Project 11345-10

# Alereon, Inc.
# AL5740
# Worldwide Wireless
# A/V Adapter

Prepared for:

Alereon, Inc.
7600 N. Capital of Texas Hwy.
Building C Suite 200
Austin, Texas 78731

By

Professional Testing (EMI), Inc.
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Round Rock, Texas 78665

JULY 28, 2010

**CERTIFICATION**
**Wireless Test Report**
**Alereon, Inc.**
**AL5740**

## Table of Contents

| | |
|---|---|
| Applicant: | Alereon, Inc.. |
| Applicant's Address: | 7600 N. Capital of Texas Hwy. Bldg. C, Suite 200 |
| | Austin, TX 78731 |
| FCC ID: | U9YAL5740 |
| Project Number: | 11345-10 |
| Test Dates: | July 7-8, 2010 |

The **Alereon, Inc. AL5740** was tested to and found to be in compliance with FCC 47 CFR Part 15 Subparts B and F.

The highest emissions generated by the above equipment are listed below:

| Parameter | Frequency (MHz) | Level | | Limit | Margin (dB) |
|---|---|---|---|---|---|
| Radiated Spurious | 196.63 | 24.4 dBµV/m | | 30 dBµV/m | -5.6 |
| Output Power | 8712 | -44.1 dBm | .00004 mw | -41.3 dBm | -2.8 |

| UWB Bandwidth 10 dB AL51000 Antenna Wimedia Band Group 1 | | |
|---|---|---|
| **Low (3432 MHz)** | **Mid (3960 MHz)** | **High (4488 MHz)** |
| 514.94 MHz | 521.48 MHz | 507.64 MHz |

| UWB Bandwidth 10 dB ADM6P Antenna Wimedia Band Group 1 | | |
|---|---|---|
| **Low (3432 MHz)** | **Mid (3960 MHz)** | **High (4488 MHz)** |
| 507.80 MHz | 508.54 MHz | 496.44 MHz |

| UWB Bandwidth 10 dB ADM6P Antenna Wimedia Band Group 3 | | |
|---|---|---|
| **Low (6600 MHz)** | **Mid (7128 MHz)** | **High (7656 MHz)** |
| 505.38 MHz | 505.97 MHz | 511.77 MHz |

| UWB Bandwidth 10 dB ADM6P Antenna Wimedia Band Group 6 | | |
|---|---|---|
| **Low (7656 MHz)** | **Mid (8184 MHz)** | **High (8712 MHz)** |
| 509.36 MHz | 503.95 MHz | 508.19 MHz |

I, Jason Anderson, for Professional Testing (EMI), Inc., being familiar with the FCC rules and test procedures have reviewed the test setup, measured data and this report. I believe them to be true and accurate.

**Jason Anderson**
**EMC Engineer**

This report has been reviewed and accepted by Alereon, Inc. The undersigned is responsible for ensuring that this device will continue to comply with the FCC and IC rules.

# 1.0 Introduction

## 1.1 Scope

This report describes the extent of the Equipment Under Test (EUT) conformance to the Intentional Radiator requirements of the USA and Canada.

## 1.2 EUT Description

The Alereon AL5740 is a UWB radio device with HDMI, VGA, USB and Stereo Audio interfaces to attached devices. This device is intended to provide a short-range wireless connection for computers to transfer multimedia content to displays and audio speakers. The AL5740 is powered from 120VAC through an external 5 Volt DC adapter. The interface between the AL5740 and attached devices is the industry-standard HDMI or VGA, USB and Stereo Audio. The AL5740 operates in the frequency band defined in the FCC Rules and Regulations for UWB devices. Specifically, it operates between the frequencies of 3.168 to 4.752 GHz, 6.336 to 7.920 GHz and 7.392 to 8.976 GHz per the industry-defined WiMedia 1.1 specification. The AL5740 uses the AL51000 antenna and the Acon ADM6P antenna.

## 1.3 EUT Operation

The EUT was tested while in a continuous transmit mode. The EUT was tuned to Wimedia Band Group 1 for the AL51000 antenna and Wimedia Band Groups 1, 3, and 6 for the Acon ADM6P antenna to perform power, UWB bandwidth, harmonic and spurious tests. The EUT continuously transmitted at maximum power. The system tested consisted of the following:

| Manufacturer | Model | FCC ID Number |
|---|---|---|
| Alereon, Inc. | AL5740 | U9YAL5740 |

The following rules apply to the operation of the EUT:

| Guidelines | FCC Rules |
|---|---|
| | Part 15 |
| Transmitter Characteristics | 15.519 |
| Spurious Radiated Power | 15.209, 15.519(c) |
| Power Line Conducted | 15.207 |
| Antenna Requirement | 15.203 |
| Radiated Emissions in GPS Bands | 15.519 (d) |
| UWB Bandwidth | 15.519 (b) |
| Peak Emissions within a 50 MHz Bandwidth | 15.519 (e) |

## 1.4 Test Site

Measurements were made at the PTI semi-anechoic facility designated Site 45 (FCC 459644, IC 3036B-1) in Austin, Texas. This site is registered with the FCC under Section 2.948 and Industry Canada per RS-212 and is subsequently confirmed by laboratory accreditation (NVLAP). The test site is located at 11400 Burnett Rd., Austin, Texas, 78758 while the main office is located at 1601 N. A.W. Grimes Blvd., Suite B, Round Rock, Texas, 78665. Professional Testing (EMI), Inc. (PTI), follows the guidelines of NIST for all uncertainty

calculations, estimates and expressions thereof for EMC testing. The procedure of ANSI C63.4:2009 and C63.10:2009 were utilized for making all emissions measurements.

## 1.5 Applicable Documents

The data collected for this report are presented entirely in Appendix B.

| Document | Title | Release |
|---|---|---|
| ANSI C63.4 | American National Standard for Methods of Measurement of Radio-Noise Emissions from Low Voltage Electrical and Electronic Equipment. | 2009 |
| ANSI C63.10 | American National Standard for Testing Unlicensed Wireless Devices | 2009 |
| 47 CFR | Part 15 – Radio Frequency Devices<br>Subpart C: Intentional Radiators; Subpart F: Ultra–Wideband Operation | 2007 |

# 2.0 Power Line Conducted Emissions

## 2.1 Test Procedure

The EUT was configured and operated in a manner consistent with typical applications. The EUT power cord in excess of one meter was folded back and forth forming a bundle 30 to 40 cm long in the approximate center of the cable. Power supply cords for the peripheral equipment were powered from an auxiliary LISN. Excess interface cable lengths were separately bundled in a non-inductive arrangement at the approximate center of the cable with the bundle 30 to 40 centimeters in length. The conducted emissions were maximized, by varying the operating states and configuration of the EUT.

The tests were performed in an 8' x 8' RayProof modular shielded room. The EUT was placed on a non-metallic table 0.4 meters from a vertical metal reference plane and 0.8 meters from a horizontal metal reference plane. A drawing showing the test setup is given as Figure 1.

## 2.2 Test Criteria

The FCC Part 15 Class B conduction limits are given below.

| Frequency (MHz) | Conducted Limits (dBuV) | |
|---|---|---|
| | Average | Quasi-Peak |
| 0.15 – .50 | 66-56* | 56 – 46* |
| .50 - 5 | 56 | 46 |
| 5 – 30 | 60 | 50 |

The tighter limit shall apply at the edge between two frequency bands.
*Decreases with the logarithm of the frequency.

# 3.0 Average Output Power

Peak power measurements were made on selected fundamental transmit frequencies of the EUT for the lowest, most center, and highest sub-bands of Wimedia Band Group 1 for the AL51000 antenna, and Wimedia Band Groups 1, 3, and 6 for the ADM6P antenna.

Tests of the fundamental emissions of the EUT also determined the worse case polarization of the device. The emissions of the device were measured with the EUT in three orthogonal axes.

## 3.1 Test Procedure

The EUT was placed on a non-conductive table 0.8 meters above the ground plane. The table was centered on a motorized turntable, which allows 360-degree rotation. For measurements of the fundamental signal, a measurement antenna was positioned at a distance of 1 meter as measured from the closest point of the EUT. Rotating the EUT maximized the emissions.

A spectrum analyzer with peak detection was used to find the maximum field strength during the variability testing. RBW used is recorded. A calculation was then made to determine the peak power at the antenna terminal. A drawing showing the test setup is given in Appendix A.

### 3.2 Test Criteria

The maximum average output power is -41.3 dBm for devices operating in the frequency range 3100 - 10600 MHz according to FCC 15.519.

## 4.0 UWB Bandwidth

UWB bandwidth measurements were performed on the EUT to determine compliance with FCC 15.519(b).

### 4.1 Test Procedure

The UWB bandwidth was measured with a spectrum analyzer connected to a double-ridged guide horn while the EUT was operating in continuous transmit mode at the appropriate center frequency. The analyzer center frequency was set to the EUT carrier frequency. The analyzer was set to resolution bandwidth of 5 MHz and a video bandwidth of 50 MHz. Measurements were made at the Lower, Middle, and Upper sub-bands within Wimedia Band Group 1 for the AL51000 antenna, and Wimedia Band Groups 1, 3, and 6 for the ADM6P antenna. Frequency characteristics for Wimedia Band Groups 1, 3, and 6 are shown in the table below. A drawing showing the test setup is given in Appendix A.

| BG | Channel | Ch1 | Ch0 | F low | F mid | F high |
|---|---|---|---|---|---|---|
| N/A | N/A | 0 | 0 | - | - | - |
| 1 | 1(A) | 0 | 1 | 3168 MHz | 3432 MHz | 3696 MHz |
| | 2(B) | 1 | 0 | 3696 MHz | 3960 MHz | 4224 MHz |
| | 3(C) | 1 | 1 | 4224 MHz | 4488 MHz | 4752 MHz |
| 2 | 4(A) | 0 | 1 | 4752 MHz | 5016 MHz | 5280 MHz |
| | 5(B) | 1 | 0 | 5280 MHz | 5544 MHz | 5808 MHz |
| | 6(C) | 1 | 1 | 5808 MHz | 6072 MHz | 6336 MHz |
| 3 | 7(A) | 0 | 1 | 6336 MHz | 6600 MHz | 6864 MHz |
| | 8(B) | 1 | 0 | 6864 MHz | 7128 MHz | 7392 MHz |
| | 9(C) | 1 | 1 | 7392 MHz | 7656 MHz | 7920 MHz |
| 6 | 9(A) | 0 | 1 | 7392 MHz | 7656 MHz | 7920 MHz |
| | 10(B) | 1 | 0 | 7920 MHz | 8184 MHz | 8448 MHz |
| | 11(C) | 1 | 1 | 8448 MHz | 8712 MHz | 8976 MHz |

### 4.2 Test Criteria

A UWB transmitter is defined as an intentional radiator that, at any point in time, has a fractional bandwidth equal or greater than 0.20 or has a UWB bandwidth equal to or greater than 500 MHz, regardless of the fractional bandwidth. The UWB bandwidth is the frequency band bounded by the points that are 10 dB below the highest radiated emission, as based on the complete transmission system including the antenna. The upper boundary is designated $f_H$ and the lower boundary is designated $f_L$. The frequency at which the highest radiated emission occurs is designated $f_M$.

Center frequency. The center frequency, $f_C$, equals $(f_H + f_L)/2$. Fractional bandwidth. The fractional bandwidth equals $2(f_H - f_L)/ (f_H + f_L)$.

Per section 15.519(b), the UWB bandwidth of a UWB system operating under the provisions of this section must be contained between 3100 MHz and 10600 MHz.

## 5.0 Spurious Radiated Emissions

Spurious radiated emissions measurements were performed on the EUT to determine compliance to FCC 15.209 and 15.519(c).

### 5.1 Test Procedure

The EUT was placed on a non-conductive table 0.8 meters above the ground plane. The table was centered on a rotating turntable at a distance of 10 meters from the measurement antenna.

For spurious emissions below 1 GHz quasi-peak detection is used with a resolution bandwidth of 120 kHz. All measurements below 1 GHz were normalized to 3 meters using a 20 dB/decade distance extrapolation. The emissions were maximized by rotating the EUT and raising and lowering the measurement antenna from 1-4 meters. The test setup is included in Appendix A.

Spurious/harmonic emissions above 1 GHz peak are measured with average and peak detection with a resolution bandwidth of 1 MHz and measured at a distance of 1 meter. Average detection is used to determine compliance of the EUT if the peak does not meet the average limit. Non-harmonic emissions must satisfy the average limit and the peak limit (20 dB above average). The test setup is included in Appendix A.

Note: Spurious/harmonic emissions above 1 GHz were investigated to 40 GHz with no discrepancies observed.

### 5.2 Test Criteria

The radiated limits of FCC 15.209 are shown below. The limits specified are at 3 meters. The limits are quasi-peak for emissions below 1 GHz and average for emissions above 1 GHz. Also above 1 GHz the peak limit is 20 dB above the average limit.

| Frequency MHz | Test Distance (Meters) | Field Strength (µV/m) | (dBµV/m) |
|---|---|---|---|
| 30 to 88 | 3 | 100 | 40.0 |
| 88 to 216 | 3 | 150 | 43.5 |
| 216 to 960 | 3 | 200 | 46.0 |
| Above 960 | 3 | 500 | 54.0 |

The radiated limits of FCC 15.519c are shown below. The limits specified are at 3 meters.

| Frequency MHz | Test Distance (Meters) | Field Strength EIRP (dBm) | (dBµV/m) |
|---|---|---|---|
| 960 to 1610 | 3 | -75.3 | 19.9 |
| 1610 to 1990 | 3 | -63.3 | 31.9 |
| 1990 to 3100 | 3 | -61.3 | 33.9 |
| 3100 to 10600 | 3 | -41.3 | 53.9 |
| Above 10600 | 3 | -61.3 | 33.9 |

# 6.0 Radiated Emissions in GPS Bands

Radiated emissions measurements were performed on the EUT to determine compliance to FCC 15.519(d).

## 6.1 Test Procedure

The EUT was placed on a non-conductive table 0.8 meters above the ground plane. The table was centered on a rotating turntable at a distance of 3 meters from the measurement antenna.

The measurements made over the frequency range from 1164 MHz to 1240 MHz and from 1559 MHz to 1610 MHz were maximized using a spectrum analyzer with RMS detector capabilities. A RBW of 1 kHz and VBW of 1 kHz with a suitable averaging time were used for these measurements. The test setup is included in Appendix A.

## 6.2 Test Criteria

In addition to the radiated emission limits specified in the table in paragraph 5.2 of this report, UWB transmitters operating under the provisions of this section shall not exceed the following average limits when measured using a resolution bandwidth of no less than 1 kHz.

| Frequency MHz | Test Distance (Meters) | Field Strength EIRP (dBm) | (dBµV/m) |
|---|---|---|---|
| 1164 to 1240 | 3 | -85.3 | 9.9 |
| 1559 to 1610 | 3 | -85.3 | 9.9 |

# 7.0 Peak Emissions FM within 50 MHz Bandwidth

The EUT was evaluated to determine compliance with FCC 15.519(e) following the procedures described in FCC Section 15.521.

## 7.1 Test Procedure

The EUT was placed on a non-conductive table 0.8 meters above the ground plane. The table was centered on a rotating turntable at a distance of 1 meter from the measurement antenna.

The measurements made over the intentionally radiating frequency range of the EUT, from 3100 MHz to 10600 MHz, were maximized using a spectrum analyzer with peak detector capabilities. A spectrum analyzer was used for the final measurement utilizing a peak detector at the frequency with the largest amplitude. The spectrum analyzer did not support the prescribed resolution bandwidth of 50 MHz. However, when a peak measurement is required, it is acceptable to use a resolution bandwidth other than the 50 MHz specified in 47 CFR Part 15, Subpart F. The resolution bandwidth for the measurement was set to 1 MHz. The measurement was centered on the frequency at which the highest radiated emission occurred, $f_M$. The video bandwidth was 8 MHz.

Since a resolution bandwidth other than 50 MHz was used, the peak EIRP limit has to be adjusted by the resolution bandwidth ratio of 20 log (RBW/50) dB, where RBW is the resolution bandwidth used for the measurement expressed in MHz.

The test setup is included in Appendix A.

### 7.2 Test Criteria

There is a limit on the peak level of the emissions contained within a 50 MHz bandwidth centered on the frequency at which the highest radiated emission occurs, $f_M$. That limit is 0 dBm EIRP. The EUT was evaluated to determine compliance with FCC 15.519(e) following the procedures described in FCC Section 15.521.

## 8.0 Antenna Requirements

An antenna evaluation was performed on the EUT to determine compliance with FCC sections 15.203 and 15.247(b).

### 8.1 Evaluation Procedure

The design of the EUT antenna is evaluated for conformance to engineering requirements for gain and to prevent substitution of unapproved antennae. Gain of the antenna is assessed by reviewing the antenna manufacturer's data sheet.

### 8.2 Evaluation Criteria

The antenna design must meet at least one of the following criteria:

a) Antenna is permanently attached to the unit.
b) Antenna must use a unique type of connector to attach to the EUT.
c) Unit must be professionally installed. Installer shall be responsible for verifying that the correct antenna is employed with the unit.

Section 15.247(b)(4)(i) states that if the transmitting antenna has a directional gain greater than 6 dBi the power shall be reduced the amount in dB that the directional gain is greater than 6 dBi.

## 9.0 Modifications

N/A

## 10.0 Test Equipment

A list of the test equipment utilized to perform the testing is given below. The date of calibration is given for each.

**Conducted Test Equipment**

| Asset # | Manufacturer | Model # | Description | Calibration Due |
|---|---|---|---|---|
| 1277 | HP | 85650A | Quasi-peak Adapter | October 27, 2010 |
| 0045 | HP | 85662A | Spectrum Analyzer Display | NCR |
| 1284 | HP | 8568B | Spectrum Analyzer | January 13, 2011 |
| 1088 | PTI | PTI-ALF4 | Attenuator, Limiter, Filter | March 31, 2011 |
| 1185 | Emco | 3825/2 | Line Impedance Stabilization Network | August 13, 2010 |
| 0081 | ELGAR | 1751SL | AC Power Supply | NCR |
| 1683 | TESEQ | T800 | ISN | November 24, 2010 |
| 1173 | PTI | 100KHz HPF | High Pass Filter | February 5, 2011 |

## Radiated Test Equipment

| Asset # | Manufacturer | Model # | Description | Calibration Due |
|---|---|---|---|---|
| 1280 | HP | 85650A | Quasi-peak Adapter (high band) | October 27, 2010 |
| 0949 | HP | 85662A | Spectrum Analyzer Display (high band) | NCR |
| 1841 | HP | 8566B | Spectrum Analyzer (high band) | June 8, 2011 |
| 0990 | HP | 85685A | RF Preselector (high band) | March 24, 2011 |
| 1281 | HP | 85650A | Quasi-peak Adapter (low band) | January 13, 2011 |
| 1629 | HP | 85662A | Spectrum Analyzer Display (low band) | NCR |
| 1129 | HP | 8568B | Spectrum Analyzer (low band) | August 5, 2010 |
| 1035 | HP | 85685A | RF Preselector (low band) | March 3, 2011 |
| 1454 | HP | 8447D | RF Preamplifier | July 06, 2011 |
| 1389 | Emco | 3108 | Biconical Antenna | August 7, 2010 |
| 1487 | Emco | 3147 | Log Periodic Dipole Array Antenna | July 29, 2010 |
| C026 | none | none | Coaxial Cable (low band) | July 27, 2010 |
| C027 | none | none | Coaxial Cable (high band) | July 27, 2010 |

| Asset # | Manufacturer | Model # | Description | Calibration Due |
|---|---|---|---|---|
| 0267 | EMCO | 3115 | Ridge Guide Antenna | October 19, 2010 |
| 1529 | Miteq | Antenna Mounted | Microwave Preamplifier (preamp 1) | July 16, 2011 |
| 1841 | HP | 8566B | Spectrum Analyzer | June 8, 2011 |
| 1273 | HP | 85662A | Spectrum Analyzer Display | NCR |
| 1530 | Miteq | None | Microwave Preamplifier (preamp 2) | July 16, 2011 |
| C030 | None | None | Coaxial Cable (MRE band) | July 27, 2010 |

## Microwave Radiated Test Equipment

| Asset # | Manufacturer | Model # | Description | Calibration Due |
|---|---|---|---|---|
| 0267 | EMCO | 3115 | Ridge Guide Antenna | October 19, 2010 |
| 1529 | Miteq | Antenna Mounted | Microwave Preamplifier (preamp 1) | July 16, 2011 |
| 0084 | HP | 8566B | Spectrum Analyzer | April 5, 2011 |
| 1273 | HP | 85662A | Spectrum Analyzer Display | NCR |
| 1530 | Miteq | None | Microwave Preamplifier (preamp 2) | July 17, 2010 |
| C030 | None | None | Coaxial Cable (MRE band) | July 27, 2010 |

| Asset # | Manufacturer | Model # | Description | Calibration Due |
|---|---|---|---|---|
| XXXX | Pasternack | LLS | 2 sections, total 12ft | Cal Before Use |
| 0582 | EMCO | 3115 | Ridge Guide Antenna | October 19, 2010 |

| | | | | |
|---|---|---|---|---|
| 1594 | Miteq | AFS44-00102650 | Microwave Preamplifier (preamp 1) | March 2, 2011 |
| (Rental unit) | Agilent | E4446A | Spectrum Analyzer | July 6, 2012 |
| 1542 | A.H. Systems | SAS 572 | Antenna, Horn 18-26.5GHz | NCR |
| 1735 | Pasternack | PE9850-20 | Antenna, Horn 26.5-40GHz | NCR |

# Appendix A Test Setup Diagrams

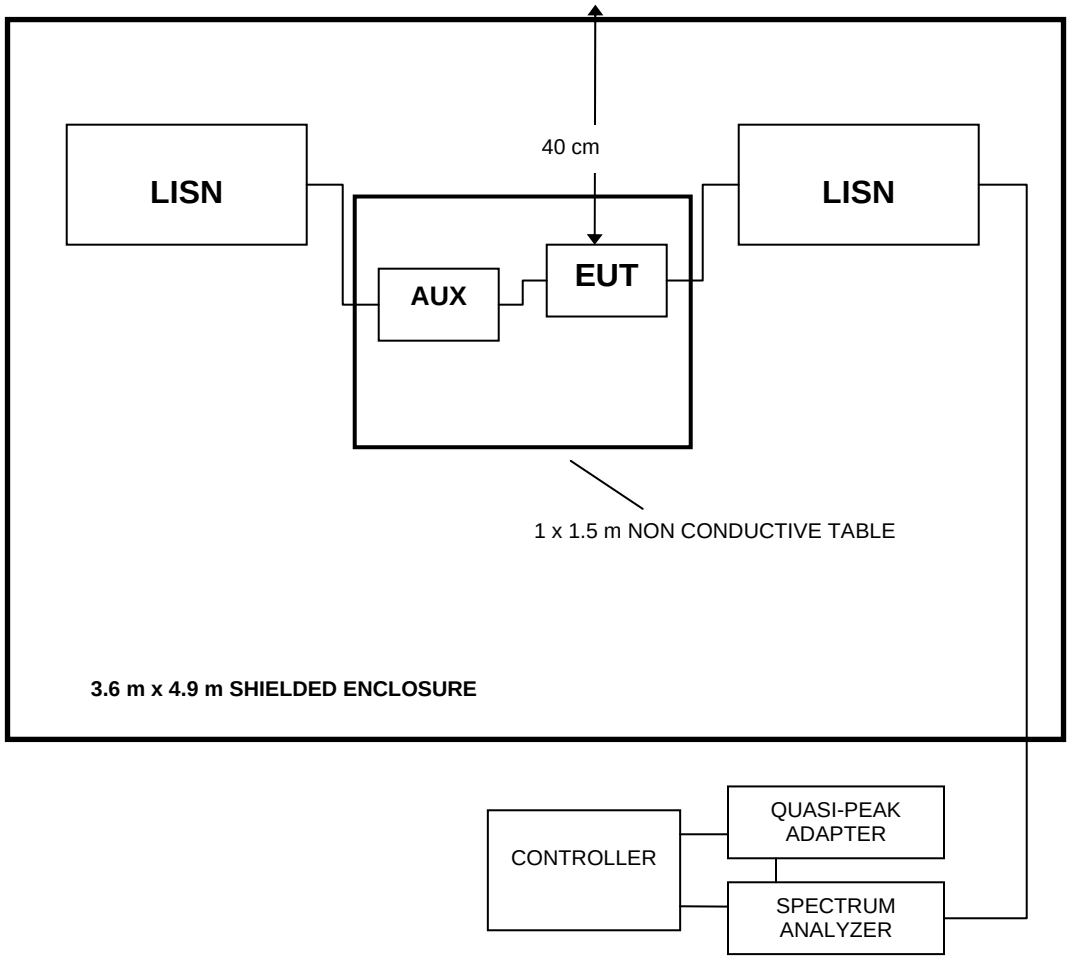



**FIGURE 1: Conducted Emissions Test Setup**

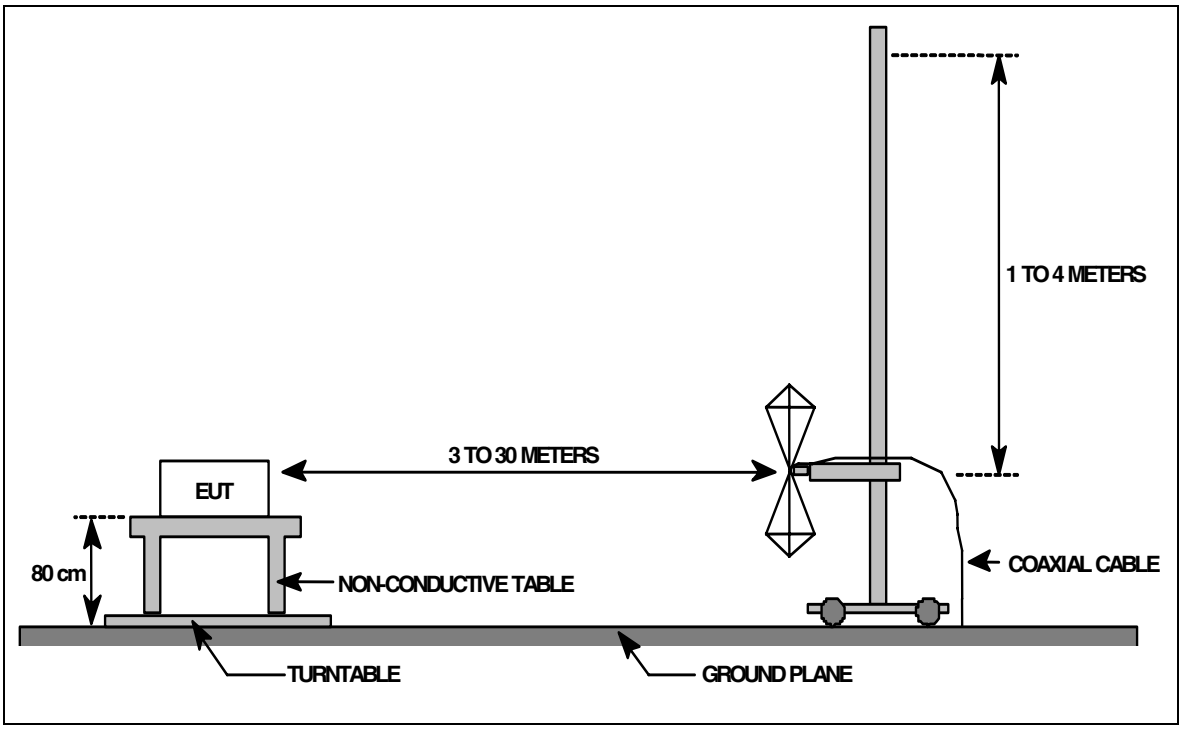



**FIGURE 2: Radiated Emissions Test Setup**

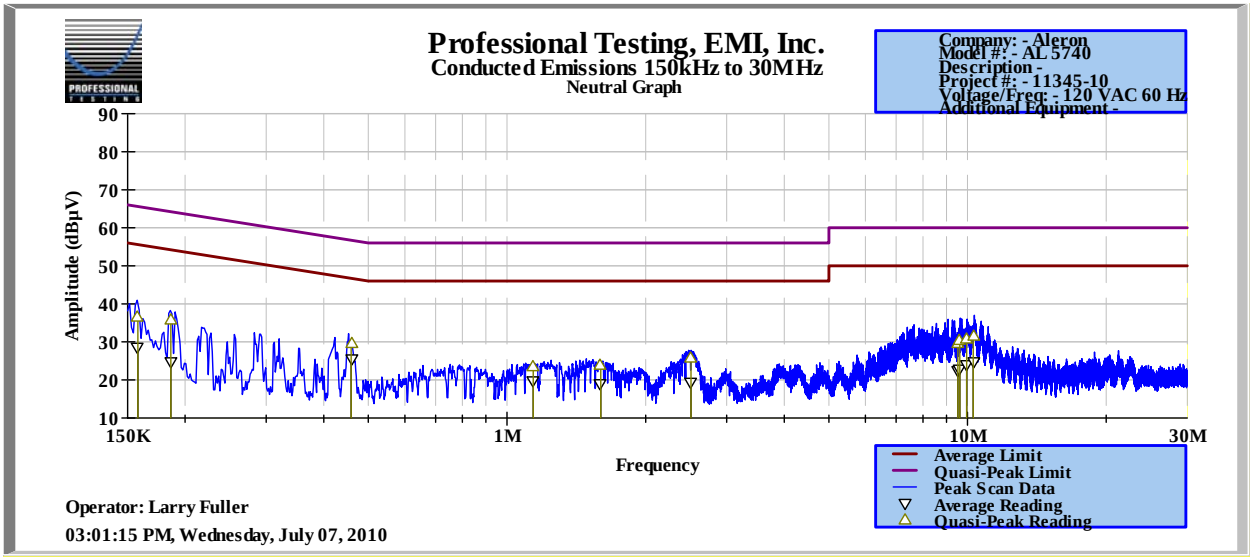
# Appendix B Test Results

## Mains Conducted Emissions Data Sheet
## 150 kHz … 30 MHz

| PROJECT # | DATE | CLASS | LINE | RBW | VBW | DETECTOR |
|---|---|---|---|---|---|---|
| 11345-10 | July 7, 2010 | FCC B | Neutral | CISPR 9 kHz | 100 kHz | Quasi-Peak/Avg |

| COMMENT | Transmitting |
|---|---|

| Frequency Reading (MHz) | Quasi-peak Reading (dBuV) | Average Reading (dBuV) | Quasi-peak Limit (dBuV) | Quasi-peak Margin (dB) | Average Limit (dBuV) | Average Margin (dB) |
|---|---|---|---|---|---|---|
| 0.15795 | 36.6 | 28.6 | 65.6 | -28.9 | 55.6 | -27 |
| 0.18624 | 35.7 | 24.6 | 64.2 | -28.5 | 54.2 | -29.6 |
| 0.4588 | 29.7 | 25.5 | 56.7 | -27 | 46.7 | -21.2 |
| 1.1399 | 23.5 | 19.7 | 56 | -32.5 | 46 | -26.3 |
| 1.5971 | 23.9 | 18.8 | 56 | -32.1 | 46 | -27.2 |
| 2.5086 | 26 | 19.4 | 56 | -30 | 46 | -26.6 |
| 9.5246 | 29.5 | 22.2 | 60 | -30.5 | 50 | -27.8 |
| 9.6228 | 30.5 | 22.9 | 60 | -29.5 | 50 | -27.1 |
| 9.9544 | 30.9 | 24 | 60 | -29.1 | 50 | -26 |
| 10.2879 | 31.5 | 24.8 | 60 | -28.5 | 50 | -25.2 |

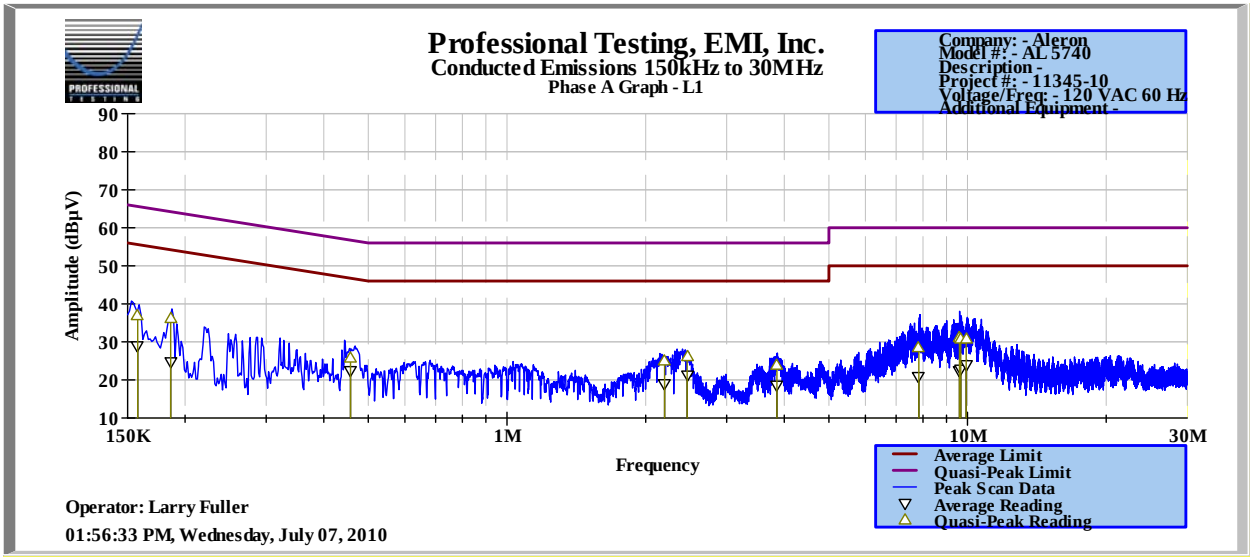


## Mains Conducted Emissions Data Sheet
## 150 kHz … 30 MHz

| PROJECT # | DATE | CLASS | LINE | RBW | VBW | DETECTOR |
|---|---|---|---|---|---|---|
| 11345-10 | July 7, 2010 | FCC B | Phase | CISPR 9 kHz | 100 kHz | Quasi-Peak/Avg |

| COMMENT | Transmitting |
|---|---|

| Frequency Reading (MHz) | Quasi-peak Reading (dBuV) | Average Reading (dBuV) | Quasi-peak Limit (dBuV) | Quasi-peak Margin (dB) | Average Limit (dBuV) | Average Margin (dB) |
|---|---|---|---|---|---|---|
| 0.15776 | 37.1 | 28.8 | 65.6 | -28.4 | 55.6 | -26.7 |
| 0.18605 | 36 | 24.7 | 64.2 | -28.2 | 54.2 | -29.5 |
| 0.45755 | 25.9 | 22.3 | 56.7 | -30.9 | 46.7 | -24.4 |
| 2.1983 | 24.9 | 18.9 | 56 | -31.1 | 46 | -27.1 |
| 2.4604 | 26.2 | 21.2 | 56 | -29.8 | 46 | -24.8 |
| 3.8544 | 23.8 | 18.4 | 56 | -32.2 | 46 | -27.6 |
| 7.8364 | 28.5 | 20.8 | 60 | -31.5 | 50 | -29.2 |
| 9.6055 | 31.3 | 22.5 | 60 | -28.7 | 50 | -27.5 |
| 9.6621 | 30.9 | 22.6 | 60 | -29.1 | 50 | -27.4 |
| 9.9349 | 31 | 23.8 | 60 | -29 | 50 | -26.2 |



# Average Power Data Sheet

| PROJECT # | DATE | RULE | DISTANCE | ANTENNA | RBW | VBW | DETECTOR |
|---|---|---|---|---|---|---|---|
| 11345-10 | July 8, 2010 | 15.519 | 1m | Horn | 1 MHz | 3 MHz | RMS Avg |

| COMMENT | Transmitting UWB BG 1 (AL51000 Antenna) |
|---|---|

| Frequency (MHz) | EUT Direction (degrees) | Antenna Elevation (Meters) | Recorded Level (dBµV) | Amplifier Gain (dB) | Antenna Factor (dB/m) | Cable Loss (dB) | Corrected Level (dBµV /m) |
|---|---|---|---|---|---|---|---|
| 3432 | 0 | 1 | 57.8 | 32.0 | 31.7 | 3.5 | 61.0 |
| 3960 | 0 | 1 | 54.3 | 31.6 | 32.9 | 3.5 | 59.0 |
| 4488 | 0 | 1 | 54.7 | 31.4 | 32.0 | 3.9 | 59.1 |

| COMMENT | Transmitting UWB BG 1 (ADM6P Antenna) |
|---|---|

| Frequency (MHz) | EUT Direction (degrees) | Antenna Elevation (Meters) | Recorded Level (dBµV) | Amplifier Gain (dB) | Antenna Factor (dB/m) | Cable Loss (dB) | Corrected Level (dBµV /m) |
|---|---|---|---|---|---|---|---|
| 3432 | 0 | 1 | 59 | 32.0 | 31.7 | 3.5 | 62.2 |
| 3960 | 0 | 1 | 56.9 | 31.6 | 32.9 | 3.5 | 61.6 |
| 4488 | 0 | 1 | 54.2 | 31.4 | 32.0 | 3.9 | 58.6 |

| COMMENT | Transmitting UWB BG 3 (ADM6P Antenna) |
|---|---|

| Frequency (MHz) | EUT Direction (degrees) | Antenna Elevation (Meters) | Recorded Level (dBµV) | Amplifier Gain (dB) | Antenna Factor (dB/m) | Cable Loss (dB) | Corrected Level (dBµV /m) |
|---|---|---|---|---|---|---|---|
| 6600 | 0 | 1 | 52.5 | 31.4 | 35.6 | 4.8 | 61.5 |
| 7128 | 0 | 1 | 50.1 | 30.7 | 36.4 | 4.9 | 60.6 |
| 7656 | 0 | 1 | 45.6 | 30.9 | 37.2 | 4.7 | 56.6 |

| COMMENT | Transmitting UWB BG 6 (ADM6P Antenna) |
|---|---|

| Frequency (MHz) | EUT Direction (degrees) | Antenna Elevation (Meters) | Recorded Level (dBµV) | Amplifier Gain (dB) | Antenna Factor (dB/m) | Cable Loss (dB) | Corrected Level (dBµV /m) |
|---|---|---|---|---|---|---|---|
| 7656 | 0 | 1 | 45.7 | 30.9 | 37.2 | 4.7 | 56.7 |
| 8184 | 0 | 1 | 49.6 | 30.8 | 37.2 | 5.0 | 61.0 |
| 8712 | 0 | 1 | 51.3 | 30.9 | 37.5 | 5.0 | 62.9 |

## Calculations

$$P = \frac{(E * d)^2}{30 * G}$$

P=Power in watts, E=measured maximum field strength in V/m, d=distance in meters, G=numeric gain of transmitting antenna

Distance=1 meters
Gain=0 dBi

**Calculated Result AL51000 Antenna BG 1**

| Frequency (MHz) | Field Strength (dBµV) | E.I.R.P. | | Limit (dBm) |
|---|---|---|---|---|
| | | dBm | mW | |
| 3432 | 61.0 | -46.00 | .000025 | -41.3 |
| 3960 | 59.0 | -48.00 | .000016 | -41.3 |
| 4488 | 59.1 | -47.90 | .000016 | -41.3 |

**Calculated Result ADM6P Antenna BG 1**

| Frequency (MHz) | Field Strength (dBµV) | E.I.R.P. | | Limit (dBm) |
|---|---|---|---|---|
| | | dBm | mW | |
| 3432 | 62.2 | -44.80 | .000033 | -41.3 |
| 3960 | 61.6 | -45.40 | .000029 | -41.3 |
| 4488 | 58.6 | -48.40 | .000014 | -41.3 |

**Calculated Result ADM6P Antenna BG 3**

| Frequency (MHz) | Field Strength (dBµV) | E.I.R.P. | | Limit (dBm) |
|---|---|---|---|---|
| | | dBm | mW | |
| 6600 | 61.5 | -45.50 | .000028 | -41.3 |
| 7128 | 60.6 | -46.40 | .000023 | -41.3 |
| 7656 | 56.6 | -50.40 | .000009 | -41.3 |

**Calculated Result ADM6P Antenna BG 6**

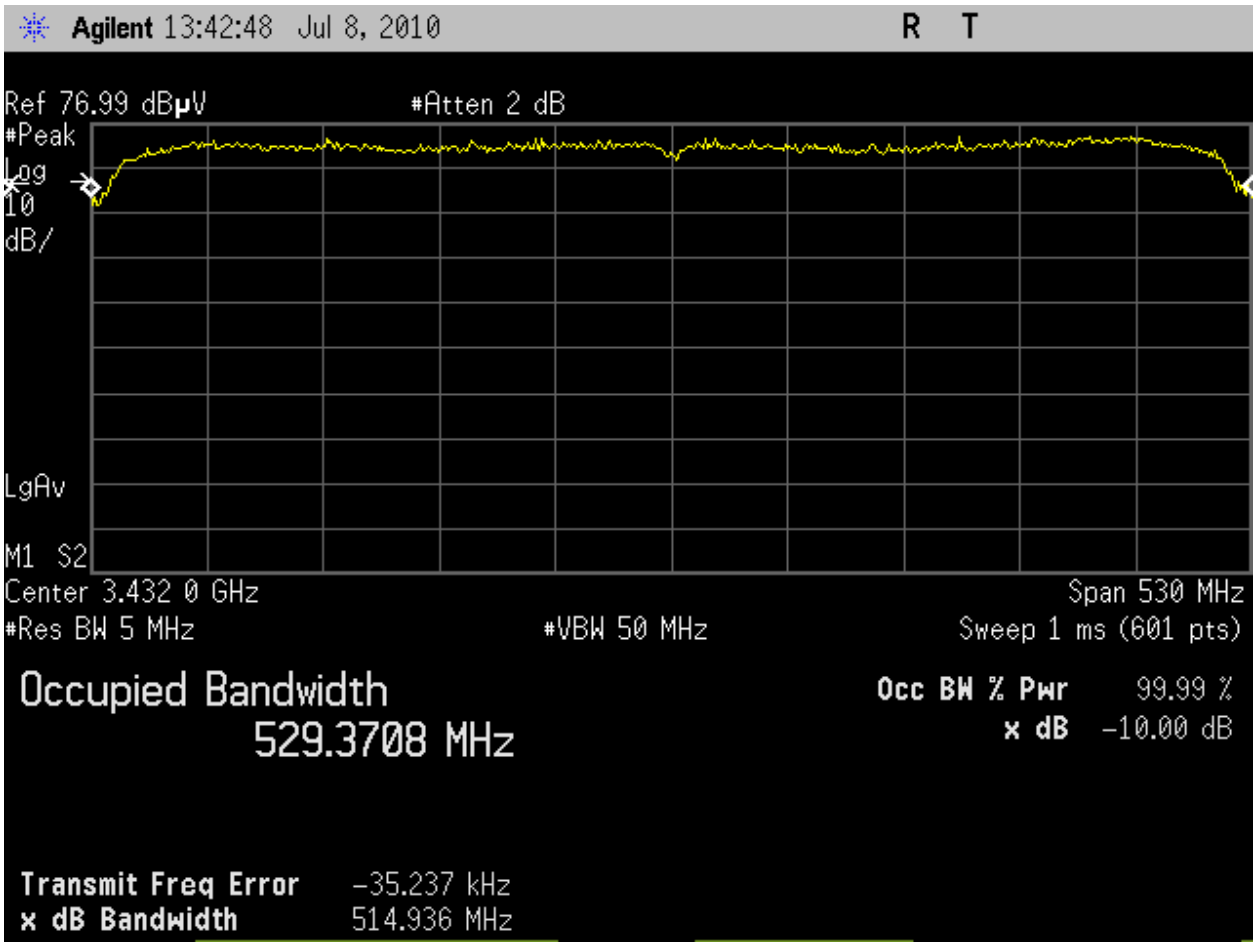
| Frequency (MHz) | Field Strength (dBµV) | E.I.R.P. | | Limit (dBm) |
|---|---|---|---|---|
| | | dBm | mW | |
| 7656 | 56.7 | -50.30 | .000009 | -41.3 |
| 8184 | 61.0 | -46.00 | .000025 | -41.3 |
| 8712 | 62.9 | -44.10 | .000039 | -41.3 |

## UWB Bandwidth Data Sheet

| PROJECT # | DATE | RULE | DISTANCE | ANTENNA | RBW | VBW | DETECTOR |
|---|---|---|---|---|---|---|---|
| 11345-10 | July 8, 2010 | 15.519(b) | 1m | Horn | 5 MHz | 50 MHz | Peak |

| COMMENT | Transmitting Low Channel AL51000 Antenna BG 1<br>10 dB Bandwidth – 514.94 MHz |
|---|---|

**Low Channel**
**10 dB**



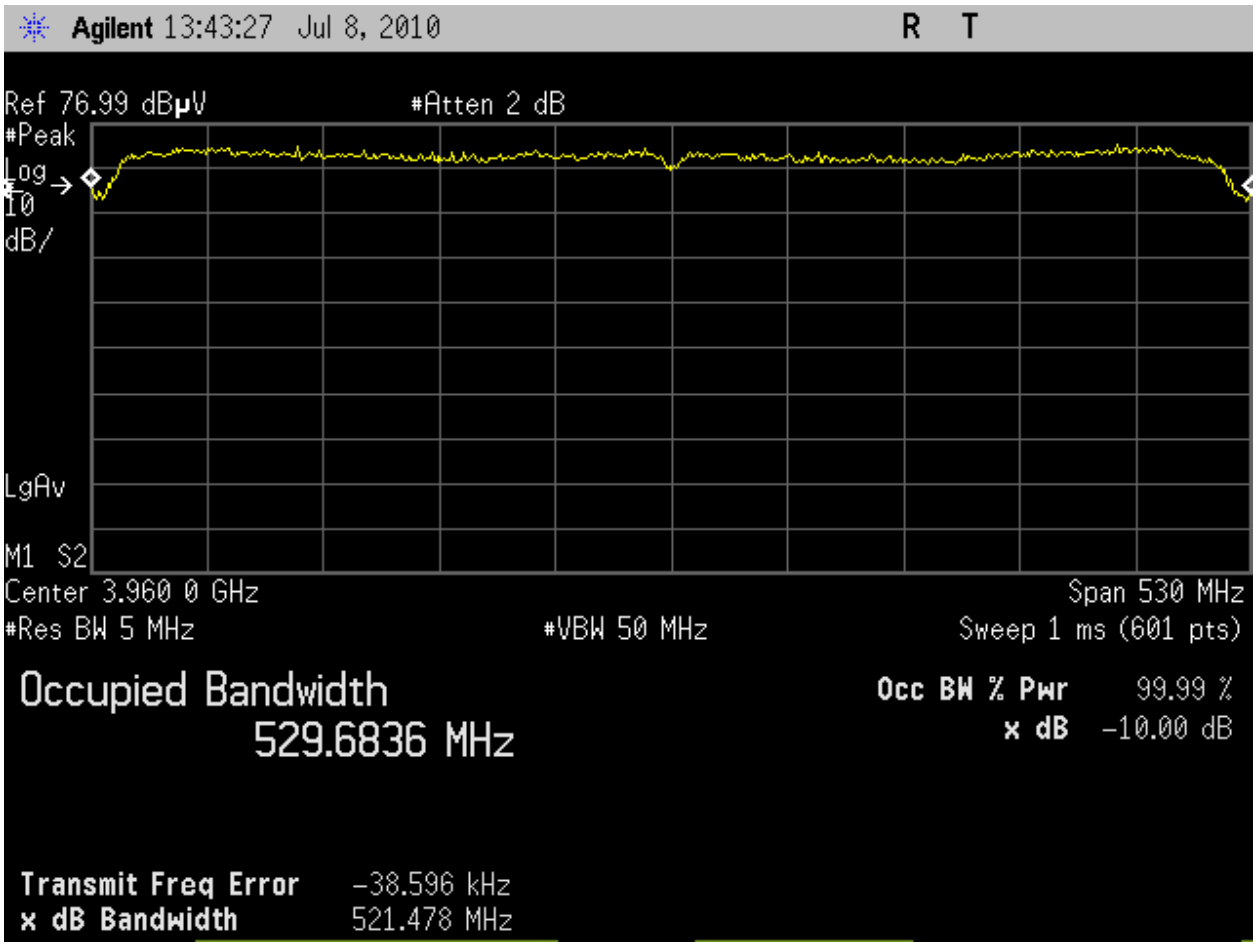

**Result = Pass**

## UWB Bandwidth Data Sheet

| PROJECT # | DATE | RULE | DISTANCE | ANTENNA | RBW | VBW | DETECTOR |
|---|---|---|---|---|---|---|---|
| 11345-10 | July 8, 2010 | 15.519(b) | 1m | Horn | 5 MHz | 50 MHz | Peak |

| COMMENT | Transmitting Middle Channel AL51000 Antenna BG 1<br>10 dB Bandwidth – 521.48 MHz |
|---|---|

**Mid Channel**
**10 dB**



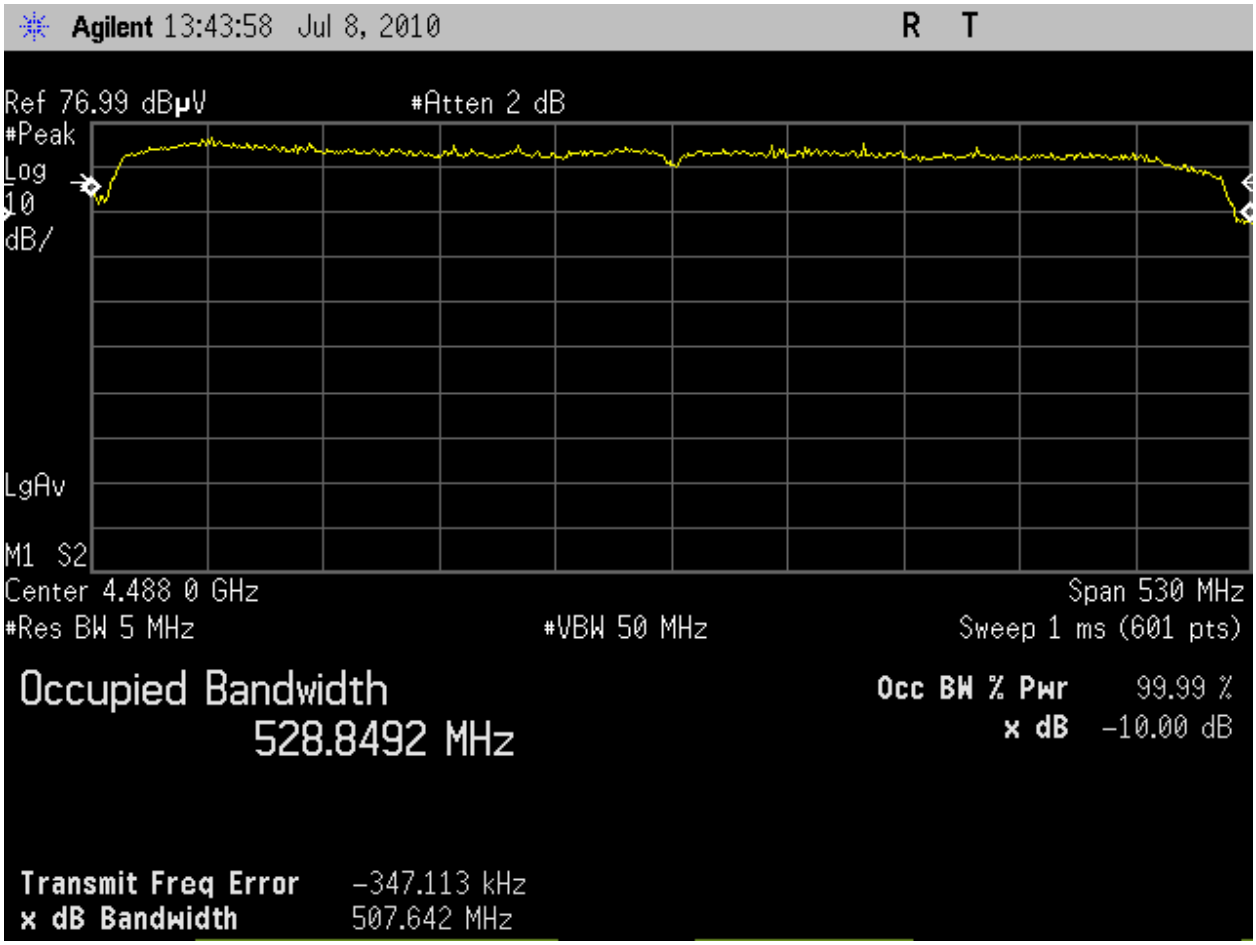

**Result = Pass**

## UWB Bandwidth Data Sheet

| PROJECT # | DATE | RULE | DISTANCE | ANTENNA | RBW | VBW | DETECTOR |
|---|---|---|---|---|---|---|---|
| 11345-10 | July 8, 2010 | 15.519(b) | 1m | Horn | 5 MHz | 50 MHz | Peak |

| COMMENT | Transmitting High Channel AL51000 Antenna BG 1<br>10 dB Bandwidth – 507.64 MHz |
|---|---|

**High Channel**
**10 dB**



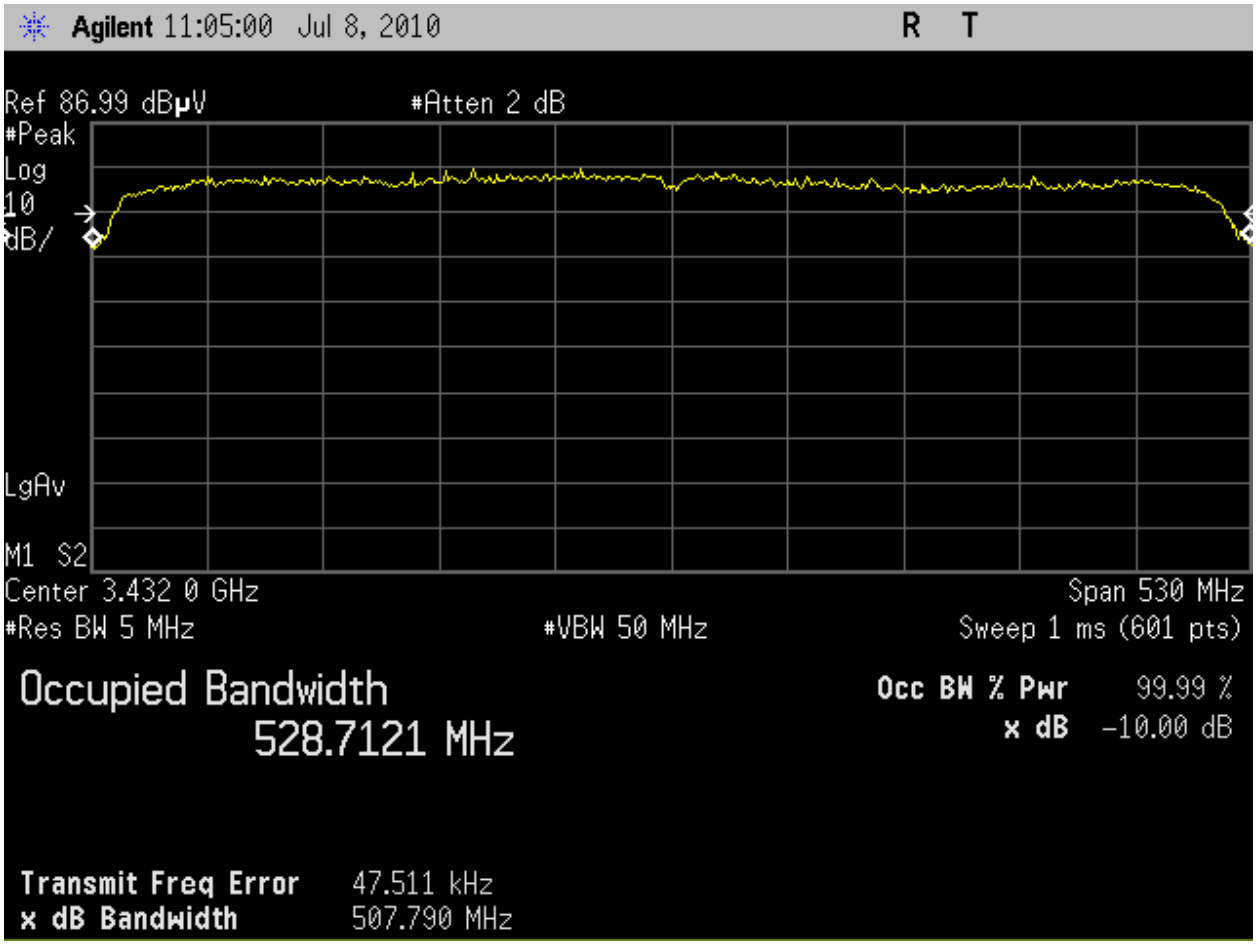

**Result = Pass**

## UWB Bandwidth Data Sheet

| PROJECT # | DATE | RULE | DISTANCE | ANTENNA | RBW | VBW | DETECTOR |
|---|---|---|---|---|---|---|---|
| 11345-10 | July 8, 2010 | 15.519(b) | 1m | Horn | 5 MHz | 50 MHz | Peak |

| COMMENT | Transmitting Low Channel ADM6P Antenna BG 1<br>10 dB Bandwidth – 507.8 MHz |
|---|---|

**Low Channel**
**10 dB**



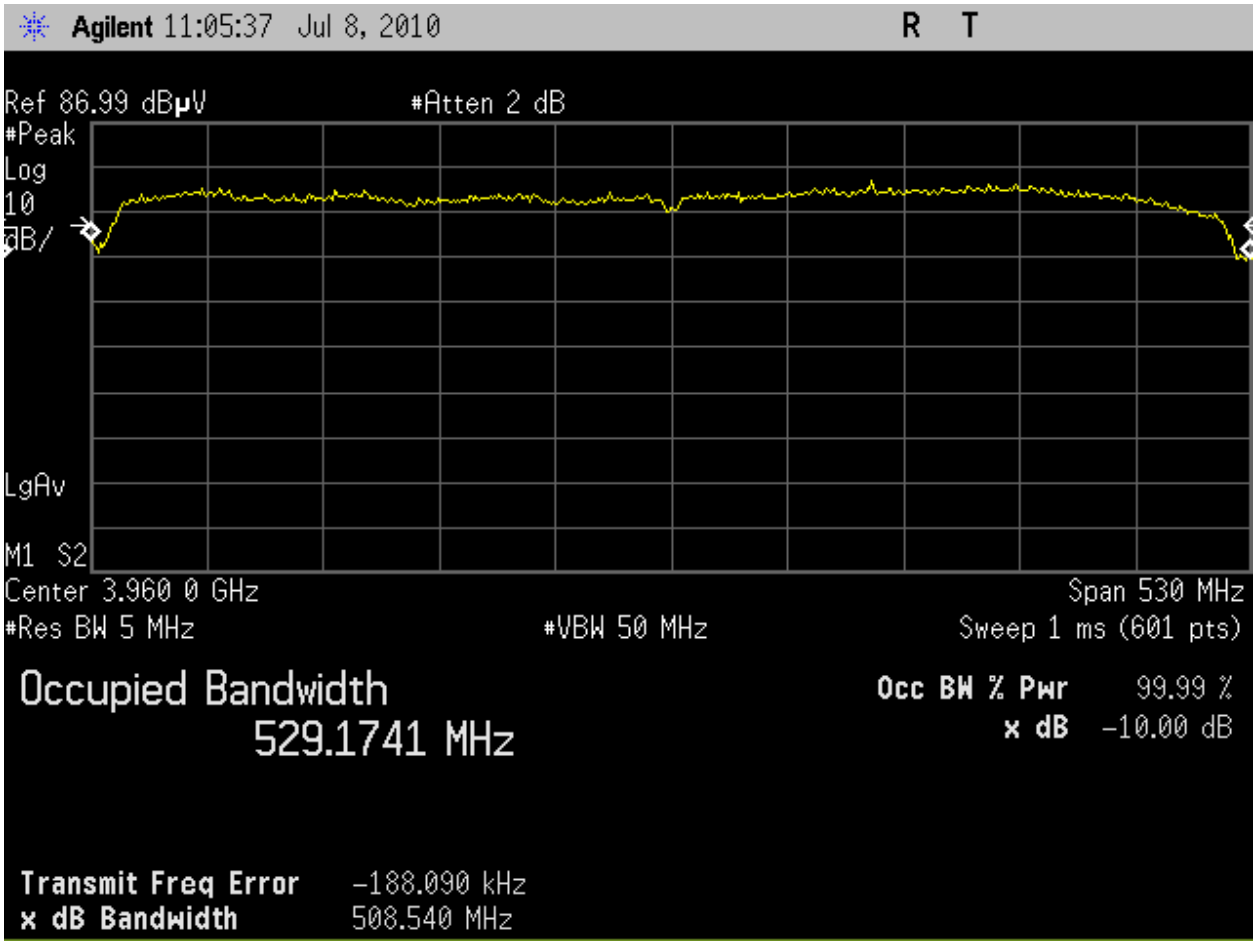

**Result = Pass**

## UWB Bandwidth Data Sheet

| PROJECT # | DATE | RULE | DISTANCE | ANTENNA | RBW | VBW | DETECTOR |
|---|---|---|---|---|---|---|---|
| 11345-10 | July 8, 2010 | 15.519(b) | 1m | Horn | 5 MHz | 50 MHz | Peak |

| COMMENT | Transmitting Mid Channel ADM6P Antenna BG 1<br>10 dB Bandwidth – 508.54 MHz |
|---|---|

**Mid Channel**
**10 dB**



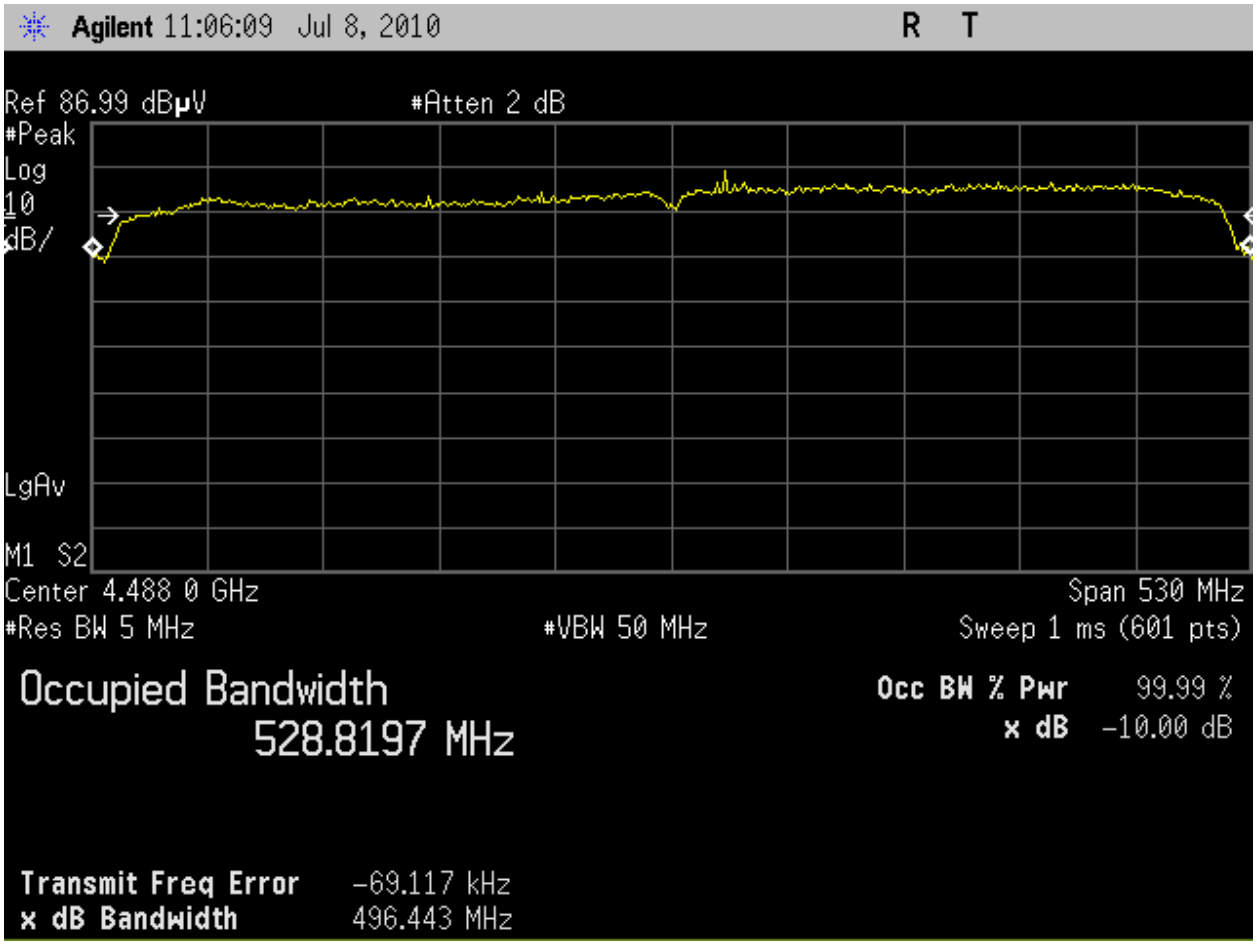

**Result = Pass**

## UWB Bandwidth Data Sheet

| PROJECT # | DATE | RULE | DISTANCE | ANTENNA | RBW | VBW | DETECTOR |
|---|---|---|---|---|---|---|---|
| 11345-10 | July 8, 2010 | 15.519(b) | 1m | Horn | 5 MHz | 50 MHz | Peak |

| COMMENT | Transmitting High Channel ADM6P Antenna BG 1<br>10 dB Bandwidth – 496.44 MHz |
|---|---|

**High Channel**
**10 dB**



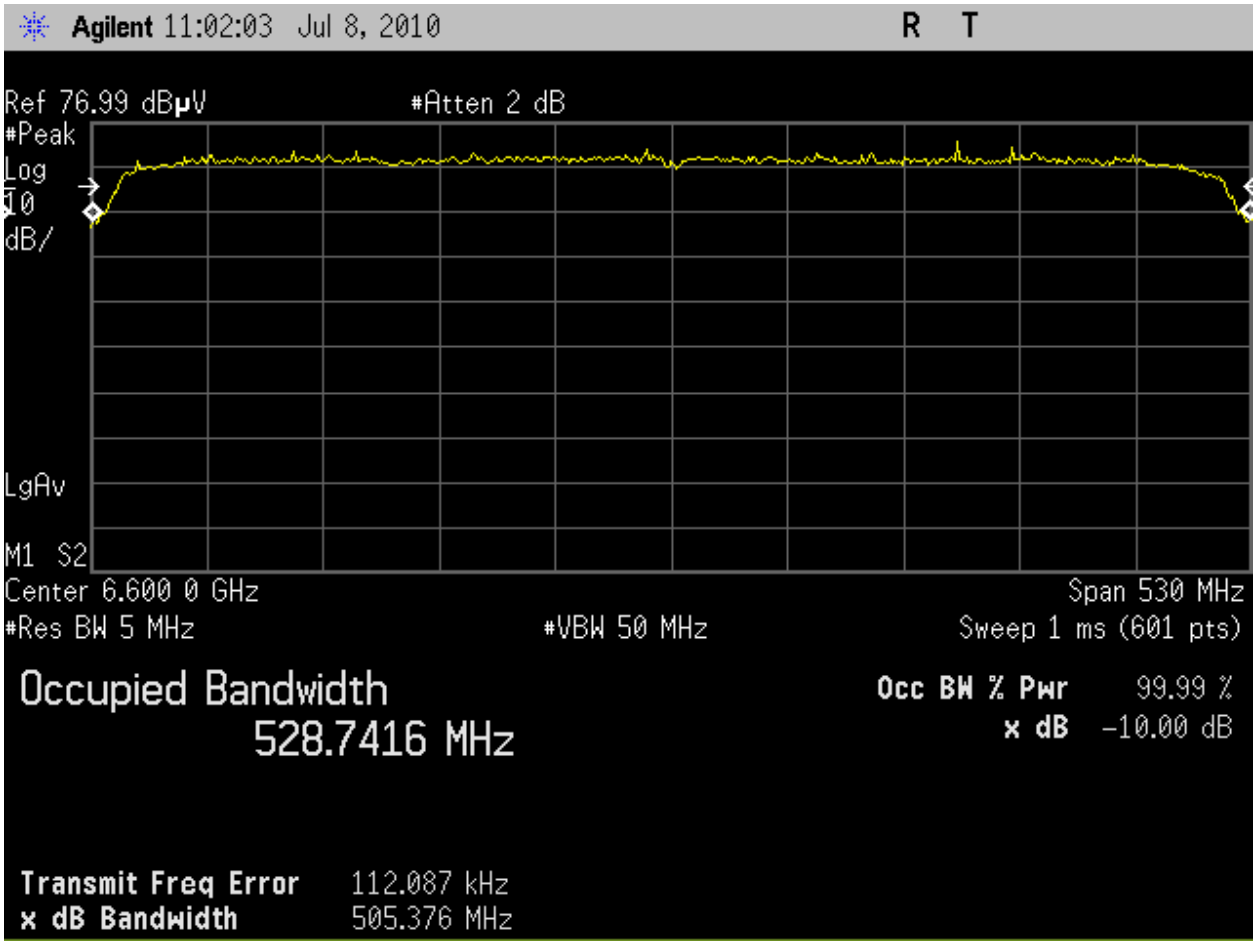

**Result = Pass**

## UWB Bandwidth Data Sheet

| PROJECT # | DATE | RULE | DISTANCE | ANTENNA | RBW | VBW | DETECTOR |
|---|---|---|---|---|---|---|---|
| 11345-10 | July 8, 2010 | 15.519(b) | 1m | Horn | 5 MHz | 50 MHz | Peak |

| COMMENT | Transmitting Low Channel ADM6P Antenna BG 3<br>10 dB Bandwidth – 505.38 MHz |
|---|---|

**Low Channel**
**10 dB**



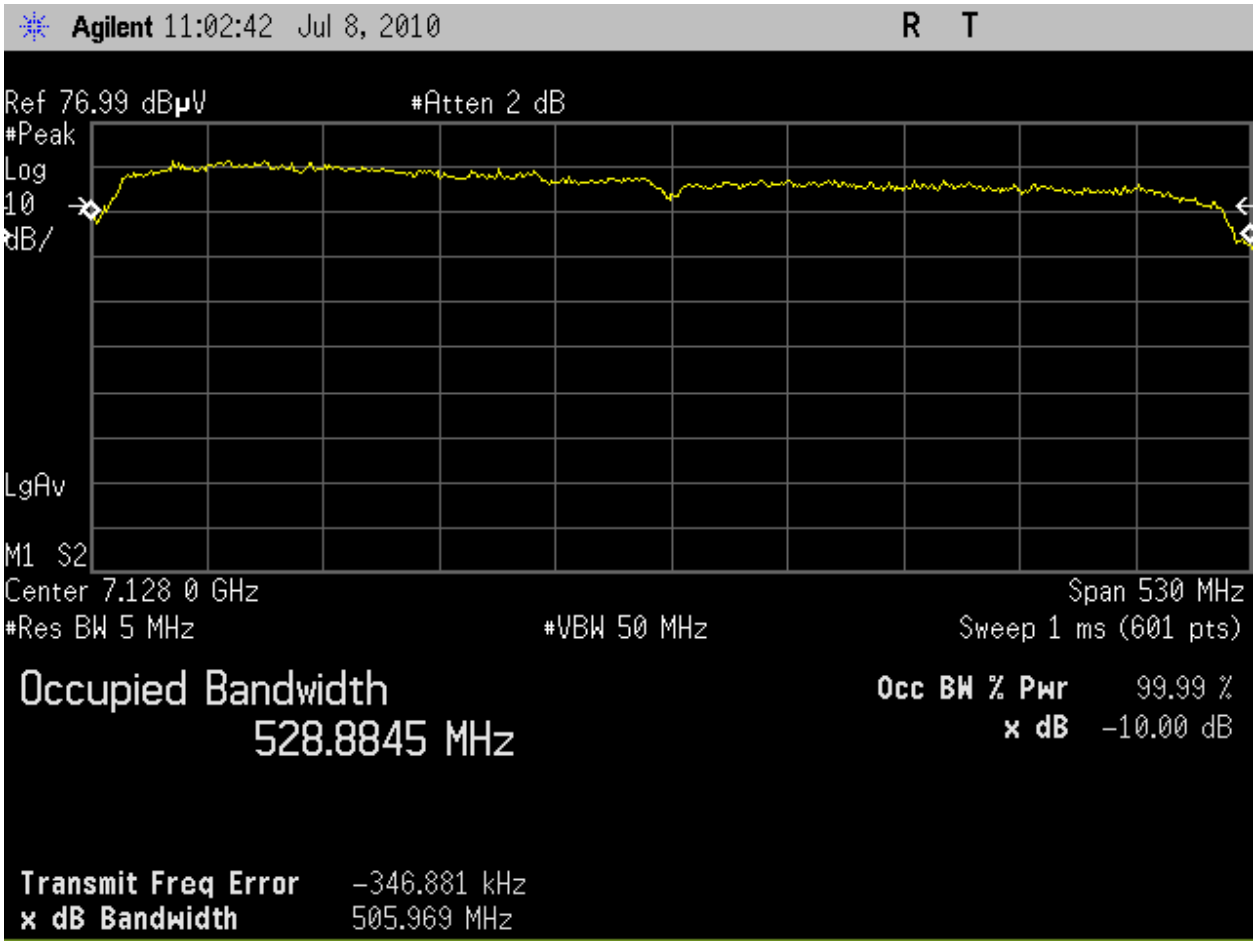

**Result = Pass**

## UWB Bandwidth Data Sheet

| PROJECT # | DATE | RULE | DISTANCE | ANTENNA | RBW | VBW | DETECTOR |
|---|---|---|---|---|---|---|---|
| 11345-10 | July 8, 2010 | 15.519(b) | 1m | Horn | 5 MHz | 50 MHz | Peak |

| COMMENT | Transmitting Mid Channel ADM6P Antenna BG 3<br>10 dB Bandwidth – 505.97 MHz |
|---|---|

**Mid Channel**
**10 dB**



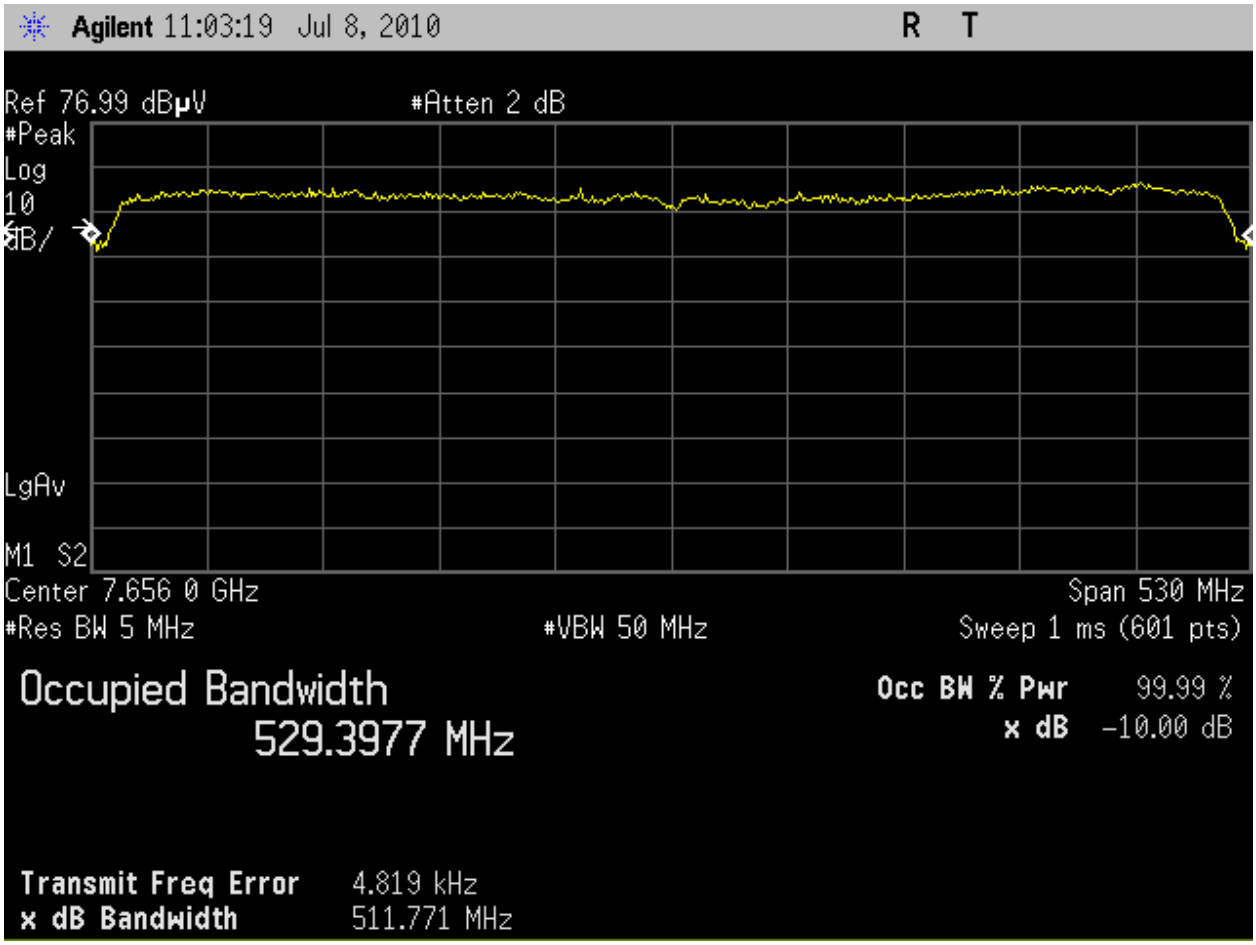

**Result = Pass**

## UWB Bandwidth Data Sheet

| PROJECT # | DATE | RULE | DISTANCE | ANTENNA | RBW | VBW | DETECTOR |
|---|---|---|---|---|---|---|---|
| 11345-10 | July 8, 2010 | 15.519(b) | 1m | Horn | 5 MHz | 50 MHz | Peak |

| COMMENT | Transmitting High Channel ADM6P Antenna BG 3<br>10 dB Bandwidth – 511.77 MHz |
|---|---|

**High Channel**
**10 dB**



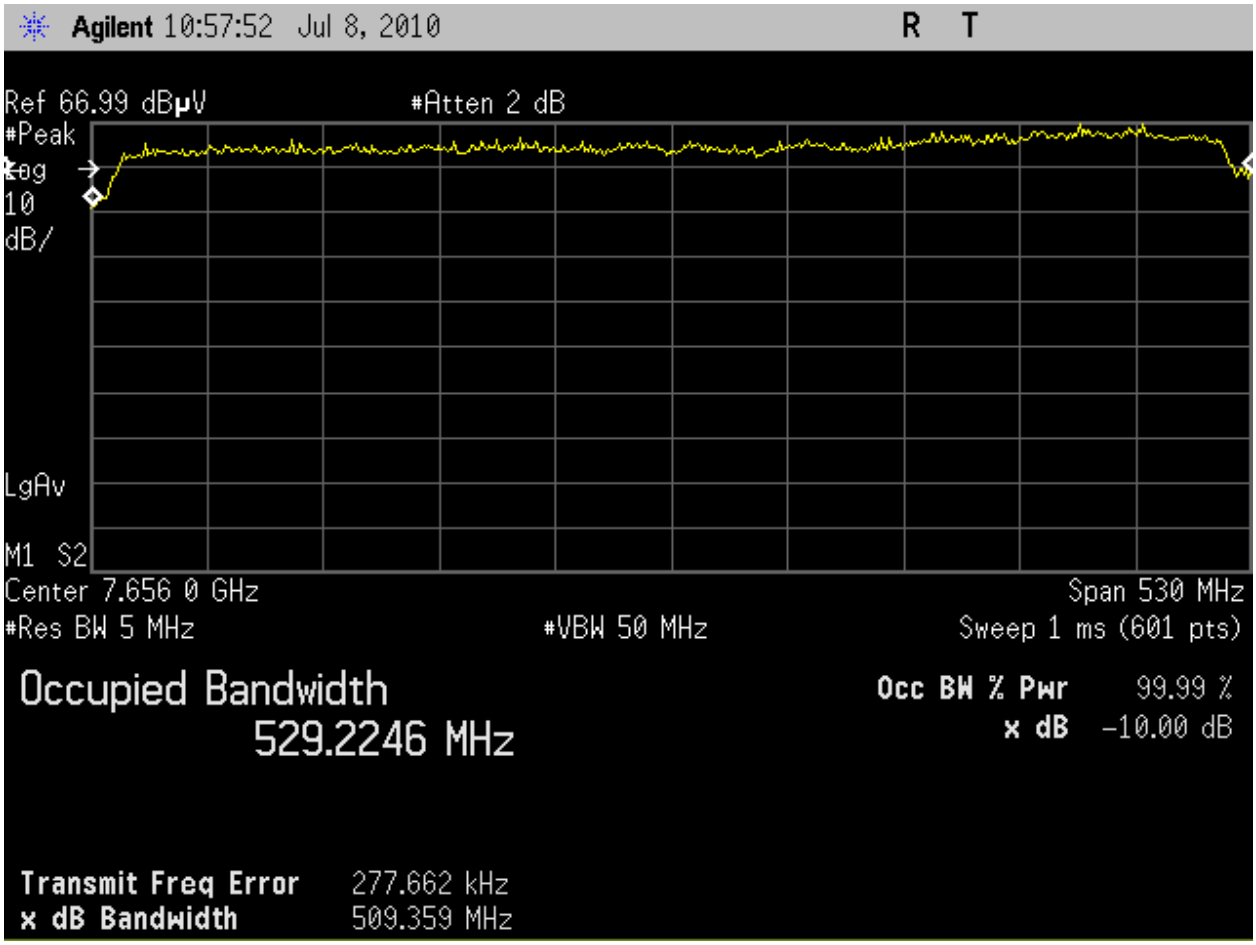

**Result = Pass**

## UWB Bandwidth Data Sheet

| PROJECT # | DATE | RULE | DISTANCE | ANTENNA | RBW | VBW | DETECTOR |
|---|---|---|---|---|---|---|---|
| 11345-10 | July 8, 2010 | 15.519(b) | 1m | Horn | 5 MHz | 50 MHz | Peak |

| COMMENT | Transmitting Low Channel ADM6P Antenna BG 6<br>10 dB Bandwidth – 509.36 MHz |
|---|---|

**Low Channel**
**10 dB**



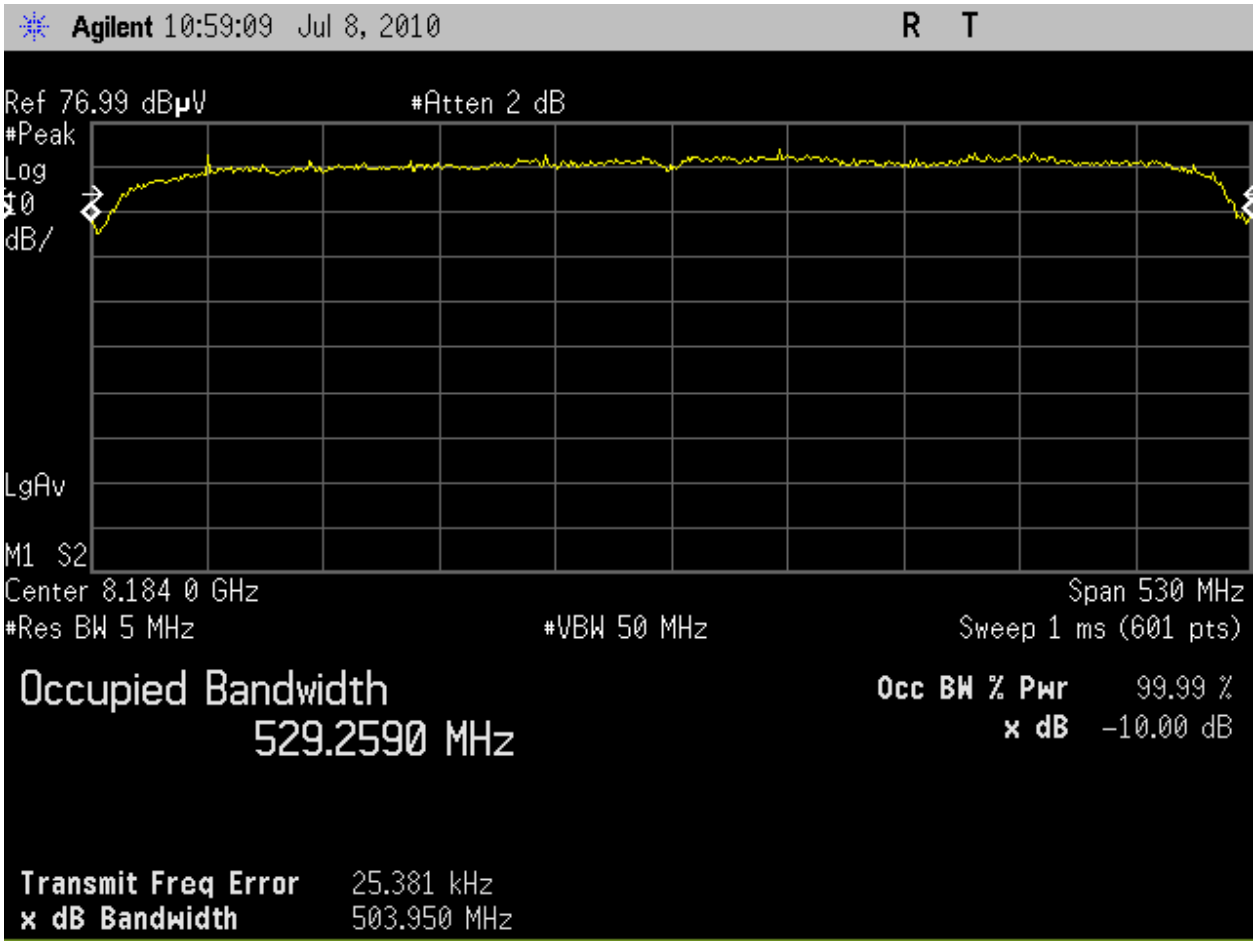

**Result = Pass**

## UWB Bandwidth Data Sheet

| PROJECT # | DATE | RULE | DISTANCE | ANTENNA | RBW | VBW | DETECTOR |
|---|---|---|---|---|---|---|---|
| 11345-10 | July 8, 2010 | 15.519(b) | 1m | Horn | 5 MHz | 50 MHz | Peak |

| COMMENT | Transmitting Mid Channel ADM6P Antenna BG 6<br>10 dB Bandwidth – 503.95 MHz |
|---|---|

**Mid Channel**
**10 dB**



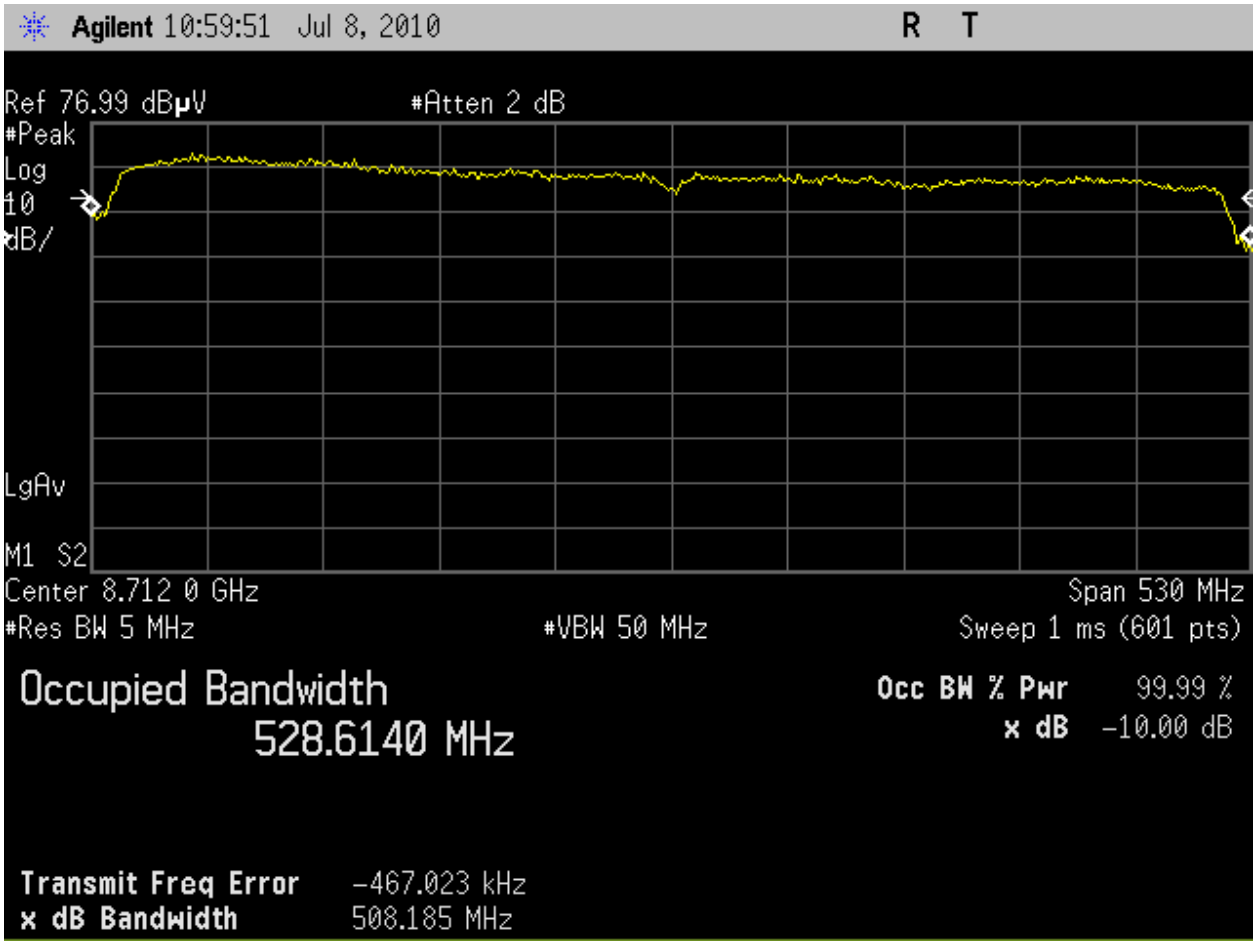

**Result = Pass**

## UWB Bandwidth Data Sheet

| PROJECT # | DATE | RULE | DISTANCE | ANTENNA | RBW | VBW | DETECTOR |
|---|---|---|---|---|---|---|---|
| 11345-10 | July 8, 2010 | 15.519(b) | 1m | Horn | 5 MHz | 50 MHz | Peak |

| COMMENT | Transmitting High Channel ADM6P Antenna BG 6<br>10 dB Bandwidth – 508.19 MHz |
|---|---|

**High Channel**
**10 dB**




**Result = Pass**

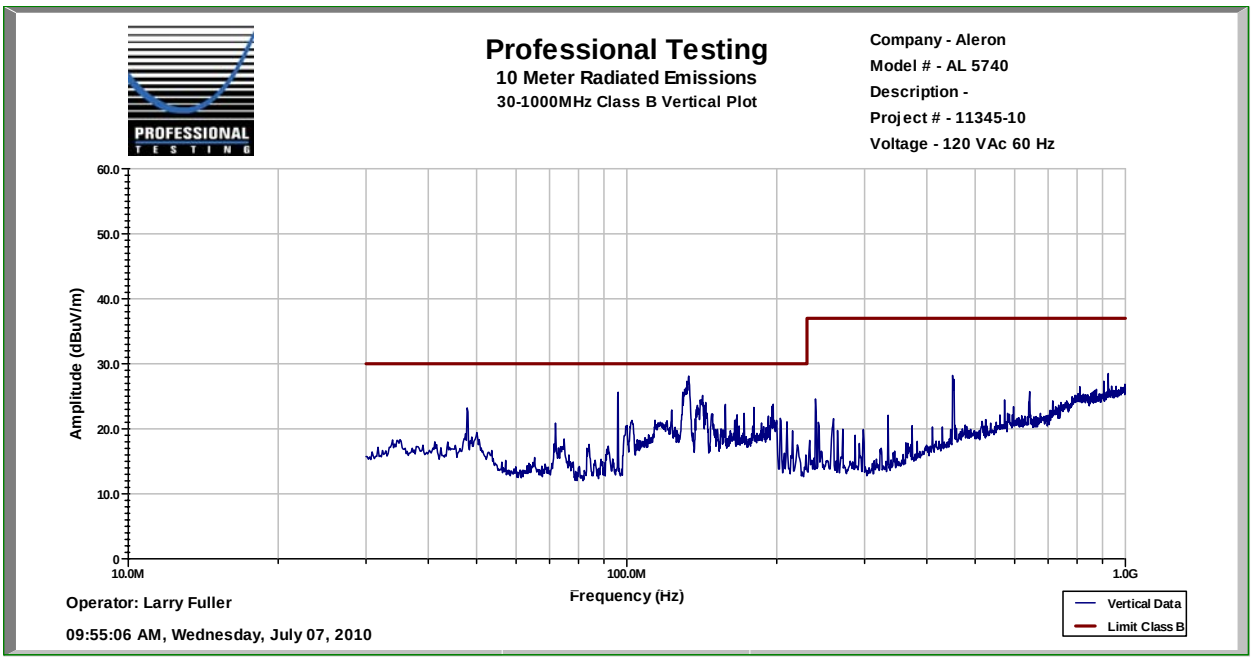
## Radiated Emissions Data Sheet
## Emissions 30 MHz … 960 MHz

| PROJECT # | DATE | RULE | DISTANCE | ANTENNA | RBW | VBW | DETECTOR |
|---|---|---|---|---|---|---|---|
| 11345-10 | July 7, 2010 | FCC B | 10 m | Bicon \| Log | CISPR 120 kHz | 1 MHz | Quasi Peak |

| COMMENT | Transmitting UWB BG 1 ADM6P Antenna |
|---|---|

### Vertical

| Frequency (MHz) | EUT Direction (degrees) | Antenna Elevation (Meters) | Recorded Level (dBµV) | Amplifier Gain (dB) | Antenna Factor (dB/m) | Cable Loss (dB) | Corrected Level (dBµV /m) | Limit (dBµV /m) | Margin (dB) | Detector |
|---|---|---|---|---|---|---|---|---|---|---|
| 48.05 | 246 | 1 | 37 | 26.7 | 11.4 | 0.7 | 22.5 | 30 | -7.5 | QP |
| 96.074 | 185 | 1.3 | 41.3 | 26.5 | 8.4 | 1.0 | 24.1 | 30 | -5.9 | QP |
| 133 | 54 | 1 | 35.1 | 26.4 | 12.0 | 1.4 | 22.1 | 30 | -7.9 | QP |
| 239.973 | 1 | 1 | 44 | 33.0 | 12.0 | 2.1 | 25.1 | 37 | -11.9 | QP |
| 455.97 | 17 | 3.6 | 38.4 | 33.3 | 18.2 | 3.2 | 26.5 | 37 | -10.5 | QP |
| 924.8 | 1 | 1 | 24.6 | 32.6 | 23.7 | 5.3 | 21.0 | 37 | -16.0 | QP |




**Result = Pass**

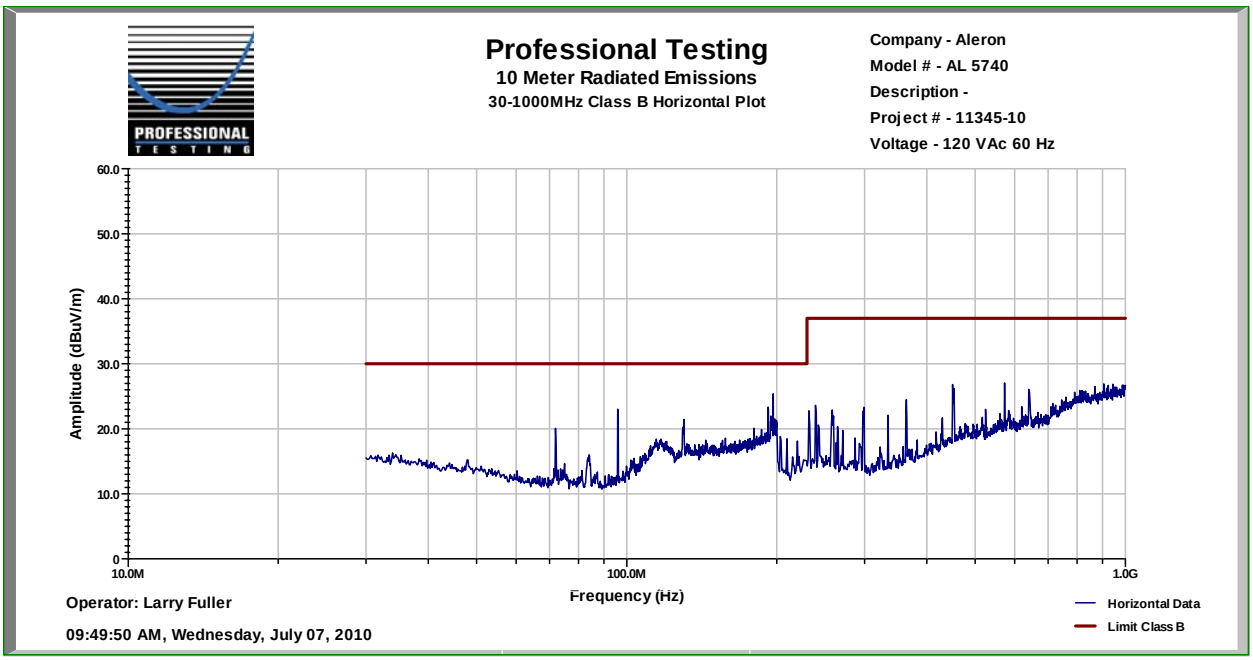
## Radiated Emissions Data Sheet
## Emissions 30 MHz … 1 GHz

| PROJECT # | DATE | CLASS | DISTANCE | ANTENNA | RBW | VBW | DETECTOR |
|---|---|---|---|---|---|---|---|
| 11345-10 | July 7, 2010 | FCC B | 10 m | Bicon \| Log | CISPR 120 kHz | 1 MHz | Quasi Peak |

| COMMENT | Transmitting UWB BG 1 ADM6P Antenna |
|---|---|

### Horizontal

| Frequency (MHz) | EUT Direction (degrees) | Antenna Elevation (Meters) | Recorded Level (dBµV) | Amplifier Gain (dB) | Antenna Factor (dB/m) | Cable Loss (dB) | Corrected Level (dBµV /m) | Limit (dBµV /m) | Margin (dB) | Detector |
|---|---|---|---|---|---|---|---|---|---|---|
| 72.06 | 203 | 4 | 36.3 | 26.616 | 9.0 | 0.8 | 19.4 | 30 | -10.6 | QP |
| 96.074 | 280 | 4 | 40 | 26.5 | 8.4 | 1.0 | 22.8 | 30 | -7.2 | QP |
| 196.629 | 270 | 4 | 35.2 | 26.1 | 13.6 | 1.8 | 24.4 | 30 | -5.6 | QP |
| 365.298 | 326 | 2.5 | 29.1 | 33.4 | 15.2 | 2.8 | 13.7 | 37 | -23.3 | QP |
| 455.97 | 317 | 1.8 | 34.2 | 33.3 | 18.2 | 3.2 | 22.3 | 37 | -14.7 | QP |
| 572.8 | 1 | 4 | 24.8 | 33.2 | 19.5 | 3.8 | 14.9 | 37 | -22.1 | QP |




**Result = Pass**

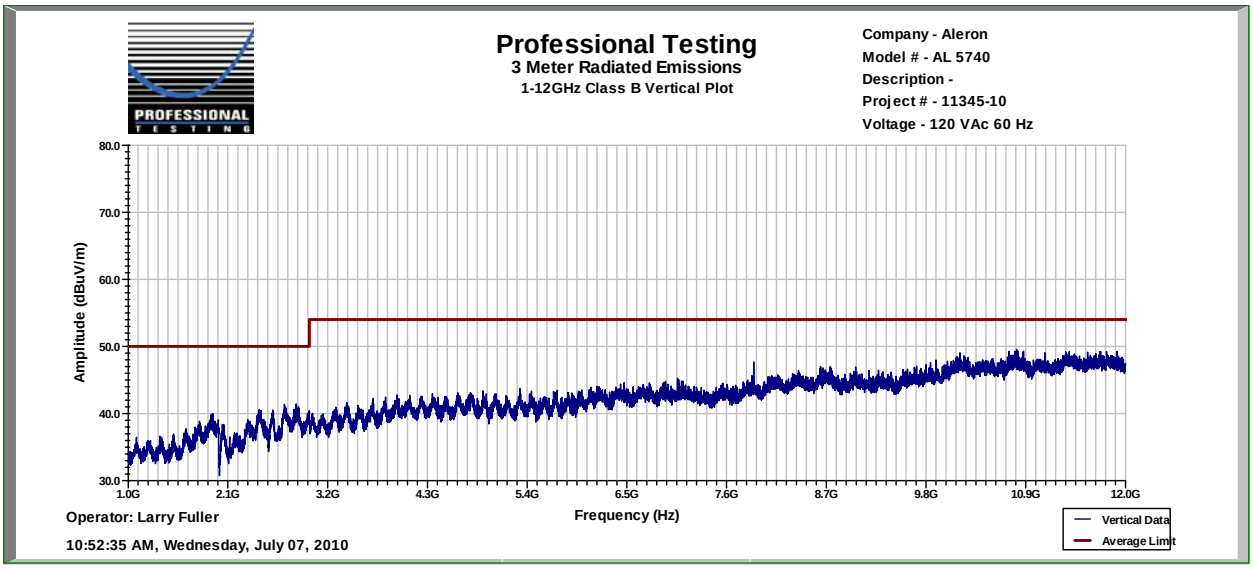
## Radiated Emissions Data Sheet
## 1 GHz…12 GHz

| PROJECT # | DATE | CLASS | DISTANCE | ANTENNA | RBW | VBW | DETECTOR |
|---|---|---|---|---|---|---|---|
| 11345-10 | July 7, 2010 | FCC B | 3 m | Horn | 1 MHz | 1 MHz | Average |

| COMMENT | Transmitting UWB BG 1 ADM6P Antenna |
|---|---|

### Vertical

| Frequency (MHz) | EUT Direction (degrees) | Antenna Elevation (Meters) | Recorded Level (dBµV) | Amplifier Gain (dB) | Antenna Factor (dB/m) | Cable Loss (dB) | Corrected Level (dBµV /m) | Limit (dBµV /m) | Margin (dB) | Detector |
|---|---|---|---|---|---|---|---|---|---|---|
| 6107 | Noise | Floor | 43.9 | 53.3 | 36.3 | 8.8 | 35.6 | 54 | -18.4 | Avg |
| 7900 | Noise | Floor | 47.7 | 50.2 | 36.7 | 10.4 | 44.5 | 54 | -9.5 | Avg |
| 8395 | Noise | Floor | 46.4 | 50.9 | 36.9 | 10.8 | 43.2 | 54 | -10.8 | Avg |
| 9024 | Noise | Floor | 46.9 | 50.5 | 37.4 | 10.3 | 44.2 | 54 | -9.8 | Avg |
| 10174 | Noise | Floor | 49 | 50.8 | 38.8 | 11.0 | 48.0 | 54 | -6.0 | Avg |
| 10800 | Noise | Floor | 49.6 | 50.0 | 39.1 | 11.6 | 50.3 | 54 | -3.7 | Avg |




**Result = Pass**

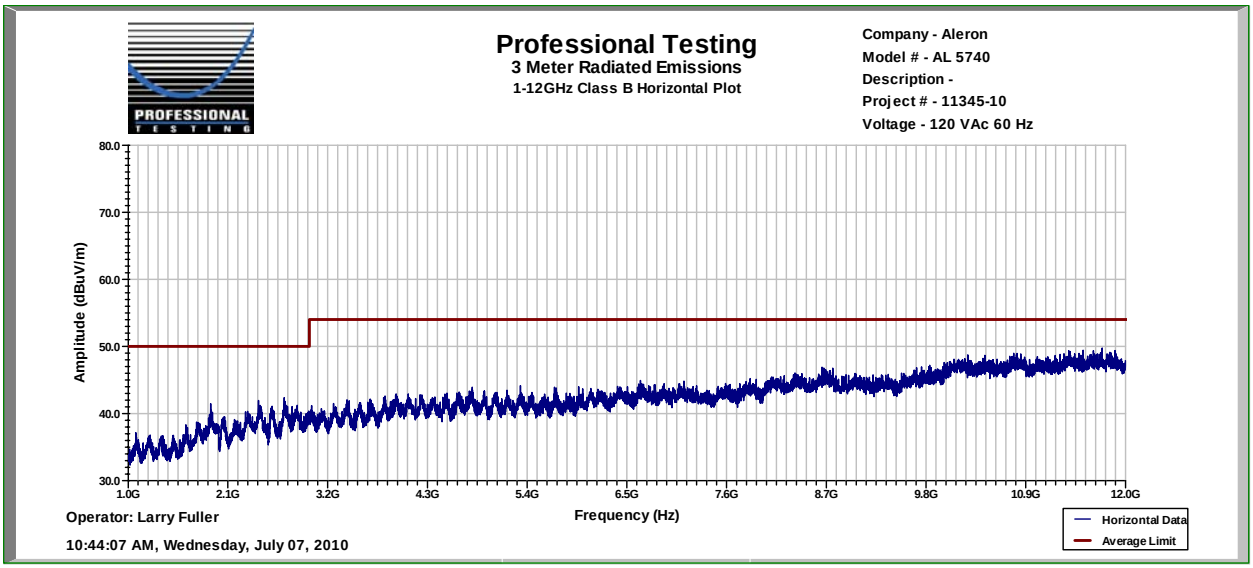
## Radiated Emissions Data Sheet
## 1 GHz…12 GHz

| PROJECT # | DATE | CLASS | DISTANCE | ANTENNA | RBW | VBW | DETECTOR |
|---|---|---|---|---|---|---|---|
| 11345-10 | July 7, 2010 | FCC B | 3 m | Horn | 1 MHz | 1 MHz | Average |

| COMMENT | Transmitting UWB BG 1 ADM6P Antenna |
|---|---|

### Horizontal

| Frequency (MHz) | EUT Direction (degrees) | Antenna Elevation (Meters) | Recorded Level (dBµV) | Amplifier Gain (dB) | Antenna Factor (dB/m) | Cable Loss (dB) | Corrected Level (dBµV /m) | Limit (dBµV /m) | Margin (dB) | Detector |
|---|---|---|---|---|---|---|---|---|---|---|
| 6651 | Noise | Floor | 44.9 | 52.1 | 36.6 | 9.3 | 38.8 | 54 | -15.2 | Avg |
| 7927 | Noise | Floor | 45.1 | 50.3 | 36.7 | 10.4 | 41.9 | 54 | -12.1 | Avg |
| 8654 | Noise | Floor | 46.9 | 49.3 | 37.1 | 10.8 | 45.5 | 54 | -8.5 | Avg |
| 9856 | Noise | Floor | 46.8 | 50.2 | 38.4 | 10.5 | 45.5 | 54 | -8.5 | Avg |
| 10262 | Noise | Floor | 48.8 | 51.1 | 38.9 | 11.2 | 47.7 | 54 | -6.3 | Avg |
| 11344 | Noise | Floor | 49.4 | 50.9 | 39.3 | 12.0 | 49.7 | 54 | -4.3 | Avg |




**Result = Pass**

## Spurious/Harmonic Emissions
## 1 GHz … 40 GHz

| PROJECT # | DATE | CLASS | DISTANCE | ANTENNA | RBW | VBW | DETECTOR |
|---|---|---|---|---|---|---|---|
| 11345-10 | July 8, 2010 | FCC B | 1 m | Horn | 1 MHz | 3 MHz | Peak |

| | |
|---|---|
| **COMMENT** | Transmitting Low Channel AL51000 Antenna BG 1<br>Investigated up to 40 GHz. Harmonics from 26.5 – 40 GHz were measured at a distance of .3 meters to improve the measurement system's noise floor. Limit is converted to account for .3 meter distance. |

### Horizontal

| Frequency (GHz) | EUT Direction (degrees) | Antenna Elevation (Meters) | Recorded Level (dBµV) | Amplifier Gain (dB) | Antenna Factor (dB/m) | Cable Loss (dB) | Corrected Level (dBµV /m) | Limit (dBµV /m) | Margin (dB) | Detector Function |
|---|---|---|---|---|---|---|---|---|---|---|
| 6.864 | noise | floor | 33.6 | 43.1 | 36.7 | 4.6 | 31.8 | 63.4 | -31.6 | Peak |
| 10.296 | noise | floor | 34 | 38.4 | 38.8 | 6.6 | 41.0 | 63.4 | -22.4 | Peak |
| 13.728 | noise | floor | 33.4 | 39.5 | 41.5 | 6.8 | 42.2 | 53.4 | -11.2 | Peak |
| 17.16 | noise | floor | 31.8 | 41.4 | 43.8 | 8.4 | 42.6 | 53.4 | -10.8 | Peak |
| 20.592 | noise | floor | 32.6 | 43.9 | 37.1 | 9.0 | 34.8 | 53.4 | -18.6 | Peak |

### Vertical

| Frequency (GHz) | EUT Direction (degrees) | Antenna Elevation (Meters) | Recorded Level (dBµV) | Amplifier Gain (dB) | Antenna Factor (dB/m) | Cable Loss (dB) | Corrected Level (dBµV /m) | Limit (dBµV /m) | Margin (dB) | Detector Function |
|---|---|---|---|---|---|---|---|---|---|---|
| 6.864 | noise | floor | 33.6 | 43.1 | 36.7 | 4.6 | 31.8 | 63.4 | -31.6 | Peak |
| 10.296 | noise | floor | 34 | 38.4 | 38.8 | 6.6 | 41.0 | 63.4 | -22.4 | Peak |
| 13.728 | noise | floor | 33.4 | 39.5 | 41.5 | 6.8 | 42.2 | 53.4 | -11.2 | Peak |
| 17.16 | noise | floor | 31.8 | 41.4 | 43.8 | 8.4 | 42.6 | 53.4 | -10.8 | Peak |
| 20.592 | noise | floor | 32.6 | 43.9 | 37.1 | 9.0 | 34.8 | 53.4 | -18.6 | Peak |

**Result = Pass**

## Spurious/Harmonic Emissions
## 1 GHz … 40 GHz

| PROJECT # | DATE | CLASS | DISTANCE | ANTENNA | RBW | VBW | DETECTOR |
|---|---|---|---|---|---|---|---|
| 11345-10 | July 8, 2010 | FCC B | 1 m | Horn | 1 MHz | 3 MHz | Peak |

| | |
|---|---|
| **COMMENT** | Transmitting Middle Channel AL51000 Antenna BG 1<br>Investigated up to 40 GHz. Harmonics from 26.5 – 40 GHz were measured at a distance of .3 meters to improve the measurement system's noise floor. Limit is converted to account for .3 meter distance. |

### Horizontal

| Frequency (GHz) | EUT Direction (degrees) | Antenna Elevation (Meters) | Recorded Level (dBµV) | Amplifier Gain (dB) | Antenna Factor (dB/m) | Cable Loss (dB) | Corrected Level (dBµV /m) | Limit (dBµV /m) | Margin (dB) | Detector Function |
|---|---|---|---|---|---|---|---|---|---|---|
| 7.92 | noise | floor | 34 | 42.1 | 37.0 | 4.9 | 33.8 | 63.4 | -29.6 | Peak |
| 11.88 | noise | floor | 32 | 37.1 | 40.2 | 6.1 | 41.2 | 53.4 | -12.2 | Peak |
| 15.84 | noise | floor | 33.4 | 39.6 | 38.0 | 7.4 | 39.2 | 53.4 | -14.2 | Peak |
| 19.8 | noise | floor | 30.8 | 43.7 | 36.5 | 8.2 | 31.9 | 53.4 | -21.5 | Peak |
| 23.76 | noise | floor | 32.1 | 41.8 | 37.1 | 10.8 | 38.3 | 53.4 | -15.1 | Peak |

### Vertical

| Frequency (GHz) | EUT Direction (degrees) | Antenna Elevation (Meters) | Recorded Level (dBµV) | Amplifier Gain (dB) | Antenna Factor (dB/m) | Cable Loss (dB) | Corrected Level (dBµV /m) | Limit (dBµV /m) | Margin (dB) | Detector Function |
|---|---|---|---|---|---|---|---|---|---|---|
| 7.92 | noise | floor | 34 | 42.1 | 37.0 | 4.9 | 33.8 | 63.4 | -29.6 | Peak |
| 11.88 | noise | floor | 32 | 37.1 | 40.2 | 6.1 | 41.2 | 53.4 | -12.2 | Peak |
| 15.84 | noise | floor | 33.4 | 39.6 | 38.0 | 7.4 | 39.2 | 53.4 | -14.2 | Peak |
| 19.8 | noise | floor | 30.8 | 43.7 | 36.5 | 8.2 | 31.9 | 53.4 | -21.5 | Peak |
| 23.76 | noise | floor | 32.1 | 41.8 | 37.1 | 10.8 | 38.3 | 53.4 | -15.1 | Peak |

**Result = Pass**

## Spurious/Harmonic Emissions
## 1 GHz to 40 GHz

| PROJECT # | DATE | CLASS | DISTANCE | ANTENNA | RBW | VBW | DETECTOR |
|---|---|---|---|---|---|---|---|
| 11345-10 | July 8, 2010 | FCC B | 1 m | Horn | 1 MHz | 3 MHz | Peak |

| | |
|---|---|
| **COMMENT** | Transmitting High Channel AL51000 Antenna BG 1<br>Investigated up to 40 GHz. Harmonics from 26.5 – 40 GHz were measured at a distance of .3 meters to improve the measurement system's noise floor. Limit is converted to account for .3 meter distance. |

### Horizontal

| Frequency (GHz) | EUT Direction (degrees) | Antenna Elevation (Meters) | Recorded Level (dBµV) | Amplifier Gain (dB) | Antenna Factor (dB/m) | Cable Loss (dB) | Corrected Level (dBµV /m) | Limit (dBµV /m) | Margin (dB) | Detector Function |
|---|---|---|---|---|---|---|---|---|---|---|
| 8.976 | noise | floor | 32.6 | 40.5 | 37.6 | 4.9 | 34.6 | 63.4 | -28.8 | Peak |
| 13.464 | noise | floor | 35.5 | 38.6 | 41.4 | 7.0 | 45.3 | 53.4 | -8.1 | Peak |
| 17.952 | noise | floor | 32.8 | 42.7 | 46.8 | 9.0 | 45.9 | 53.4 | -7.5 | Peak |
| 22.44 | noise | floor | 33 | 40.5 | 37.1 | 9.4 | 39.0 | 62.9 | -23.9 | Peak |
| 26.928 | noise | floor | 39.3 | 41.3 | 37 | 9.0 | 44.6 | 62.9 | -18.9 | Peak |

### Vertical

| Frequency (GHz) | EUT Direction (degrees) | Antenna Elevation (Meters) | Recorded Level (dBµV) | Amplifier Gain (dB) | Antenna Factor (dB/m) | Cable Loss (dB) | Corrected Level (dBµV /m) | Limit (dBµV /m) | Margin (dB) | Detector Function |
|---|---|---|---|---|---|---|---|---|---|---|
| 8.976 | noise | floor | 32.6 | 40.5 | 37.6 | 4.9 | 34.6 | 63.4 | -28.8 | Peak |
| 13.464 | noise | floor | 35.5 | 38.6 | 41.4 | 7.0 | 45.3 | 53.4 | -8.1 | Peak |
| 17.952 | noise | floor | 32.8 | 42.7 | 46.8 | 9.0 | 45.9 | 53.4 | -7.5 | Peak |
| 22.44 | noise | floor | 33 | 40.5 | 37.1 | 9.4 | 39.0 | 62.9 | -23.9 | Peak |
| 26.928 | noise | floor | 39.3 | 41.3 | 37 | 9.0 | 44.6 | 62.9 | -18.6 | Peak |

**Result = Pass**

## Spurious/Harmonic Emissions
## 1 GHz to 40 GHz

| PROJECT # | DATE | CLASS | DISTANCE | ANTENNA | RBW | VBW | DETECTOR |
|---|---|---|---|---|---|---|---|
| 11345-10 | July 8, 2010 | FCC B | 1 m | Horn | 1 MHz | 3 MHz | Peak |

| | |
|---|---|
| **COMMENT** | Transmitting Low Channel ADM6P Antenna BG 1<br>Investigated up to 40 GHz. Harmonics from 26.5 – 40 GHz were measured at a distance of .3 meters to improve the measurement system's noise floor. Limit is converted to account for .3 meter distance. |

### Horizontal

| Frequency (GHz) | EUT Direction (degrees) | Antenna Elevation (Meters) | Recorded Level (dBµV) | Amplifier Gain (dB) | Antenna Factor (dB/m) | Cable Loss (dB) | Corrected Level (dBµV /m) | Limit (dBµV /m) | Margin (dB) | Detector Function |
|---|---|---|---|---|---|---|---|---|---|---|
| 6.864 | Noise | Floor | 25.8 | 43.1 | 36.7 | 4.6 | 24.0 | 63.4 | -39.4 | Peak |
| 10.296 | Noise | Floor | 24.9 | 38.4 | 38.8 | 6.6 | 31.9 | 63.4 | -31.5 | Peak |
| 13.728 | Noise | Floor | 25.8 | 39.5 | 41.5 | 6.8 | 34.6 | 53.4 | -18.8 | Peak |
| 17.16 | Noise | Floor | 24.1 | 41.4 | 43.8 | 8.4 | 34.9 | 53.4 | -18.5 | Peak |
| 20.59 | Noise | Floor | 23.6 | 43.9 | 37.1 | 9.0 | 25.8 | 62.9 | -37.1 | Peak |

### Vertical

| Frequency (GHz) | EUT Direction (degrees) | Antenna Elevation (Meters) | Recorded Level (dBµV) | Amplifier Gain (dB) | Antenna Factor (dB/m) | Cable Loss (dB) | Corrected Level (dBµV /m) | Limit (dBµV /m) | Margin (dB) | Detector Function |
|---|---|---|---|---|---|---|---|---|---|---|
| 6.864 | Noise | Floor | 25.8 | 43.1 | 36.7 | 4.6 | 24.0 | 63.4 | -39.4 | Peak |
| 10.296 | Noise | Floor | 24.9 | 38.4 | 38.8 | 6.6 | 31.9 | 63.4 | -31.5 | Peak |
| 13.728 | Noise | Floor | 25.8 | 39.5 | 41.5 | 6.8 | 34.6 | 53.4 | -18.8 | Peak |
| 17.16 | Noise | Floor | 24.1 | 41.4 | 43.8 | 8.4 | 34.9 | 53.4 | -18.5 | Peak |
| 20.59 | Noise | Floor | 23.6 | 43.9 | 37.1 | 9.0 | 25.8 | 62.9 | -37.1 | Peak |

**Result = Pass**

## Spurious/Harmonic Emissions
## 1 GHz to 40 GHz

| PROJECT # | DATE | CLASS | DISTANCE | ANTENNA | RBW | VBW | DETECTOR |
|---|---|---|---|---|---|---|---|
| 11345-10 | July 8, 2010 | FCC B | 1 m | Horn | 1 MHz | 3 MHz | Peak |

| | |
|---|---|
| **COMMENT** | Transmitting Mid Channel ADM6P Antenna BG 1<br>Investigated up to 40 GHz. Harmonics from 26.5 – 40 GHz were measured at a distance of .3 meters to improve the measurement system's noise floor. Limit is converted to account for .3 meter distance. |

### Horizontal

| Frequency (GHz) | EUT Direction (degrees) | Antenna Elevation (Meters) | Recorded Level (dBµV) | Amplifier Gain (dB) | Antenna Factor (dB/m) | Cable Loss (dB) | Corrected Level (dBµV /m) | Limit (dBµV /m) | Margin (dB) | Detector Function |
|---|---|---|---|---|---|---|---|---|---|---|
| 7.92 | Noise | Floor | 25.5 | 42.1 | 37.0 | 4.9 | 25.2 | 63.4 | -38.2 | Peak |
| 11.88 | Noise | Floor | 23.4 | 37.1 | 40.2 | 6.1 | 32.6 | 53.4 | -20.8 | Peak |
| 15.84 | Noise | Floor | 24.5 | 39.6 | 38.0 | 7.4 | 30.4 | 53.4 | -23.0 | Peak |
| 19.8 | Noise | Floor | 22.4 | 43.7 | 36.5 | 8.2 | 23.5 | 62.9 | -39.4 | Peak |
| 23.76 | Noise | Floor | 23.9 | 41.8 | 37.1 | 10.8 | 30.1 | 62.9 | -32.8 | Peak |

### Vertical

| Frequency (GHz) | EUT Direction (degrees) | Antenna Elevation (Meters) | Recorded Level (dBµV) | Amplifier Gain (dB) | Antenna Factor (dB/m) | Cable Loss (dB) | Corrected Level (dBµV /m) | Limit (dBµV /m) | Margin (dB) | Detector Function |
|---|---|---|---|---|---|---|---|---|---|---|
| 7.92 | Noise | Floor | 25.5 | 42.1 | 37.0 | 4.9 | 25.2 | 63.4 | -38.2 | Peak |
| 11.88 | Noise | Floor | 23.4 | 37.1 | 40.2 | 6.1 | 32.6 | 53.4 | -20.8 | Peak |
| 15.84 | Noise | Floor | 24.5 | 39.6 | 38.0 | 7.4 | 30.4 | 53.4 | -23.0 | Peak |
| 19.8 | Noise | Floor | 22.4 | 43.7 | 36.5 | 8.2 | 23.5 | 62.9 | -39.4 | Peak |
| 23.76 | Noise | Floor | 23.9 | 41.8 | 37.1 | 10.8 | 30.1 | 62.9 | -32.8 | Peak |

**Result = Pass**

## Spurious/Harmonic Emissions
## 1 GHz to 40 GHz

| PROJECT # | DATE | CLASS | DISTANCE | ANTENNA | RBW | VBW | DETECTOR |
|---|---|---|---|---|---|---|---|
| 11345-10 | July 8, 2010 | FCC B | 1 m | Horn | 1 MHz | 3 MHz | Peak |

| | |
|---|---|
| **COMMENT** | Transmitting High Channel ADM6P Antenna BG 1<br>Investigated up to 40 GHz. Harmonics. Harmonics from 26.5 – 40 GHz were measured at a distance of .3 meters to improve the measurement system's noise floor. Limit is converted to account for .3 meter distance. |

### Horizontal

| Frequency (GHz) | EUT Direction (degrees) | Antenna Elevation (Meters) | Recorded Level (dBµV) | Amplifier Gain (dB) | Antenna Factor (dB/m) | Cable Loss (dB) | Corrected Level (dBµV /m) | Limit (dBµV /m) | Margin (dB) | Detector Function |
|---|---|---|---|---|---|---|---|---|---|---|
| 8.976 | Noise | Floor | 23.9 | 40.5 | 37.6 | 4.9 | 25.9 | 63.4 | -37.5 | Peak |
| 13.464 | Noise | Floor | 26.1 | 38.6 | 41.4 | 7.0 | 35.9 | 53.4 | -17.5 | Peak |
| 17.952 | Noise | Floor | 23.9 | 42.7 | 46.8 | 9.0 | 37.0 | 53.4 | -16.4 | Peak |
| 22.44 | Noise | Floor | 24.3 | 40.5 | 37.1 | 9.4 | 30.3 | 62.9 | -32.6 | Peak |
| 26.928 | Noise | Floor | 39.6 | 41.3 | 37.0 | 9.0 | 44.3 | 62.9 | -18.6 | Peak |

### Vertical

| Frequency (GHz) | EUT Direction (degrees) | Antenna Elevation (Meters) | Recorded Level (dBµV) | Amplifier Gain (dB) | Antenna Factor (dB/m) | Cable Loss (dB) | Corrected Level (dBµV /m) | Limit (dBµV /m) | Margin (dB) | Detector Function |
|---|---|---|---|---|---|---|---|---|---|---|
| 8.976 | Noise | Floor | 23.9 | 40.5 | 37.6 | 4.9 | 25.9 | 63.4 | -37.5 | Peak |
| 13.464 | Noise | Floor | 26.1 | 38.6 | 41.4 | 7.0 | 35.9 | 53.4 | -17.5 | Peak |
| 17.952 | Noise | Floor | 23.9 | 42.7 | 46.8 | 9.0 | 37.0 | 53.4 | -16.4 | Peak |
| 22.44 | Noise | Floor | 24.3 | 40.5 | 37.1 | 9.4 | 30.3 | 62.9 | -32.6 | Peak |
| 26.928 | Noise | Floor | 39.6 | 41.3 | 37.0 | 9.0 | 44.3 | 62.9 | -18.6 | Peak |

**Result = Pass**

## Spurious/Harmonic Emissions
## 1 GHz to 40 GHz

| PROJECT # | DATE | CLASS | DISTANCE | ANTENNA | RBW | VBW | DETECTOR |
|---|---|---|---|---|---|---|---|
| 11345-10 | July 8, 2010 | FCC B | 1 m | Horn | 1 MHz | 3 MHz | Peak |

| | |
|---|---|
| **COMMENT** | Transmitting Low Channel ADM6P Antenna BG 3<br>Investigated up to 40 GHz. Harmonics from 26.5 – 40 GHz were measured at a distance of .3 meters to improve the measurement system's noise floor. Limit is converted to account for .3 meter distance. |

### Horizontal

| Frequency (GHz) | EUT Direction (degrees) | Antenna Elevation (Meters) | Recorded Level (dBµV) | Amplifier Gain (dB) | Antenna Factor (dB/m) | Cable Loss (dB) | Corrected Level (dBµV /m) | Limit (dBµV /m) | Margin (dB) | Detector Function |
|---|---|---|---|---|---|---|---|---|---|---|
| 13.2 | Noise | Floor | 25.2 | 39.0 | 40.7 | 7.1 | 34.0 | 53.4 | -19.4 | Peak |
| 19.8 | Noise | Floor | 22.3 | 43.9 | 36.5 | 8.2 | 23.1 | 62.9 | -39.8 | Peak |
| 26.4 | Noise | Floor | 26.8 | 41.3 | 37.1 | 9.4 | 32.0 | 62.9 | -30.9 | Peak |
| 33 | Noise | Floor | 47.2 | 41.3 | 37.1 | 9.4 | 52.4 | 62.9 | -10.5 | Peak |
| 39.6 | Noise | Floor | 52.3 | 41.3 | 37.1 | 9.4 | 57.5 | 62.9 | -5.4 | Peak |

### Vertical

| Frequency (GHz) | EUT Direction (degrees) | Antenna Elevation (Meters) | Recorded Level (dBµV) | Amplifier Gain (dB) | Antenna Factor (dB/m) | Cable Loss (dB) | Corrected Level (dBµV /m) | Limit (dBµV /m) | Margin (dB) | Detector Function |
|---|---|---|---|---|---|---|---|---|---|---|
| 13.2 | Noise | Floor | 25.2 | 39.0 | 40.7 | 7.1 | 34.0 | 53.4 | -19.4 | Peak |
| 19.8 | Noise | Floor | 22.3 | 43.9 | 36.5 | 8.2 | 23.1 | 62.9 | -39.8 | Peak |
| 26.4 | Noise | Floor | 26.8 | 41.3 | 37.1 | 9.4 | 32.0 | 62.9 | -30.9 | Peak |
| 33 | Noise | Floor | 47.2 | 41.3 | 37.1 | 9.4 | 52.4 | 62.9 | -10.5 | Peak |
| 39.6 | Noise | Floor | 52.3 | 41.3 | 37.1 | 9.4 | 57.5 | 62.9 | -5.4 | Peak |

**Result = Pass**

## Spurious/Harmonic Emissions
## 1 GHz to 40 GHz

| PROJECT # | DATE | CLASS | DISTANCE | ANTENNA | RBW | VBW | DETECTOR |
|---|---|---|---|---|---|---|---|
| 11345-10 | July 8, 2010 | FCC B | 1 m | Horn | 1 MHz | 3 MHz | Peak |

| | |
|---|---|
| **COMMENT** | Transmitting Mid Channel ADM6P Antenna BG 3<br>Investigated up to 40 GHz. Harmonics from 26.5 – 40 GHz were measured at a distance of .3 meters to improve the measurement system's noise floor. Limit is converted to account for .3 meter distance. |

### Horizontal

| Frequency (GHz) | EUT Direction (degrees) | Antenna Elevation (Meters) | Recorded Level (dBµV) | Amplifier Gain (dB) | Antenna Factor (dB/m) | Cable Loss (dB) | Corrected Level (dBµV /m) | Limit (dBµV /m) | Margin (dB) | Detector Function |
|---|---|---|---|---|---|---|---|---|---|---|
| 14.256 | Noise | Floor | 25.8 | 39.5 | 42.4 | 6.2 | 34.9 | 53.4 | -18.5 | Peak |
| 21.384 | Noise | Floor | 22.5 | 43.1 | 36.9 | 9.9 | 26.2 | 62.9 | -36.7 | Peak |
| 28.512 | Noise | Floor | 40.5 | 41.3 | 37.1 | 9.4 | 45.7 | 62.9 | -17.2 | Peak |
| 35.64 | Noise | Floor | 50.3 | 41.3 | 37.1 | 9.4 | 55.5 | 62.9 | -7.4 | Peak |

### Vertical

| Frequency (GHz) | EUT Direction (degrees) | Antenna Elevation (Meters) | Recorded Level (dBµV) | Amplifier Gain (dB) | Antenna Factor (dB/m) | Cable Loss (dB) | Corrected Level (dBµV /m) | Limit (dBµV /m) | Margin (dB) | Detector Function |
|---|---|---|---|---|---|---|---|---|---|---|
| 14.256 | Noise | Floor | 25.8 | 39.5 | 42.4 | 6.2 | 34.9 | 53.4 | -18.5 | Peak |
| 21.384 | Noise | Floor | 22.5 | 43.1 | 36.9 | 9.9 | 26.2 | 62.9 | -36.7 | Peak |
| 28.512 | Noise | Floor | 40.5 | 41.3 | 37.1 | 9.4 | 45.7 | 62.9 | -17.2 | Peak |
| 35.64 | Noise | Floor | 50.3 | 41.3 | 37.1 | 9.4 | 55.5 | 62.9 | -7.4 | Peak |

**Result = Pass**

## Spurious/Harmonic Emissions
## 1 GHz to 40 GHz

| PROJECT # | DATE | CLASS | DISTANCE | ANTENNA | RBW | VBW | DETECTOR |
|---|---|---|---|---|---|---|---|
| 11345-10 | July 8, 2010 | FCC B | 1 m | Horn | 1 MHz | 3 MHz | Peak |

| | |
|---|---|
| **COMMENT** | Transmitting High Channel ADM6P Antenna BG 3<br>Investigated up to 40 GHz. Harmonics from 26.5 – 40 GHz were measured at a distance of .3 meters to improve the measurement system's noise floor. Limit is converted to account for .3 meter distance. |

### Horizontal

| Frequency (GHz) | EUT Direction (degrees) | Antenna Elevation (Meters) | Recorded Level (dBµV) | Amplifier Gain (dB) | Antenna Factor (dB/m) | Cable Loss (dB) | Corrected Level (dBµV /m) | Limit (dBµV /m) | Margin (dB) | Detector Function |
|---|---|---|---|---|---|---|---|---|---|---|
| 15.312 | Noise | Floor | 25.6 | 39.4 | 39.3 | 7.3 | 32.7 | 53.4 | -20.7 | Peak |
| 22.968 | Noise | Floor | 24 | 40.6 | 37.0 | 10.1 | 30.5 | 62.9 | -32.4 | Peak |
| 30.624 | Noise | Floor | 41.2 | 41.3 | 37.1 | 9.4 | 46.4 | 62.9 | -16.5 | Peak |
| 38.28 | Noise | Floor | 52.7 | 41.3 | 37.1 | 9.4 | 57.9 | 62.9 | -5 | Peak |

### Vertical

| Frequency (GHz) | EUT Direction (degrees) | Antenna Elevation (Meters) | Recorded Level (dBµV) | Amplifier Gain (dB) | Antenna Factor (dB/m) | Cable Loss (dB) | Corrected Level (dBµV /m) | Limit (dBµV /m) | Margin (dB) | Detector Function |
|---|---|---|---|---|---|---|---|---|---|---|
| 15.312 | Noise | Floor | 25.6 | 39.4 | 39.3 | 7.3 | 32.7 | 53.4 | -20.7 | Peak |
| 22.968 | Noise | Floor | 24 | 40.6 | 37.0 | 10.1 | 30.5 | 62.9 | -32.4 | Peak |
| 30.624 | Noise | Floor | 41.2 | 41.3 | 37.1 | 9.4 | 46.4 | 62.9 | -16.5 | Peak |
| 38.28 | Noise | Floor | 52.7 | 41.3 | 37.1 | 9.4 | 57.9 | 62.9 | -5 | Peak |

**Result = Pass**

## Spurious/Harmonic Emissions
## 1 GHz to 40 GHz

| PROJECT # | DATE | CLASS | DISTANCE | ANTENNA | RBW | VBW | DETECTOR |
|---|---|---|---|---|---|---|---|
| 11345-10 | July 8, 2010 | FCC B | 1 m | Horn | 1 MHz | 3 MHz | Peak |

| | |
|---|---|
| **COMMENT** | Transmitting Low Channel ADM6P Antenna BG 6<br>Investigated up to 40 GHz. Harmonics from 26.5 – 40 GHz were measured at a distance of .3 meters to improve the measurement system's noise floor. Limit is converted to account for .3 meter distance. |

### Horizontal

| Frequency (GHz) | EUT Direction (degrees) | Antenna Elevation (Meters) | Recorded Level (dBµV) | Amplifier Gain (dB) | Antenna Factor (dB/m) | Cable Loss (dB) | Corrected Level (dBµV /m) | Limit (dBµV /m) | Margin (dB) | Detector Function |
|---|---|---|---|---|---|---|---|---|---|---|
| 15.312 | Noise | Floor | 25.63 | 39.4 | 39.3 | 7.3 | 32.8 | 53.4 | -20.6 | Peak |
| 22.968 | Noise | Floor | 24.2 | 40.6 | 37.0 | 10.1 | 30.7 | 62.9 | -32.2 | Peak |
| 30.624 | Noise | Floor | 41.2 | 41.3 | 37.1 | 9.4 | 46.4 | 62.9 | -16.5 | Peak |
| 38.28 | Noise | Floor | 52.7 | 41.3 | 37.1 | 9.4 | 57.9 | 62.9 | -5 | Peak |

### Vertical

| Frequency (GHz) | EUT Direction (degrees) | Antenna Elevation (Meters) | Recorded Level (dBµV) | Amplifier Gain (dB) | Antenna Factor (dB/m) | Cable Loss (dB) | Corrected Level (dBµV /m) | Limit (dBµV /m) | Margin (dB) | Detector Function |
|---|---|---|---|---|---|---|---|---|---|---|
| 15.312 | Noise | Floor | 25.63 | 39.4 | 39.3 | 7.3 | 32.8 | 53.4 | -20.6 | Peak |
| 22.968 | Noise | Floor | 24.2 | 40.6 | 37.0 | 10.1 | 30.7 | 62.9 | -32.2 | Peak |
| 30.624 | Noise | Floor | 41.2 | 41.3 | 37.1 | 9.4 | 46.4 | 62.9 | -16.5 | Peak |
| 38.28 | Noise | Floor | 52.7 | 41.3 | 37.1 | 9.4 | 57.9 | 62.9 | -5 | Peak |

**Result = Pass**

## Spurious/Harmonic Emissions
## 1 GHz to 40 GHz

| PROJECT # | DATE | CLASS | DISTANCE | ANTENNA | RBW | VBW | DETECTOR |
|---|---|---|---|---|---|---|---|
| 11345-10 | July 8, 2010 | FCC B | 1 m | Horn | 1 MHz | 3 MHz | Peak |

| | |
|---|---|
| **COMMENT** | Transmitting Mid Channel ADM6P Antenna BG 6<br>Investigated up to 40 GHz. Harmonics from 26.5 – 40 GHz were measured at a distance of .3 meters to improve the measurement system's noise floor. Limit is converted to account for .3 meter distance. |

### Horizontal

| Frequency (GHz) | EUT Direction (degrees) | Antenna Elevation (Meters) | Recorded Level (dBµV) | Amplifier Gain (dB) | Antenna Factor (dB/m) | Cable Loss (dB) | Corrected Level (dBµV /m) | Limit (dBµV /m) | Margin (dB) | Detector Function |
|---|---|---|---|---|---|---|---|---|---|---|
| 16.368 | Noise | Floor | 24.2 | 40.2 | 38.8 | 8.0 | 30.7 | 53.4 | -22.7 | Peak |
| 24.552 | Noise | Floor | 24.2 | 42.2 | 37.2 | 9.8 | 29.0 | 62.9 | -33.9 | Peak |
| 32.736 | Noise | Floor | 46.2 | 41.3 | 37.1 | 9.4 | 51.4 | 62.9 | -11.5 | Peak |

### Vertical

| Frequency (GHz) | EUT Direction (degrees) | Antenna Elevation (Meters) | Recorded Level (dBµV) | Amplifier Gain (dB) | Antenna Factor (dB/m) | Cable Loss (dB) | Corrected Level (dBµV /m) | Limit (dBµV /m) | Margin (dB) | Detector Function |
|---|---|---|---|---|---|---|---|---|---|---|
| 16.368 | Noise | Floor | 24.2 | 40.2 | 38.8 | 8.0 | 30.7 | 53.4 | -22.7 | Peak |
| 24.552 | Noise | Floor | 24.2 | 42.2 | 37.2 | 9.8 | 29.0 | 62.9 | -33.9 | Peak |
| 32.736 | Noise | Floor | 46.2 | 41.3 | 37.1 | 9.4 | 51.4 | 62.9 | -11.5 | Peak |

**Result = Pass**

## Spurious/Harmonic Emissions
## 1 GHz to 40 GHz

| PROJECT # | DATE | CLASS | DISTANCE | ANTENNA | RBW | VBW | DETECTOR |
|---|---|---|---|---|---|---|---|
| 11345-10 | July 8, 2010 | FCC B | 1 m | Horn | 1 MHz | 3 MHz | Peak |

| | |
|---|---|
| **COMMENT** | Transmitting High Channel ADM6P Antenna BG 6<br>Investigated up to 40 GHz. Harmonics from 26.5 – 40 GHz were measured at a distance of .3 meters to improve the measurement system's noise floor. Limit is converted to account for .3 meter distance. |

### Horizontal

| Frequency (GHz) | EUT Direction (degrees) | Antenna Elevation (Meters) | Recorded Level (dBµV) | Amplifier Gain (dB) | Antenna Factor (dB/m) | Cable Loss (dB) | Corrected Level (dBµV /m) | Limit (dBµV /m) | Margin (dB) | Detector Function |
|---|---|---|---|---|---|---|---|---|---|---|
| 17.424 | Noise | Floor | 24.05 | 41.5 | 44.6 | 8.7 | 35.7 | 53.4 | -17.7 | Peak |
| 26.136 | Noise | Floor | 25.4 | 40.7 | 37.4 | 9.3 | 31.3 | 62.9 | -31.6 | Peak |
| 34.848 | Noise | Floor | 47.2 | 41.3 | 37.1 | 9.4 | 52.4 | 62.9 | -10.5 | Peak |

### Vertical

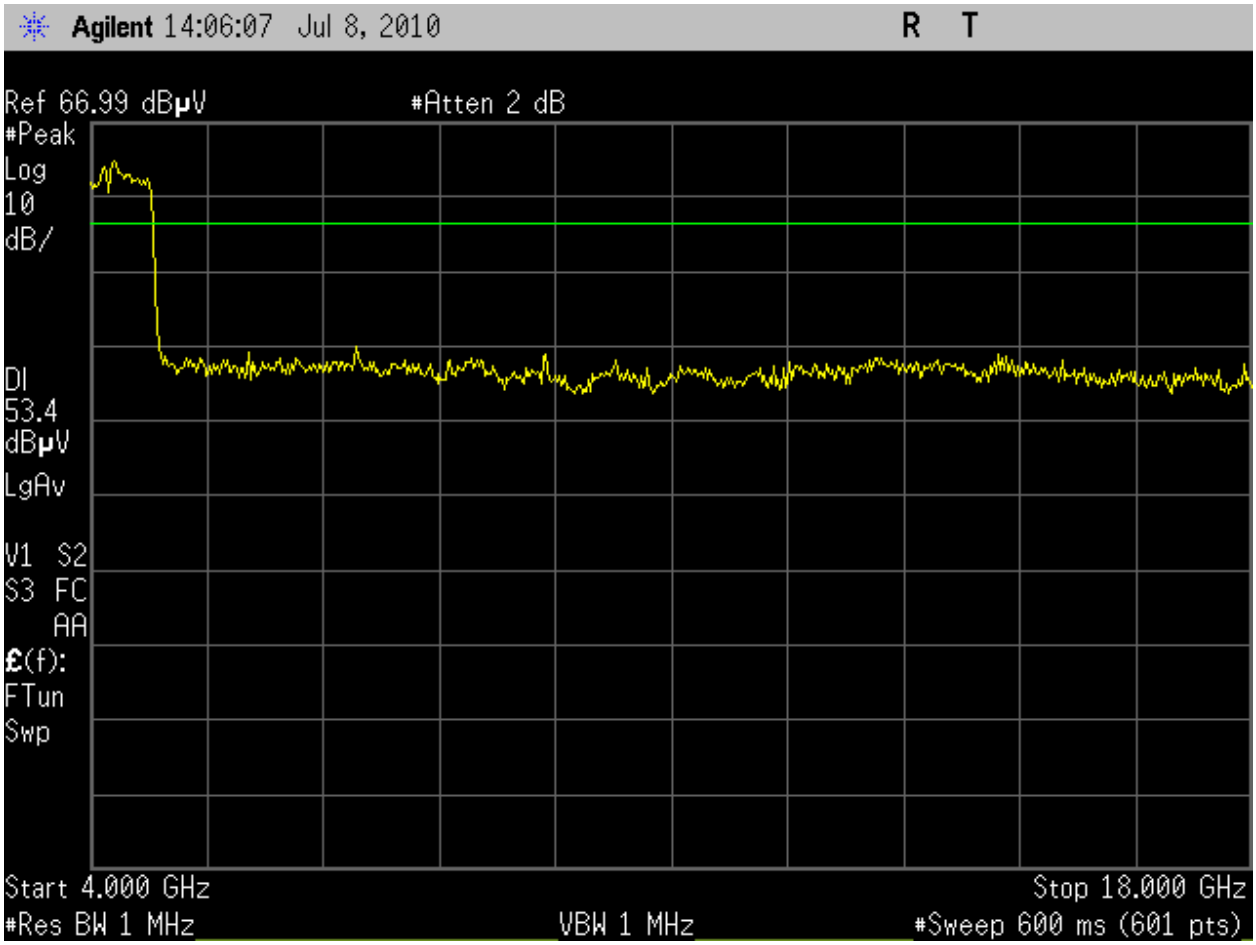
| Frequency (GHz) | EUT Direction (degrees) | Antenna Elevation (Meters) | Recorded Level (dBµV) | Amplifier Gain (dB) | Antenna Factor (dB/m) | Cable Loss (dB) | Corrected Level (dBµV /m) | Limit (dBµV /m) | Margin (dB) | Detector Function |
|---|---|---|---|---|---|---|---|---|---|---|
| 17.424 | Noise | Floor | 24.05 | 41.5 | 44.6 | 8.7 | 35.7 | 53.4 | -17.7 | Peak |
| 26.136 | Noise | Floor | 25.4 | 40.7 | 37.4 | 9.3 | 31.3 | 62.9 | -31.6 | Peak |
| 34.848 | Noise | Floor | 47.2 | 41.3 | 37.1 | 9.4 | 52.4 | 62.9 | -10.5 | Peak |

**Result = Pass**

## Spurious/Harmonic Emissions
## 1 GHz to 40 GHz

| PROJECT # | DATE | RULE | DISTANCE | ANTENNA | RBW | VBW | DETECTOR |
|---|---|---|---|---|---|---|---|
| 11345-10 | July 8, 2010 | 15.519 | 1 m | Horn | 1 MHz | 1 MHz | Peak |

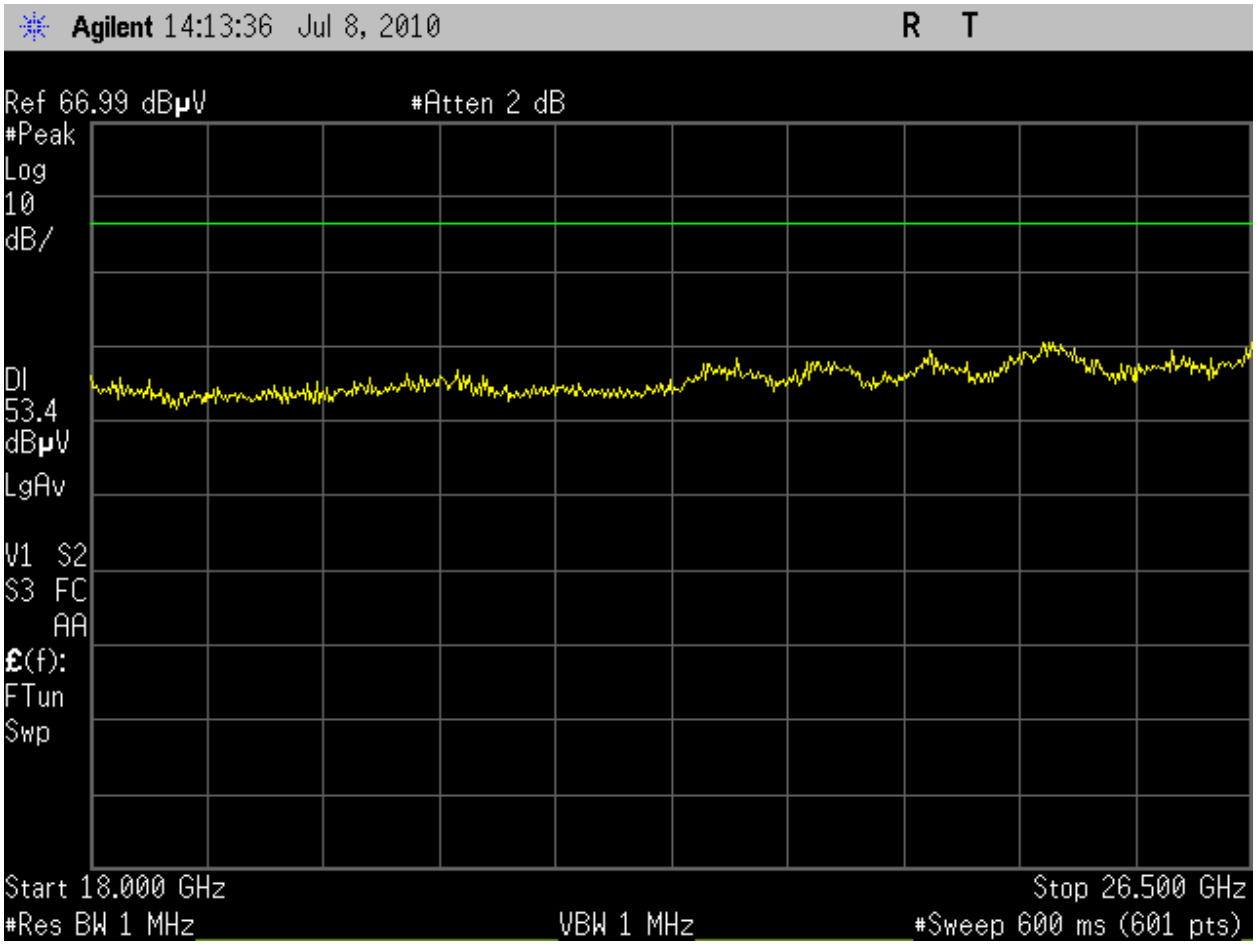
| COMMENT | AL51000 Antenna 4 to 18 GHz |
|---|---|



## Spurious/Harmonic Emissions
## 1 GHz to 40 GHz

| PROJECT # | DATE | RULE | DISTANCE | ANTENNA | RBW | VBW | DETECTOR |
|---|---|---|---|---|---|---|---|
| 11345-10 | July 8, 2010 | 15.519 | 1 m | Horn | 1 MHz | 1 MHz | Peak |

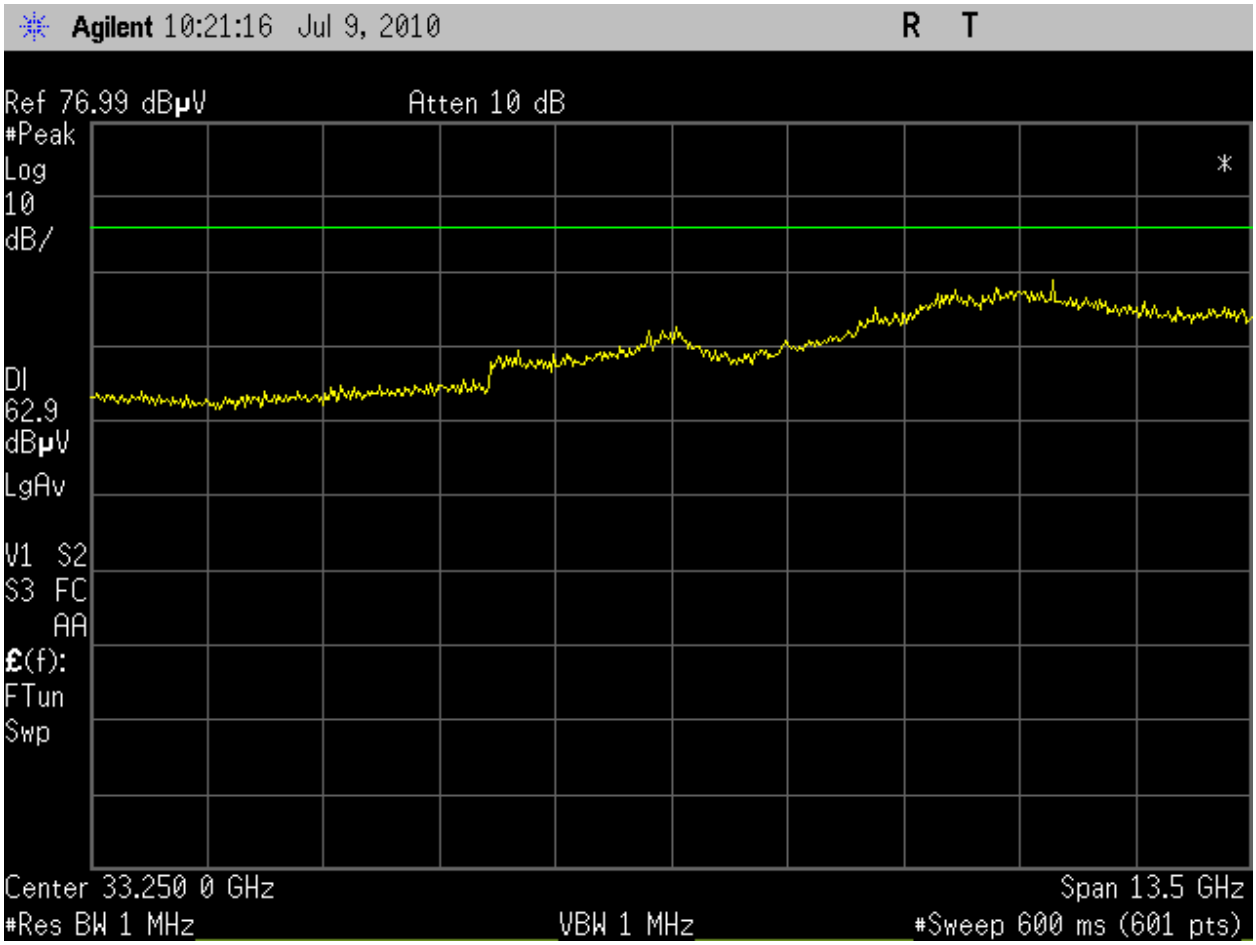
| COMMENT | AL51000 Antenna 18 to 26.5 GHz |
|---|---|



## Spurious/Harmonic Emissions
## 1 GHz … 40 GHz

| PROJECT # | DATE | RULE | DISTANCE | ANTENNA | RBW | VBW | DETECTOR |
|---|---|---|---|---|---|---|---|
| 11345-10 | July 8, 2010 | 15.519 | .3 m | Horn | 1 MHz | 1 MHz | Peak |

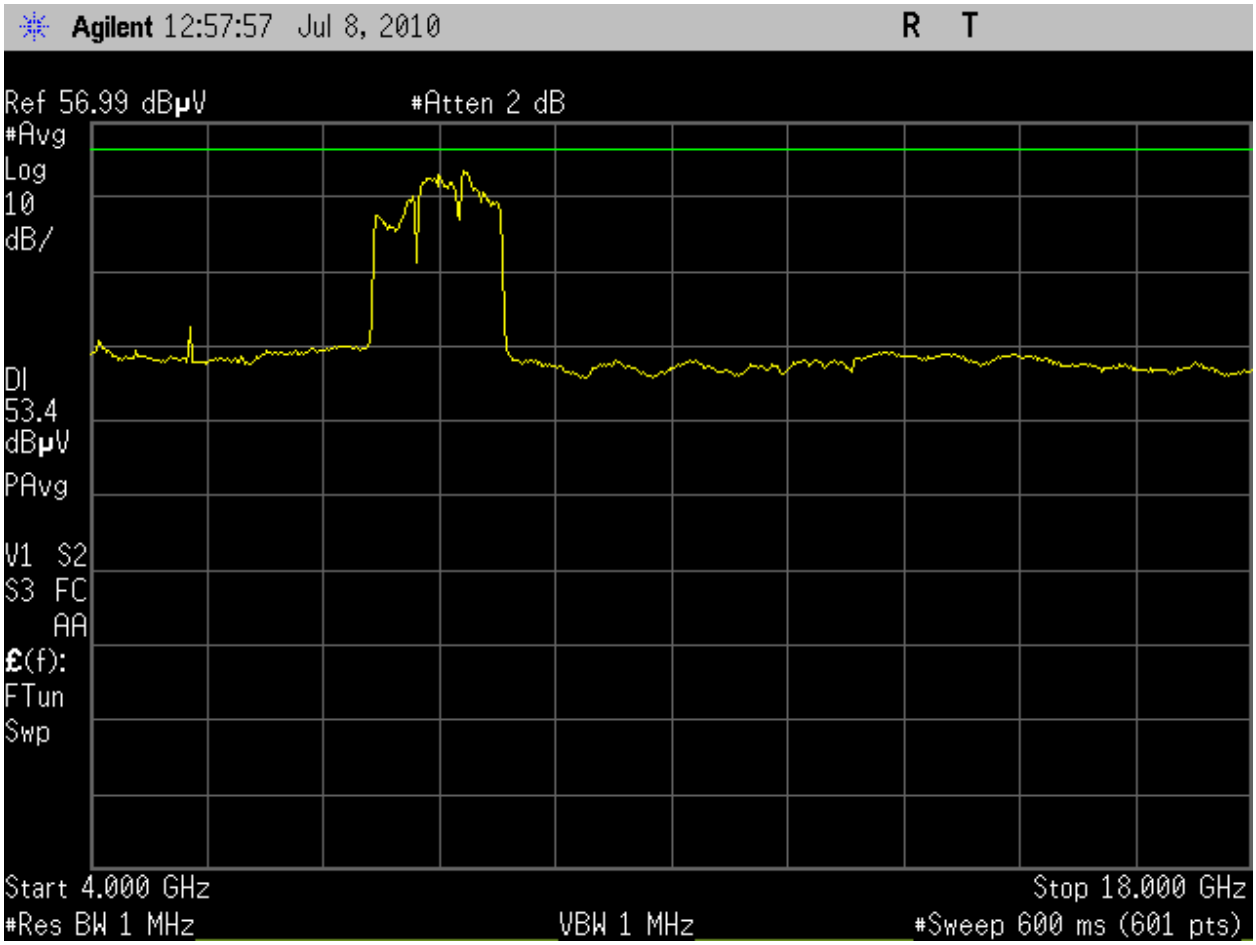
| COMMENT | AL51000 Antenna 26.5 to 40 GHz |
|---|---|



## Spurious/Harmonic Emissions
## 1 GHz … 40 GHz

| PROJECT # | DATE | RULE | DISTANCE | ANTENNA | RBW | VBW | DETECTOR |
|---|---|---|---|---|---|---|---|
| 11345-10 | July 8, 2010 | 15.519 | 1 m | Horn | 1 MHz | 1 MHz | Peak |

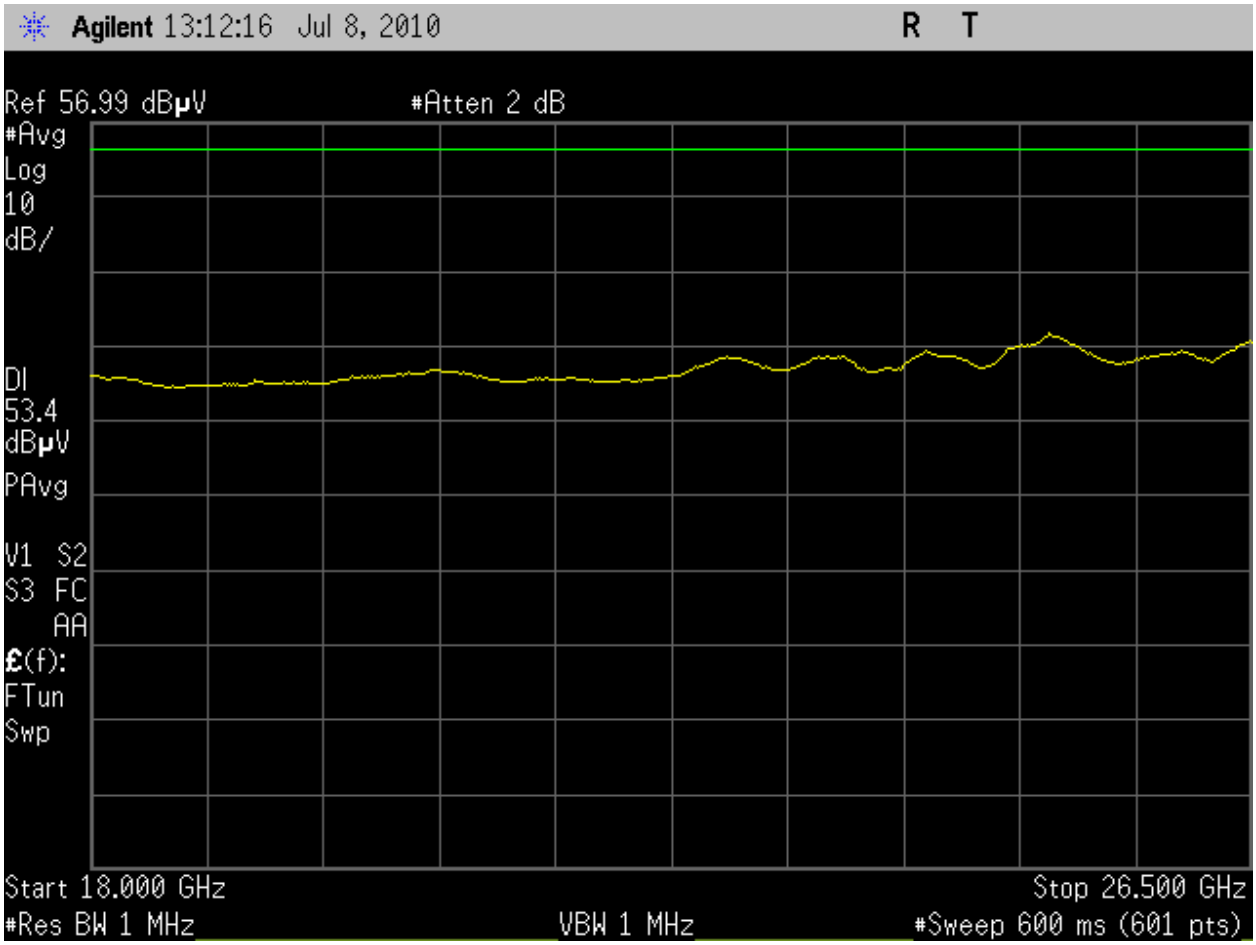
| COMMENT | ADM6P Antenna to 18 GHz |
|---|---|



## Spurious/Harmonic Emissions
## 1 GHz … 40 GHz

| PROJECT # | DATE | RULE | DISTANCE | ANTENNA | RBW | VBW | DETECTOR |
|---|---|---|---|---|---|---|---|
| 11345-10 | July 8, 2010 | 15.519 | 1 m | Horn | 1 MHz | 1 MHz | Peak |

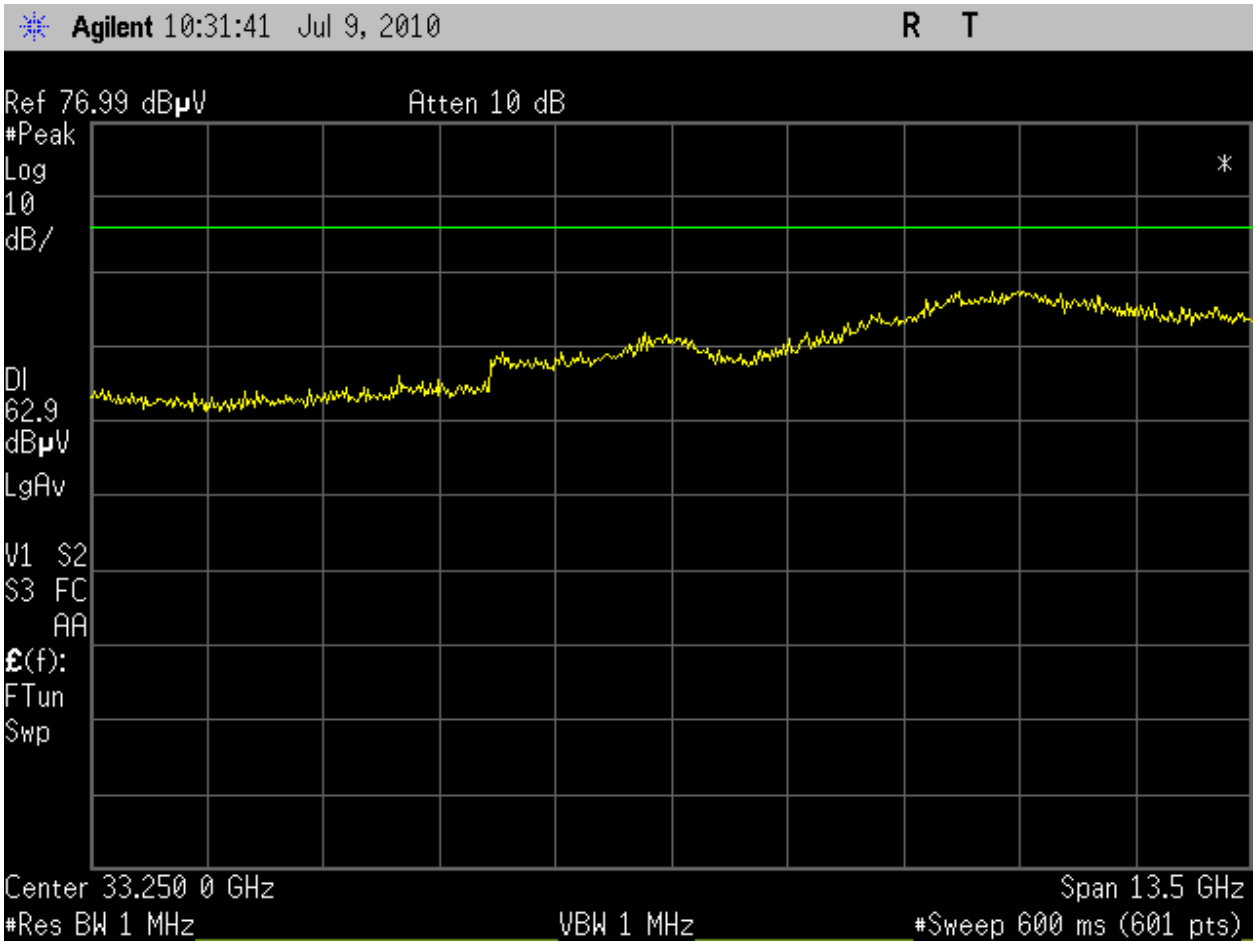
| COMMENT | ADM6P Antenna 18 to 26.5 GHz |
|---|---|



## Spurious/Harmonic Emissions
## 1 GHz … 40 GHz

| PROJECT # | DATE | RULE | DISTANCE | ANTENNA | RBW | VBW | DETECTOR |
|---|---|---|---|---|---|---|---|
| 11345-10 | July 8, 2010 | 15.519 | .3 m | Horn | 1 MHz | 1 MHz | Peak |

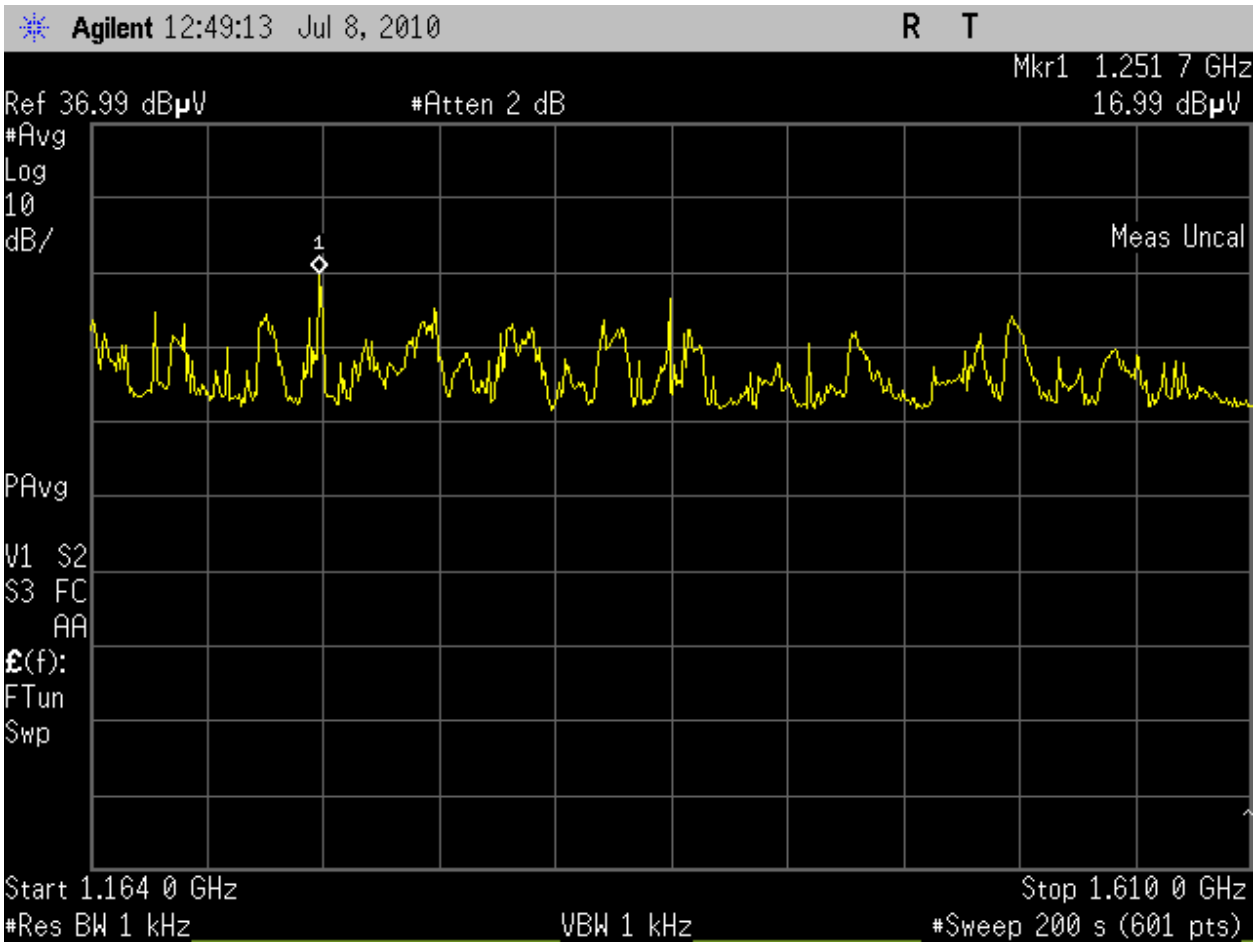
| COMMENT | ADM6P Antenna 26.5 to 40 GHz |
|---|---|



## Spurious Radiated Emissions in GPS Bands

| PROJECT # | DATE | RULE | DISTANCE | ANTENNA | RBW | VBW | DETECTOR |
|---|---|---|---|---|---|---|---|
| 11345-10 | July 8, 2010 | 15.519(d) | 1 m | Horn | 1 kHz | 1 kHz | Peak |

| COMMENT | GPS Ambient 1164 MHz to 1610 MHz |
|---|---|

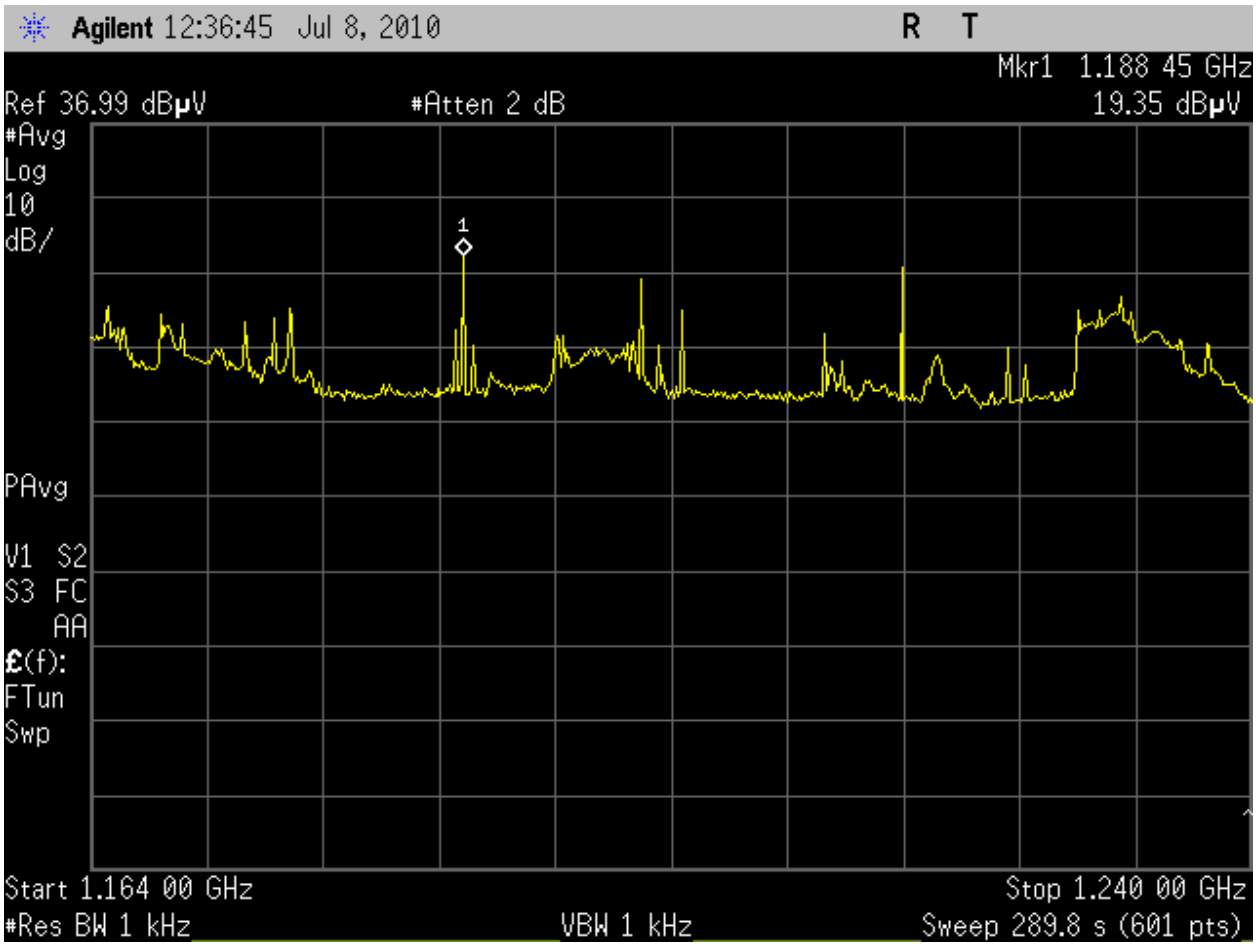


## Spurious Radiated Emissions in GPS Bands

| PROJECT # | DATE | RULE | DISTANCE | ANTENNA | RBW | VBW | DETECTOR |
|---|---|---|---|---|---|---|---|
| 11345-10 | July 8, 2010 | 15.519(d) | 1 m | Horn | 1 kHz | 1 kHz | Peak |

| COMMENT | Transmitting ADM6P Antenna<br>1164 MHz to 1240 MHz |
|---|---|

### ADM6P Antenna



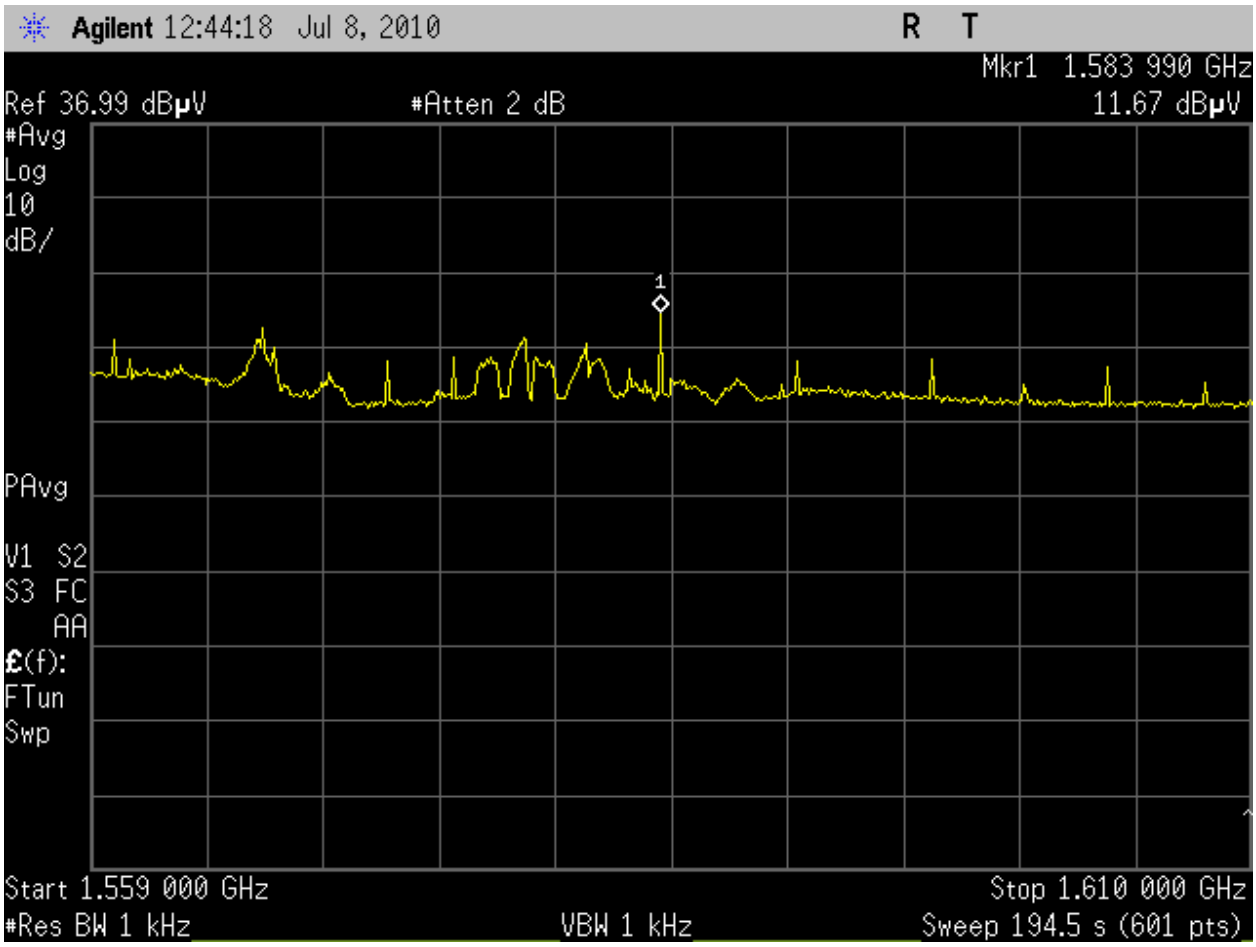

**NOTE: All digital emissions from the transmitter radiating from the antenna port meet the limits of 47 CFR, Part 15, Subpart F, 15.519(d), 15.209**

## Spurious Radiated Emissions in GPS Bands

| PROJECT # | DATE | RULE | DISTANCE | ANTENNA | RBW | VBW | DETECTOR |
|---|---|---|---|---|---|---|---|
| 11345-10 | July 8, 2010 | 15.519(d) | 1 m | Horn | 1 kHz | 1 kHz | Peak |

| COMMENT | Transmitting ADM6P Antenna<br>1559 MHz to 1610 MHz |
|---|---|

### ADM6P Antenna



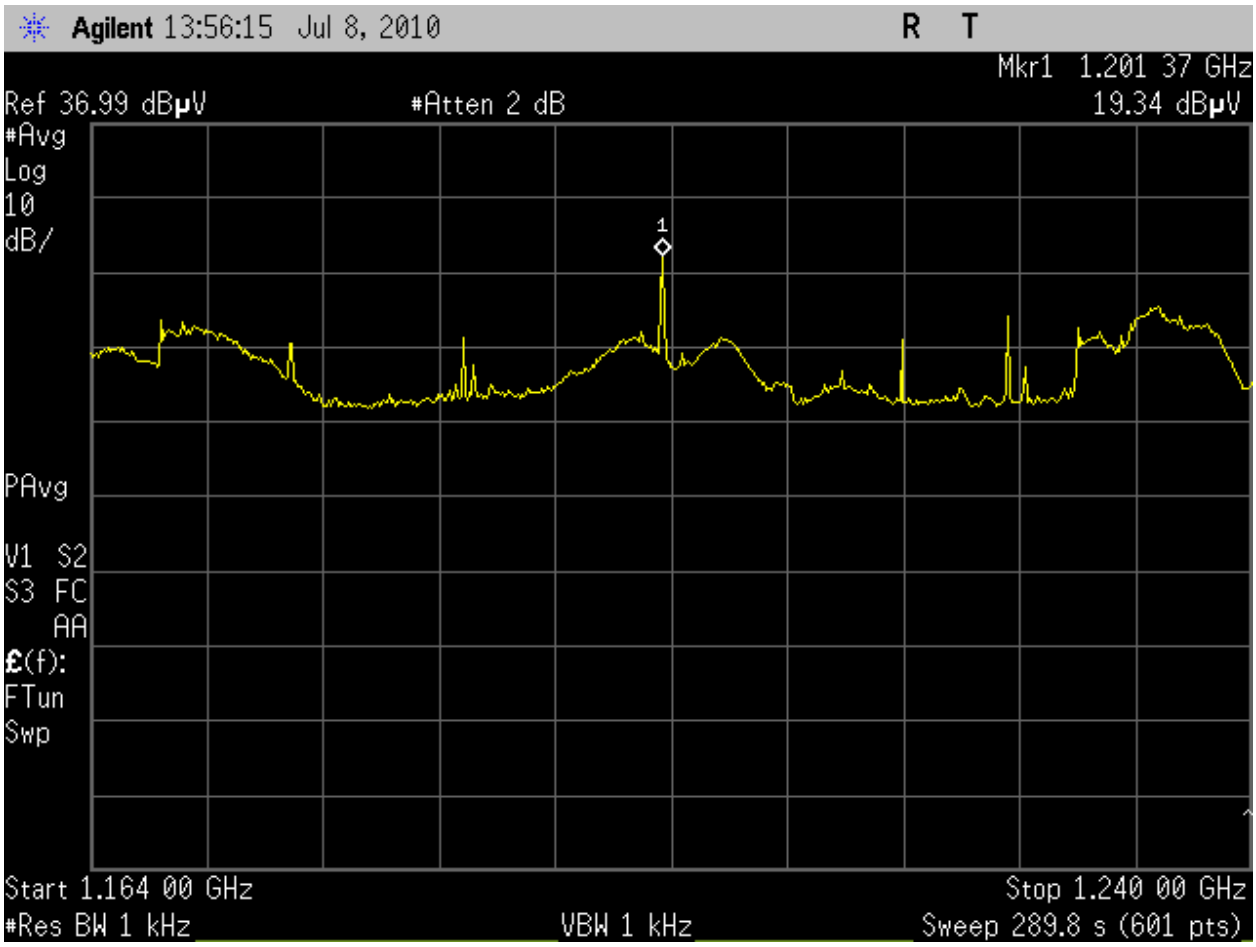

**NOTE: All digital emissions from the transmitter radiating from the antenna port meet the limits of 47 CFR, Part 15, Subpart F, 15.519(d), 15.209**

## Spurious Radiated Emissions in GPS Bands

| PROJECT # | DATE | RULE | DISTANCE | ANTENNA | RBW | VBW | DETECTOR |
|---|---|---|---|---|---|---|---|
| 11345-10 | July 8, 2010 | 15.519(d) | 1 m | Horn | 1 kHz | 1 kHz | Peak |

| COMMENT | Transmitting AL51000 Antenna<br>1164 MHz to 1240 MHz |
|---|---|

**AL51000 Antenna**



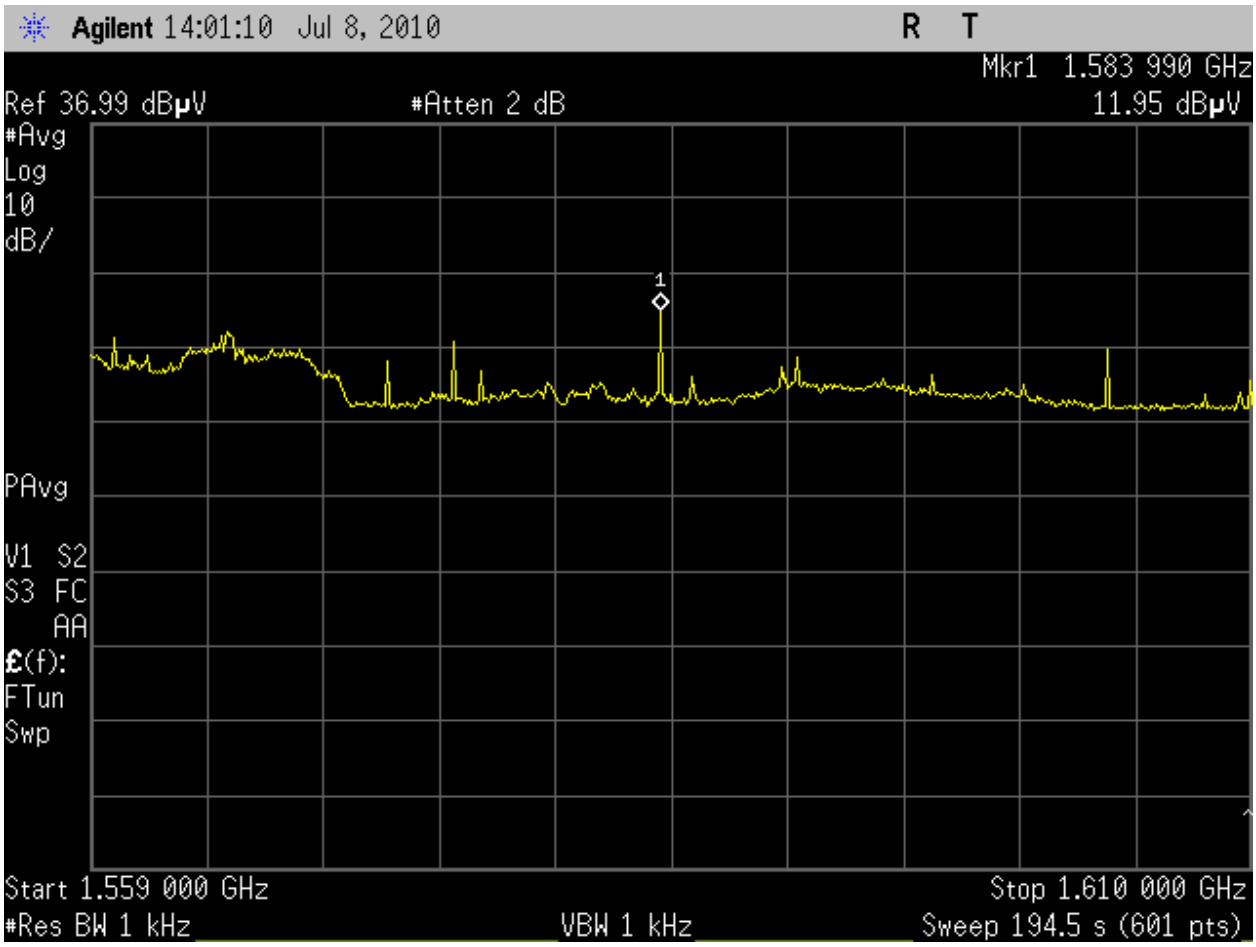

**NOTE: All digital emissions from the transmitter radiating from the antenna port meet the limits of 47 CFR, Part 15, Subpart F, 15.519(d), 15.209**

## Spurious Radiated Emissions in GPS Bands

| PROJECT # | DATE | RULE | DISTANCE | ANTENNA | RBW | VBW | DETECTOR |
|---|---|---|---|---|---|---|---|
| 11345-10 | July 8, 2010 | 15.519(d) | 1 m | Horn | 1 kHz | 1 kHz | Peak |

| COMMENT | Transmitting AL51000 Antenna<br>1559 MHz to 1610 MHz |
|---|---|

**AL51000 Antenna**




**NOTE: All digital emissions from the transmitter radiating from the antenna port meet the limits of 47 CFR, Part 15, Subpart F, 15.519(d), 15.209**

## Peak Emissions within 50 MHz Bandwidth

| PROJECT # | DATE | RULE | DISTANCE | ANTENNA | RBW | VBW | DETECTOR |
|---|---|---|---|---|---|---|---|
| 11345-10 | July 8, 2010 | 15.519(e) | 1 m | Horn | 1 MHz | 8 MHz | Peak |
| **COMMENT** | Transmitting Low Channel AL51000 Antenna BG 1<br>Note: If a resolution bandwidth other than 50 MHz is employed, the peak EIRP limit shall be 20 log(RBW/50)dBm where RBW is the resolution bandwidth in megahertz that is employed. 20 log(1/50) = -33.9dBm. | | | | | | |

| Frequency (GHz) | EUT Direction (degrees) | Antenna Elevation (Meters) | Recorded Level (dBµV) | Amplifier Gain (dB) | Antenna Factor (dB/m) | Cable Loss (dB) | Corrected Level (dBµV /m) | Limit (dBµV /m) | Margin (dB) | Detector Function |
|---|---|---|---|---|---|---|---|---|---|---|
| 3.64 | 0 | 1 | 55.9 | 40.7 | 32.1 | 3.3 | 50.6 | 70.7 | -20.1 | Peak |

**Result = Pass**

| PROJECT # | DATE | RULE | DISTANCE | ANTENNA | RBW | VBW | DETECTOR |
|---|---|---|---|---|---|---|---|
| 11345-10 | July 8, 2010 | 15.519(e) | 1 m | Horn | 1 MHz | 8 MHz | Peak |
| **COMMENT** | Transmitting Mid Channel AL51000 Antenna BG 1<br>Note: If a resolution bandwidth other than 50 MHz is employed, the peak EIRP limit shall be 20 log(RBW/50)dBm where RBW is the resolution bandwidth in megahertz that is employed. 20 log(1/50) = -33.9dBm | | | | | | |

| Frequency (GHz) | EUT Direction (degrees) | Antenna Elevation (Meters) | Recorded Level (dBµV) | Amplifier Gain (dB) | Antenna Factor (dB/m) | Cable Loss (dB) | Corrected Level (dBµV /m) | Limit (dBµV /m) | Margin (dB) | Detector Function |
|---|---|---|---|---|---|---|---|---|---|---|
| 3.738 | 0 | 1 | 55.9 | 40.7 | 32.1 | 3.3 | 50.6 | 70.7 | -20.1 | Peak |

**Result = Pass**

| PROJECT # | DATE | RULE | DISTANCE | ANTENNA | RBW | VBW | DETECTOR |
|---|---|---|---|---|---|---|---|
| 11345-10 | July 8, 2010 | 15.519(e) | 1 m | Horn | 1 MHz | 8 MHz | Peak |
| **COMMENT** | Transmitting High Channel AL51000 Antenna BG 1<br>Note: If a resolution bandwidth other than 50 MHz is employed, the peak EIRP limit shall be 20 log(RBW/50)dBm where RBW is the resolution bandwidth in megahertz that is employed. 20 log(1/50) = -33.9dBm | | | | | | |

| Frequency (GHz) | EUT Direction (degrees) | Antenna Elevation (Meters) | Recorded Level (dBµV) | Amplifier Gain (dB) | Antenna Factor (dB/m) | Cable Loss (dB) | Corrected Level (dBµV /m) | Limit (dBµV /m) | Margin (dB) | Detector Function |
|---|---|---|---|---|---|---|---|---|---|---|
| 4.275 | 0 | 1 | 54.9 | 41.2 | 32.5 | 3.8 | 50.0 | 70.7 | -20.7 | Peak |

**Result = Pass**

## Peak Emissions within 50 MHz Bandwidth

| PROJECT # | DATE | RULE | DISTANCE | ANTENNA | RBW | VBW | DETECTOR |
|---|---|---|---|---|---|---|---|
| 11345-10 | July 8, 2010 | 15.519(e) | 1 m | Horn | 1 MHz | 8 MHz | Peak |
| **COMMENT** | Transmitting Low Channel ADM6P Antenna BG 1<br>Note: If a resolution bandwidth other than 50 MHz is employed, the peak EIRP limit shall be 20 log(RBW/50)dBm where RBW is the resolution bandwidth in megahertz that is employed. 20 log(1/50) = -33.9dBm | | | | | | |

| Frequency (GHz) | EUT Direction (degrees) | Antenna Elevation (Meters) | Recorded Level (dBµV) | Amplifier Gain (dB) | Antenna Factor (dB/m) | Cable Loss (dB) | Corrected Level (dBµV /m) | Limit (dBµV /m) | Margin (dB) | Detector Function |
|---|---|---|---|---|---|---|---|---|---|---|
| 3.462 | 0 | 1 | 66.5 | 40.5 | 31.7 | 3.5 | 61.2 | 70.7 | -9.5 | Peak |

**Result = Pass**

| PROJECT # | DATE | RULE | DISTANCE | ANTENNA | RBW | VBW | DETECTOR |
|---|---|---|---|---|---|---|---|
| 11345-10 | July 8, 2010 | 15.519(e) | 1 m | Horn | 1 MHz | 8 MHz | Peak |
| **COMMENT** | Transmitting Mid Channel ADM6P Antenna BG 1<br>Note: If a resolution bandwidth other than 50 MHz is employed, the peak EIRP limit shall be 20 log(RBW/50)dBm where RBW is the resolution bandwidth in megahertz that is employed. 20 log(1/50) = -33.9dBm | | | | | | |

| Frequency (GHz) | EUT Direction (degrees) | Antenna Elevation (Meters) | Recorded Level (dBµV) | Amplifier Gain (dB) | Antenna Factor (dB/m) | Cable Loss (dB) | Corrected Level (dBµV /m) | Limit (dBµV /m) | Margin (dB) | Detector Function |
|---|---|---|---|---|---|---|---|---|---|---|
| 4.107 | 0 | 1 | 63.9 | 41.0 | 32.7 | 3.6 | 59.2 | 70.7 | -11.5 | Peak |

**Result = Pass**

| PROJECT # | DATE | RULE | DISTANCE | ANTENNA | RBW | VBW | DETECTOR |
|---|---|---|---|---|---|---|---|
| 11345-10 | July 8, 2010 | 15.519(e) | 1 m | Horn | 1 MHz | 8 MHz | Peak |
| **COMMENT** | Transmitting High Channel ADM6P Antenna BG 1<br>Note: If a resolution bandwidth other than 50 MHz is employed, the peak EIRP limit shall be 20 log(RBW/50)dBm where RBW is the resolution bandwidth in megahertz that is employed. 20 log(1/50) = -33.9dBm | | | | | | |

| Frequency (GHz) | EUT Direction (degrees) | Antenna Elevation (Meters) | Recorded Level (dBµV) | Amplifier Gain (dB) | Antenna Factor (dB/m) | Cable Loss (dB) | Corrected Level (dBµV /m) | Limit (dBµV /m) | Margin (dB) | Detector Function |
|---|---|---|---|---|---|---|---|---|---|---|
| 4.7 | 0 | 1 | 63.3 | 41.6 | 32.7 | 4.2 | 58.5 | 70.7 | -12.2 | Peak |

**Result = Pass**

## Peak Emissions within 50 MHz Bandwidth

| PROJECT # | DATE | RULE | DISTANCE | ANTENNA | RBW | VBW | DETECTOR |
|---|---|---|---|---|---|---|---|
| 11345-10 | July 8, 2010 | 15.519(e) | 1 m | Horn | 1 MHz | 8 MHz | Peak |
| **COMMENT** | Transmitting Low Channel ADM6P Antenna BG 3<br>Note: If a resolution bandwidth other than 50 MHz is employed, the peak EIRP limit shall be 20 log(RBW/50)dBm where RBW is the resolution bandwidth in megahertz that is employed. 20 log(1/50) = -33.9dBm | | | | | | |

| Frequency (GHz) | EUT Direction (degrees) | Antenna Elevation (Meters) | Recorded Level (dBµV) | Amplifier Gain (dB) | Antenna Factor (dB/m) | Cable Loss (dB) | Corrected Level (dBµV /m) | Limit (dBµV /m) | Margin (dB) | Detector Function |
|---|---|---|---|---|---|---|---|---|---|---|
| 6.408 | 0 | 1 | 59.44 | 42.9 | 35.6 | 4.5 | 56.6 | 70.7 | -14.1 | Peak |

**Result = Pass**

| PROJECT # | DATE | RULE | DISTANCE | ANTENNA | RBW | VBW | DETECTOR |
|---|---|---|---|---|---|---|---|
| 11345-10 | July 8, 2010 | 15.519(e) | 1 m | Horn | 1 MHz | 8 MHz | Peak |
| **COMMENT** | Transmitting Mid Channel ADM6P Antenna BG 3<br>Note: If a resolution bandwidth other than 50 MHz is employed, the peak EIRP limit shall be 20 log(RBW/50)dBm where RBW is the resolution bandwidth in megahertz that is employed. 20 log(1/50) = -33.9dBm | | | | | | |

| Frequency (GHz) | EUT Direction (degrees) | Antenna Elevation (Meters) | Recorded Level (dBµV) | Amplifier Gain (dB) | Antenna Factor (dB/m) | Cable Loss (dB) | Corrected Level (dBµV /m) | Limit (dBµV /m) | Margin (dB) | Detector Function |
|---|---|---|---|---|---|---|---|---|---|---|
| 6.924 | 0 | 1 | 58.8 | 43.1 | 36.7 | 4.6 | 57.0 | 70.7 | -13.7 | Peak |

**Result = Pass**

| PROJECT # | DATE | RULE | DISTANCE | ANTENNA | RBW | VBW | DETECTOR |
|---|---|---|---|---|---|---|---|
| 11345-10 | July 8, 2010 | 15.519(e) | 1 m | Horn | 1 MHz | 8 MHz | Peak |
| **COMMENT** | Transmitting High Channel ADM6P Antenna BG 3<br>Note: If a resolution bandwidth other than 50 MHz is employed, the peak EIRP limit shall be 20 log(RBW/50)dBm where RBW is the resolution bandwidth in megahertz that is employed. 20 log(1/50) = -33.9dBm | | | | | | |

| Frequency (GHz) | EUT Direction (degrees) | Antenna Elevation (Meters) | Recorded Level (dBµV) | Amplifier Gain (dB) | Antenna Factor (dB/m) | Cable Loss (dB) | Corrected Level (dBµV /m) | Limit (dBµV /m) | Margin (dB) | Detector Function |
|---|---|---|---|---|---|---|---|---|---|---|
| 7.868 | 0 | 1 | 55 | 42.1 | 37.0 | 4.8 | 54.7 | 70.7 | -16.0 | Peak |

**Result = Pass**

## Peak Emissions within 50 MHz Bandwidth

| PROJECT # | DATE | RULE | DISTANCE | ANTENNA | RBW | VBW | DETECTOR |
|---|---|---|---|---|---|---|---|
| 11345-10 | July 8, 2010 | 15.519(e) | 1 m | Horn | 1 MHz | 8 MHz | Peak |
| **COMMENT** | Transmitting Low Channel ADM6P Antenna BG 6<br>Note: If a resolution bandwidth other than 50 MHz is employed, the peak EIRP limit shall be 20 log(RBW/50)dBm where RBW is the resolution bandwidth in megahertz that is employed. 20 log(1/50) = -33.9dBm | | | | | | |

| Frequency (GHz) | EUT Direction (degrees) | Antenna Elevation (Meters) | Recorded Level (dBµV) | Amplifier Gain (dB) | Antenna Factor (dB/m) | Cable Loss (dB) | Corrected Level (dBµV /m) | Limit (dBµV /m) | Margin (dB) | Detector Function |
|---|---|---|---|---|---|---|---|---|---|---|
| 7.889 | 0 | 1 | 56.3 | 42.1 | 37.0 | 4.8 | 56.0 | 70.7 | -14.7 | Peak |

**Result = Pass**

| PROJECT # | DATE | RULE | DISTANCE | ANTENNA | RBW | VBW | DETECTOR |
|---|---|---|---|---|---|---|---|
| 11345-10 | July 8, 2010 | 15.519(e) | 1 m | Horn | 1 MHz | 8 MHz | Peak |
| **COMMENT** | Transmitting Mid Channel ADM6P Antenna BG 6<br>Note: If a resolution bandwidth other than 50 MHz is employed, the peak EIRP limit shall be 20 log(RBW/50)dBm where RBW is the resolution bandwidth in megahertz that is employed. 20 log(1/50) = -33.9dBm | | | | | | |

| Frequency (GHz) | EUT Direction (degrees) | Antenna Elevation (Meters) | Recorded Level (dBµV) | Amplifier Gain (dB) | Antenna Factor (dB/m) | Cable Loss (dB) | Corrected Level (dBµV /m) | Limit (dBµV /m) | Margin (dB) | Detector Function |
|---|---|---|---|---|---|---|---|---|---|---|
| 8.121 | 0 | 1 | 58.4 | 41.9 | 37.4 | 4.7 | 58.6 | 70.7 | -12.1 | Peak |

**Result = Pass**

| PROJECT # | DATE | RULE | DISTANCE | ANTENNA | RBW | VBW | DETECTOR |
|---|---|---|---|---|---|---|---|
| 11345-10 | July 8, 2010 | 15.519(e) | 1 m | Horn | 1 MHz | 8 MHz | Peak |
| **COMMENT** | Transmitting High Channel ADM6P Antenna BG 6<br>Note: If a resolution bandwidth other than 50 MHz is employed, the peak EIRP limit shall be 20 log(RBW/50)dBm where RBW is the resolution bandwidth in megahertz that is employed. 20 log(1/50) = -33.9dBm | | | | | | |

| Frequency (GHz) | EUT Direction (degrees) | Antenna Elevation (Meters) | Recorded Level (dBµV) | Amplifier Gain (dB) | Antenna Factor (dB/m) | Cable Loss (dB) | Corrected Level (dBµV /m) | Limit (dBµV /m) | Margin (dB) | Detector Function |
|---|---|---|---|---|---|---|---|---|---|---|
| 8.521 | 0 | 1 | 59.3 | 41.5 | 37.2 | 5.3 | 60.3 | 70.7 | -10.4 | Peak |

**Result = Pass**

**End of Report**

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