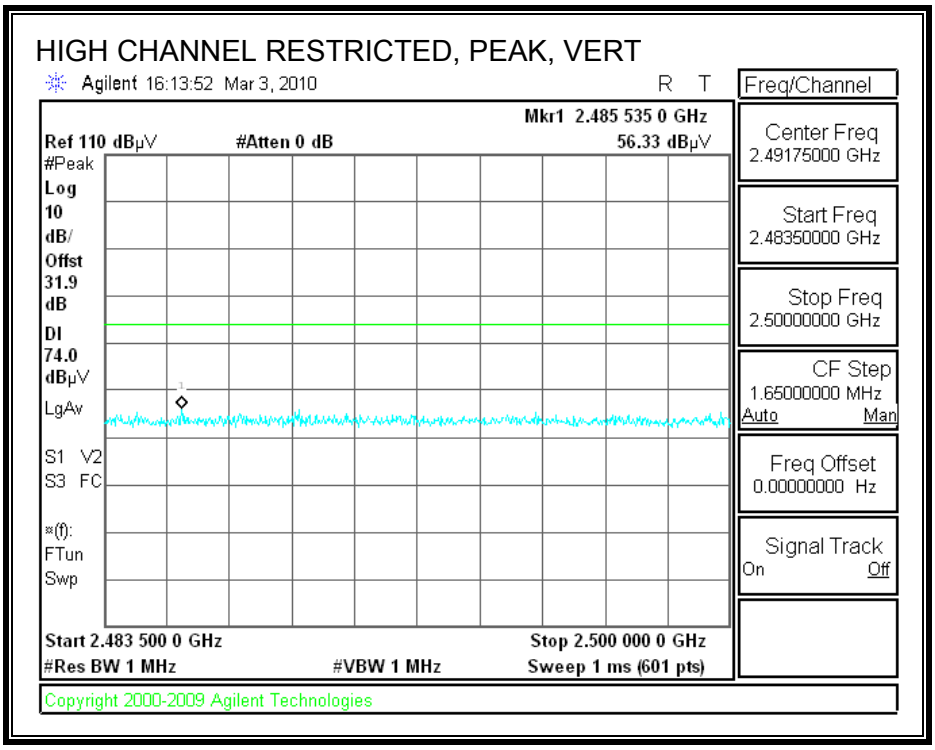



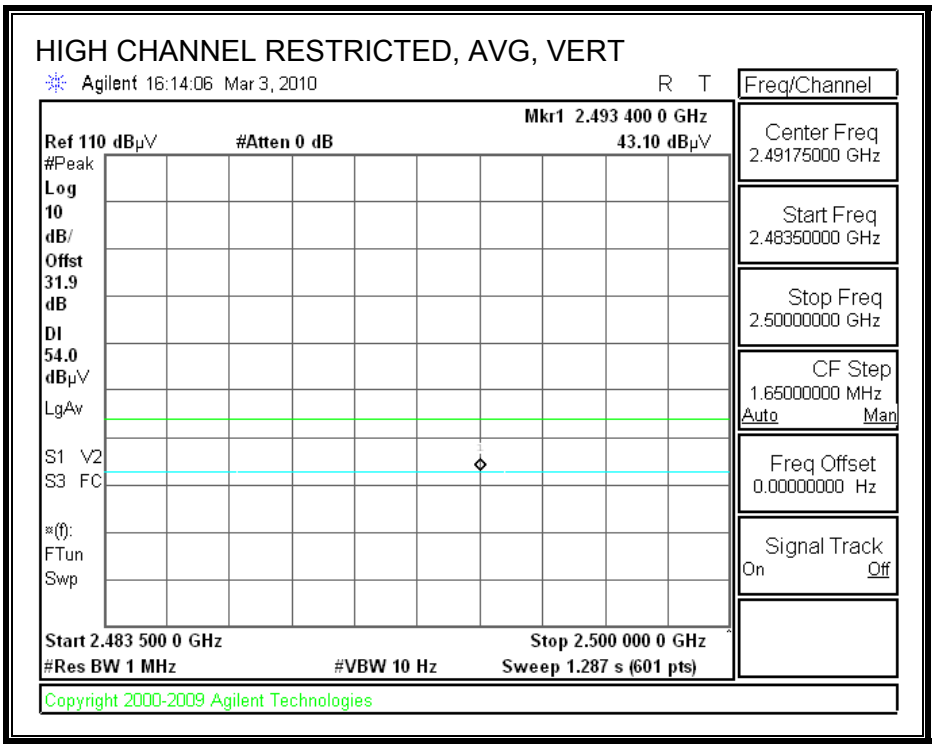
**RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)**



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



## HARMONICS AND SPURIOUS EMISSIONS

**High Frequency Measurement**
**Compliance Certification Services, Fremont 5m Chamber**

**Test Engr:** Oliver Su
**Date:** 03/05/10
**Project #:** 10J13094
**Company:** Hon Hai Precision
**EUT Description:** Portable Game Machine
**EUT M/N:** UTL-001, with Foxconn Ant + Earphone
**Test Target:** FCC 15 Class B
**Mode Oper:** 802.11 b, Tx

| | | | | | |
|---|---|---|---|---|---|
| f | Measurement Frequency | Amp | Preamp Gain | | Average Field Strength Limit |
| Dist | Distance to Antenna | D Corr | Distance Correct to 3 meters | | Peak Field Strength Limit |
| Read | Analyzer Reading | Avg | Average Field Strength @ 3 m | | Margin vs. Average Limit |
| AF | Antenna Factor | Peak | Calculated Peak Field Strength | | Margin vs. Peak Limit |
| CL | Cable Loss | HPF | High Pass Filter | | |

| f GHz | Dist (m) | Read dBuV | AF dB/m | CL dB | Amp dB | D Corr dB | Fltr dB | Corr. dBuV/m | Limit dBuV/m | Margin dB | Ant. Pol. V/H | Det. P/A/QP | Ant.High cm | Table Angle Degree | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Low ch, 2412 MHz | | | | | | | | | | | | | | | |
| 4.824 | 3.0 | 39.2 | 32.8 | 5.8 | -34.8 | 0.0 | 0.0 | 42.9 | 74.0 | -31.1 | H | P | 199.3 | 179.6 | |
| 4.824 | 3.0 | 26.0 | 32.8 | 5.8 | -34.8 | 0.0 | 0.0 | 29.7 | 54.0 | -24.3 | H | A | 199.3 | 179.6 | |
| 12.060 | 3.0 | 35.5 | 38.5 | 9.8 | -32.4 | 0.0 | 0.0 | 51.3 | 74.0 | -22.7 | H | P | 122.2 | 359.2 | |
| 12.060 | 3.0 | 22.1 | 38.5 | 9.8 | -32.4 | 0.0 | 0.0 | 38.0 | 54.0 | -16.0 | H | A | 122.2 | 359.2 | |
| 4.824 | 3.0 | 39.0 | 32.8 | 5.8 | -34.8 | 0.0 | 0.0 | 42.7 | 74.0 | -31.3 | V | P | 130.0 | 85.0 | |
| 4.824 | 3.0 | 26.0 | 32.8 | 5.8 | -34.8 | 0.0 | 0.0 | 29.7 | 54.0 | -24.3 | V | A | 130.0 | 85.0 | |
| 12.060 | 3.0 | 34.3 | 38.5 | 9.8 | -32.4 | 0.0 | 0.0 | 50.1 | 74.0 | -23.9 | V | P | 142.9 | 318.9 | |
| 12.060 | 3.0 | 22.1 | 38.5 | 9.8 | -32.4 | 0.0 | 0.0 | 37.9 | 54.0 | -16.1 | V | A | 142.9 | 318.9 | |
| Mid ch, 2437 MHz | | | | | | | | | | | | | | | |
| 4.874 | 3.0 | 37.8 | 32.8 | 5.8 | -34.9 | 0.0 | 0.0 | 41.6 | 74.0 | -32.4 | H | P | 168.9 | 190.7 | |
| 4.874 | 3.0 | 25.5 | 32.8 | 5.8 | -34.9 | 0.0 | 0.0 | 29.3 | 54.0 | -24.7 | H | A | 168.9 | 190.7 | |
| 7.311 | 3.0 | 36.9 | 35.2 | 7.3 | -34.7 | 0.0 | 0.0 | 44.7 | 74.0 | -29.3 | H | P | 135.6 | 73.9 | |
| 7.311 | 3.0 | 25.0 | 35.2 | 7.3 | -34.7 | 0.0 | 0.0 | 32.8 | 54.0 | -21.2 | H | A | 135.6 | 73.9 | |
| 12.185 | 3.0 | 34.1 | 38.6 | 9.8 | -32.4 | 0.0 | 0.0 | 50.1 | 74.0 | -23.9 | H | P | 199.9 | 257.5 | |
| 12.185 | 3.0 | 21.9 | 38.6 | 9.8 | -32.4 | 0.0 | 0.0 | 37.9 | 54.0 | -16.1 | H | A | 199.9 | 257.5 | |
| 4.874 | 3.0 | 37.8 | 32.8 | 5.8 | -34.9 | 0.0 | 0.0 | 41.6 | 74.0 | -32.4 | V | P | 120.0 | 6.5 | |
| 4.874 | 3.0 | 25.6 | 32.8 | 5.8 | -34.9 | 0.0 | 0.0 | 29.4 | 54.0 | -24.6 | V | A | 120.0 | 6.5 | |
| 7.311 | 3.0 | 36.9 | 35.2 | 7.3 | -34.7 | 0.0 | 0.0 | 44.7 | 74.0 | -29.3 | V | P | 182.6 | 56.3 | |
| 7.311 | 3.0 | 25.0 | 35.2 | 7.3 | -34.7 | 0.0 | 0.0 | 32.8 | 54.0 | -21.2 | V | A | 182.6 | 56.3 | |
| 12.185 | 3.0 | 34.4 | 38.6 | 9.8 | -32.4 | 0.0 | 0.0 | 50.4 | 74.0 | -23.6 | V | P | 153.6 | 46.2 | |
| 12.185 | 3.0 | 21.9 | 38.6 | 9.8 | -32.4 | 0.0 | 0.0 | 37.9 | 54.0 | -16.1 | V | A | 153.6 | 46.2 | |
| High ch, 2462 MHz | | | | | | | | | | | | | | | |
| 4.924 | 3.0 | 38.2 | 32.8 | 5.9 | -34.9 | 0.0 | 0.0 | 42.0 | 74.0 | -32.0 | H | P | 179.0 | 251.7 | |
| 4.924 | 3.0 | 25.8 | 32.8 | 5.9 | -34.9 | 0.0 | 0.0 | 29.7 | 54.0 | -24.3 | H | A | 179.0 | 251.7 | |
| 7.386 | 3.0 | 37.0 | 35.3 | 7.3 | -34.6 | 0.0 | 0.0 | 45.0 | 74.0 | -29.0 | H | P | 192.5 | 252.0 | |
| 7.386 | 3.0 | 24.8 | 35.3 | 7.3 | -34.6 | 0.0 | 0.0 | 32.8 | 54.0 | -21.2 | H | A | 192.5 | 252.0 | |
| 12.310 | 3.0 | 34.3 | 38.7 | 9.9 | -32.4 | 0.0 | 0.0 | 50.4 | 74.0 | -23.6 | H | P | 106.8 | 359.5 | |
| 12.310 | 3.0 | 22.0 | 38.7 | 9.9 | -32.4 | 0.0 | 0.0 | 38.1 | 54.0 | -15.9 | H | A | 106.8 | 359.5 | |
| 4.924 | 3.0 | 37.9 | 32.8 | 5.9 | -34.9 | 0.0 | 0.0 | 41.7 | 74.0 | -32.3 | V | P | 199.9 | 11.0 | |
| 4.924 | 3.0 | 27.7 | 32.8 | 5.9 | -34.9 | 0.0 | 0.0 | 31.6 | 54.0 | -22.4 | V | A | 199.9 | 11.0 | |
| 7.386 | 3.0 | 37.7 | 35.3 | 7.3 | -34.6 | 0.0 | 0.0 | 45.7 | 74.0 | -28.3 | V | P | 100.4 | 342.8 | |
| 7.386 | 3.0 | 24.8 | 35.3 | 7.3 | -34.6 | 0.0 | 0.0 | 32.8 | 54.0 | -21.2 | V | A | 100.4 | 342.8 | |
| 12.310 | 3.0 | 33.9 | 38.7 | 9.9 | -32.4 | 0.0 | 0.0 | 50.1 | 74.0 | -23.9 | V | P | 198.7 | 272.8 | |
| 12.310 | 3.0 | 22.0 | 38.7 | 9.9 | -32.4 | 0.0 | 0.0 | 38.1 | 54.0 | -15.9 | V | A | 198.7 | 272.8 | |

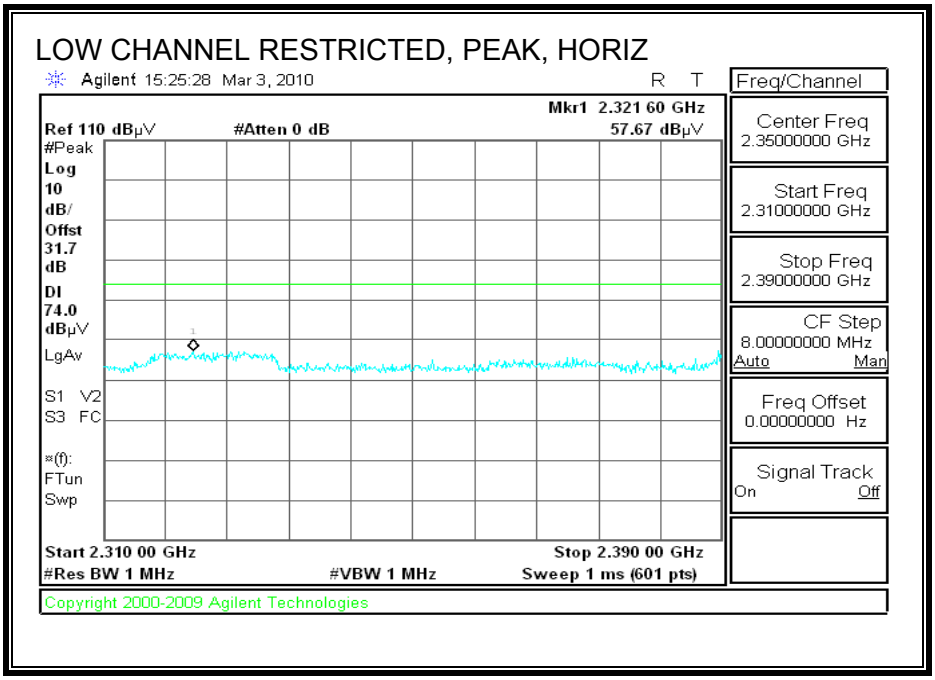
Rev. 4.1.2.7
Note: No other emissions were detected above the system noise floor.

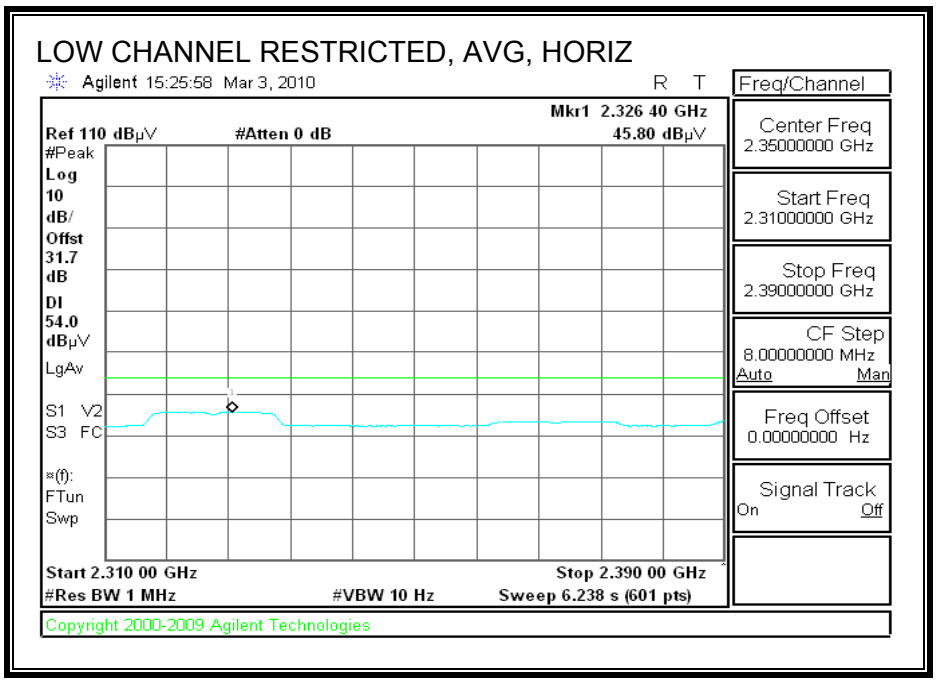
## 8.2.3. 802.11g MODE IN THE 2.4 GHz BAND

***TWL-001 HOST***

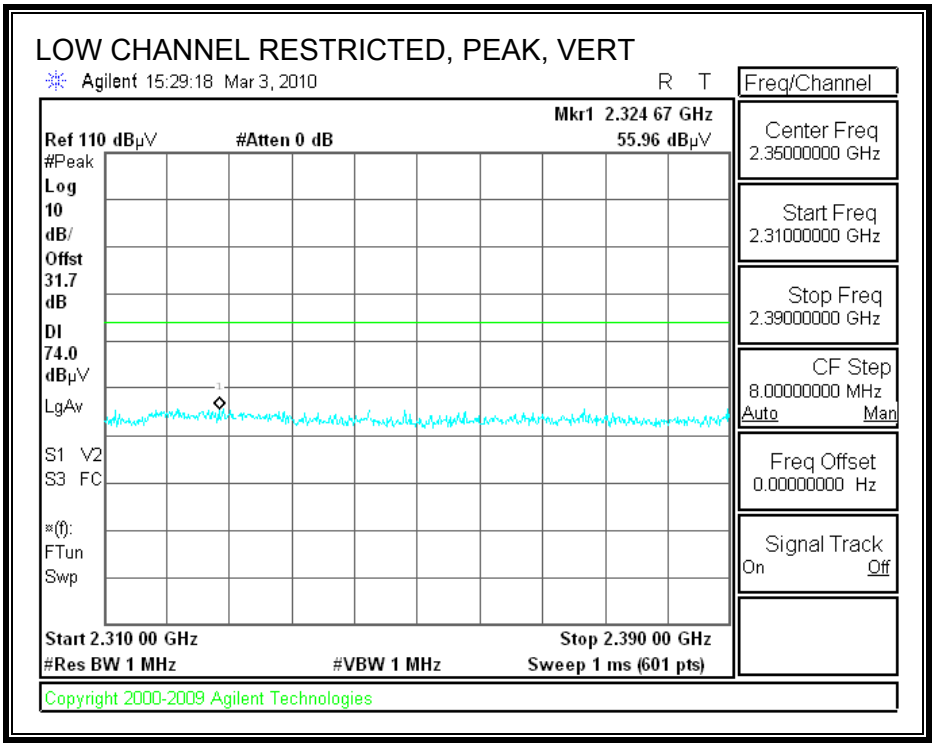
**Foxconn antenna**

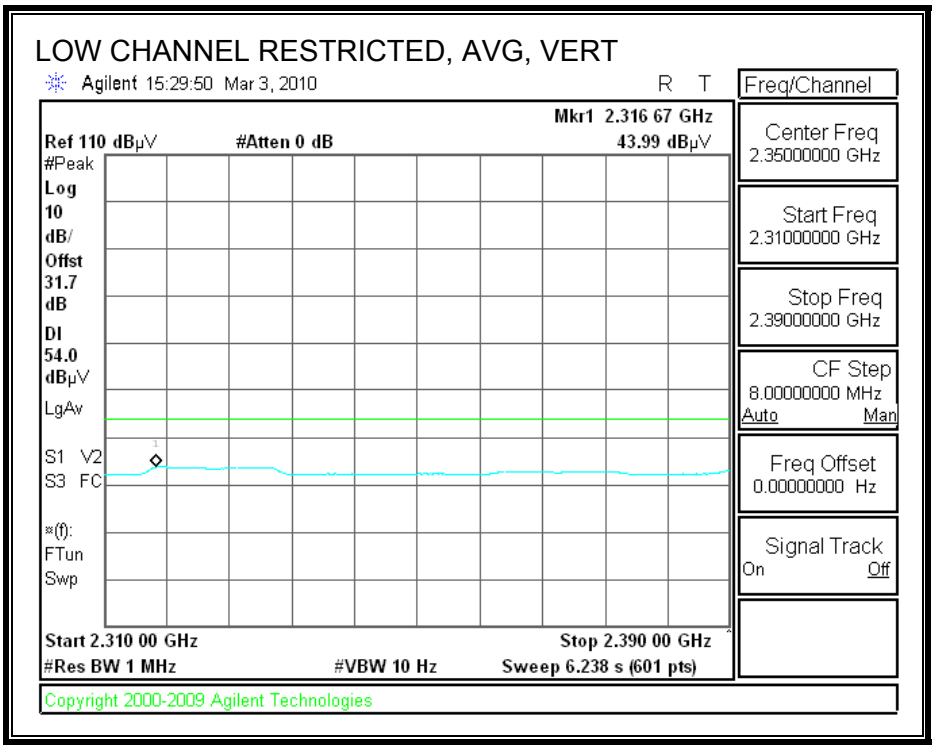
**RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)**



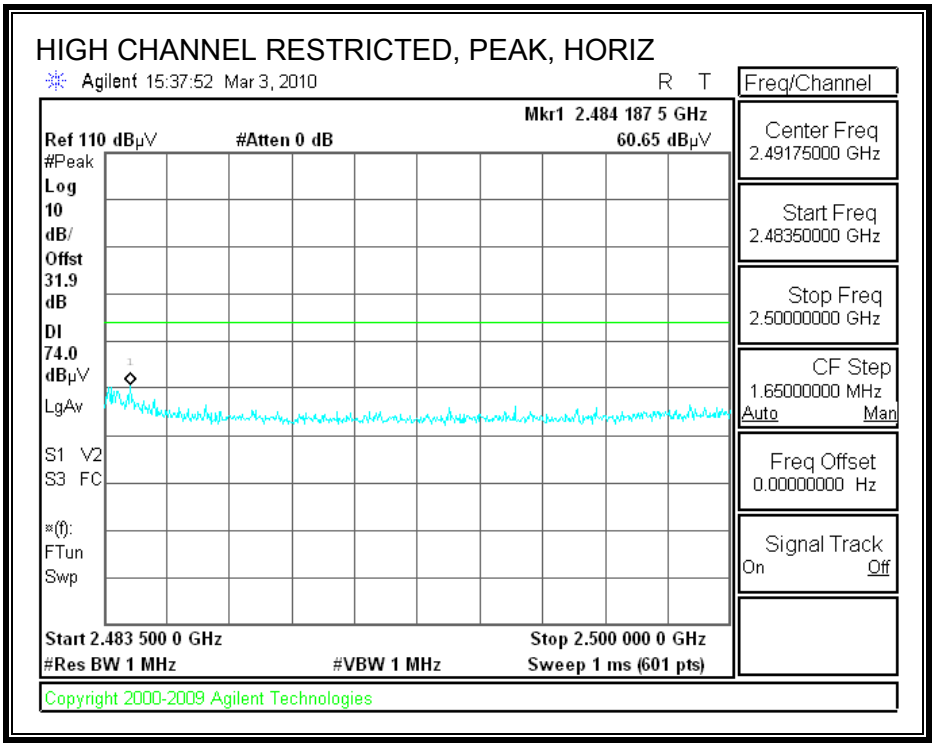



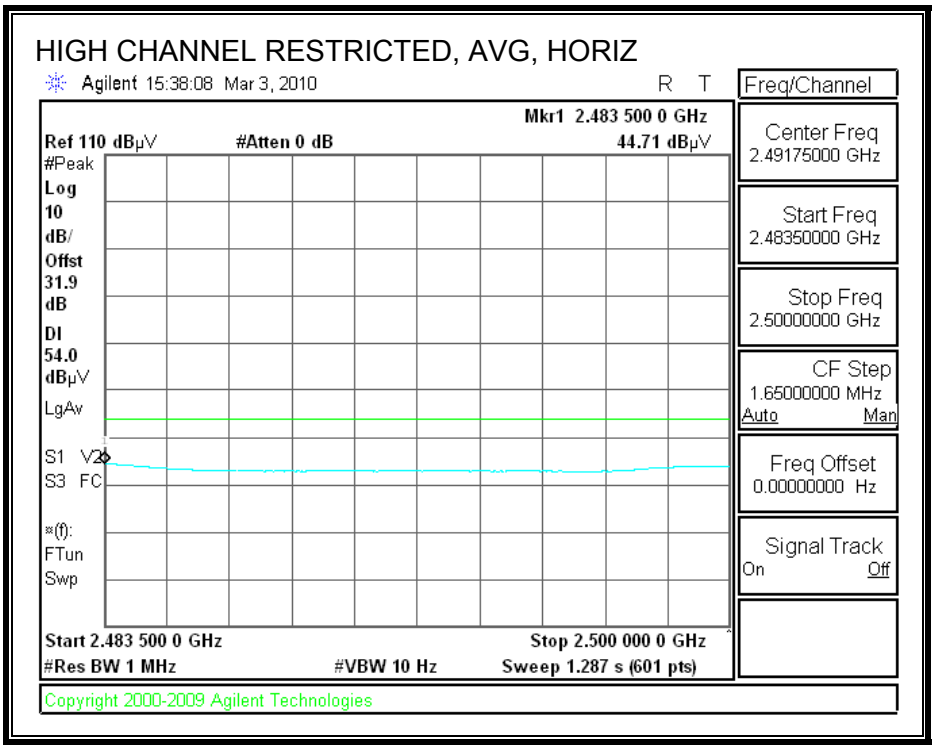
**RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)**



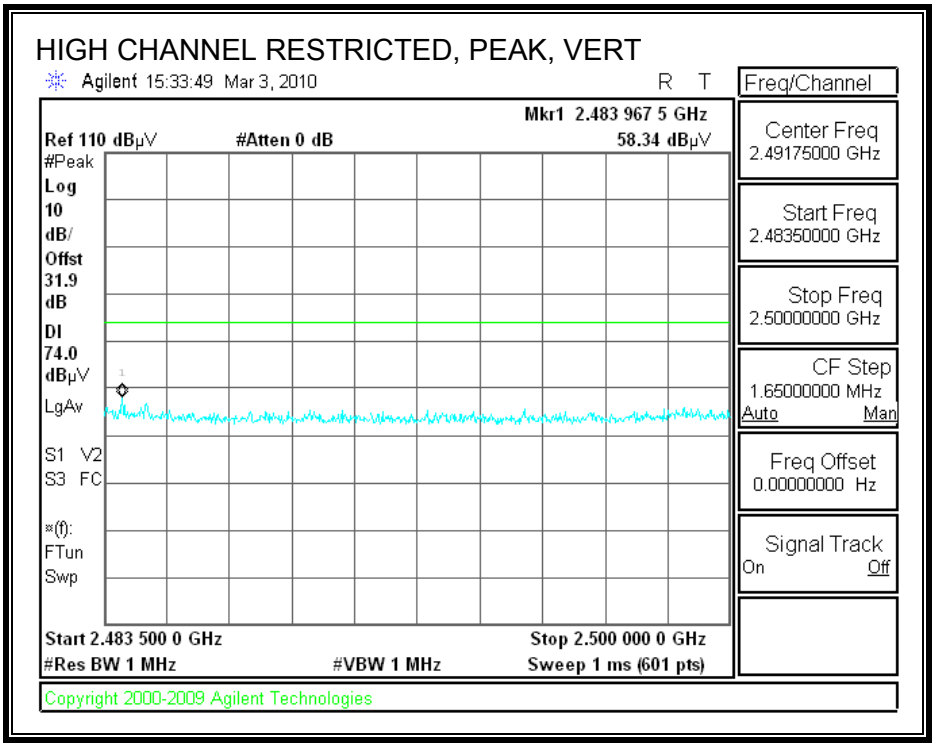



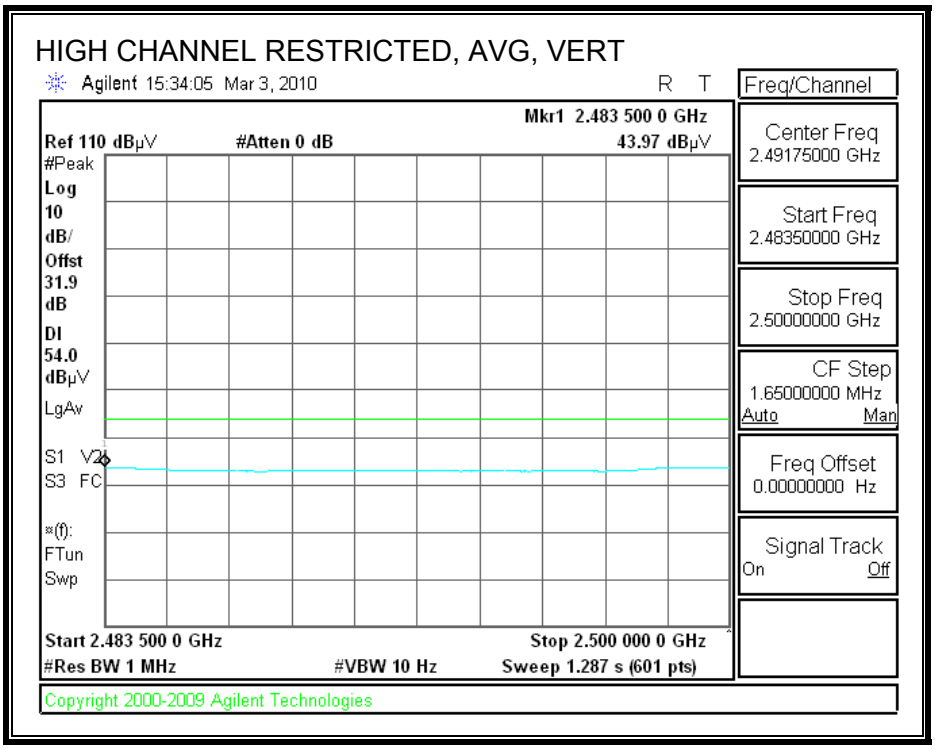
**RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)**



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



## HARMONICS AND SPURIOUS EMISSIONS

**High Frequency Measurement**
**Compliance Certification Services, Fremont 5m Chamber**

**Test Engr:** Oliver Su
**Date:** 03/05/10
**Project #:** 10J13094
**Company:** Hon Hai Precision
**EUT Description:** Portable Game Machine
**EUT M/N:** TWL-001, with Foxconn ant + Earphone
**Test Target:** FCC 15 Class B
**Mode Oper:** 802.11g, Tx

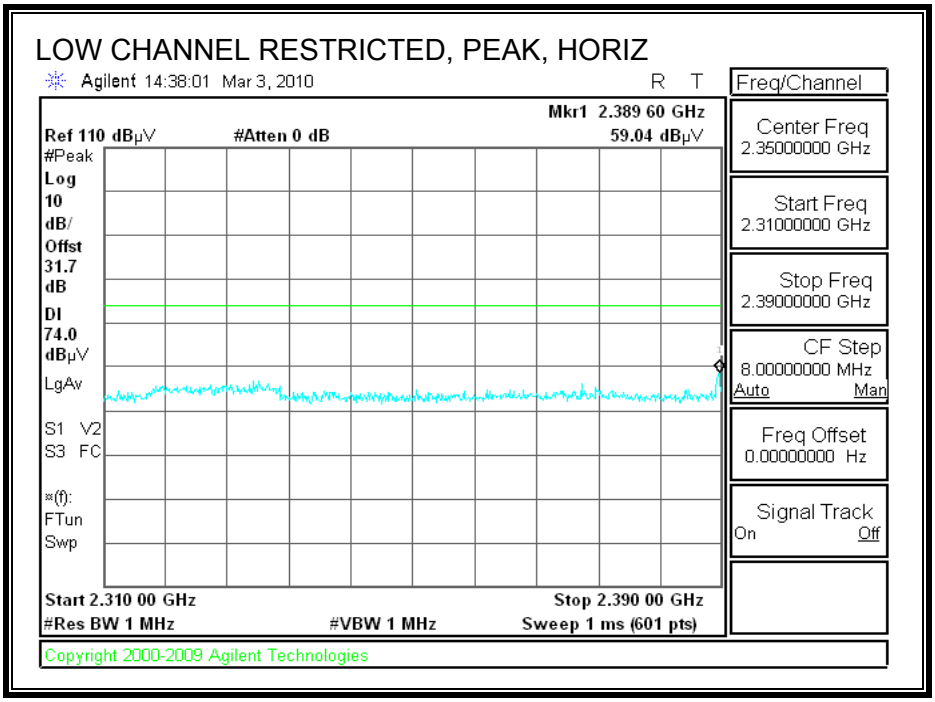
| | | | | |
|---|---|---|---|---|
| f | Measurement Frequency | Amp | Preamp Gain | Average Field Strength Limit |
| Dist | Distance to Antenna | D Corr | Distance Correct to 3 meters | Peak Field Strength Limit |
| Read | Analyzer Reading | Avg | Average Field Strength @ 3 m | Margin vs. Average Limit |
| AF | Antenna Factor | Peak | Calculated Peak Field Strength | Margin vs. Peak Limit |
| CL | Cable Loss | HPF | High Pass Filter | |

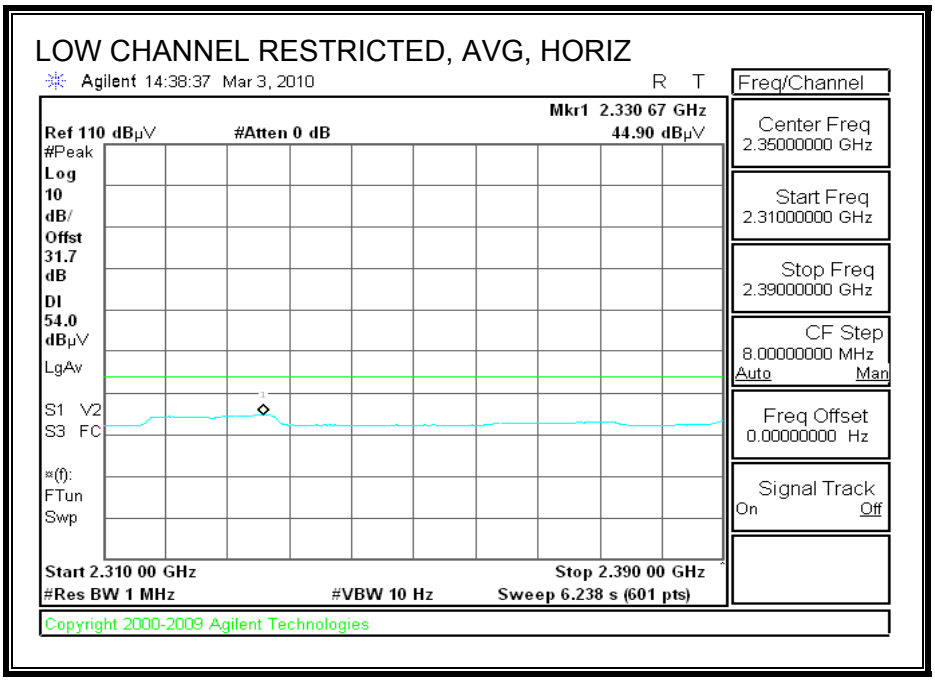
| f GHz | Dist (m) | Read dBuV | AF dB/m | CL dB | Amp dB | D Corr dB | Fltr dB | Corr. dBuV/m | Limit dBuV/m | Margin dB | Ant. Pol. V/H | Det. P/A/QP | Ant.High cm | Table Angle Degree | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Low ch, 2412MHz | | | | | | | | | | | | | | | |
| 4.824 | 3.0 | 38.0 | 32.8 | 5.8 | -34.8 | 0.0 | 0.0 | 41.7 | 74.0 | -32.3 | V | P | 170.6 | 27.6 | |
| 4.824 | 3.0 | 25.9 | 32.8 | 5.8 | -34.8 | 0.0 | 0.0 | 29.7 | 54.0 | -24.3 | V | A | 170.6 | 27.6 | |
| 12.060 | 3.0 | 34.6 | 38.5 | 9.8 | -32.4 | 0.0 | 0.0 | 50.4 | 74.0 | -23.6 | V | P | 100.4 | 158.8 | |
| 12.060 | 3.0 | 22.0 | 38.5 | 9.8 | -32.4 | 0.0 | 0.0 | 37.9 | 54.0 | -16.1 | V | A | 100.4 | 158.8 | |
| 4.824 | 3.0 | 38.0 | 32.8 | 5.8 | -34.8 | 0.0 | 0.0 | 41.7 | 74.0 | -32.3 | H | P | 155.3 | 77.9 | |
| 4.824 | 3.0 | 25.9 | 32.8 | 5.8 | -34.8 | 0.0 | 0.0 | 29.6 | 54.0 | -24.4 | H | A | 155.3 | 77.9 | |
| 12.060 | 3.0 | 34.6 | 38.5 | 9.8 | -32.4 | 0.0 | 0.0 | 50.5 | 74.0 | -23.5 | H | P | 139.3 | 278.7 | |
| 12.060 | 3.0 | 22.0 | 38.5 | 9.8 | -32.4 | 0.0 | 0.0 | 37.9 | 54.0 | -16.1 | H | A | 139.3 | 278.7 | |
| Mid ch, 2437MHz | | | | | | | | | | | | | | | |
| 4.874 | 3.0 | 37.6 | 32.8 | 5.8 | -34.9 | 0.0 | 0.0 | 41.3 | 74.0 | -32.7 | V | P | 155.6 | 35.9 | |
| 4.874 | 3.0 | 25.5 | 32.8 | 5.8 | -34.9 | 0.0 | 0.0 | 29.3 | 54.0 | -24.7 | V | A | 155.6 | 35.9 | |
| 7.311 | 3.0 | 37.4 | 35.2 | 7.3 | -34.7 | 0.0 | 0.0 | 45.2 | 74.0 | -28.8 | V | P | 167.8 | 213.6 | |
| 7.311 | 3.0 | 24.9 | 35.2 | 7.3 | -34.7 | 0.0 | 0.0 | 32.7 | 54.0 | -21.3 | V | A | 167.8 | 213.6 | |
| 12.185 | 3.0 | 34.5 | 38.6 | 9.8 | -32.4 | 0.0 | 0.0 | 50.5 | 74.0 | -23.5 | V | P | 194.7 | 87.8 | |
| 12.185 | 3.0 | 21.9 | 38.6 | 9.8 | -32.4 | 0.0 | 0.0 | 37.9 | 54.0 | -16.1 | V | A | 194.7 | 87.8 | |
| 4.874 | 3.0 | 38.1 | 32.8 | 5.8 | -34.9 | 0.0 | 0.0 | 41.9 | 74.0 | -32.1 | H | P | 193.5 | 64.6 | |
| 4.874 | 3.0 | 25.5 | 32.8 | 5.8 | -34.9 | 0.0 | 0.0 | 29.3 | 54.0 | -24.7 | H | A | 193.5 | 64.6 | |
| 7.311 | 3.0 | 37.4 | 35.2 | 7.3 | -34.7 | 0.0 | 0.0 | 45.2 | 74.0 | -28.8 | H | P | 110.1 | 232.7 | |
| 7.311 | 3.0 | 24.9 | 35.2 | 7.3 | -34.7 | 0.0 | 0.0 | 32.7 | 54.0 | -21.3 | H | A | 110.1 | 232.7 | |
| 12.185 | 3.0 | 33.9 | 38.6 | 9.8 | -32.4 | 0.0 | 0.0 | 49.9 | 74.0 | -24.1 | H | P | 162.9 | 114.7 | |
| 12.185 | 3.0 | 21.8 | 38.6 | 9.8 | -32.4 | 0.0 | 0.0 | 37.8 | 54.0 | -16.2 | H | A | 162.9 | 114.7 | |
| High ch, 2462MHz | | | | | | | | | | | | | | | |
| 4.924 | 3.0 | 38.3 | 32.8 | 5.9 | -34.9 | 0.0 | 0.0 | 42.2 | 74.0 | -31.8 | V | P | 149.8 | 178.2 | |
| 4.924 | 3.0 | 25.9 | 32.8 | 5.9 | -34.9 | 0.0 | 0.0 | 29.8 | 54.0 | -24.2 | V | A | 149.8 | 178.2 | |
| 7.386 | 3.0 | 38.4 | 35.3 | 7.3 | -34.6 | 0.0 | 0.0 | 46.4 | 74.0 | -27.6 | V | P | 120.8 | 164.1 | |
| 7.386 | 3.0 | 24.9 | 35.3 | 7.3 | -34.6 | 0.0 | 0.0 | 32.9 | 54.0 | -21.1 | V | A | 120.8 | 164.1 | |
| 12.310 | 3.0 | 34.9 | 38.7 | 9.9 | -32.4 | 0.0 | 0.0 | 51.0 | 74.0 | -23.0 | V | P | 159.4 | 286.2 | |
| 12.310 | 3.0 | 22.2 | 38.7 | 9.9 | -32.4 | 0.0 | 0.0 | 38.3 | 54.0 | -15.7 | V | A | 159.4 | 286.2 | |
| 4.924 | 3.0 | 38.5 | 32.8 | 5.9 | -34.9 | 0.0 | 0.0 | 42.3 | 74.0 | -31.7 | H | P | 102.6 | 7.8 | |
| 4.924 | 3.0 | 25.9 | 32.8 | 5.9 | -34.9 | 0.0 | 0.0 | 29.8 | 54.0 | -24.2 | H | A | 102.6 | 7.8 | |
| 7.386 | 3.0 | 37.5 | 35.3 | 7.3 | -34.6 | 0.0 | 0.0 | 45.5 | 74.0 | -28.5 | H | P | 169.2 | 51.8 | |
| 7.386 | 3.0 | 24.9 | 35.3 | 7.3 | -34.6 | 0.0 | 0.0 | 32.9 | 54.0 | -21.1 | H | A | 169.2 | 51.8 | |
| 12.310 | 3.0 | 34.7 | 38.7 | 9.9 | -32.4 | 0.0 | 0.0 | 50.9 | 74.0 | -23.1 | H | P | 102.9 | 13.4 | |
| 12.310 | 3.0 | 22.1 | 38.7 | 9.9 | -32.4 | 0.0 | 0.0 | 38.3 | 54.0 | -15.7 | H | A | 102.9 | 13.4 | |

Rev. 4.1.2.7
Note: No other emissions were detected above the system noise floor.

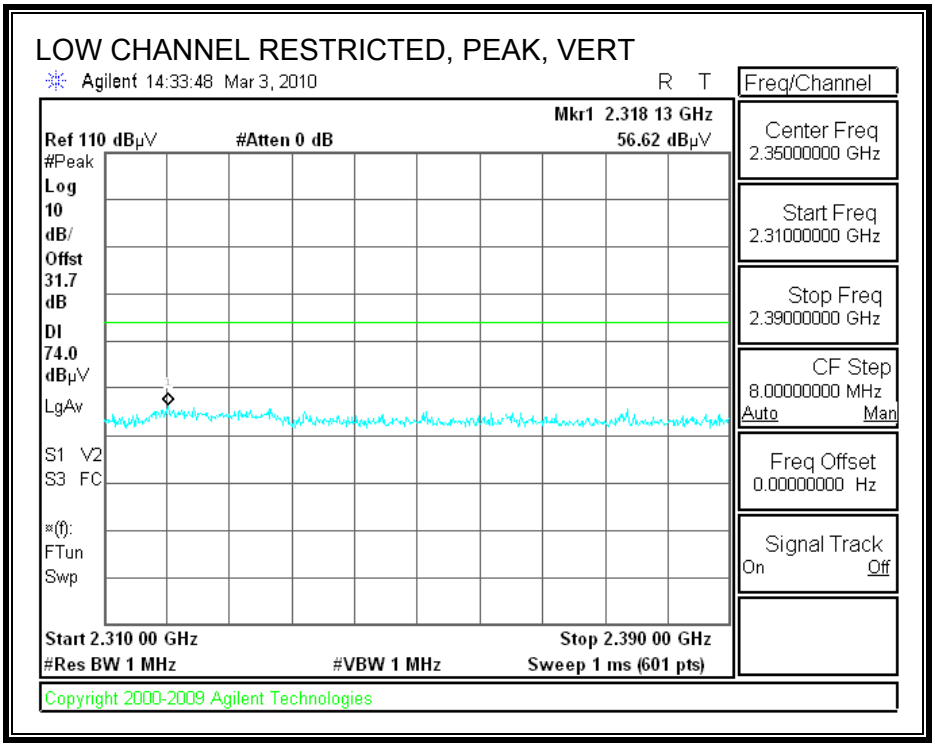
**Tyco antenna**

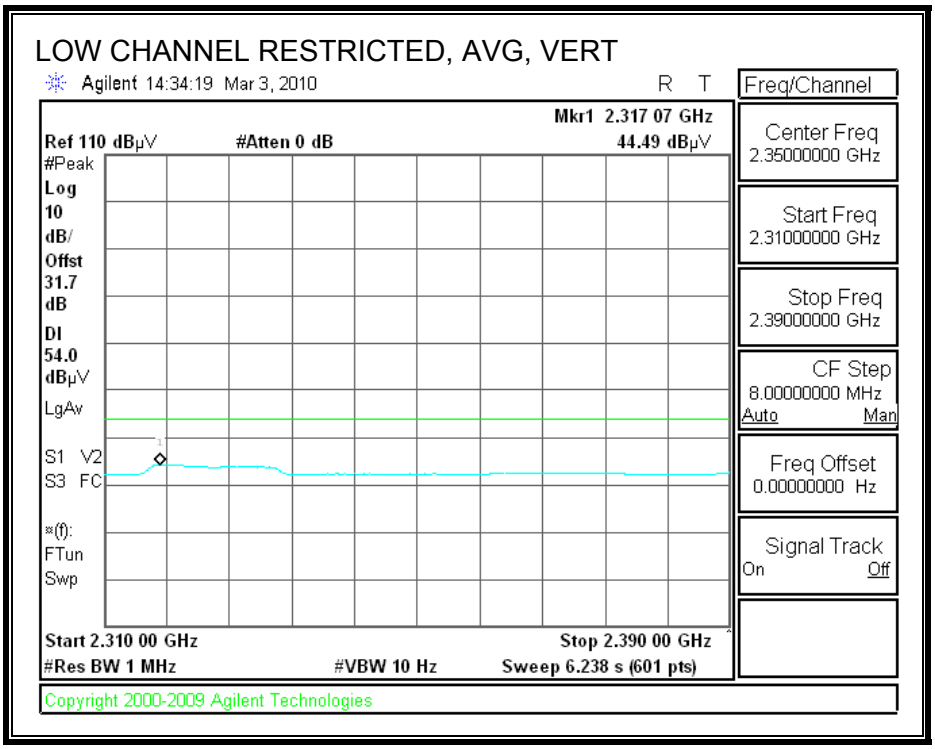
**RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)**



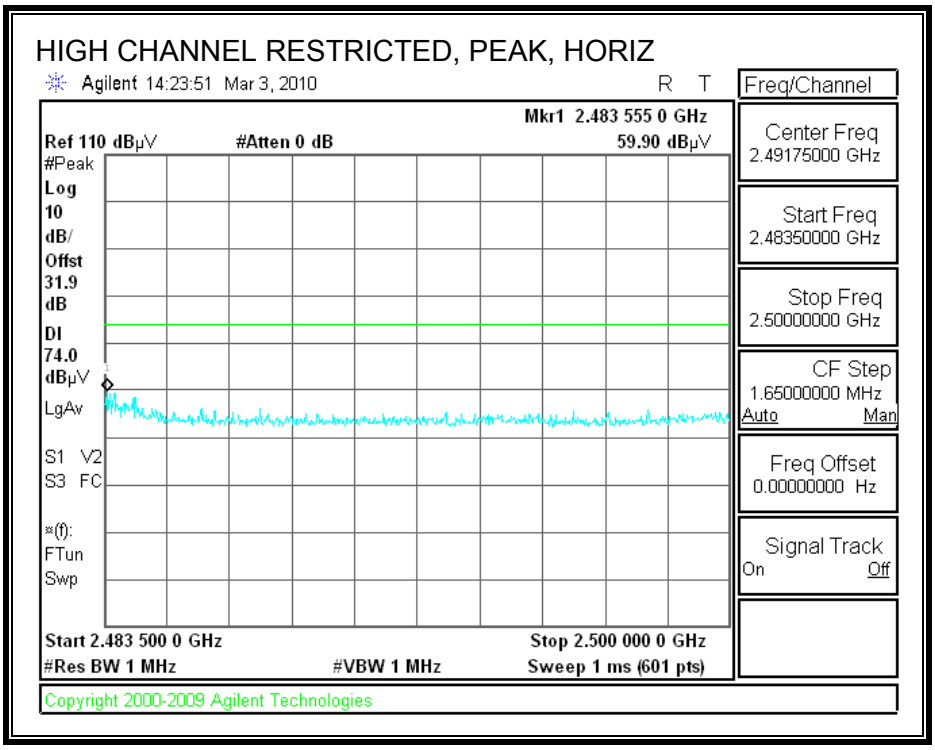



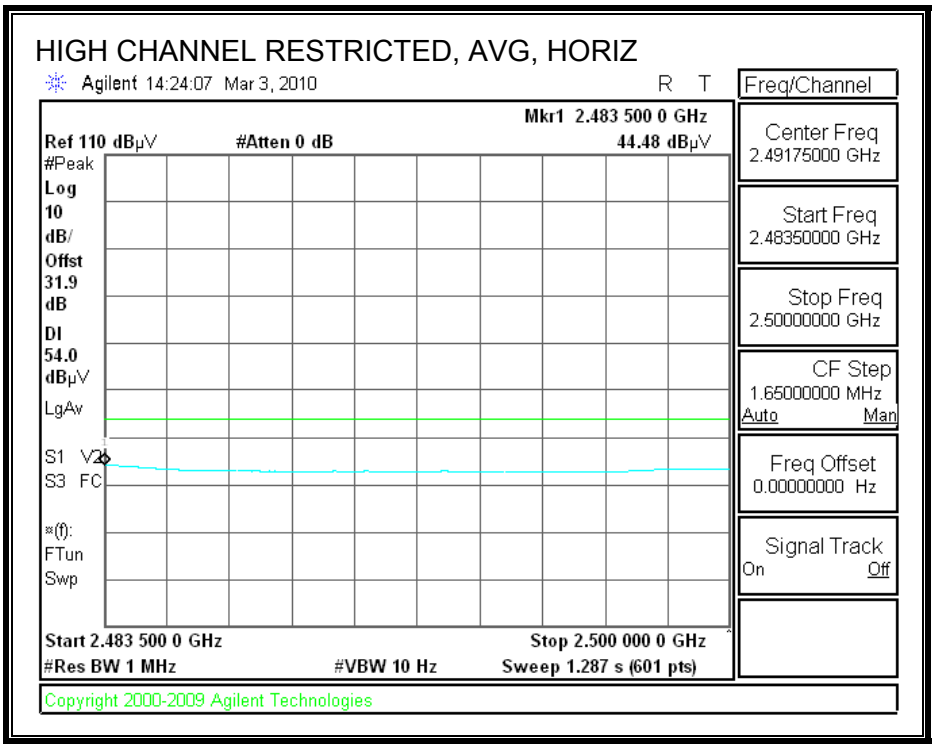
**RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)**



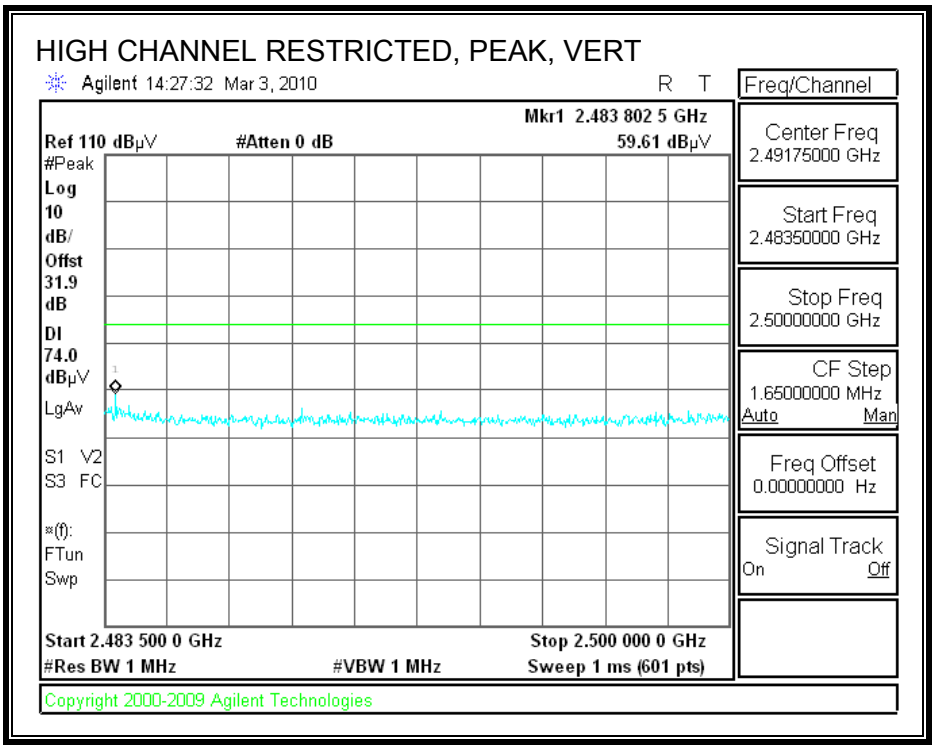



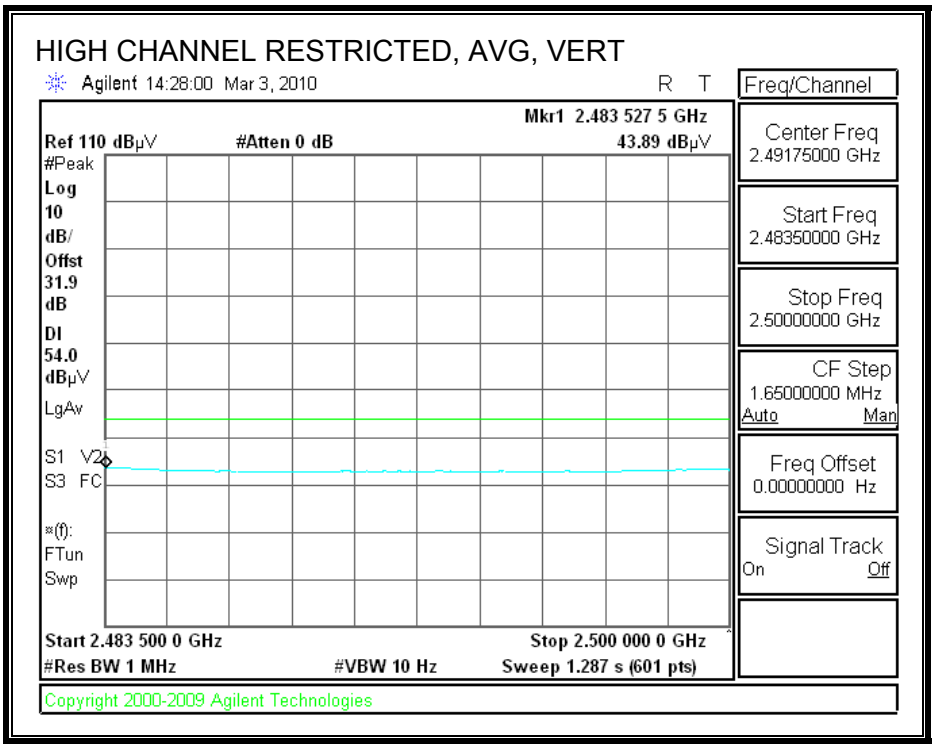
**RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)**



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



## HARMONICS AND SPURIOUS EMISSIONS

**High Frequency Measurement**
**Compliance Certification Services, Fremont 5m Chamber**

**Test Engr:** Oliver Su
**Date:** 03/04/10
**Project #:** 10J13094
**Company:** Hon Hai Precision
**EUT Description:** Protable Game Machine
**EUT M/N:** TWL-001 with Tyco Antenna + Earphone
**Test Target:** FCC 15 Class B
**Mode Oper:** TX, 801.11g mode

| | | | | |
|---|---|---|---|---|
| f | Measurement Frequency | Amp | Preamp Gain | Average Field Strength Limit |
| Dist | Distance to Antenna | D Corr | Distance Correct to 3 meters | Peak Field Strength Limit |
| Read | Analyzer Reading | Avg | Average Field Strength @ 3 m | Margin vs. Average Limit |
| AF | Antenna Factor | Peak | Calculated Peak Field Strength | Margin vs. Peak Limit |
| CL | Cable Loss | HPF | High Pass Filter | |

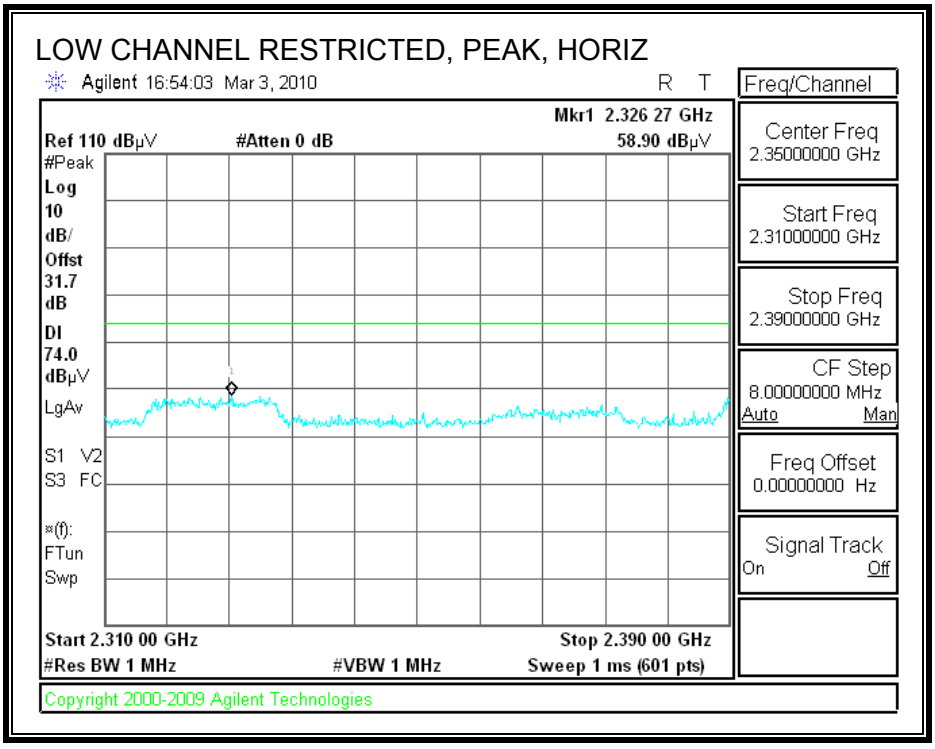
| f GHz | Dist (m) | Read dBuV | AF dB/m | CL dB | Amp dB | D Corr dB | Fltr dB | Corr. dBuV/m | Limit dBuV/m | Margin dB | Ant. Pol. V/H | Det. P/A/QP | Ant.High cm | Table Angle Degree | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Low ch, 2412MHz | | | | | | | | | | | | | | | |
| 4.824 | 3.0 | 38.9 | 32.8 | 5.8 | -34.8 | 0.0 | 0.0 | 42.6 | 74.0 | -31.4 | V | P | 143.6 | 172.9 | |
| 4.824 | 3.0 | 26.0 | 32.8 | 5.8 | -34.8 | 0.0 | 0.0 | 29.7 | 54.0 | -24.3 | V | A | 143.6 | 172.9 | |
| 12.060 | 3.0 | 34.3 | 38.5 | 9.8 | -32.4 | 0.0 | 0.0 | 50.2 | 74.0 | -23.8 | V | P | 105.9 | 238.2 | |
| 12.060 | 3.0 | 22.1 | 38.5 | 9.8 | -32.4 | 0.0 | 0.0 | 38.0 | 54.0 | -16.0 | V | A | 105.9 | 238.2 | |
| 4.824 | 3.0 | 38.4 | 32.8 | 5.8 | -34.8 | 0.0 | 0.0 | 42.1 | 74.0 | -31.9 | H | P | 164.2 | 130.2 | |
| 4.824 | 3.0 | 26.0 | 32.8 | 5.8 | -34.8 | 0.0 | 0.0 | 29.7 | 54.0 | -24.3 | H | A | 164.2 | 130.2 | |
| 12.060 | 3.0 | 34.6 | 38.5 | 9.8 | -32.4 | 0.0 | 0.0 | 50.5 | 74.0 | -23.5 | H | P | 100.0 | 47.2 | |
| 12.060 | 3.0 | 22.1 | 38.5 | 9.8 | -32.4 | 0.0 | 0.0 | 38.0 | 54.0 | -16.0 | H | A | 100.0 | 47.2 | |
| Middle ch, 2437MHz | | | | | | | | | | | | | | | |
| 4.874 | 3.0 | 37.6 | 32.8 | 5.8 | -34.9 | 0.0 | 0.0 | 41.4 | 74.0 | -32.6 | V | P | 124.6 | 163.2 | |
| 4.874 | 3.0 | 25.6 | 32.8 | 5.8 | -34.9 | 0.0 | 0.0 | 29.4 | 54.0 | -24.6 | V | A | 124.6 | 163.2 | |
| 7.311 | 3.0 | 37.6 | 35.2 | 7.3 | -34.7 | 0.0 | 0.0 | 45.4 | 74.0 | -28.6 | V | P | 200.0 | 161.5 | |
| 7.311 | 3.0 | 25.0 | 35.2 | 7.3 | -34.7 | 0.0 | 0.0 | 32.8 | 54.0 | -21.2 | V | A | 200.0 | 161.5 | |
| 12.185 | 3.0 | 35.8 | 38.6 | 9.8 | -32.4 | 0.0 | 0.0 | 51.8 | 74.0 | -22.2 | V | P | 198.7 | 251.0 | |
| 12.185 | 3.0 | 21.9 | 38.6 | 9.8 | -32.4 | 0.0 | 0.0 | 37.9 | 54.0 | -16.1 | V | A | 198.7 | 251.0 | |
| 4.874 | 3.0 | 38.5 | 32.8 | 5.8 | -34.9 | 0.0 | 0.0 | 42.3 | 74.0 | -31.7 | H | P | 198.6 | 196.4 | |
| 4.874 | 3.0 | 25.6 | 32.8 | 5.8 | -34.9 | 0.0 | 0.0 | 29.4 | 54.0 | -24.6 | H | A | 198.6 | 196.4 | |
| 7.311 | 3.0 | 37.1 | 35.2 | 7.3 | -34.7 | 0.0 | 0.0 | 44.9 | 74.0 | -29.1 | H | P | 190.3 | 93.6 | |
| 7.311 | 3.0 | 25.0 | 35.2 | 7.3 | -34.7 | 0.0 | 0.0 | 32.8 | 54.0 | -21.2 | H | A | 190.3 | 93.6 | |
| 12.185 | 3.0 | 35.3 | 38.6 | 9.8 | -32.4 | 0.0 | 0.0 | 51.3 | 74.0 | -22.7 | H | P | 200.0 | 0.0 | |
| 12.185 | 3.0 | 21.9 | 38.6 | 9.8 | -32.4 | 0.0 | 0.0 | 37.9 | 54.0 | -16.1 | H | A | 200.0 | 0.0 | |
| High ch, 2462MHz | | | | | | | | | | | | | | | |
| 4.924 | 3.0 | 38.2 | 32.8 | 5.9 | -34.9 | 0.0 | 0.0 | 42.1 | 74.0 | -31.9 | V | P | 146.0 | 312.8 | |
| 4.924 | 3.0 | 25.9 | 32.8 | 5.9 | -34.9 | 0.0 | 0.0 | 29.7 | 54.0 | -24.3 | V | A | 146.0 | 312.8 | |
| 7.386 | 3.0 | 37.9 | 35.3 | 7.3 | -34.6 | 0.0 | 0.0 | 45.8 | 74.0 | -28.2 | V | P | 182.7 | 104.0 | |
| 7.386 | 3.0 | 24.9 | 35.3 | 7.3 | -34.6 | 0.0 | 0.0 | 32.8 | 54.0 | -21.2 | V | A | 182.7 | 104.0 | |
| 12.310 | 3.0 | 34.0 | 38.7 | 9.9 | -32.4 | 0.0 | 0.0 | 50.2 | 74.0 | -23.8 | V | P | 141.0 | 139.9 | |
| 12.310 | 3.0 | 22.0 | 38.7 | 9.9 | -32.4 | 0.0 | 0.0 | 38.2 | 54.0 | -15.8 | V | A | 141.0 | 139.9 | |
| 4.924 | 3.0 | 37.8 | 32.8 | 5.9 | -34.9 | 0.0 | 0.0 | 41.7 | 74.0 | -32.3 | H | P | 118.8 | 197.7 | |
| 4.924 | 3.0 | 25.9 | 32.8 | 5.9 | -34.9 | 0.0 | 0.0 | 29.7 | 54.0 | -24.3 | H | A | 118.8 | 197.7 | |
| 7.386 | 3.0 | 37.7 | 35.3 | 7.3 | -34.6 | 0.0 | 0.0 | 45.6 | 74.0 | -28.4 | H | P | 113.0 | 290.8 | |
| 7.386 | 3.0 | 24.8 | 35.3 | 7.3 | -34.6 | 0.0 | 0.0 | 32.8 | 54.0 | -21.2 | H | A | 113.0 | 290.8 | |
| 12.310 | 3.0 | 34.9 | 38.7 | 9.9 | -32.4 | 0.0 | 0.0 | 51.1 | 74.0 | -22.9 | H | P | 159.2 | 98.6 | |
| 12.310 | 3.0 | 22.0 | 38.7 | 9.9 | -32.4 | 0.0 | 0.0 | 38.2 | 54.0 | -15.8 | H | A | 159.2 | 98.6 | |

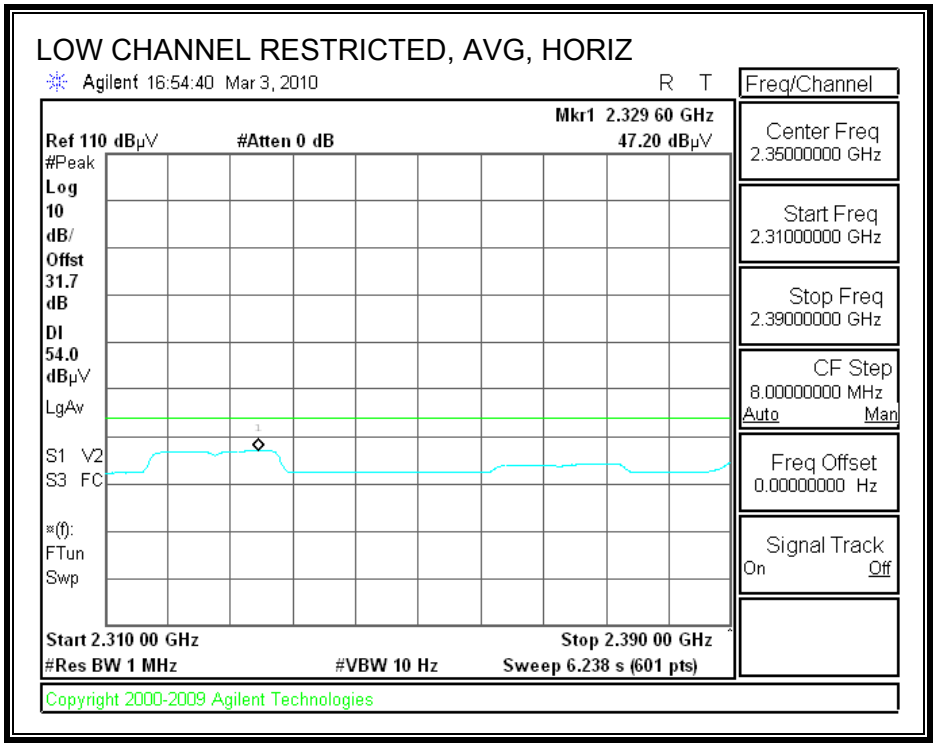
Rev. 4.1.2.7
Note: No other emissions were detected above the system noise floor.

***UTL-001 HOST***

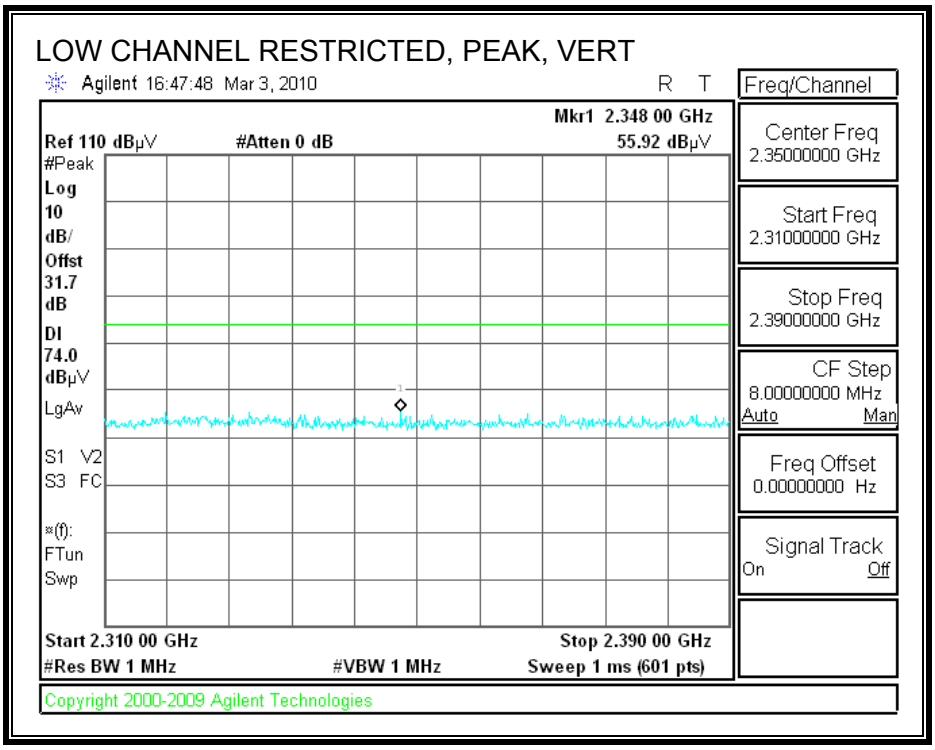
**Foxconn antenna**

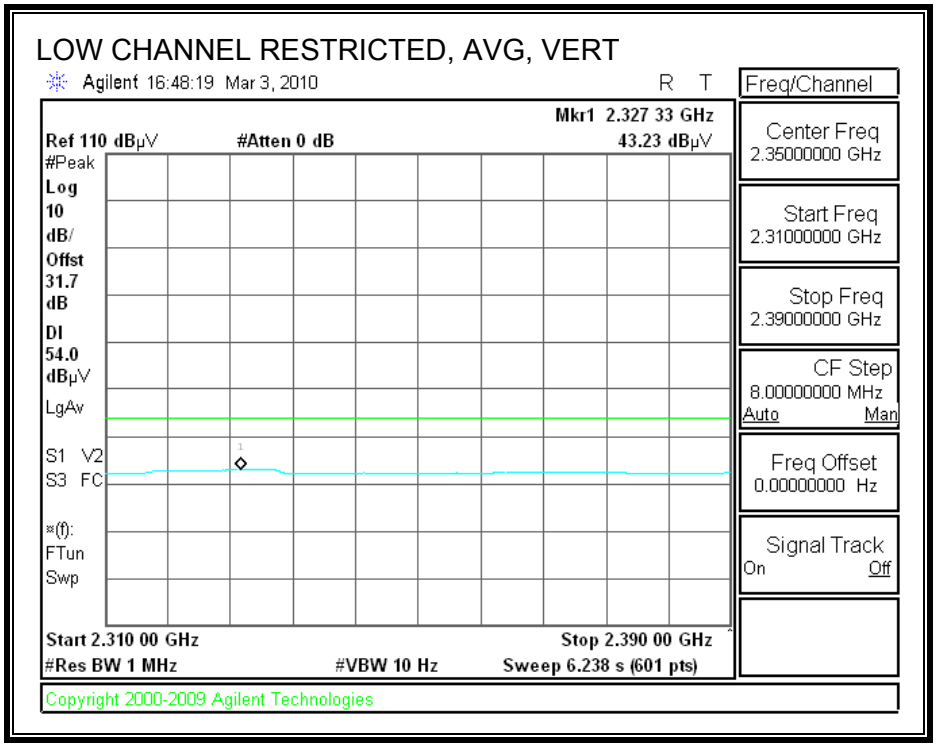
**RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)**



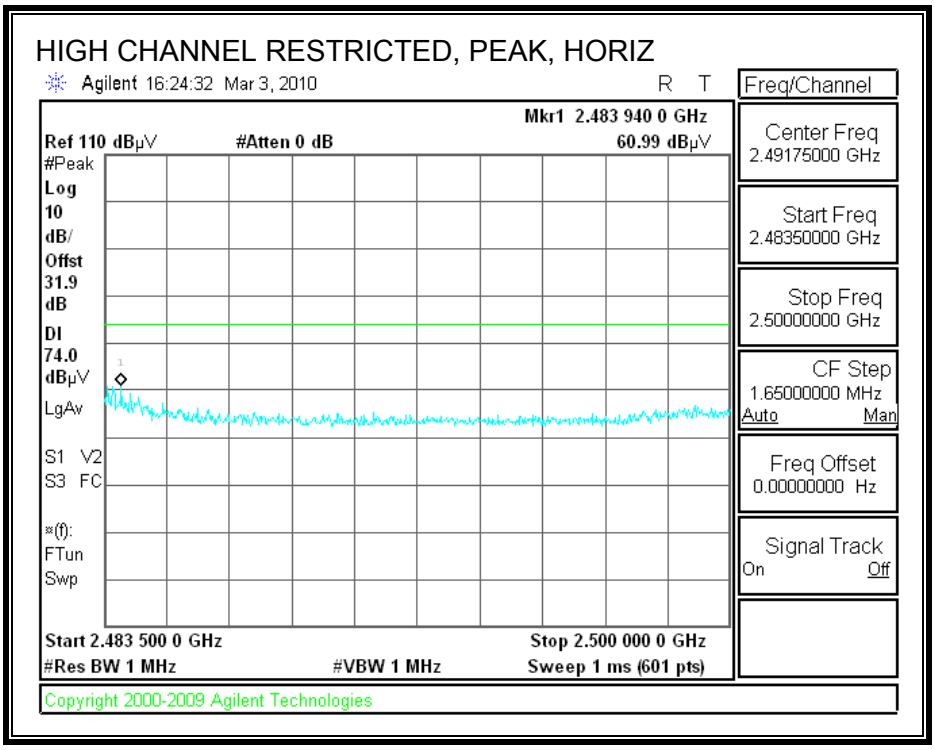



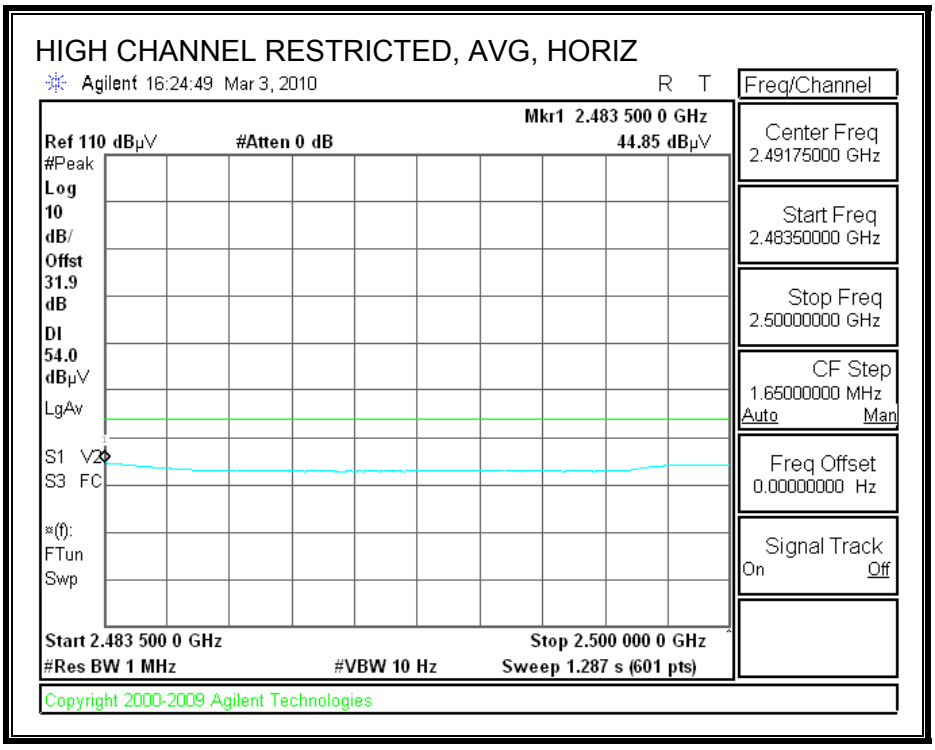
**RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)**



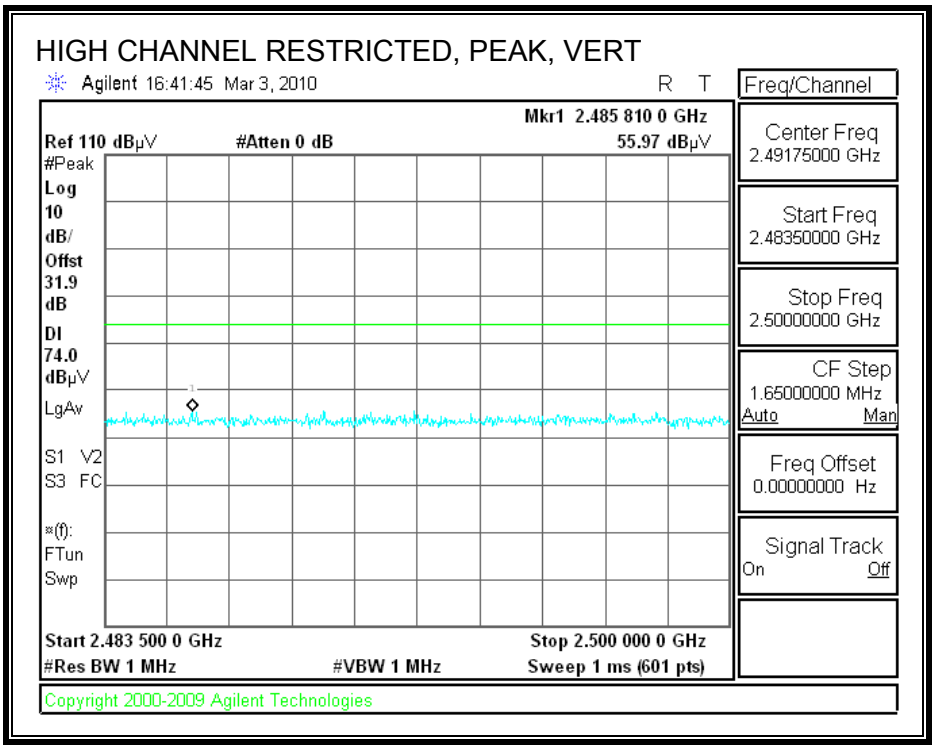



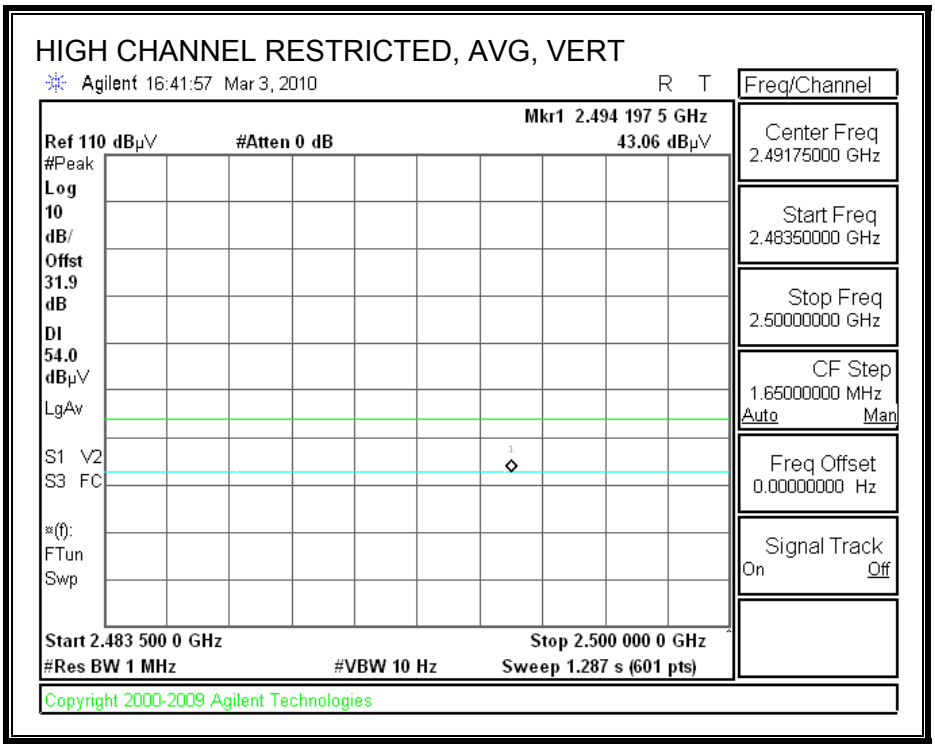
**RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)**



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



## HARMONICS AND SPURIOUS EMISSIONS

**High Frequency Measurement**
**Compliance Certification Services, Fremont 5m Chamber**

**Test Engr:** Oliver Su
**Date:** 03/05/10
**Project #:** 10J13094
**Company:** Hon Hai Precision
**EUT Description:** Portable Game Machine
**EUT M/N:** UTL-001 with Foxconn Ant + Earphone
**Test Target:** FCC 15 Class B
**Mode Oper:** 802.11g, Tx

| | | | | | |
|---|---|---|---|---|---|
| f | Measurement Frequency | Amp | Preamp Gain | | Average Field Strength Limit |
| Dist | Distance to Antenna | D Corr | Distance Correct to 3 meters | | Peak Field Strength Limit |
| Read | Analyzer Reading | Avg | Average Field Strength @ 3 m | | Margin vs. Average Limit |
| AF | Antenna Factor | Peak | Calculated Peak Field Strength | | Margin vs. Peak Limit |
| CL | Cable Loss | HPF | High Pass Filter | | |

| f GHz | Dist (m) | Read dBuV | AF dB/m | CL dB | Amp dB | D Corr dB | Fltr dB | Corr. dBuV/m | Limit dBuV/m | Margin dB | Ant. Pol. V/H | Det. P/A/QP | Ant.High cm | Table Angle Degree | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Low ch, 2412MHz | | | | | | | | | | | | | | | |
| 4.824 | 3.0 | 37.8 | 32.8 | 5.8 | -34.8 | 0.0 | 0.0 | 41.5 | 74.0 | -32.5 | H | P | 111.5 | 189.5 | |
| 4.824 | 3.0 | 25.9 | 32.8 | 5.8 | -34.8 | 0.0 | 0.0 | 29.6 | 54.0 | -24.4 | H | A | 111.5 | 189.5 | |
| 12.060 | 3.0 | 33.9 | 38.5 | 9.8 | -32.4 | 0.0 | 0.0 | 49.8 | 74.0 | -24.2 | H | P | 105.0 | 309.9 | |
| 12.060 | 3.0 | 22.1 | 38.5 | 9.8 | -32.4 | 0.0 | 0.0 | 37.9 | 54.0 | -16.1 | H | A | 105.0 | 309.9 | |
| 4.824 | 3.0 | 38.6 | 32.8 | 5.8 | -34.8 | 0.0 | 0.0 | 42.3 | 74.0 | -31.7 | V | P | 199.3 | 125.1 | |
| 4.824 | 3.0 | 26.0 | 32.8 | 5.8 | -34.8 | 0.0 | 0.0 | 29.7 | 54.0 | -24.3 | V | A | 199.3 | 125.1 | |
| 12.060 | 3.0 | 34.2 | 38.5 | 9.8 | -32.4 | 0.0 | 0.0 | 50.0 | 74.0 | -24.0 | V | P | 102.4 | 301.3 | |
| 12.060 | 3.0 | 22.1 | 38.5 | 9.8 | -32.4 | 0.0 | 0.0 | 37.9 | 54.0 | -16.1 | V | A | 102.4 | 301.3 | |
| Mid ch, 2437MHz | | | | | | | | | | | | | | | |
| 4.874 | 3.0 | 37.5 | 32.8 | 5.8 | -34.9 | 0.0 | 0.0 | 41.3 | 74.0 | -32.7 | H | P | 104.5 | 249.9 | |
| 4.874 | 3.0 | 25.5 | 32.8 | 5.8 | -34.9 | 0.0 | 0.0 | 29.3 | 54.0 | -24.7 | H | A | 104.5 | 249.9 | |
| 7.311 | 3.0 | 37.7 | 35.2 | 7.3 | -34.7 | 0.0 | 0.0 | 45.5 | 74.0 | -28.5 | H | P | 172.0 | 283.9 | |
| 7.311 | 3.0 | 24.9 | 35.2 | 7.3 | -34.7 | 0.0 | 0.0 | 32.7 | 54.0 | -21.3 | H | A | 172.0 | 283.9 | |
| 12.185 | 3.0 | 34.6 | 38.6 | 9.8 | -32.4 | 0.0 | 0.0 | 50.6 | 74.0 | -23.4 | H | P | 100.8 | 181.8 | |
| 12.185 | 3.0 | 21.9 | 38.6 | 9.8 | -32.4 | 0.0 | 0.0 | 37.9 | 54.0 | -16.1 | H | A | 100.8 | 181.8 | |
| 4.874 | 3.0 | 38.5 | 32.8 | 5.8 | -34.9 | 0.0 | 0.0 | 42.3 | 74.0 | -31.7 | V | P | 191.9 | 229.9 | |
| 4.874 | 3.0 | 25.5 | 32.8 | 5.8 | -34.9 | 0.0 | 0.0 | 29.3 | 54.0 | -24.7 | V | A | 191.9 | 229.9 | |
| 7.311 | 3.0 | 36.6 | 35.2 | 7.3 | -34.7 | 0.0 | 0.0 | 44.4 | 74.0 | -29.6 | V | P | 195.2 | 217.0 | |
| 7.311 | 3.0 | 25.0 | 35.2 | 7.3 | -34.7 | 0.0 | 0.0 | 32.8 | 54.0 | -21.2 | V | A | 195.2 | 217.0 | |
| 12.185 | 3.0 | 34.8 | 38.6 | 9.8 | -32.4 | 0.0 | 0.0 | 50.8 | 74.0 | -23.2 | V | P | 129.6 | 304.2 | |
| 12.185 | 3.0 | 21.8 | 38.6 | 9.8 | -32.4 | 0.0 | 0.0 | 37.8 | 54.0 | -16.2 | V | A | 129.6 | 304.2 | |
| High ch, 2462MHz | | | | | | | | | | | | | | | |
| 4.924 | 3.0 | 39.1 | 32.8 | 5.9 | -34.9 | 0.0 | 0.0 | 42.9 | 74.0 | -31.1 | H | P | 100.4 | 199.9 | |
| 4.924 | 3.0 | 25.8 | 32.8 | 5.9 | -34.9 | 0.0 | 0.0 | 29.6 | 54.0 | -24.4 | H | A | 100.4 | 199.9 | |
| 7.386 | 3.0 | 37.4 | 35.3 | 7.3 | -34.6 | 0.0 | 0.0 | 45.3 | 74.0 | -28.7 | H | P | 198.3 | 330.2 | |
| 7.386 | 3.0 | 24.8 | 35.3 | 7.3 | -34.6 | 0.0 | 0.0 | 32.8 | 54.0 | -21.2 | H | A | 198.3 | 330.2 | |
| 12.310 | 3.0 | 34.2 | 38.7 | 9.9 | -32.4 | 0.0 | 0.0 | 50.3 | 74.0 | -23.7 | H | P | 103.5 | 281.9 | |
| 12.310 | 3.0 | 22.0 | 38.7 | 9.9 | -32.4 | 0.0 | 0.0 | 38.1 | 54.0 | -15.9 | H | A | 103.5 | 281.9 | |
| 4.924 | 3.0 | 37.6 | 32.8 | 5.9 | -34.9 | 0.0 | 0.0 | 41.4 | 74.0 | -32.6 | V | P | 200.0 | 293.5 | |
| 4.924 | 3.0 | 25.8 | 32.8 | 5.9 | -34.9 | 0.0 | 0.0 | 29.7 | 54.0 | -24.3 | V | A | 200.0 | 293.5 | |
| 7.386 | 3.0 | 36.8 | 35.3 | 7.3 | -34.6 | 0.0 | 0.0 | 44.7 | 74.0 | -29.3 | V | P | 100.7 | 22.7 | |
| 7.386 | 3.0 | 24.8 | 35.3 | 7.3 | -34.6 | 0.0 | 0.0 | 32.8 | 54.0 | -21.2 | V | A | 100.7 | 22.7 | |
| 12.310 | 3.0 | 34.5 | 38.7 | 9.9 | -32.4 | 0.0 | 0.0 | 50.6 | 74.0 | -23.4 | V | P | 151.1 | 359.5 | |
| 12.310 | 3.0 | 22.0 | 38.7 | 9.9 | -32.4 | 0.0 | 0.0 | 38.1 | 54.0 | -15.9 | V | A | 151.1 | 359.5 | |

Rev. 4.1.2.7
Note: No other emissions were detected above the system noise floor.

## 8.3. WORST CASE RECEIVER ABOVE 1 GHz

***TWL-001 HOST***

**Tyco Antenna**

High Frequency Measurement
Compliance Certification Services, Fremont 5m Chamber

**Company:** Hon Hai Precision
**Project #:** 10J13094
**Date:** 03/05/10
**Test Engineer:** Thanh Nguyen
**Configuration:** EUT TWL-001 Tyco Antenna
**Mode:** Receive

**Test Equipment:**

| Horn 1-18GHz | Pre-amplifer 1-26GHz | Pre-amplifer 26-40GHz | Horn > 18GHz | Limit |
|---|---|---|---|---|
| T60; S/N: 2238 @3m | T34 HP 8449B | | | RX RSS 210 |

Hi Frequency Cables

| 3' cable 22807700 | 12' cable 22807600 | 20' cable 22807500 | HPF | Reject Filter |
|---|---|---|---|---|
| 3' cable 22807700 | 12' cable 22807600 | 20' cable 22807500 | | |

**Peak Measurements**
RBW=VBW=1MHz
**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 | Fltr dB | Peak dBuV/m | Avg dBuV/m | Pk Lim dBuV/m | Avg Lim dBuV/m | Pk Mar dB | Avg Mar dB | Notes (V/H) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1.040 | 3.0 | 45.9 | 31.8 | 24.6 | 2.4 | -38.2 | | 0.0 | 34.7 | 20.6 | 74 | 54 | -39.3 | -33.4 | V |
| 1.147 | 3.0 | 45.7 | 31.5 | 25.0 | 2.5 | -38.1 | | 0.0 | 35.2 | 20.9 | 74 | 54 | -38.8 | -33.1 | V |
| 2.380 | 3.0 | 42.6 | 28.4 | 28.0 | 3.8 | -36.3 | | 0.0 | 38.1 | 23.9 | 74 | 54 | -35.9 | -30.1 | V |
| 1.060 | 3.0 | 45.4 | 30.9 | 24.7 | 2.4 | -38.2 | | 0.0 | 34.3 | 19.8 | 74 | 54 | -39.7 | -34.2 | H |
| 1.220 | 3.0 | 44.8 | 30.7 | 25.2 | 2.6 | -38.0 | | 0.0 | 34.7 | 20.5 | 74 | 54 | -39.3 | -33.5 | H |
| 1.867 | 3.0 | 43.3 | 30.0 | 27.4 | 3.3 | -37.1 | | 0.0 | 36.9 | 23.7 | 74 | 54 | -37.1 | -30.3 | H |
| No other emissions were detected above system noise floor | | | | | | | | | | | | | | | |

Rev. 11.10.08

| | | | | | |
|---|---|---|---|---|---|
| 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 | | |

## Foxconn Antenna

**High Frequency Measurement**
**Compliance Certification Services, Fremont 5m Chamber**

**Company:** Hon Hai Precision
**Project #:** 10J13094
**Date:** 03/05/10
**Test Engineer:** Thanh Nguyen
**Configuration:** EUT TWL-001 Foxconn Antenna with AC/DC Adapter
**Mode:** Receive

**Test Equipment:**

| Horn 1-18GHz | Pre-amplifer 1-26GHz | Pre-amplifer 26-40GHz | Horn > 18GHz | Limit |
|---|---|---|---|---|
| T60; S/N: 2238 @3m | T34 HP 8449B | | | RX RSS 210 |

Hi Frequency Cables

| 3' cable 22807700 | 12' cable 22807600 | 20' cable 22807500 | HPF | Reject Filter |
|---|---|---|---|---|
| 3' cable 22807700 | 12' cable 22807600 | 20' cable 22807500 | | |

**Peak Measurements**
RBW=VBW=1MHz
**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 | Fltr dB | Peak dBuV/m | Avg dBuV/m | Pk Lim dBuV/m | Avg Lim dBuV/m | Pk Mar dB | Avg Mar dB | Notes (V/H) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1.133 | 3.0 | 46.1 | 32.7 | 24.9 | 2.5 | -38.1 | | 0.0 | 35.5 | 22.1 | 74 | 54 | -38.5 | -31.9 | V |
| 1.230 | 3.0 | 45.4 | 31.9 | 25.2 | 2.6 | -37.9 | | 0.0 | 35.3 | 21.8 | 74 | 54 | -38.7 | -32.2 | V |
| 2.650 | 3.0 | 42.1 | 30.1 | 28.7 | 4.1 | -36.1 | | 0.0 | 38.7 | 26.7 | 74 | 54 | -35.3 | -27.3 | V |
| 1.037 | 3.0 | 45.7 | 31.7 | 24.6 | 2.4 | -38.2 | | 0.0 | 34.5 | 20.4 | 74 | 54 | -39.5 | -33.6 | H |
| 1.143 | 3.0 | 47.4 | 33.2 | 24.9 | 2.5 | -38.1 | | 0.0 | 36.9 | 22.6 | 74 | 54 | -37.1 | -31.4 | H |
| 1.753 | 3.0 | 44.5 | 30.6 | 27.0 | 3.2 | -37.2 | | 0.0 | 37.5 | 23.5 | 74 | 54 | -36.5 | -30.5 | H |
| No other emissions were detected above system noise floor | | | | | | | | | | | | | | | |

Rev. 11.10.08

| | | | | | |
|---|---|---|---|---|---|
| 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 | | |

***UTL-001 HOST***

## Foxconn Antenna

**High Frequency Measurement**
**Compliance Certification Services, Fremont 5m Chamber**

**Company:** Hon Hai Precision
**Project #:** 10J13094
**Date:** 03/05/10
**Test Engineer:** Thanh Nguyen
**Configuration:** EUT UTL-001 Foxconn Antenna.
**Mode:** Receive

**Test Equipment:**

| Horn 1-18GHz | Pre-amplifer 1-26GHz | Pre-amplifer 26-40GHz | Horn > 18GHz | Limit |
|---|---|---|---|---|
| T60; S/N: 2238 @3m | T34 HP 8449B | | | RX RSS 210 |

Hi Frequency Cables

| 3' cable 22807700 | 12' cable 22807600 | 20' cable 22807500 | HPF | Reject Filter |
|---|---|---|---|---|
| 3' cable 22807700 | 12' cable 22807600 | 20' cable 22807500 | | |

**Peak Measurements**
RBW=VBW=1MHz
**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 | Fltr dB | Peak dBuV/m | Avg dBuV/m | Pk Lim dBuV/m | Avg Lim dBuV/m | Pk Mar dB | Avg Mar dB | Notes (V/H) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1.045 | 3.0 | 46.6 | 35.7 | 24.6 | 2.4 | -38.2 | | 0.0 | 35.4 | 24.5 | 74 | 54 | -38.6 | -29.5 | V |
| 1.120 | 3.0 | 45.4 | 32.4 | 24.9 | 2.5 | -38.1 | | 0.0 | 34.6 | 21.6 | 74 | 54 | -39.4 | -32.4 | V |
| 2.355 | 3.0 | 42.9 | 30.9 | 28.0 | 3.8 | -36.4 | | 0.0 | 38.3 | 26.4 | 74 | 54 | -35.7 | -27.6 | V |
| 1.982 | 3.0 | 43.0 | 25.6 | 27.7 | 3.4 | -36.9 | | 0.0 | 37.3 | 19.9 | 74 | 54 | -36.7 | -34.1 | H |
| No other emissions were detected above system noise floor | | | | | | | | | | | | | | | |

Rev. 11.10.08

| | | | | | |
|---|---|---|---|---|---|
| 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 | | |

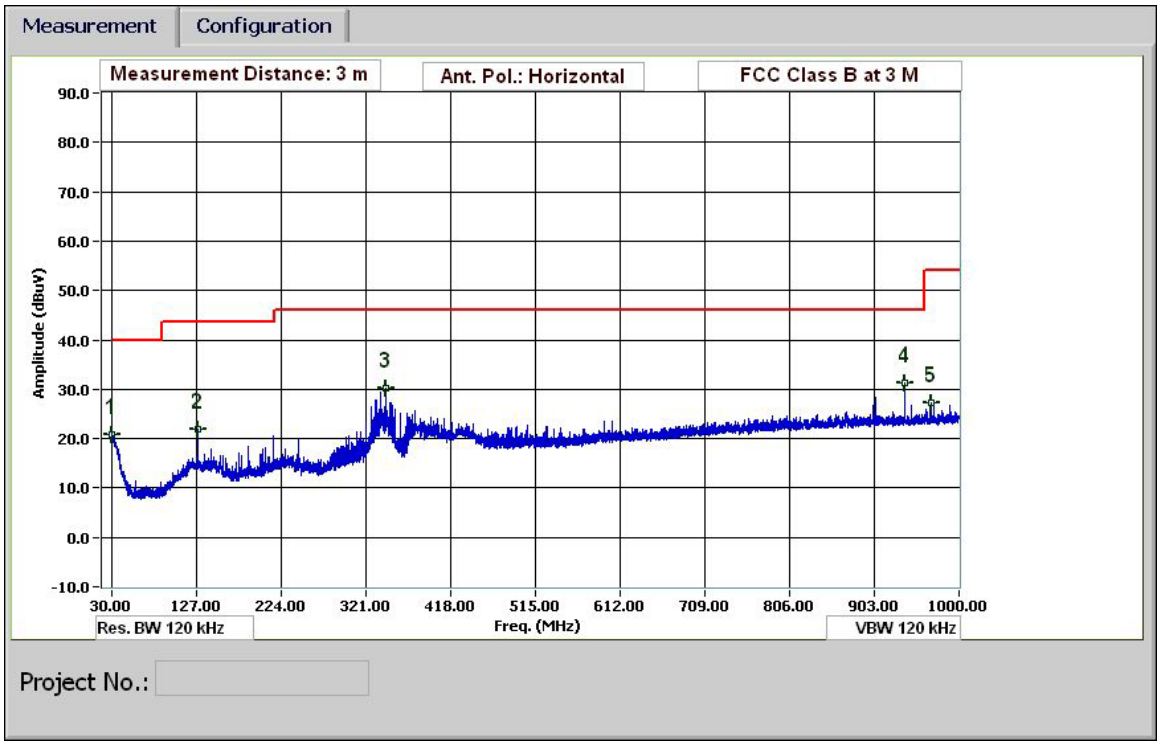
## 8.4. WORST-CASE BELOW 1 GHz

***TWL-001 Host and Operated by Battery***

### TYCO Antenna

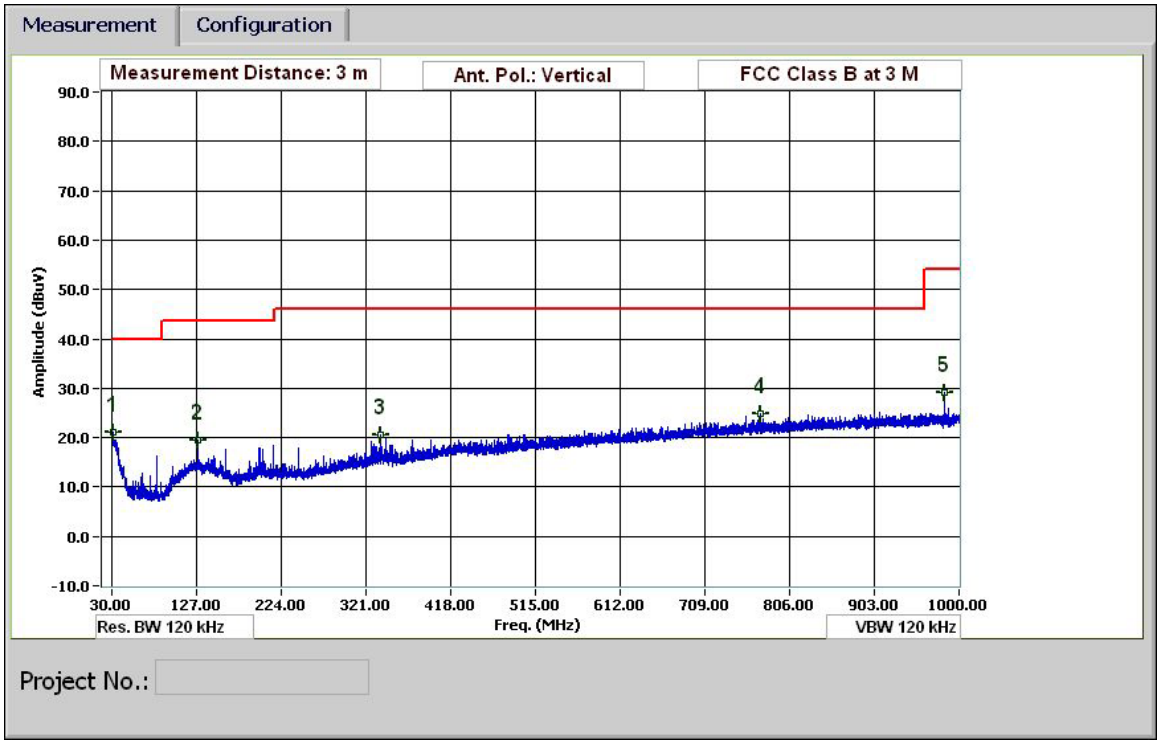
**SPURIOUS EMISSIONS 30 TO 1000 MHz (WORST-CASE CONFIGURATION, HORIZONTAL)**

HORIZONTAL PLOT



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

VERTICAL PLOT



## HORIZONTAL & VERTICAL DATA

**30-1000MHz Frequency Measurement**
**Compliance Certification Services, Fremont 5m Chamber**

**Test Engr:** Vien Tran
**Date:** 3/5/2010
**Project #:** 10J13094
**Company:** Hon Hai Precision
**EUT Description:** EUT in TWL-001 Host with Tyco Antenna & with Battery Operation
**EUT M/N:** J27H020
**Test Target:** FCC Class B
**Mode Oper:** Transmit Worst Case

| | | | | | |
|---|---|---|---|---|---|
| f | Measurement Frequency | Amp | Preamp Gain | Margin | Margin vs. Limit |
| Dist | Distance to Antenna | D Corr | Distance Correct to 3 meters | | |
| Read | Analyzer Reading | Filter | Filter Insert Loss | | |
| AF | Antenna Factor | Corr. | Calculated Field Strength | | |
| CL | Cable Loss | Limit | Field Strength Limit | | |

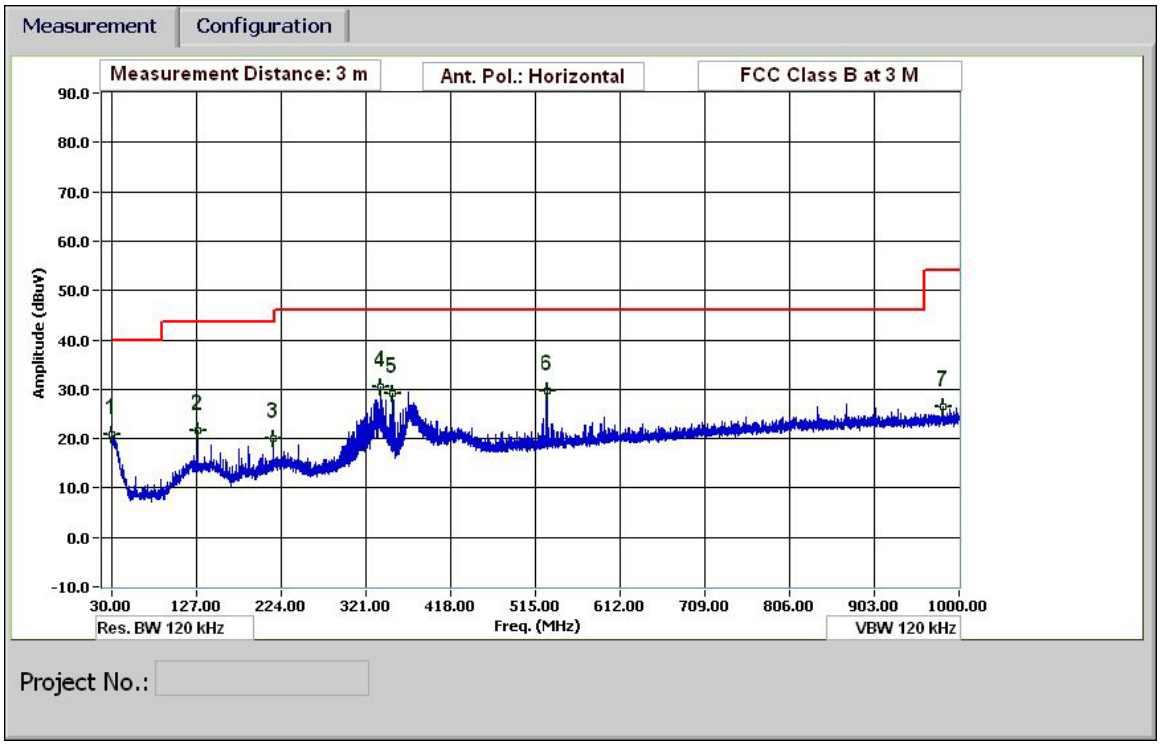
| f MHz | Dist (m) | Read dBuV | AF dB/m | CL dB | Amp dB | D Corr dB | Filter dB | Corr. dBuV/m | Limit dBuV/m | Margin dB | Ant. Pol. V/H | Det. P/A/QP | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Horizontal** | | | | | | | | | | | | | |
| 30.480 | 3.0 | 28.8 | 19.9 | 0.5 | 28.4 | 0.0 | 0.0 | 20.8 | 40.0 | -19.2 | H | P | |
| 128.884 | 3.0 | 35.7 | 13.6 | 1.1 | 28.3 | 0.0 | 0.0 | 22.0 | 43.5 | -21.5 | H | P | |
| 343.573 | 3.0 | 42.5 | 14.1 | 1.6 | 28.1 | 0.0 | 0.0 | 30.1 | 46.0 | -15.9 | H | P | |
| 937.837 | 3.0 | 34.1 | 22.1 | 2.9 | 27.8 | 0.0 | 0.0 | 31.2 | 46.0 | -14.8 | H | P | |
| 967.959 | 3.0 | 30.0 | 22.3 | 2.9 | 27.9 | 0.0 | 0.0 | 27.4 | 54.0 | -26.6 | H | P | |
| **Vertical** | | | | | | | | | | | | | |
| 31.440 | 3.0 | 29.5 | 19.5 | 0.5 | 28.4 | 0.0 | 0.0 | 21.1 | 40.0 | -18.9 | V | P | |
| 128.884 | 3.0 | 33.2 | 13.6 | 1.1 | 28.3 | 0.0 | 0.0 | 19.6 | 43.5 | -23.9 | V | P | |
| 337.933 | 3.0 | 32.9 | 14.0 | 1.6 | 28.1 | 0.0 | 0.0 | 20.4 | 46.0 | -25.6 | V | P | |
| 772.111 | 3.0 | 29.0 | 20.6 | 2.6 | 27.4 | 0.0 | 0.0 | 24.8 | 46.0 | -21.2 | V | P | |
| 983.439 | 3.0 | 31.7 | 22.4 | 3.0 | 27.9 | 0.0 | 0.0 | 29.1 | 54.0 | -24.9 | V | P | |

Rev. 1.27.09
Note: No other emissions were detected above the system noise floor.

## FOXCONN Antenna

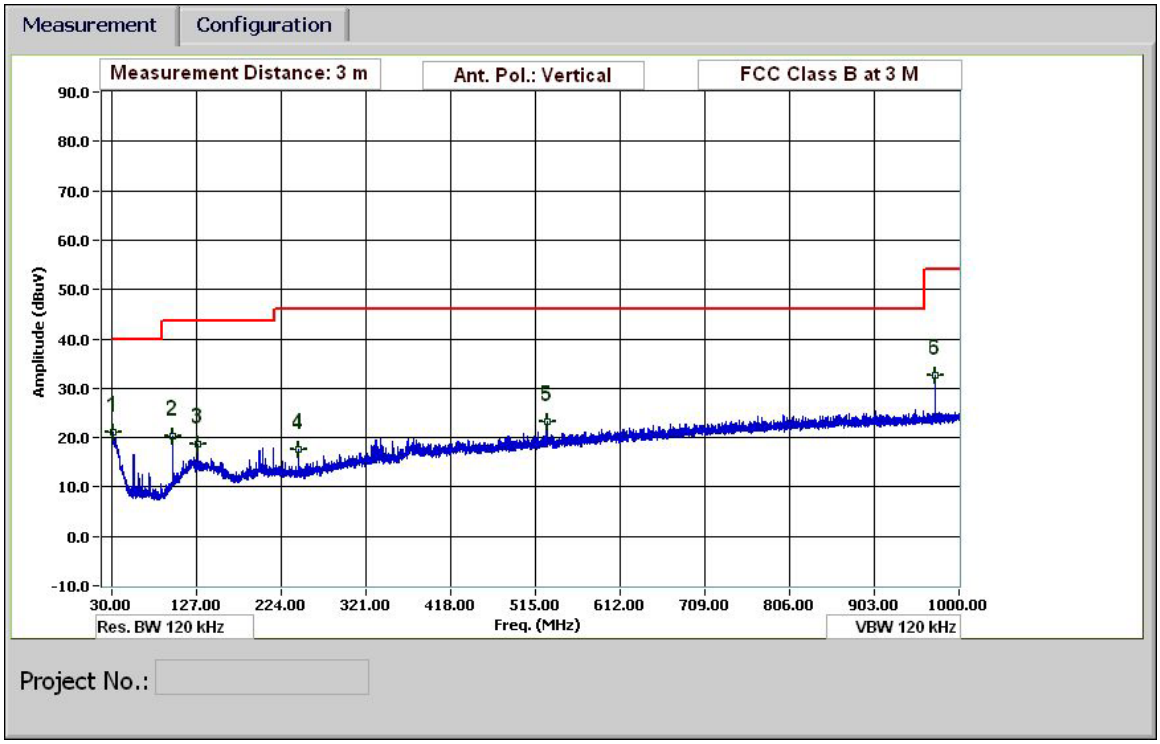
**SPURIOUS EMISSIONS 30 TO 1000 MHz (WORST-CASE CONFIGURATION, HORIZONTAL)**

HORIZONTAL PLOT



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

VERTICAL PLOT



# HORIZONTAL & VERTICAL DATA

**30-1000MHz Frequency Measurement**
**Compliance Certification Services, Fremont 5m Chamber**

**Test Engr:** Vien Tran
**Date:** 3/5/2010
**Project #:** 10J13094
**Company:** Hon Hai Precision
**EUT Description:** EUT in TWL-001 Host with Foxconn Antenna & with Battery Operation
**EUT M/N:** J27H020
**Test Target:** FCC Class B
**Mode Oper:** Transmit Worst Case

| | | | | | |
|---|---|---|---|---|---|
| f | Measurement Frequency | Amp | Preamp Gain | Margin | Margin vs. Limit |
| Dist | Distance to Antenna | D Corr | Distance Correct to 3 meters | | |
| Read | Analyzer Reading | Filter | Filter Insert Loss | | |
| AF | Antenna Factor | Corr. | Calculated Field Strength | | |
| CL | Cable Loss | Limit | Field Strength Limit | | |

| f MHz | Dist (m) | Read dBuV | AF dB/m | CL dB | Amp dB | D Corr dB | Filter dB | Corr. dBuV/m | Limit dBuV/m | Margin dB | Ant. Pol. V/H | Det. P/A/QP | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Horizontal** | | | | | | | | | | | | | |
| 30.360 | 3.0 | 28.9 | 19.9 | 0.5 | 28.4 | 0.0 | 0.0 | 21.0 | 40.0 | -19.0 | H | P | |
| 128.884 | 3.0 | 35.3 | 13.6 | 1.1 | 28.3 | 0.0 | 0.0 | 21.7 | 43.5 | -21.8 | H | P | |
| 214.808 | 3.0 | 34.9 | 11.9 | 1.3 | 28.2 | 0.0 | 0.0 | 19.9 | 43.5 | -23.6 | H | P | |
| 337.933 | 3.0 | 43.0 | 14.0 | 1.6 | 28.1 | 0.0 | 0.0 | 30.5 | 46.0 | -15.5 | H | P | |
| 351.973 | 3.0 | 41.3 | 14.2 | 1.7 | 28.1 | 0.0 | 0.0 | 29.1 | 46.0 | -16.9 | H | P | |
| 528.021 | 3.0 | 38.1 | 17.2 | 2.1 | 27.7 | 0.0 | 0.0 | 29.7 | 46.0 | -16.3 | H | P | |
| 981.999 | 3.0 | 29.0 | 22.4 | 3.0 | 27.9 | 0.0 | 0.0 | 26.4 | 54.0 | -27.6 | H | P | |
| **Vertical** | | | | | | | | | | | | | |
| 30.960 | 3.0 | 29.4 | 19.7 | 0.5 | 28.4 | 0.0 | 0.0 | 21.1 | 40.0 | -18.9 | V | P | |
| 99.603 | 3.0 | 37.9 | 9.8 | 0.9 | 28.3 | 0.0 | 0.0 | 20.3 | 43.5 | -23.2 | V | P | |
| 128.884 | 3.0 | 32.2 | 13.6 | 1.1 | 28.3 | 0.0 | 0.0 | 18.6 | 43.5 | -24.9 | V | P | |
| 243.369 | 3.0 | 32.6 | 11.8 | 1.3 | 28.2 | 0.0 | 0.0 | 17.5 | 46.0 | -28.5 | V | P | |
| 528.021 | 3.0 | 31.7 | 17.2 | 2.1 | 27.7 | 0.0 | 0.0 | 23.2 | 46.0 | -22.8 | V | P | |
| 973.119 | 3.0 | 35.2 | 22.3 | 2.9 | 27.9 | 0.0 | 0.0 | 32.5 | 54.0 | -21.5 | V | P | |

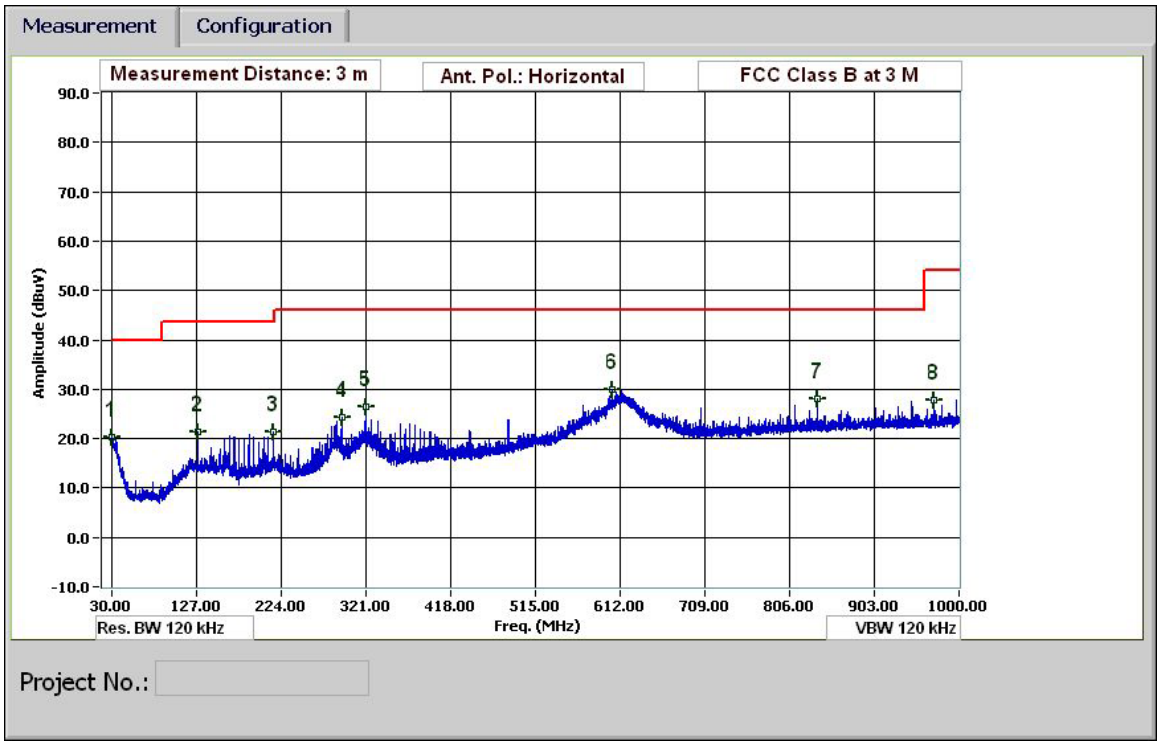
**Rev. 1.27.09**
**Note: No other emissions were detected above the system noise floor.**

***UTL-001 Host and Operated by Battery***

## FOXCONN Antenna

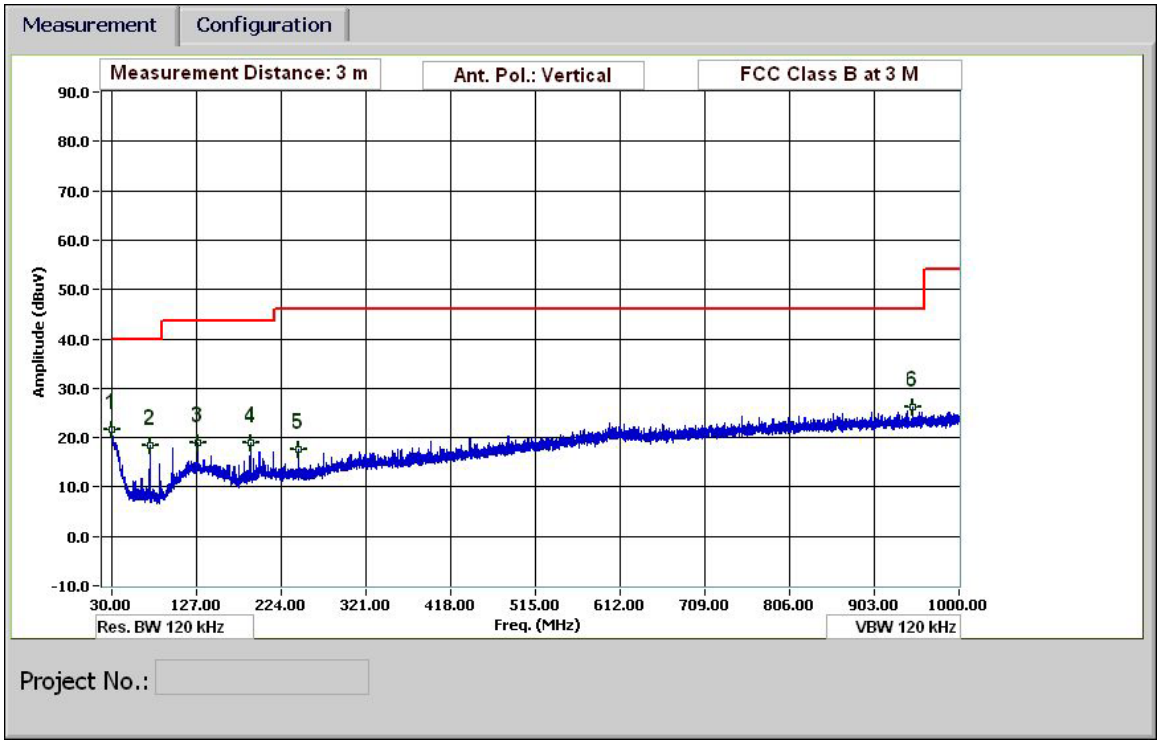
**SPURIOUS EMISSIONS 30 TO 1000 MHz (WORST-CASE CONFIGURATION, HORIZONTAL)**

HORIZONTAL PLOT



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

VERTICAL PLOT



## HORIZONTAL & VERTICAL DATA

**30-1000MHz Frequency Measurement**
**Compliance Certification Services, Fremont 5m Chamber**

**Test Engr:** Vien Tran
**Date:** 3/5/2010
**Project #:** 10J13094
**Company:** Hon Hai Precision
**EUT Description:** EUT in UTL-001 Host with Foxconn Antenna & with Battery Operation
**EUT M/N:** J27H020
**Test Target:** FCC Class B
**Mode Oper:** Transmit Worst Case

| | | | | | |
|---|---|---|---|---|---|
| f | Measurement Frequency | Amp | Preamp Gain | Margin | Margin vs. Limit |
| Dist | Distance to Antenna | D Corr | Distance Correct to 3 meters | | |
| Read | Analyzer Reading | Filter | Filter Insert Loss | | |
| AF | Antenna Factor | Corr. | Calculated Field Strength | | |
| CL | Cable Loss | Limit | Field Strength Limit | | |

| f MHz | Dist (m) | Read dBuV | AF dB/m | CL dB | Amp dB | D Corr dB | Filter dB | Corr. dBuV/m | Limit dBuV/m | Margin dB | Ant. Pol. V/H | Det. P/A/QP | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Horizontal** | | | | | | | | | | | | | |
| 30.360 | 3.0 | 28.3 | 19.9 | 0.5 | 28.4 | 0.0 | 0.0 | 20.3 | 40.0 | -19.7 | H | P | |
| 128.884 | 3.0 | 35.1 | 13.6 | 1.1 | 28.3 | 0.0 | 0.0 | 21.5 | 43.5 | -22.1 | H | P | |
| 214.808 | 3.0 | 36.3 | 11.9 | 1.3 | 28.2 | 0.0 | 0.0 | 21.3 | 43.5 | -22.2 | H | P | |
| 293.291 | 3.0 | 37.8 | 13.2 | 1.5 | 28.1 | 0.0 | 0.0 | 24.4 | 46.0 | -21.6 | H | P | |
| 321.132 | 3.0 | 39.1 | 13.7 | 1.6 | 28.1 | 0.0 | 0.0 | 26.3 | 46.0 | -19.7 | H | P | |
| 603.264 | 3.0 | 36.8 | 18.5 | 2.2 | 27.5 | 0.0 | 0.0 | 30.0 | 46.0 | -16.0 | H | P | |
| 837.873 | 3.0 | 31.5 | 21.3 | 2.7 | 27.6 | 0.0 | 0.0 | 28.0 | 46.0 | -18.0 | H | P | |
| 971.919 | 3.0 | 30.4 | 22.3 | 2.9 | 27.9 | 0.0 | 0.0 | 27.8 | 54.0 | -26.2 | H | P | |
| **Vertical** | | | | | | | | | | | | | |
| 30.480 | 3.0 | 29.7 | 19.9 | 0.5 | 28.4 | 0.0 | 0.0 | 21.6 | 40.0 | -18.4 | V | P | |
| 74.162 | 3.0 | 38.1 | 7.7 | 0.8 | 28.3 | 0.0 | 0.0 | 18.3 | 40.0 | -21.7 | V | P | |
| 128.884 | 3.0 | 32.5 | 13.6 | 1.1 | 28.3 | 0.0 | 0.0 | 18.9 | 43.5 | -24.6 | V | P | |
| 189.487 | 3.0 | 34.7 | 11.3 | 1.2 | 28.2 | 0.0 | 0.0 | 19.0 | 43.5 | -24.5 | V | P | |
| 243.369 | 3.0 | 32.6 | 11.8 | 1.3 | 28.2 | 0.0 | 0.0 | 17.6 | 46.0 | -28.4 | V | P | |
| 947.558 | 3.0 | 29.0 | 22.2 | 2.9 | 27.9 | 0.0 | 0.0 | 26.2 | 46.0 | -19.8 | V | P | |

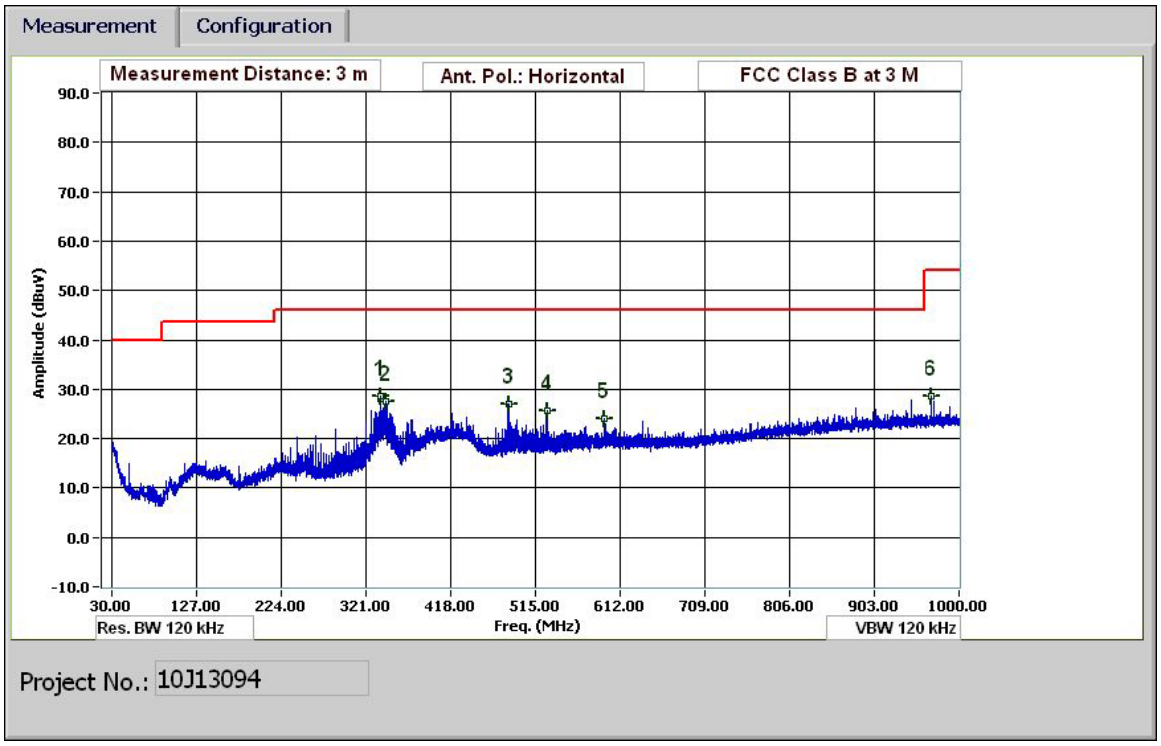
**Rev. 1.27.09**
**Note: No other emissions were detected above the system noise floor.**

***TWL-001 Host and Operated by Tabuchi AC Adapter***

**TYCO Antenna**

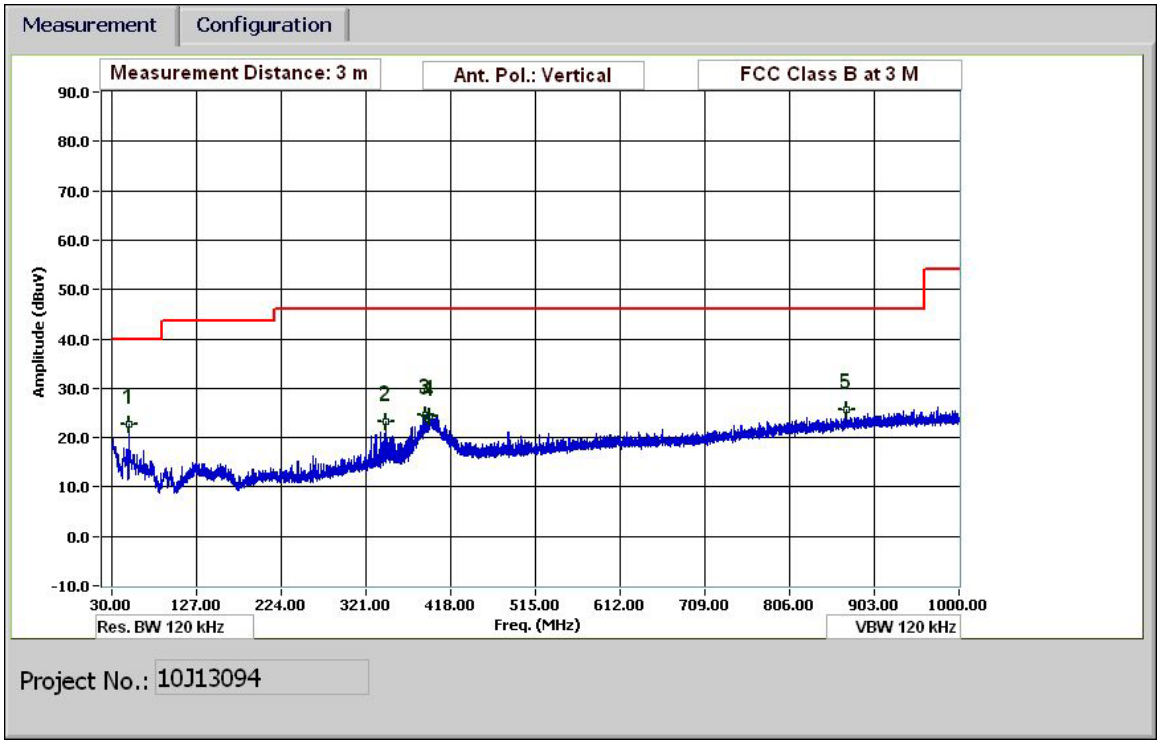
**SPURIOUS EMISSIONS 30 TO 1000 MHz (WORST-CASE CONFIGURATION, HORIZONTAL)**

HORIZONTAL PLOT



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

VERTICAL PLOT



# HORIZONTAL & VERTICAL DATA

**30-1000MHz Frequency Measurement**
**Compliance Certification Services, Fremont 5m Chamber**

**Test Engr:** Thanh Nguyen
**Date:** 3/4/2010
**Project #:** 10J13094
**Company:** Hon Hai Precision
**EUT Description:** EUT TWL-001 Tyco Antenna with Tabuchi AC/DC Adapter
**EUT M/N:** J27H020
**Test Target:** FCC Part 15.247
**Mode Oper:** Transmit worst case

| | | | | | |
|---|---|---|---|---|---|
| f | Measurement Frequency | Amp | Preamp Gain | Margin | Margin vs. Limit |
| Dist | Distance to Antenna | D Corr | Distance Correct to 3 meters | | |
| Read | Analyzer Reading | Filter | Filter Insert Loss | | |
| AF | Antenna Factor | Corr. | Calculated Field Strength | | |
| CL | Cable Loss | Limit | Field Strength Limit | | |

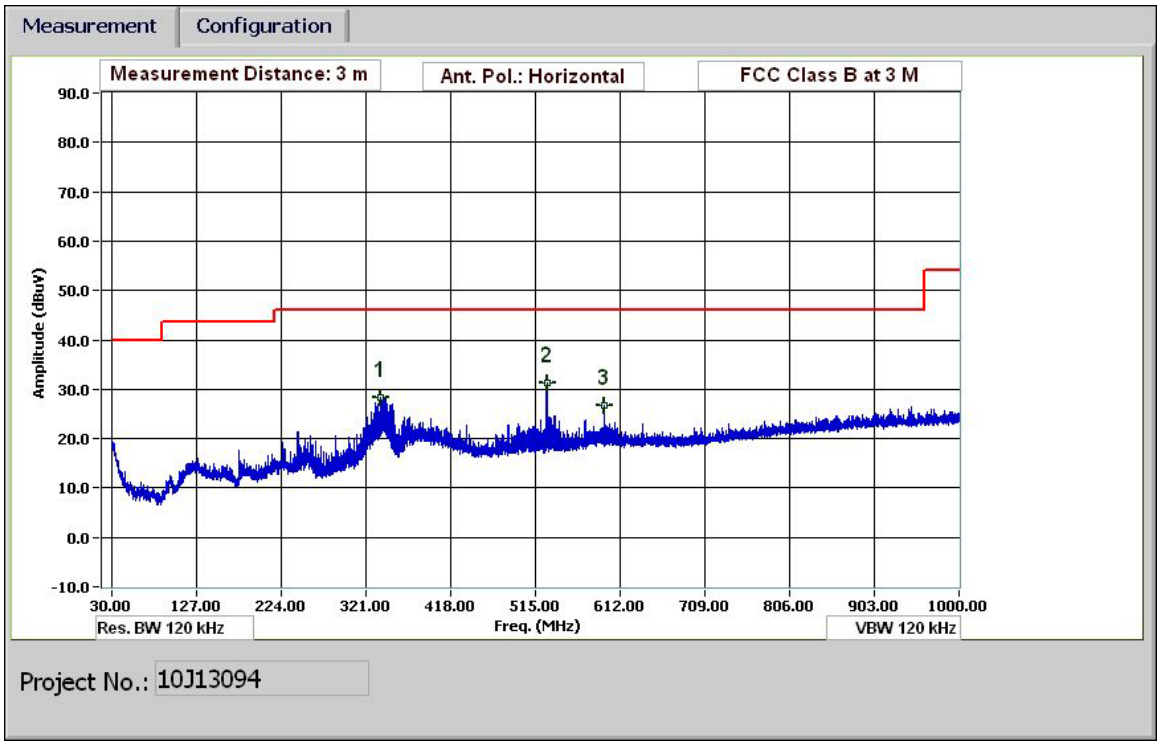
| f MHz | Dist (m) | Read dBuV | AF dB/m | CL dB | Amp dB | D Corr dB | Filter dB | Corr. dBuV/m | Limit dBuV/m | Margin dB | Ant. Pol. V/H | Det. P/A/QP | Ant. High cm | Table Angle Degree | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TWL Tyco Ant | | | | | | | | | | | | | | | Full scan |
| 50.281 | 3.0 | 41.1 | 9.3 | 0.6 | 28.3 | 0.0 | 0.0 | 22.7 | 40.0 | -17.3 | V | P | 100.0 | 0 - 360 | |
| 343.573 | 3.0 | 35.1 | 14.2 | 1.6 | 27.7 | 0.0 | 0.0 | 23.2 | 46.0 | -22.8 | V | P | 100.0 | 0 - 360 | |
| 388.815 | 3.0 | 35.9 | 14.8 | 1.7 | 27.9 | 0.0 | 0.0 | 24.5 | 46.0 | -21.5 | V | P | 100.0 | 0 - 360 | |
| 393.735 | 3.0 | 35.7 | 14.9 | 1.7 | 28.0 | 0.0 | 0.0 | 24.4 | 46.0 | -21.6 | V | P | 100.0 | 0 - 360 | |
| 871.355 | 3.0 | 29.2 | 21.7 | 2.7 | 28.0 | 0.0 | 0.0 | 25.6 | 46.0 | -20.4 | V | P | 100.0 | 0 - 360 | |
| 337.933 | 3.0 | 40.5 | 14.1 | 1.6 | 27.6 | 0.0 | 0.0 | 28.5 | 46.0 | -17.5 | H | P | 100.0 | 0 - 360 | |
| 343.573 | 3.0 | 39.4 | 14.2 | 1.6 | 27.7 | 0.0 | 0.0 | 27.4 | 46.0 | -18.6 | H | P | 100.0 | 0 - 360 | |
| 483.979 | 3.0 | 37.1 | 16.6 | 1.9 | 28.5 | 0.0 | 0.0 | 27.1 | 46.0 | -18.9 | H | P | 100.0 | 0 - 360 | |
| 528.021 | 3.0 | 34.9 | 17.3 | 2.0 | 28.6 | 0.0 | 0.0 | 25.6 | 46.0 | -20.4 | H | P | 100.0 | 0 - 360 | |
| 594.023 | 3.0 | 32.1 | 18.4 | 2.2 | 28.6 | 0.0 | 0.0 | 24.0 | 46.0 | -22.0 | H | P | 100.0 | 0 - 360 | |
| 967.959 | 3.0 | 31.0 | 22.5 | 2.8 | 27.7 | 0.0 | 0.0 | 28.7 | 54.0 | -25.3 | H | P | 100.0 | 0 - 360 | |

**Rev. 1.27.09**
**Note: No other emissions were detected above the system noise floor.**

## FOXCONN Antenna

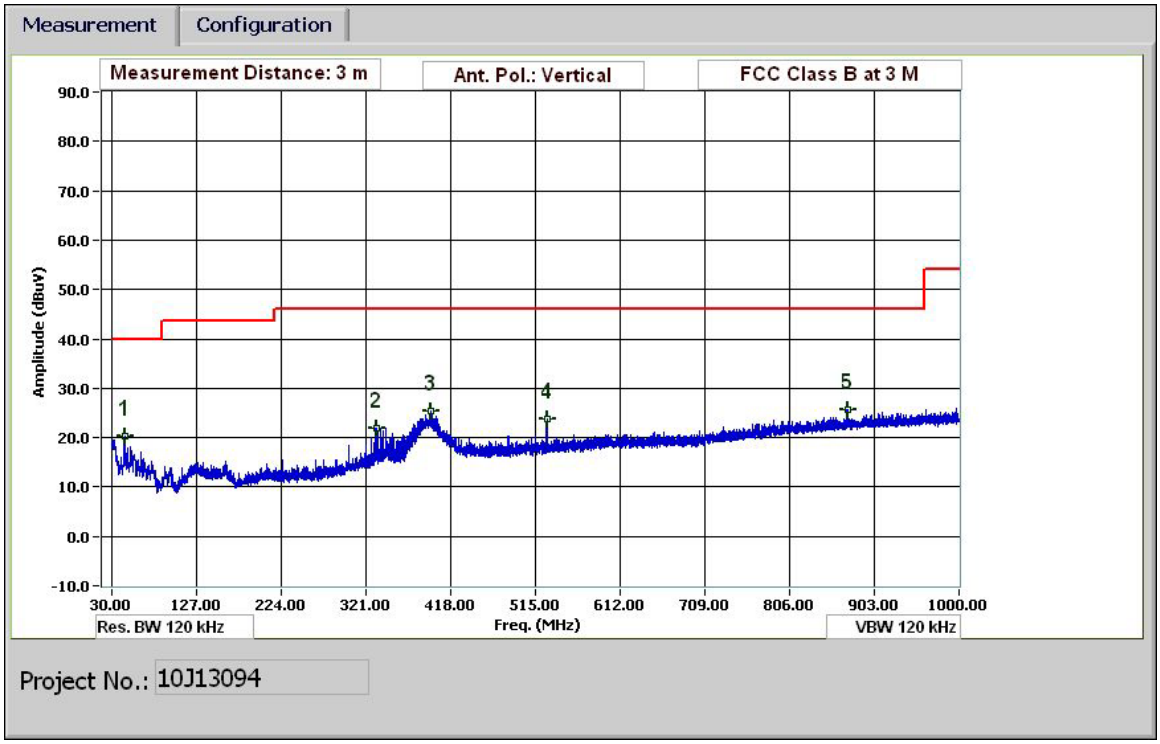
**SPURIOUS EMISSIONS 30 TO 1000 MHz (WORST-CASE CONFIGURATION, HORIZONTAL)**

HORIZONTAL PLOT



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

VERTICAL PLOT



## HORIZONTAL & VERTICAL DATA

**30-1000MHz Frequency Measurement**
**Compliance Certification Services, Fremont 5m Chamber**

**Test Engr:** Thanh Nguyen
**Date:** 3/4/2010
**Project #:** 10J13094
**Company:** Hon Hai Precision
**EUT Description:** EUT TWL-001 Foxconn Antenna with Tabuchi AC/DC Adapter
**EUT M/N:** J27H020
**Test Target:** FCC Part 15.247
**Mode Oper:** Transmit worst case

| | | | | |
|---|---|---|---|---|
| f | Measurement Frequency | Amp | Preamp Gain | Margin Margin vs. Limit |
| Dist | Distance to Antenna | D Corr | Distance Correct to 3 meters | |
| Read | Analyzer Reading | Filter | Filter Insert Loss | |
| AF | Antenna Factor | Corr. | Calculated Field Strength | |
| CL | Cable Loss | Limit | Field Strength Limit | |

| f MHz | Dist (m) | Read dBuV | AF dB/m | CL dB | Amp dB | D Corr dB | Filter dB | Corr. dBuV/m | Limit dBuV/m | Margin dB | Ant. Pol. V/H | Det. P/A/QP | Ant. High cm | Table Angle Degree | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TWL FoxAnt | | | | | | | | | | | | | | | Full Scan |
| 45.001 | 3.0 | 36.2 | 11.8 | 0.6 | 28.3 | 0.0 | 0.0 | 20.2 | 40.0 | -19.8 | V | P | 100.0 | 0 - 360 | |
| 332.412 | 3.0 | 33.9 | 14.0 | 1.6 | 27.6 | 0.0 | 0.0 | 21.9 | 46.0 | -24.1 | V | P | 100.0 | 0 - 360 | |
| 395.055 | 3.0 | 36.8 | 14.9 | 1.7 | 28.0 | 0.0 | 0.0 | 25.5 | 46.0 | -20.5 | V | P | 100.0 | 0 - 360 | |
| 528.021 | 3.0 | 33.0 | 17.3 | 2.0 | 28.6 | 0.0 | 0.0 | 23.7 | 46.0 | -22.3 | V | P | 100.0 | 0 - 360 | |
| 871.955 | 3.0 | 29.2 | 21.7 | 2.7 | 28.0 | 0.0 | 0.0 | 25.6 | 46.0 | -20.4 | V | P | 100.0 | 0 - 360 | |
| 337.933 | 3.0 | 40.4 | 14.1 | 1.6 | 27.6 | 0.0 | 0.0 | 28.4 | 46.0 | -17.6 | H | P | 100.0 | 0 - 360 | |
| 528.021 | 3.0 | 40.6 | 17.3 | 2.0 | 28.6 | 0.0 | 0.0 | 31.3 | 46.0 | -14.7 | H | P | 100.0 | 0 - 360 | |
| 594.023 | 3.0 | 34.7 | 18.4 | 2.2 | 28.6 | 0.0 | 0.0 | 26.7 | 46.0 | -19.3 | H | P | 100.0 | 0 - 360 | |

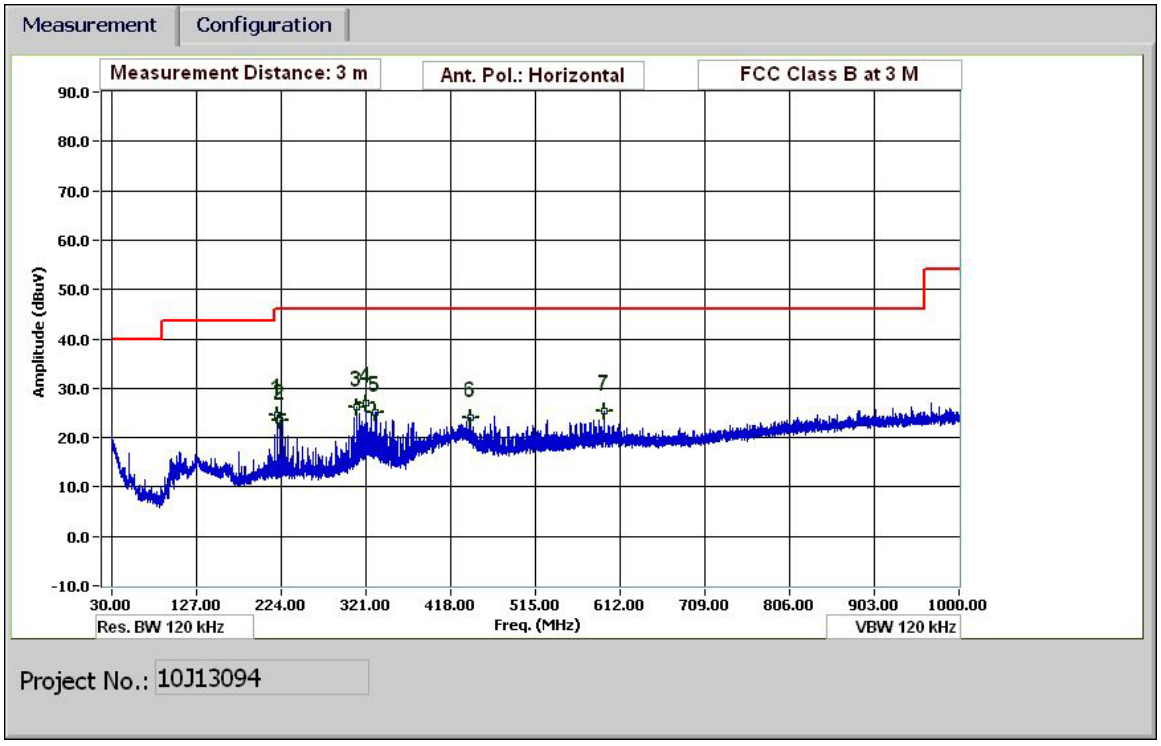
Rev. 1.27.09
Note: No other emissions were detected above the system noise floor.

***TWL-001 Host and Operated by Mitsumi AC Adapter***

**TYCO Antenna**

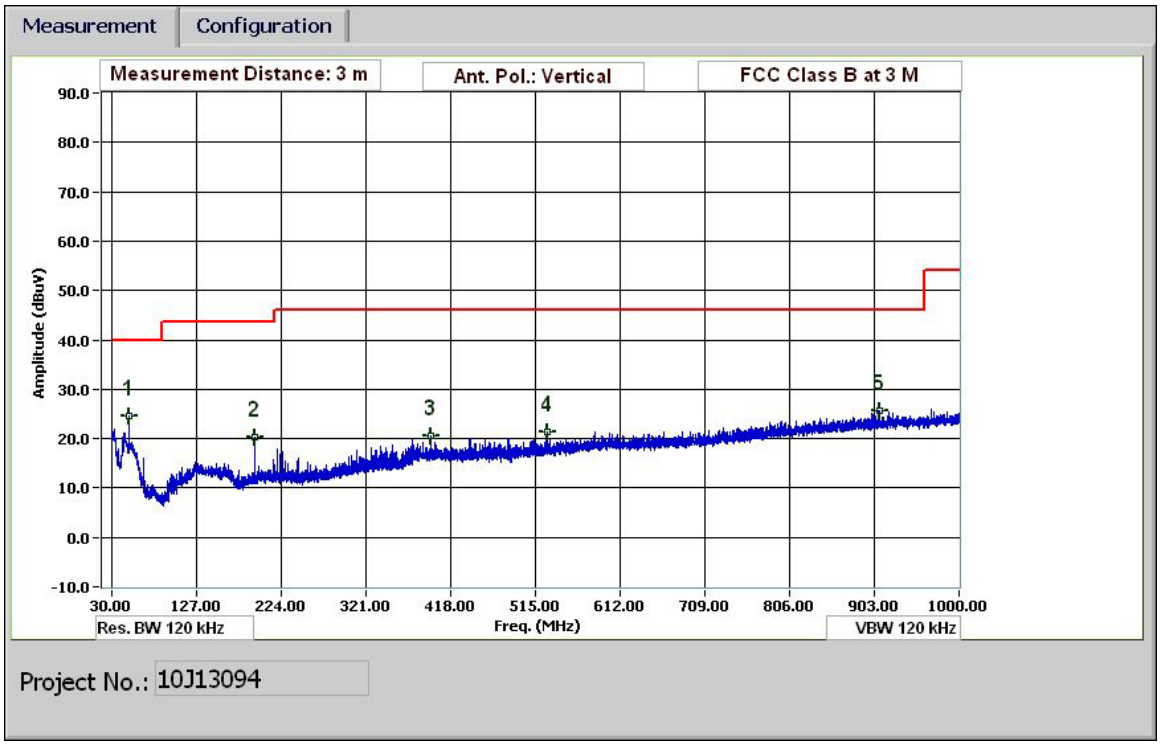
**SPURIOUS EMISSIONS 30 TO 1000 MHz (WORST-CASE CONFIGURATION, HORIZONTAL)**

HORIZONTAL PLOT



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

VERTICAL PLOT



# HORIZONTAL & VERTICAL DATA

**30-1000MHz Frequency Measurement**
**Compliance Certification Services, Fremont 5m Chamber**

**Test Engr:** Thanh Nguyen
**Date:** 3/5/2010
**Project #:** 10J13094
**Company:** Hon Hai Precision
**EUT Description:** EUT TWL-001 Tyco Antenna with Mitsui AC/DC Adapter
**EUT M/N:** J27H020
**Test Target:** FCC Part 15.247
**Mode Oper:** Transmit worst case

| | | | | | |
|---|---|---|---|---|---|
| f | Measurement Frequency | Amp | Preamp Gain | Margin | Margin vs. Limit |
| Dist | Distance to Antenna | D Corr | Distance Correct to 3 meters | | |
| Read | Analyzer Reading | Filter | Filter Insert Loss | | |
| AF | Antenna Factor | Corr. | Calculated Field Strength | | |
| CL | Cable Loss | Limit | Field Strength Limit | | |

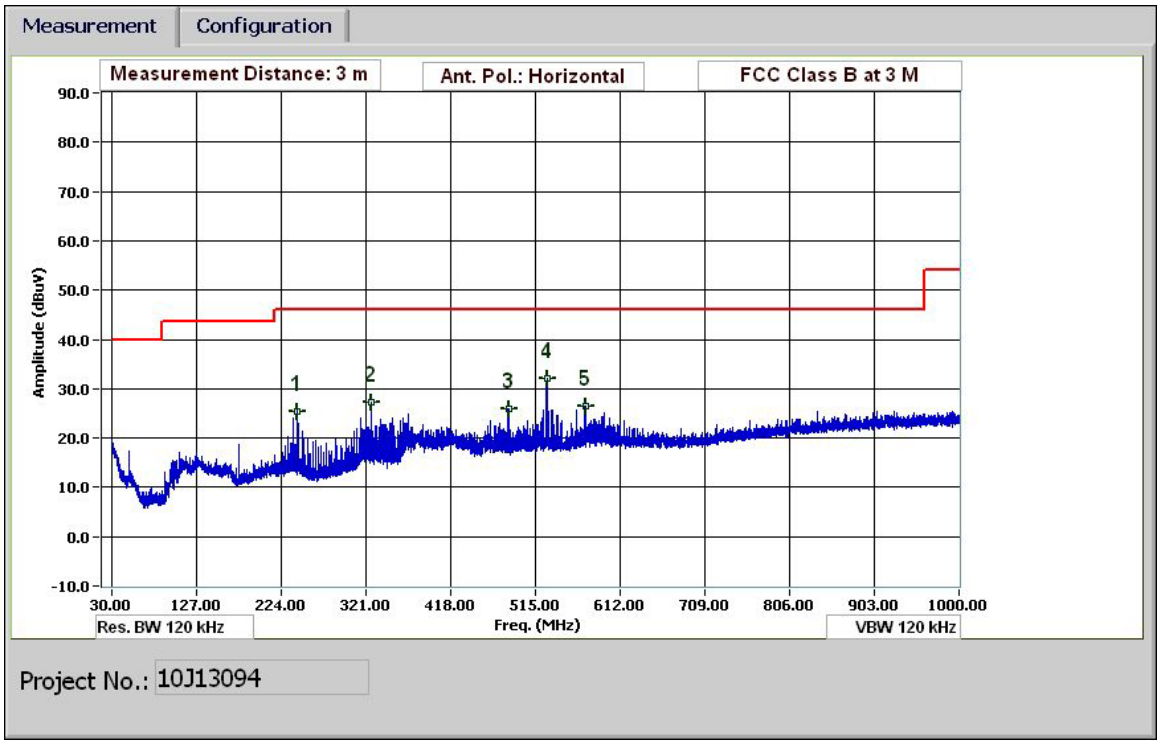
| f MHz | Dist (m) | Read dBuV | AF dB/m | CL dB | Amp dB | D Corr dB | Filter dB | Corr. dBuV/m | Limit dBuV/m | Margin dB | Ant. Pol. V/H | Det. P/A/QP | Ant. High cm | Table Angle Degree | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | Full Scan |
| 50.281 | 3.0 | 43.0 | 9.3 | 0.6 | 28.3 | 0.0 | 0.0 | 24.6 | 40.0 | -15.4 | V | P | 100.0 | 0 - 360 | |
| 193.807 | 3.0 | 34.9 | 11.5 | 1.1 | 27.4 | 0.0 | 0.0 | 20.2 | 43.5 | -23.3 | V | P | 100.0 | 0 - 360 | |
| 396.015 | 3.0 | 31.9 | 15.0 | 1.7 | 28.0 | 0.0 | 0.0 | 20.6 | 46.0 | -25.4 | V | P | 100.0 | 0 - 360 | |
| 528.021 | 3.0 | 30.6 | 17.3 | 2.0 | 28.6 | 0.0 | 0.0 | 21.3 | 46.0 | -24.7 | V | P | 100.0 | 0 - 360 | |
| 908.316 | 3.0 | 28.6 | 22.1 | 2.7 | 27.8 | 0.0 | 0.0 | 25.6 | 46.0 | -20.4 | V | P | 100.0 | 0 - 360 | |
| 222.008 | 3.0 | 37.9 | 11.9 | 1.2 | 27.4 | 0.0 | 0.0 | 23.6 | 46.0 | -22.4 | H | P | 100.0 | 0 - 360 | |
| 309.972 | 3.0 | 38.4 | 13.7 | 1.5 | 27.5 | 0.0 | 0.0 | 26.1 | 46.0 | -19.9 | H | P | 100.0 | 0 - 360 | |
| 321.132 | 3.0 | 39.1 | 13.8 | 1.5 | 27.5 | 0.0 | 0.0 | 26.9 | 46.0 | -19.1 | H | P | 100.0 | 0 - 360 | |
| 332.292 | 3.0 | 37.0 | 14.0 | 1.6 | 27.6 | 0.0 | 0.0 | 25.0 | 46.0 | -21.0 | H | P | 100.0 | 0 - 360 | |
| 440.057 | 3.0 | 34.8 | 15.7 | 1.8 | 28.3 | 0.0 | 0.0 | 24.1 | 46.0 | -21.9 | H | P | 100.0 | 0 - 360 | |
| 594.023 | 3.0 | 33.4 | 18.4 | 2.2 | 28.6 | 0.0 | 0.0 | 25.4 | 46.0 | -20.6 | H | P | 100.0 | 0 - 360 | |

**Rev. 1.27.09**
**Note: No other emissions were detected above the system noise floor.**

## FOXCONN Antenna

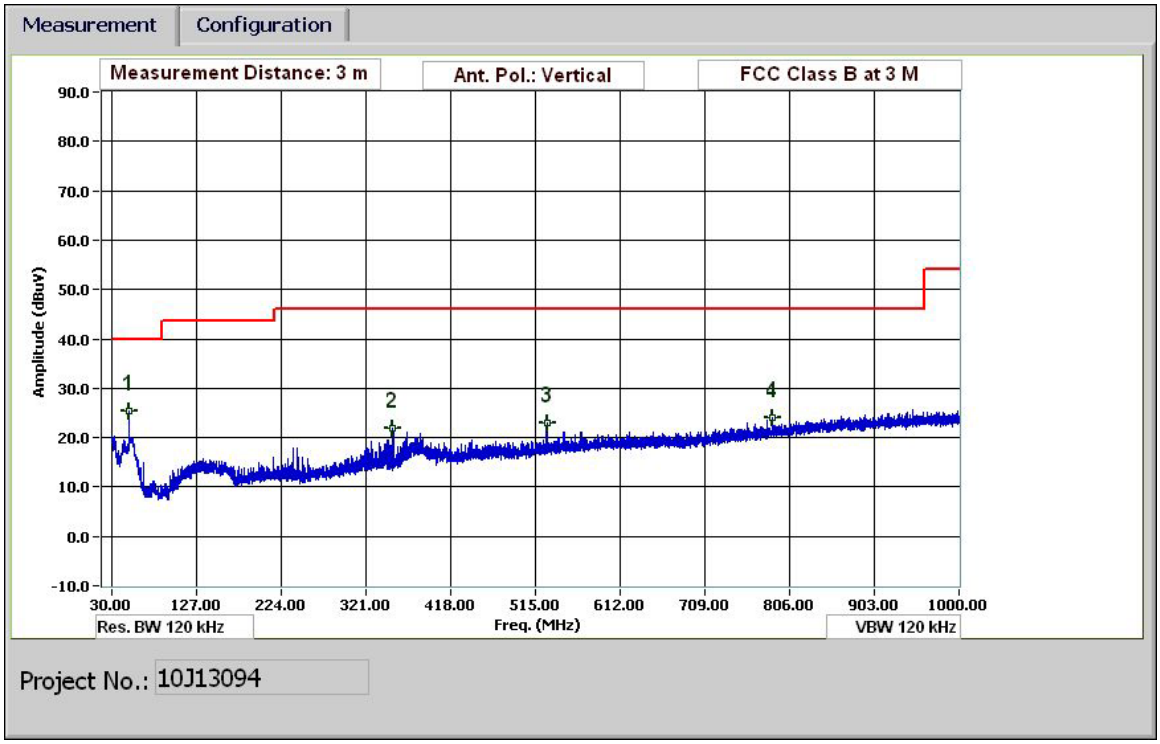
**SPURIOUS EMISSIONS 30 TO 1000 MHz (WORST-CASE CONFIGURATION, HORIZONTAL)**

HORIZONTAL PLOT



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

VERTICAL PLOT



# HORIZONTAL & VERTICAL DATA

**30-1000MHz Frequency Measurement**
**Compliance Certification Services, Fremont 5m Chamber**

**Test Engr:** Thanh Nguyen
**Date:** 3/5/2010
**Project #:** 10J13094
**Company:** Hon Hai Precision
**EUT Description:** EUT TWL-001 Foxconn Antenna with Mitsumi AC/DC Adapter
**EUT M/N:** J27H020
**Test Target:** FCC Part 15.247
**Mode Oper:** Transmit worst case

| | | | | | |
|---|---|---|---|---|---|
| f | Measurement Frequency | Amp | Preamp Gain | Margin | Margin vs. Limit |
| Dist | Distance to Antenna | D Corr | Distance Correct to 3 meters | | |
| Read | Analyzer Reading | Filter | Filter Insert Loss | | |
| AF | Antenna Factor | Corr. | Calculated Field Strength | | |
| CL | Cable Loss | Limit | Field Strength Limit | | |

| f MHz | Dist (m) | Read dBuV | AF dB/m | CL dB | Amp dB | D Corr dB | Filter dB | Corr. dBuV/m | Limit dBuV/m | Margin dB | Ant. Pol. V/H | Det. P/A/QP | Ant. High cm | Table Angle Degree | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | Full Scan |
| 50.281 | 3.0 | 43.8 | 9.3 | 0.6 | 28.3 | 0.0 | 0.0 | 25.3 | 40.0 | -14.7 | V | P | 100.0 | 0 - 360 | |
| 351.973 | 3.0 | 33.8 | 14.3 | 1.6 | 27.7 | 0.0 | 0.0 | 22.0 | 46.0 | -24.0 | V | P | 100.0 | 0 - 360 | |
| 528.021 | 3.0 | 32.1 | 17.3 | 2.0 | 28.6 | 0.0 | 0.0 | 22.8 | 46.0 | -23.2 | V | P | 100.0 | 0 - 360 | |
| 786.391 | 3.0 | 29.2 | 20.6 | 2.5 | 28.2 | 0.0 | 0.0 | 24.1 | 46.0 | -21.9 | V | P | 100.0 | 0 - 360 | |
| 241.929 | 3.0 | 39.6 | 11.8 | 1.3 | 27.4 | 0.0 | 0.0 | 25.3 | 46.0 | -20.7 | H | P | 100.0 | 0 - 360 | |
| 326.772 | 3.0 | 39.3 | 13.9 | 1.6 | 27.6 | 0.0 | 0.0 | 27.2 | 46.0 | -18.8 | H | P | 100.0 | 0 - 360 | |
| 483.979 | 3.0 | 36.0 | 16.6 | 1.9 | 28.5 | 0.0 | 0.0 | 26.0 | 46.0 | -20.0 | H | P | 100.0 | 0 - 360 | |
| 528.021 | 3.0 | 41.3 | 17.3 | 2.0 | 28.6 | 0.0 | 0.0 | 32.0 | 46.0 | -14.0 | H | P | 100.0 | 0 - 360 | |
| 571.942 | 3.0 | 34.8 | 18.0 | 2.1 | 28.6 | 0.0 | 0.0 | 26.3 | 46.0 | -19.7 | H | P | 100.0 | 0 - 360 | |

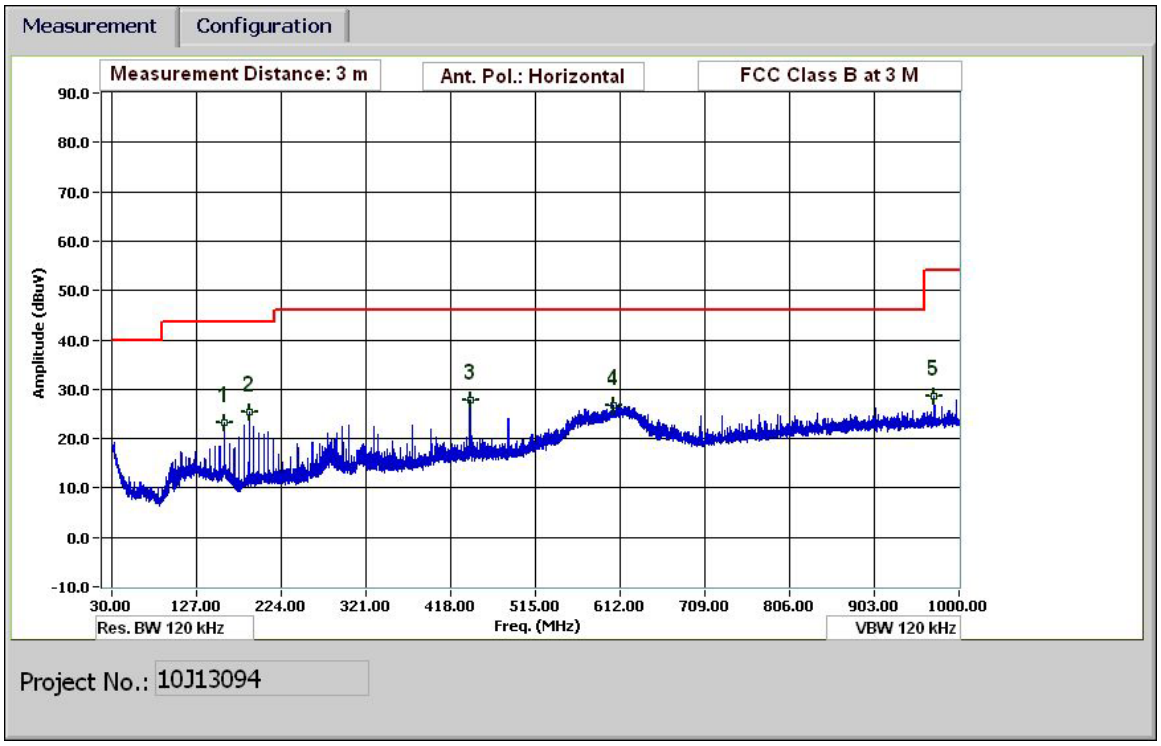
Rev. 1.27.09
Note: No other emissions were detected above the system noise floor.

***UTL-001 Host and Operated by Tabuchi AC Adapter***

**FOXCONN Antenna**

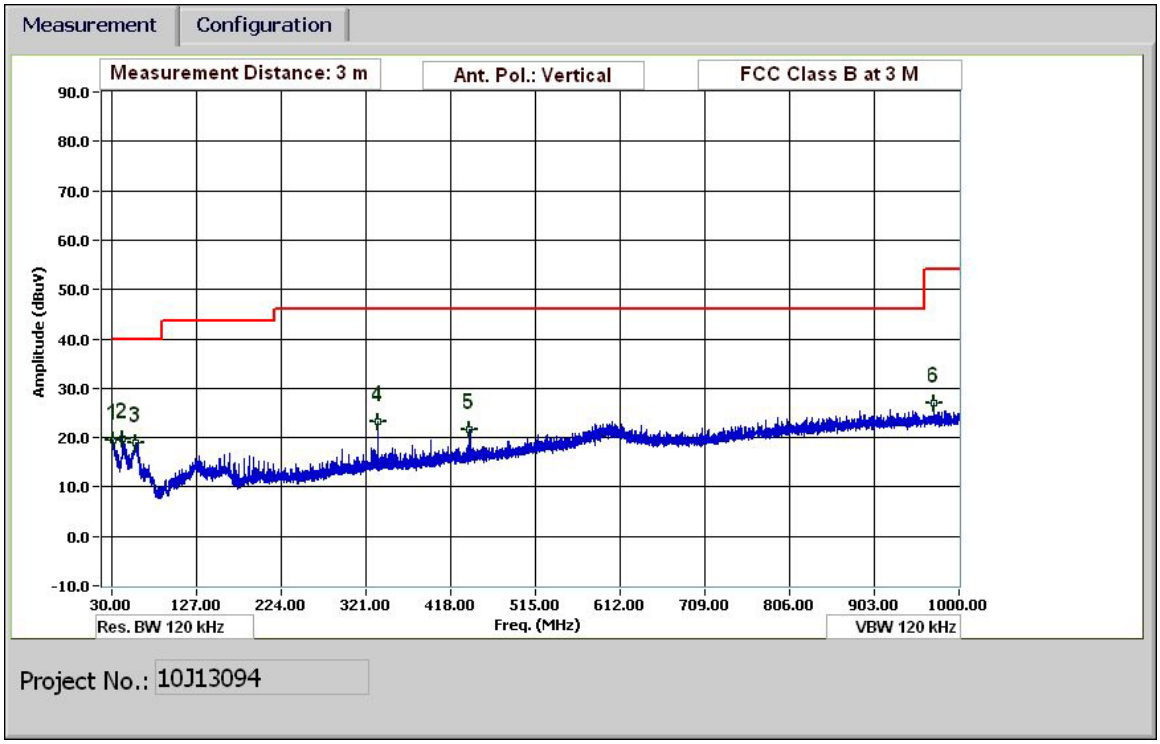
**SPURIOUS EMISSIONS 30 TO 1000 MHz (WORST-CASE CONFIGURATION, HORIZONTAL)**

HORIZONTAL PLOT



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

VERTICAL PLOT



# HORIZONTAL & VERTICAL DATA

**30-1000MHz Frequency Measurement**
**Compliance Certification Services, Fremont 5m Chamber**

**Test Engr:** Thanh Nguyen
**Date:** 03/04/10
**Project #:** 10J13094
**Company:** Hon Hai Precision
**EUT Description:** Game machine UIL-001 with FoxConn Antenna.
**EUT M/N:** 2J27H020
**Test Target:** FCC Part 15.247
**Mode Oper:** Transmit Worst Case With Tabuchi AC Adapter

| | | | | | |
|---|---|---|---|---|---|
| f | Measurement Frequency | Amp | Preamp Gain | Margin | Margin vs. Limit |
| Dist | Distance to Antenna | D Corr | Distance Correct to 3 meters | | |
| Read | Analyzer Reading | Filter | Filter Insert Loss | | |
| AF | Antenna Factor | Corr. | Calculated Field Strength | | |
| CL | Cable Loss | Limit | Field Strength Limit | | |

| f MHz | Dist (m) | Read dBuV | AF dB/m | CL dB | Amp dB | D Corr dB | Filter dB | Corr. dBuV/m | Limit dBuV/m | Margin dB | Ant. Pol. V/H | Det. P/A/QP | Ant. High cm | Table Angle Degree | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| UTL-001 | | | | | | | | | | | | | | | Full Scan |
| 54.961 | 3.0 | 39.6 | 8.6 | 0.6 | 28.3 | 0.0 | 0.0 | 20.6 | 40.0 | -19.4 | V | P | 100.0 | 0 - 360 | |
| 159.245 | 3.0 | 33.0 | 13.2 | 1.1 | 27.7 | 0.0 | 0.0 | 19.5 | 43.5 | -24.0 | V | P | 100.0 | 0 - 360 | |
| 187.086 | 3.0 | 33.5 | 11.1 | 1.1 | 27.4 | 0.0 | 0.0 | 18.3 | 43.5 | -25.2 | V | P | 100.0 | 0 - 360 | |
| 440.057 | 3.0 | 33.0 | 15.7 | 1.8 | 28.3 | 0.0 | 0.0 | 22.3 | 46.0 | -23.7 | V | P | 100.0 | 0 - 360 | |
| 603.264 | 3.0 | 32.3 | 18.5 | 2.2 | 28.6 | 0.0 | 0.0 | 24.4 | 46.0 | -21.6 | V | P | 100.0 | 0 - 360 | |
| 841.593 | 3.0 | 29.1 | 21.4 | 2.6 | 28.1 | 0.0 | 0.0 | 25.0 | 46.0 | -21.0 | V | P | 100.0 | 0 - 360 | |
| 159.245 | 3.0 | 36.8 | 13.2 | 1.1 | 27.7 | 0.0 | 0.0 | 23.3 | 43.5 | -20.2 | H | P | 100.0 | 0 - 360 | |
| 187.086 | 3.0 | 40.6 | 11.1 | 1.1 | 27.4 | 0.0 | 0.0 | 25.5 | 43.5 | -18.0 | H | P | 100.0 | 0 - 360 | |
| 440.057 | 3.0 | 38.6 | 15.7 | 1.8 | 28.3 | 0.0 | 0.0 | 27.9 | 46.0 | -18.1 | H | P | 100.0 | 0 - 360 | |
| 604.464 | 3.0 | 34.7 | 18.5 | 2.2 | 28.6 | 0.0 | 0.0 | 26.8 | 46.0 | -19.2 | H | P | 100.0 | 0 - 360 | |
| 971.919 | 3.0 | 30.8 | 22.5 | 2.9 | 27.7 | 0.0 | 0.0 | 28.5 | 54.0 | -25.5 | H | P | 100.0 | 0 - 360 | |

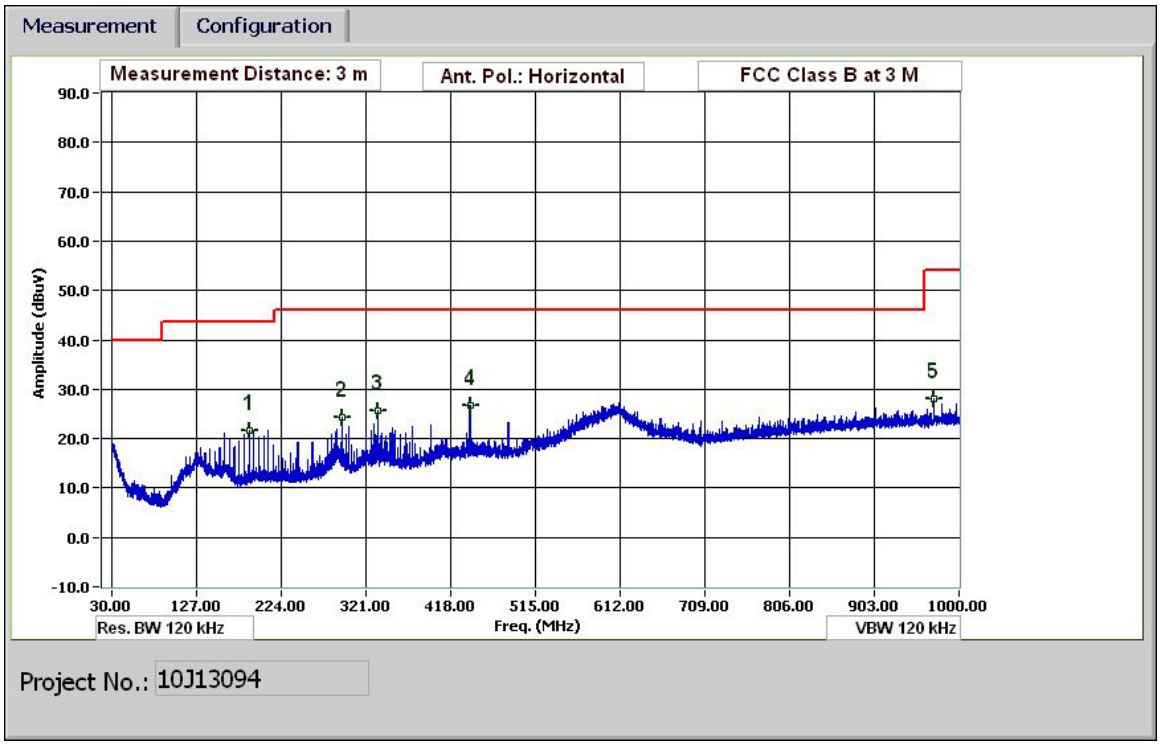
Rev. 1.27.09
Note: No other emissions were detected above the system noise floor.

***UTL-001 Host and Operated by Mitsumi AC Adapter***

**FOXCONN Antenna**

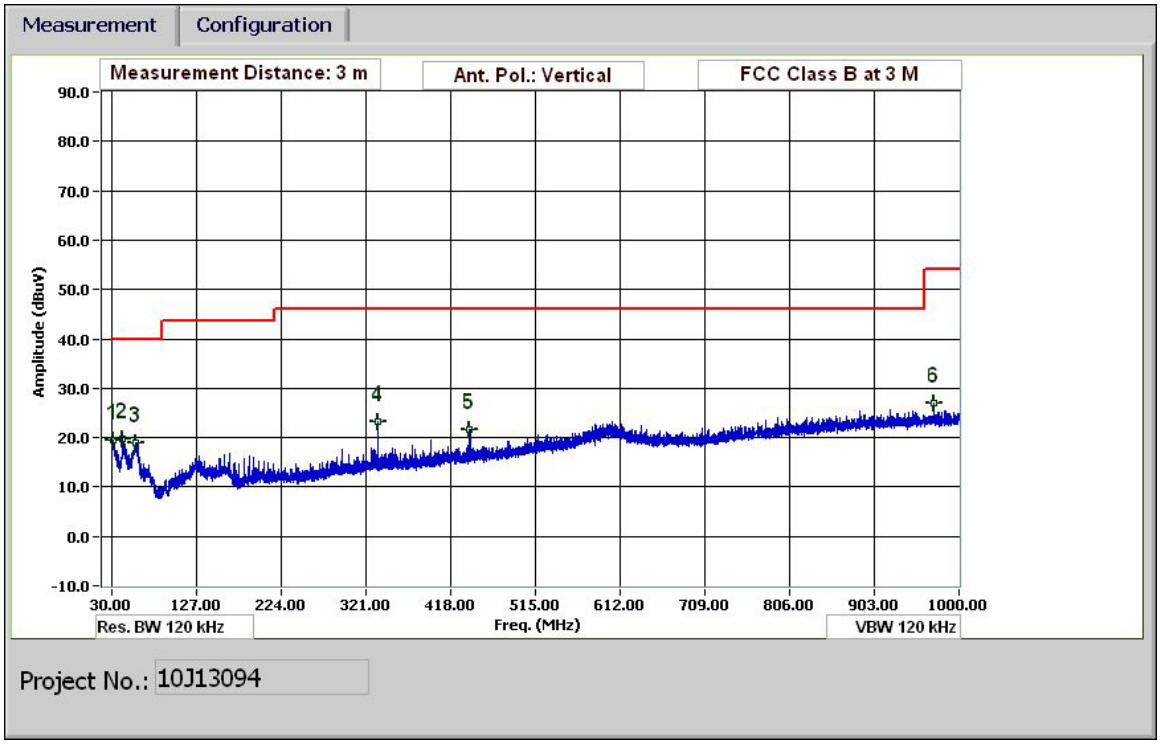
**SPURIOUS EMISSIONS 30 TO 1000 MHz (WORST-CASE CONFIGURATION, HORIZONTAL)**

HORIZONTAL PLOT



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

VERTICAL PLOT



# HORIZONTAL & VERTICAL DATA

**30-1000MHz Frequency Measurement**
**Compliance Certification Services, Fremont 5m Chamber**

**Test Engr:** Thanh Nguyen
**Date:** 03/04/10
**Project #:** 10J13094
**Company:** Hon Hai Precision
**EUT Description:** Game machine with Mitsumi AC Adapter
**EUT M/N:** 2J27H020
**Test Target:** FCC Part 15.247
**Mode Oper:** Transmit Worst Case.

| | | | | | |
|---|---|---|---|---|---|
| f | Measurement Frequency | Amp | Preamp Gain | Margin | Margin vs. Limit |
| Dist | Distance to Antenna | D Corr | Distance Correct to 3 meters | | |
| Read | Analyzer Reading | Filter | Filter Insert Loss | | |
| AF | Antenna Factor | Corr. | Calculated Field Strength | | |
| CL | Cable Loss | Limit | Field Strength Limit | | |

| f MHz | Dist (m) | Read dBuV | AF dB/m | CL dB | Amp dB | D Corr dB | Filter dB | Corr. dBuV/m | Limit dBuV/m | Margin dB | Ant. Pol. V/H | Det. P/A/QP | Ant. High cm | Table Angle Degree | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| UTL-001 | | | | | | | | | | | | | | | Full Scan |
| 31.080 | 3.0 | 28.0 | 19.5 | 0.5 | 28.4 | 0.0 | 0.0 | 19.5 | 40.0 | -20.5 | V | P | 100.0 | 0 - 360 | |
| 41.880 | 3.0 | 35.0 | 12.7 | 0.6 | 28.4 | 0.0 | 0.0 | 19.9 | 40.0 | -20.1 | V | P | 100.0 | 0 - 360 | |
| 56.761 | 3.0 | 38.2 | 8.4 | 0.6 | 28.3 | 0.0 | 0.0 | 18.9 | 40.0 | -21.1 | V | P | 100.0 | 0 - 360 | |
| 335.173 | 3.0 | 35.1 | 14.0 | 1.6 | 27.6 | 0.0 | 0.0 | 23.1 | 46.0 | -22.9 | V | P | 100.0 | 0 - 360 | |
| 439.937 | 3.0 | 32.2 | 15.7 | 1.8 | 28.3 | 0.0 | 0.0 | 21.5 | 46.0 | -24.5 | V | P | 100.0 | 0 - 360 | |
| 971.919 | 3.0 | 29.4 | 22.5 | 2.9 | 27.7 | 0.0 | 0.0 | 27.1 | 54.0 | -26.9 | V | P | 100.0 | 0 - 360 | |
| 187.086 | 3.0 | 36.9 | 11.1 | 1.1 | 27.4 | 0.0 | 0.0 | 21.7 | 43.5 | -21.8 | H | P | 100.0 | 0 - 360 | |
| 293.291 | 3.0 | 37.1 | 13.3 | 1.5 | 27.4 | 0.0 | 0.0 | 24.4 | 46.0 | -21.6 | H | P | 100.0 | 0 - 360 | |
| 335.173 | 3.0 | 37.6 | 14.0 | 1.6 | 27.6 | 0.0 | 0.0 | 25.6 | 46.0 | -20.4 | H | P | 100.0 | 0 - 360 | |
| 440.057 | 3.0 | 37.5 | 15.7 | 1.8 | 28.3 | 0.0 | 0.0 | 26.8 | 46.0 | -19.2 | H | P | 100.0 | 0 - 360 | |
| 971.919 | 3.0 | 30.5 | 22.5 | 2.9 | 27.7 | 0.0 | 0.0 | 28.2 | 54.0 | -25.8 | H | P | 100.0 | 0 - 360 | |

Rev. 1.27.09
Note: No other emissions were detected above the system noise floor.

# 9. AC POWER LINE CONDUCTED EMISSIONS

**LIMITS**

FCC §15.207 (a)

RSS-Gen 7.2.2

| 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**

ANSI C63.4

**RESULTS**

**TABUCHI AC ADAPTER, *EUT in UTL-001 HOST with FOXCONN ANTENNA***

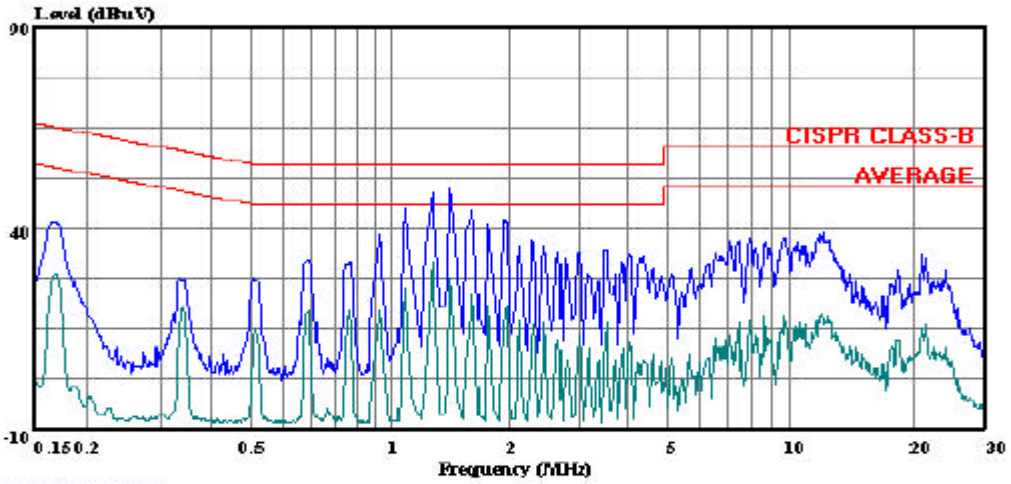
## 6 WORST EMISSIONS

| 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 |
| 0.17 | 41.53 | -- | 28.73 | 0.00 | 65.01 | 55.01 | -23.48 | -26.28 | L1 |
| 1.37 | 48.87 | -- | 31.73 | 0.00 | 56.00 | 46.00 | -7.13 | -14.27 | L1 |
| 1.52 | 49.83 | -- | 27.61 | 0.00 | 56.00 | 46.00 | -6.17 | -18.39 | L1 |
| 0.18 | 46.42 | -- | 39.69 | 0.00 | 64.63 | 54.63 | -18.21 | -14.94 | L2 |
| 1.23 | 50.12 | -- | 34.06 | 0.00 | 56.00 | 46.00 | -5.88 | -11.94 | L2 |
| 2.13 | 52.04 | -- | 33.50 | 0.00 | 56.00 | 46.00 | -3.96 | -12.50 | L2 |
| 6 Worst Data | | | | | | | | | |

**LINE 1 RESULTS**

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

Data#: 35 File#: 10j13094.emi Date: 03-05-2010 Time: 11:46:24




(Line Conduction)

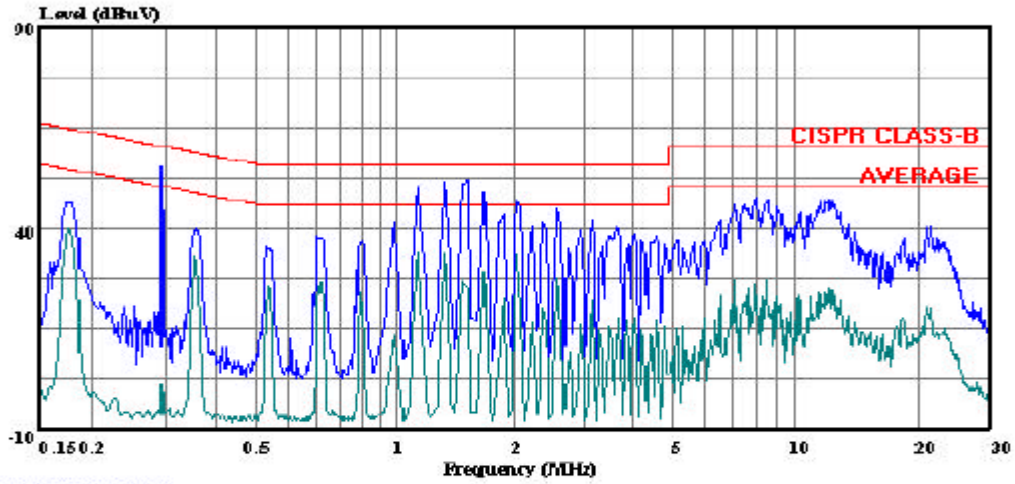
Trace: 33 Ref Trace:

Condition: CISPR CLASS-B
Test Operator: : Chin Pang
Project #: : 10J13094
Company: : Hon Hai
EUT Description:: 03 WiFi Module Portable game machine
: Foxconn( Dipole Antenna) UTL-001 with
: Tabuchi AC Adapter
Mode: : TX( Worst Case)
Target: : FCC 15 Class B
Voltage: : 115V 60Hz
: L1: Peak(Blue); Average (Green)

**LINE 2 RESULTS**

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

Data#: 42 File#: 10j13094.emi Date: 03-05-2010 Time: 11:54:43




(Line Conduction)

Trace: 40 Ref Trace:

Condition: CISPR CLASS-B
Test Operator: : Chin Pang
Project #: : 10J13094
Company: : Hon Hai
EUT Description:: 03 WiFi Module Portable game machine
: Foxconn( Dipole Antenna) UTL-001 with
: Tabuchi AC Adapter
Mode: : TX( Worst Case)
Target: : FCC 15 Class B
Voltage: : 115V 60Hz
: L2: Peak(Blue); Average (Green)

**MITSUMI AC ADAPTER, *EUT in TWL-001 HOST with TYCO ANTENNA***

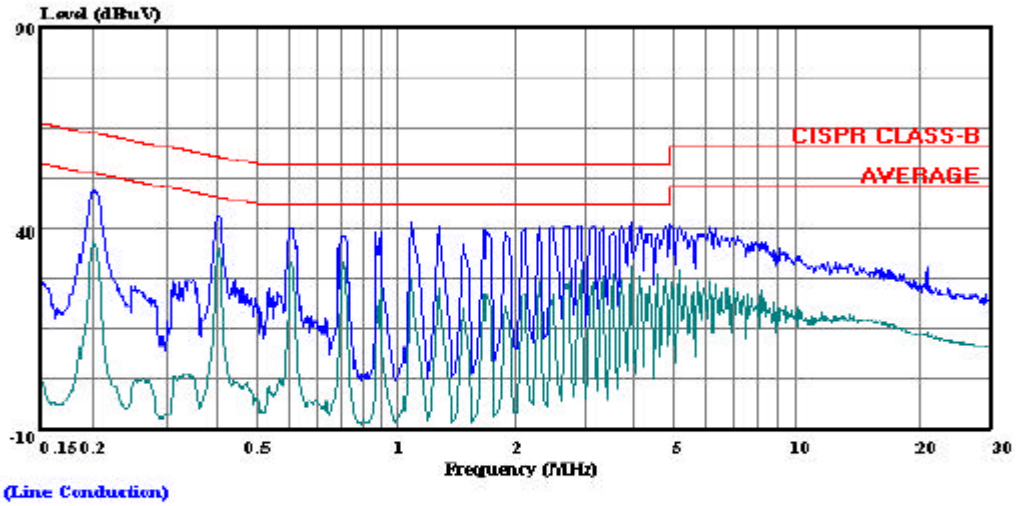
## 6 WORST EMISSIONS

| 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 |
| 0.20 | 48.97 | -- | 36.74 | 0.00 | 63.61 | 53.61 | -14.64 | -16.87 | L1 |
| 0.40 | 42.82 | -- | 35.00 | 0.00 | 57.77 | 47.77 | -14.95 | -12.77 | L1 |
| 0.08 | 38.10 | -- | 31.59 | 0.00 | 71.13 | 61.13 | -33.03 | -29.54 | L1 |
| 0.20 | 48.81 | -- | 35.87 | 0.00 | 63.45 | 53.45 | -14.64 | -17.58 | L2 |
| 0.41 | 41.52 | -- | 33.90 | 0.00 | 57.69 | 47.69 | -16.17 | -13.79 | L2 |
| 2.62 | 43.22 | -- | 29.33 | 0.00 | 56.00 | 46.00 | -12.78 | -16.67 | L2 |
| 6 Worst Data | | | | | | | | | |

**LINE 1 RESULTS**

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

Data#: 7 File#: 10j13094.emi Date: 03-05-2010 Time: 11:11:24



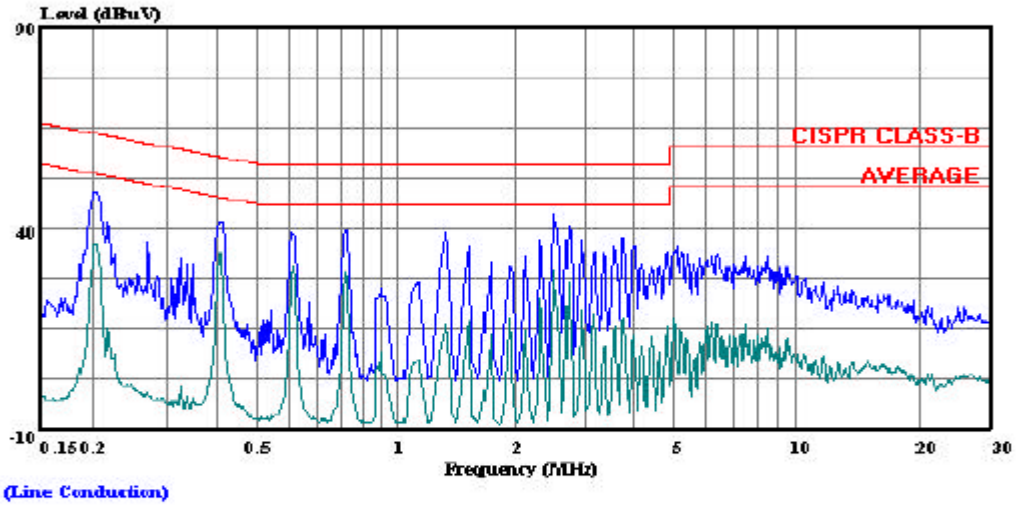

Trace: 5 Ref Trace:

Condition: CISPR CLASS-B
Test Operator: : Chin Pang
Project #: : 10J13094
Company: : Hon Hai
EUT Description:: 03 WiFi Module in Portable Game Machine
: Tyco ( PiFa Antenna) with Mitsumi AC
: Adapter
Mode: : TX( Worst Case)
Target: : FCC 15 Class B
Voltage: : 115V 60Hz
: L1: Peak(Blue); Average (Green)

**LINE 2 RESULTS**

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

Data#: 14 File#: 10j13094.emi Date: 03-05-2010 Time: 11:17:16




(Line Conduction)

Trace: 12 Ref Trace:

Condition: CISPR CLASS-B
Test Operator: : Chin Pang
Project #: : 10J13094
Company: : Hon Hai
EUT Description:: 03 WiFi Module Portable game machine
: Tyco ( PiFa Antenna) with Mitsumi AC
: Adapter
Mode: : TX( Worst Case)
Target: : FCC 15 Class B
Voltage: : 115V 60Hz
: L2: Peak(Blue); Average (Green)

**TABUCHI AC ADAPTER, *EUT in TWL-001 HOST with FOXCONN ANTENNA***

## 6 WORST EMISSIONS

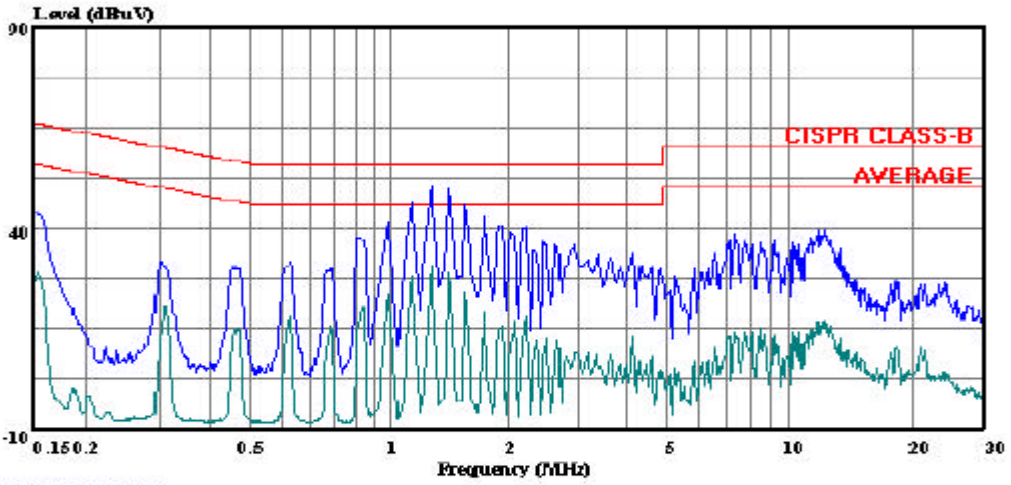
CONDUCTED EMISSIONS DATA (115VAC 60Hz)

| 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 | 43.51 | -- | 29.00 | 0.00 | 65.84 | 55.84 | -22.33 | -26.84 | L1 |
| 1.37 | 50.47 | -- | 30.81 | 0.00 | 56.00 | 46.00 | -5.53 | -15.19 | L1 |
| 1.52 | 49.73 | -- | 29.13 | 0.00 | 56.00 | 46.00 | -6.27 | -16.87 | L1 |
| 0.15 | 46.81 | -- | 38.91 | 0.00 | 65.84 | 55.84 | -19.03 | -16.93 | L2 |
| 1.37 | 52.91 | -- | 30.35 | 0.00 | 56.00 | 46.00 | -3.09 | -15.65 | L2 |
| 1.52 | 52.61 | -- | 29.45 | 0.00 | 56.00 | 46.00 | -3.39 | -16.55 | L2 |
| 6 Worst Data | | | | | | | | | |

**LINE 1 RESULTS**

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

Data#: 21 File#: 10j13094.emi Date: 03-05-2010 Time: 11:31:32




(Line Conduction)

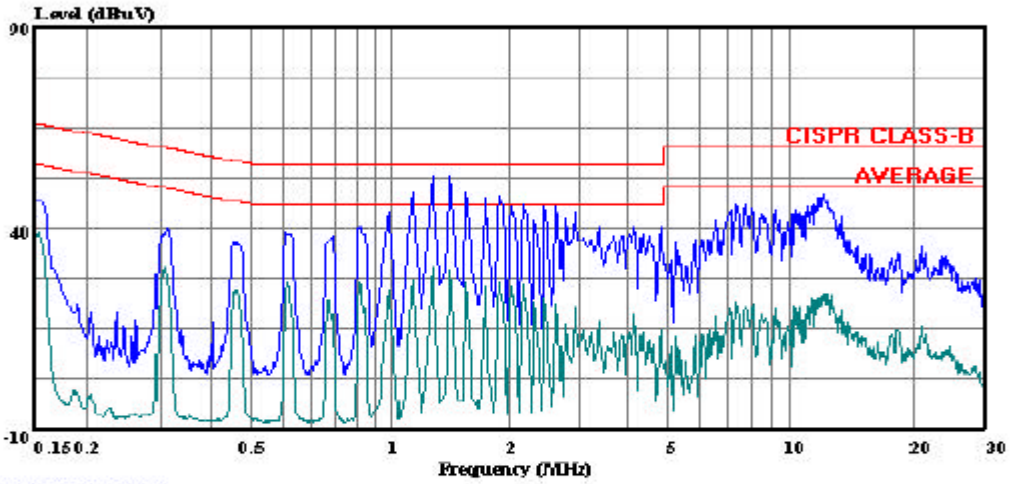
Trace: 19 Ref Trace:

Condition: CISPR CLASS-B
Test Operator: : Chin Pang
Project #: : 10J13094
Company: : Hon Hai
EUT Description:: Portable game machin
: Foxconn( Dipole Antenna) with Tabuchi AC
: Adapter
Mode: : TX( Worst Case)
Target: : FCC 15 Class B
Voltage: : 115V 60Hz
: L1: Peak(Blue); Average (Green)

**LINE 2 RESULTS**

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

Data#: 28 File#: 10j13094.emi Date: 03-05-2010 Time: 11:37:11




(Line Conduction)

Trace: 26 Ref Trace:

Condition: CISPR CLASS-B
Test Operator: : Chin Pang
Project #: : 10J13094
Company: : Hon Hai
EUT Description:: Portable game machin
: Foxconn( Dipole Antenna) with Tabuchi AC
: Adapter
Mode: : TX( Worst Case)
Target: : FCC 15 Class B
Voltage: : 115V 60Hz
: L1: Peak(Blue); Average (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 ($mW/cm^2$) | 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 | *($900/f^2$) | 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 | *($180/f^2$) | 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 ($mW/cm^2$) | 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.

**IC RULES**

IC Safety Code 6, Section 2.2.1 (a) A person other than an RF and microwave exposed worker shall not be exposed to electromagnetic radiation in a frequency band listed in Column 1 of Table 5, if the field strength exceeds the value given in Column 2 or 3 of Table 5, when averaged spatially and over time, or if the power density exceeds the value given in Column 4 of Table 5, when averaged spatially and over time.

**Table 5**
**Exposure Limits for Persons Not Classed As RF and Microwave Exposed Workers (Including the General Public)**

| 1 Frequency (MHz) | 2 Electric Field Strength; rms (V/m) | 3 Magnetic Field Strength; rms (A/m) | 4 Power Density ($W/m^2$) | 5 Averaging Time (min) |
|---|---|---|---|---|
| 0.003–1 | 280 | 2.19 | | 6 |
| 1–10 | $280/f$ | $2.19/f$ | | 6 |
| 10–30 | 28 | $2.19/f$ | | 6 |
| 30–300 | 28 | 0.073 | 2* | 6 |
| 300–1 500 | $1.585f^{0.5}$ | $0.0042f^{0.5}$ | $f/150$ | 6 |
| 1 500–15 000 | 61.4 | 0.163 | 10 | 6 |
| 15 000–150 000 | 61.4 | 0.163 | 10 | $616\,000/f^{1.2}$ |
| 150 000–300 000 | $0.158f^{0.5}$ | $4.21 \times 10^{-4}f^{0.5}$ | $6.67 \times 10^{-5}f$ | $616\,000/f^{1.2}$ |

* Power density limit is applicable at frequencies greater than 100 MHz.

**Notes:** 1. Frequency, $f$, is in MHz.
2. A power density of 10 $W/m^2$ is equivalent to 1 $mW/cm^2$.
3. A magnetic field strength of 1 A/m corresponds to 1.257 microtesla (μT) or 12.57 milligauss (mG).

## EQUATIONS

Power density is given by:

S = EIRP / (4 * Pi * D^2)

Where

S = Power density in W/m^2
EIRP = Equivalent Isotropic Radiated Power in W
D = Separation distance in m

Power density in units of W/m^2 is converted to units of mWc/m^2 by dividing by 10.

Distance is given by:

D = SQRT (EIRP / (4 * Pi * S))

Where

D = Separation distance in m
EIRP = Equivalent Isotropic Radiated Power in W
S = Power density in W/m^2

For multiple collocated transmitters operating simultaneously in frequency bands where the limit is identical, the total power density is calculated using the total EIRP obtained by summing the Power * Gain product (in linear units) of each transmitter.

Total EIRP = (P1 * G1) + (P2 * G2) + ... + (Pn * Pn)

where

Px = Power of transmitter x
Gx = Numeric gain of antenna x

In the table(s) below, Power and Gain are entered in units of dBm and dBi respectively and conversions to linear forms are used for the calculations.

## LIMITS

From FCC §1.1310 Table 1 (B), the maximum value of S = 1.0 mW/cm^2
From IC Safety Code 6, Section 2.2 Table 5 Column 4, S = 10 W/m^2

## RESULTS

| Band | Mode | Separation Distance (m) | Output Power (dBm) | Antenna Gain (dBi) | IC Power Density (W/m^2) | FCC Power Density (mW/cm^2) |
|---|---|---|---|---|---|---|
| 2.4 GHz | WLAN | 0.20 | 12.47 | 0.88 | 0.04 | 0.004 |