Project 10451-10

Alereon, Inc.
AL5730

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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January 14, 2009

CERTIFICATION
Wireless Test Report
Alereon, Inc.
AL5730

Table of Contents

Applicant:	Alereon, Inc..
Applicant's Address:	7600 N. Capital of Texas Hwy. Bldg. C, Suite 200
	Austin, TX 78731
FCC ID:	U9YAL5730
Project Number:	10451-10
Test Dates:	December 15 - 17, 2009

The **Alereon, Inc. AL5730** was tested to and found to be in compliance with FCC 47 CFR Part 15 Subpart F.

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

Parameter	Frequency (MHz)	Level		Limit	Margin (dB)
Mains Conducted	.169	33.3		55.4	-22.1
Radiated Spurious	144.84	27.4 dBµV/m		30 dBµV/m	-2.6
Output Power	3432	-41.97 dBm	.00006 mw	-41.3 dBm	-0.67

UWB Bandwidth 10 dB		
Low (3432 MHz)	**Mid (3960 MHz)**	**High (4488 MHz)**
505.6 MHz	519.9 MHz	502 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 AL5730 is a UWB radio device with HDMI, VGA 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 AL5730 is powered from 120VAC through an external 5 Volt DC adapter. The interface between the AL5730 and attached devices is the industry-standard HDMI or VGA and Stereo Audio. The AL5730 operates in the frequency band defined in the FCC Rules and Regulations for UWB devices. The AL5730 uses the AL51000 antenna. The AL51000 antenna is a directional type antenna designed specifically for use in the AL5730 Worldwide Wireless HDMI PC Extender. The topology of this antenna is a broadband dipole radiator with a reflector and director element.

1.3 EUT Operation

The EUT was tested while in a continuous transmit mode. The EUT was tuned to Wimedia Band Group #1 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.	AL5730	U9YAL5730

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 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.

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 as 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

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 1 meter 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 8 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
1279	HP	85650A	Quasi-peak Adapter	August 05, 2010
0045	HP	85662A	Spectrum Analyzer Display	NCR
1270	HP	8568B	Spectrum Analyzer	January 29, 2010
1037	PTI	PTI-ALF1	Attenuator, Limiter, Filter	June 2, 2010
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	January 26, 2010

Radiated Test Equipment

Asset #	Manufacturer	Model #	Description	Calibration Due
0275	HP	85650A	Quasi-peak Adapter (high band)	July 8, 2010
1273	HP	85662A	Spectrum Analyzer Display (high band)	NCR
0084	HP	8566B	Spectrum Analyzer (high band)	February 23, 2010
0238	HP	85685A	RF Preselector (high band)	July 16, 2010
0085	HP	85650A	Quasi-peak Adapter (low band)	July 16, 2010
1629	HP	85662A	Spectrum Analyzer Display (low band)	NCR
1145	HP	8568B	Spectrum Analyzer (low band)	July 16, 2010
0990	HP	85685A	RF Preselector (low band)	March 17, 2010
1414	HP	8447D	RF Preamplifier	June 22, 2010
1497	Emco	3108	Biconical Antenna	April 16, 2010
1486	Emco	3147	Log Periodic Dipole Array Antenna	April 16, 2010
C026	none	none	Coaxial Cable (low band)	July 27, 2010
C027	none	none	Coaxial Cable (high 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 17, 2010
0084	HP	8566B	Spectrum Analyzer	February 23, 2010
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	Janaury 21, 2010
0582	EMCO	3115	Ridge Guide Antenna	October 19, 2010
1594	Miteq	AFS44-00102650	Microwave Preamplifier (preamp 1)	February 25, 2010
(Rental unit)	Agilent	E4446A	Spectrum Analyzer	June 15, 2011
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

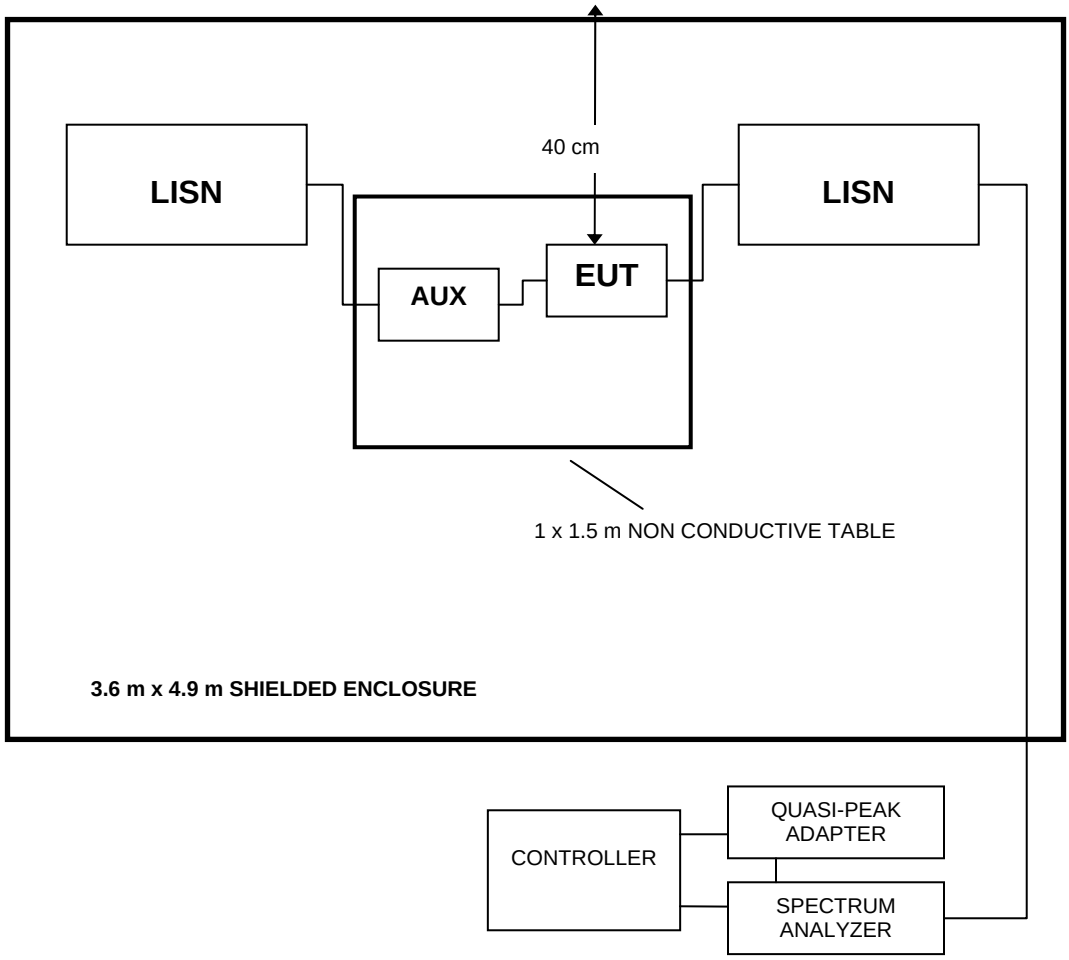


FIGURE 1: Conducted Emissions Test Setup

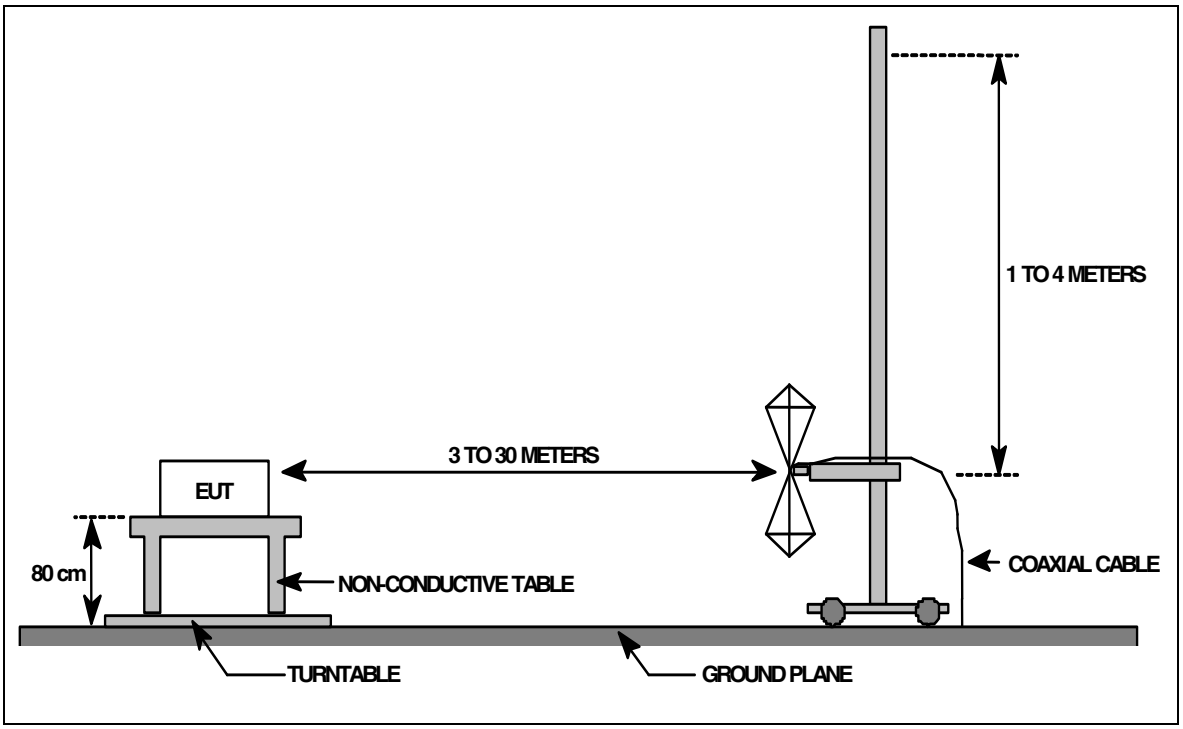


FIGURE 2: Radiated Emissions Test Setup

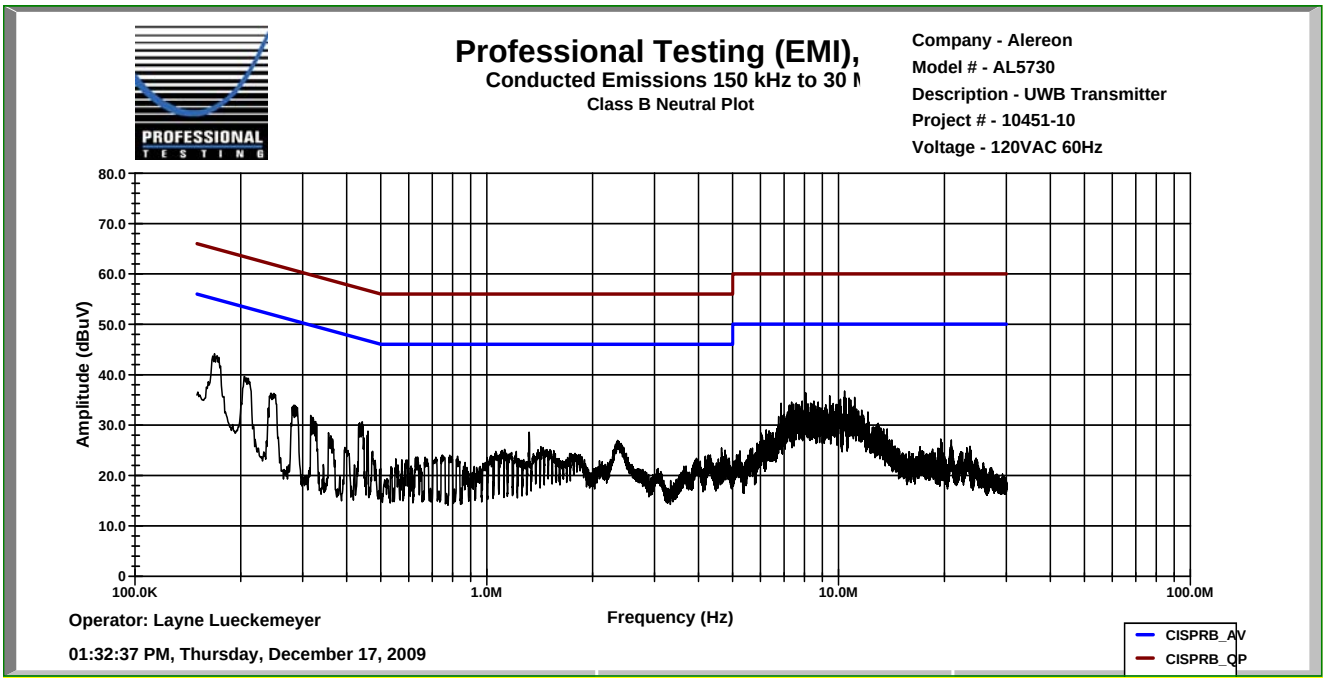
Appendix B Test Results

Mains Conducted Emissions Data Sheet
150 kHz … 30 MHz

PROJECT #	DATE	CLASS	LINE	RBW	VBW	DETECTOR
10451-10	December 17, 2009	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)
0.16941	42.2	33.1	65.4	-23.2	55.4	-22.4
0.20677	37.7	27.6	64.4	-26.6	54.4	-26.8
0.23832	34.7	23.2	63.5	-28.8	53.5	-30.3
0.28519	32	19.8	62.1	-30.1	52.1	-32.3
0.28557	30.1	19.5	62.1	-32	52.1	-32.7
8.04315	26.2	18.2	60	-33.8	50	-31.8
9.37937	27.2	19.5	60	-32.8	50	-30.5
10.3744	30.8	23	60	-29.2	50	-27
10.7071	30.8	23.5	60	-29.2	50	-26.5
11.0794	31.1	24	60	-28.9	50	-26

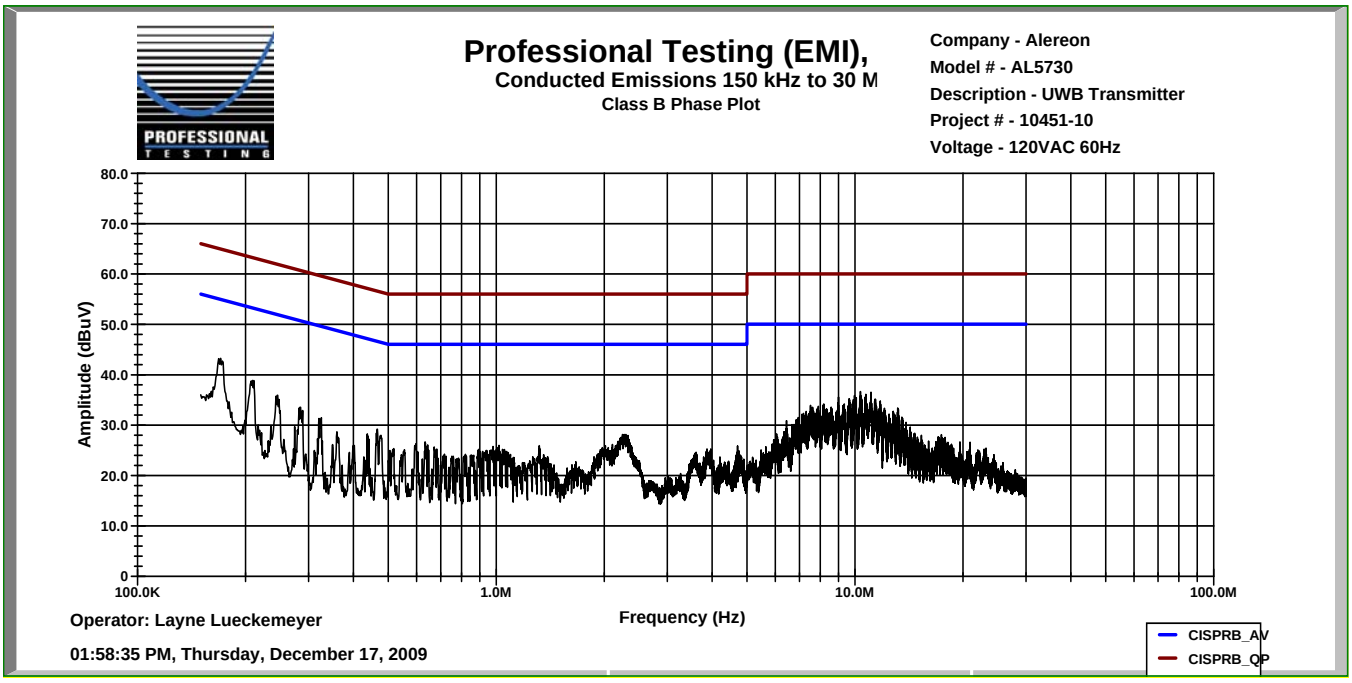


Mains Conducted Emissions Data Sheet
150 kHz … 30 MHz

PROJECT #	DATE	CLASS	LINE	RBW	VBW	DETECTOR
10451-10	December 17, 2009	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)
0.16942	41.8	33.3	65.4	-23.7	55.4	-22.1
0.20197	37.6	28.2	64.5	-26.9	54.5	-26.3
0.23866	34.7	24.1	63.5	-28.8	53.5	-29.4
0.27686	32.4	22.3	62.4	-30	52.4	-30.1
0.28732	29.9	22.1	62.1	-32.2	52.1	-30
9.00275	28.3	19.6	60	-31.7	50	-30.4
9.94117	31.1	22.4	60	-28.9	50	-27.6
10.3669	31.2	22.9	60	-28.8	50	-27.1
10.6955	31.1	23.5	60	-28.9	50	-26.5
11.0763	31.5	24.1	60	-28.5	50	-25.9



Peak Power Data Sheet

PROJECT #	DATE	RULE	DISTANCE	ANTENNA	RBW	VBW	DETECTOR
10451-10	December 16, 2009	15.519	1m	Horn	1 MHz	3 MHz	RMS Avg

COMMENT	Transmitting UWB BG 1

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	27.6	0.0	31.7	3.5	62.8
3960	0	1	25.5	0.0	32.9	3.5	61.8
4488	0	1	25.3	0.0	32	3.9	61.1

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

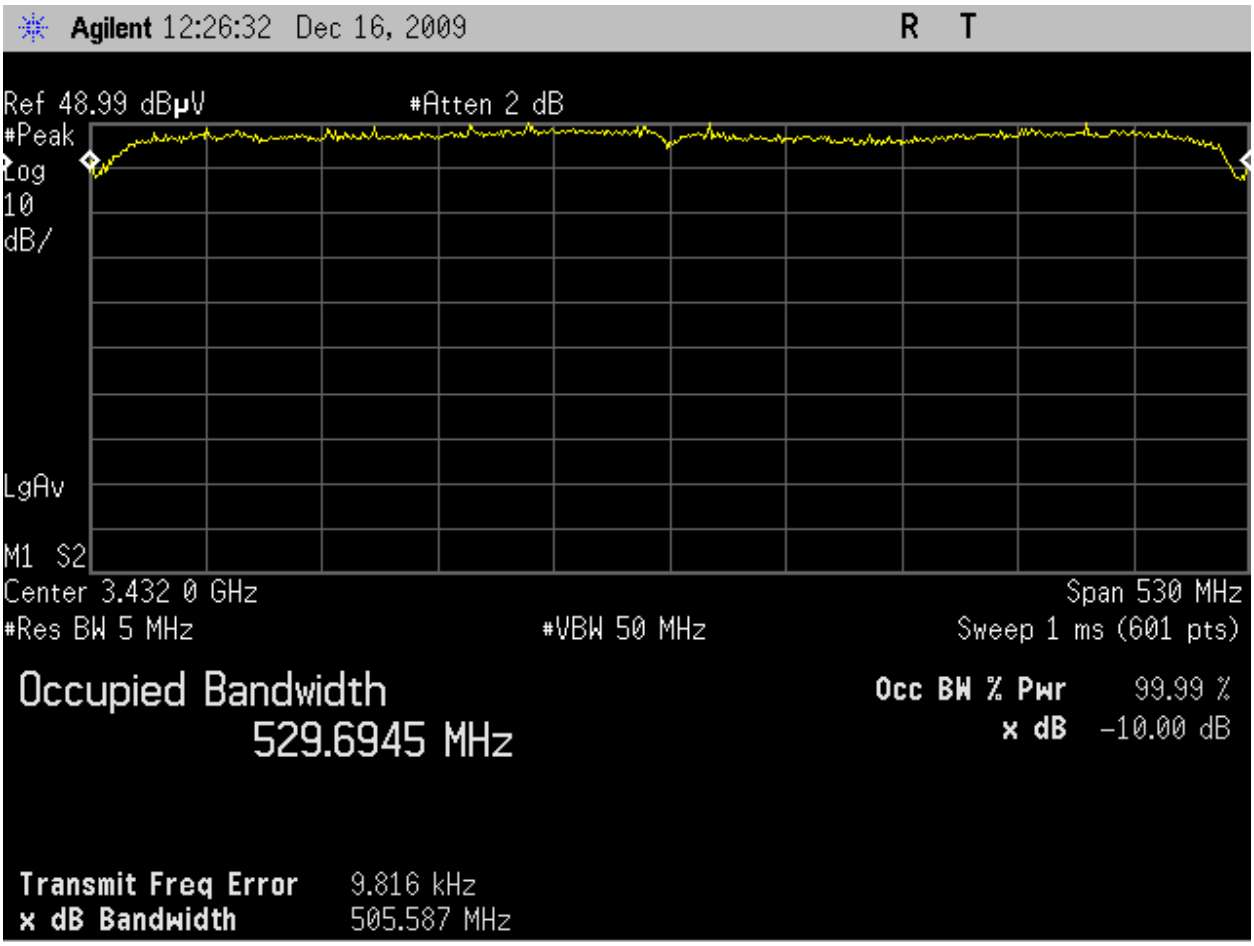
Frequency (MHz)	Field Strength (dBµV)	E.I.R.P.		Limit (dBm)
		dBm	mW	
3432	62.8	-41.97	.000064	-41.3
3960	61.8	-42.97	.00005	-41.3
4488	61.1	-43.67	.000043	-41.3

UWB Bandwidth Data Sheet

PROJECT #	DATE	RULE	DISTANCE	ANTENNA	RBW	VBW	DETECTOR
10451-10	December 16, 2009	15.519(b)	3m	Horn	5 MHz	50 MHz	Peak

COMMENT	Transmitting Low Channel 10 dB Bandwidth – 505.6 MHz

Low Channel
10 dB



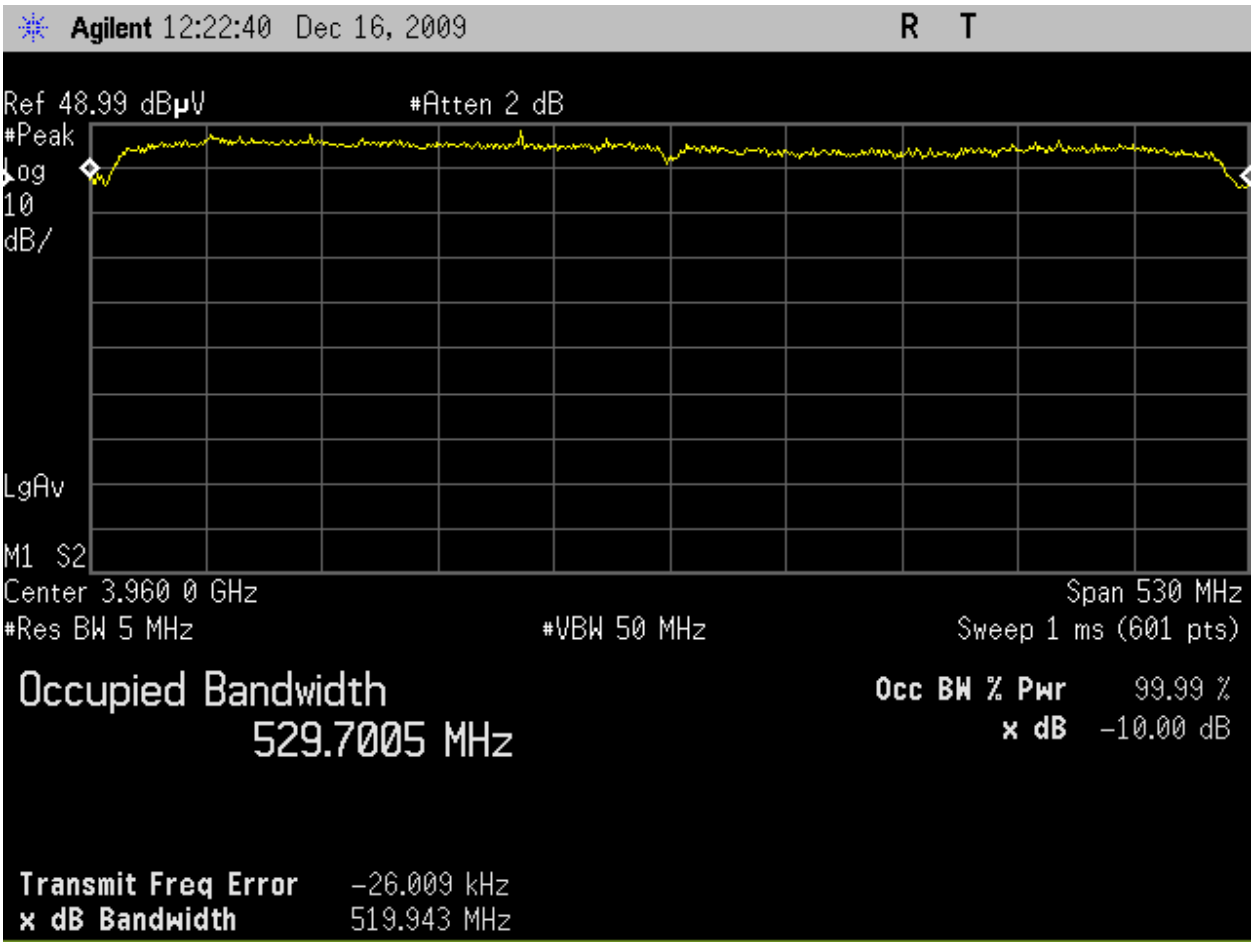
Result = Pass

UWB Bandwidth Data Sheet

PROJECT #	DATE	RULE	DISTANCE	ANTENNA	RBW	VBW	DETECTOR
10451-10	December 16, 2009	15.519(b)	3m	Horn	5 MHz	50 MHz	Peak

COMMENT	Transmitting Middle Channel 10 dB Bandwidth – 519.9 MHz

Mid Channel
10 dB



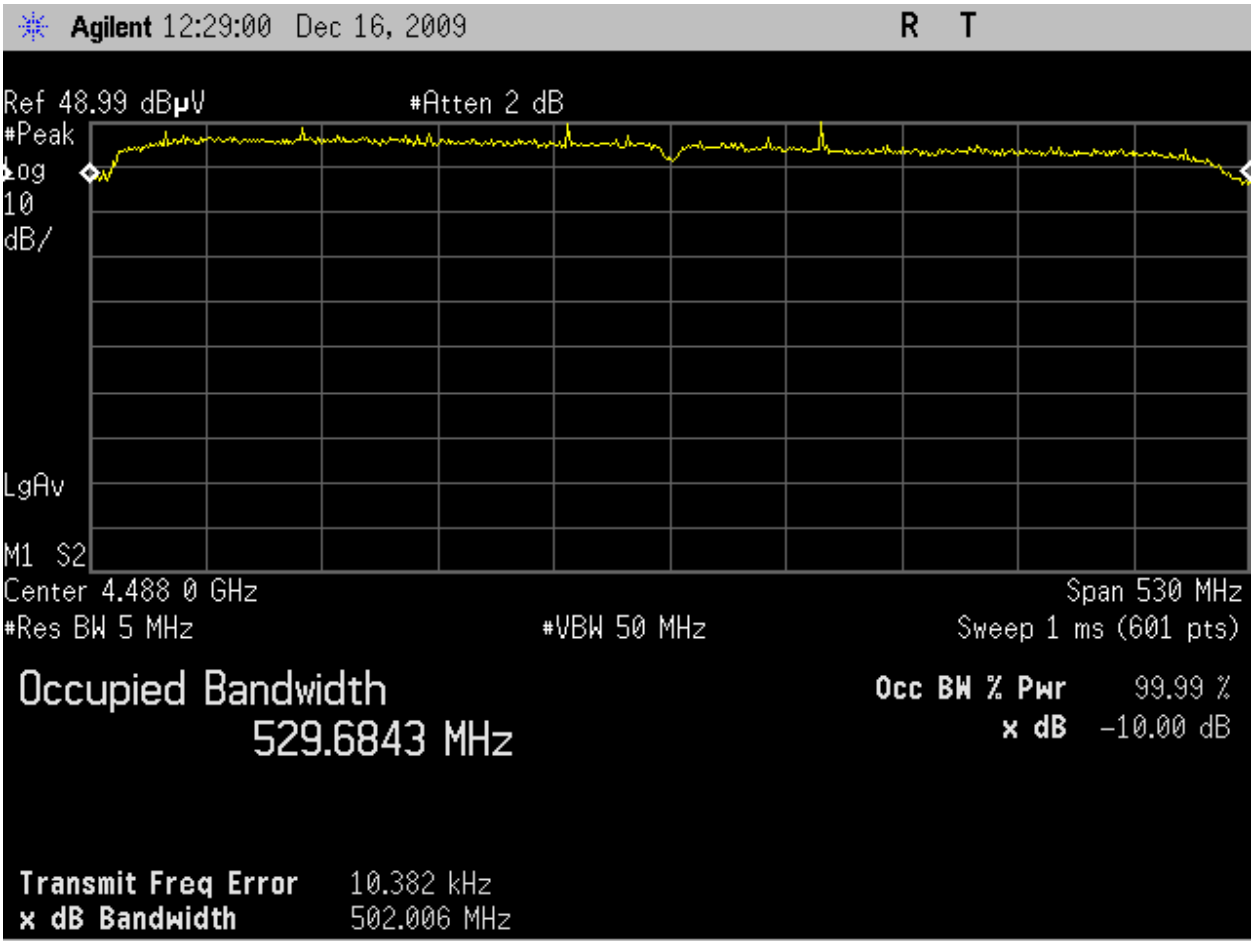
Result = Pass

UWB Bandwidth Data Sheet

PROJECT #	DATE	RULE	DISTANCE	ANTENNA	RBW	VBW	DETECTOR
10451-10	December 16, 2009	15.519(b)	3m	Horn	5 MHz	50 MHz	Peak

COMMENT	Transmitting High Channel 10 dB Bandwidth – 502 MHz

High Channel
10 dB



Result = Pass

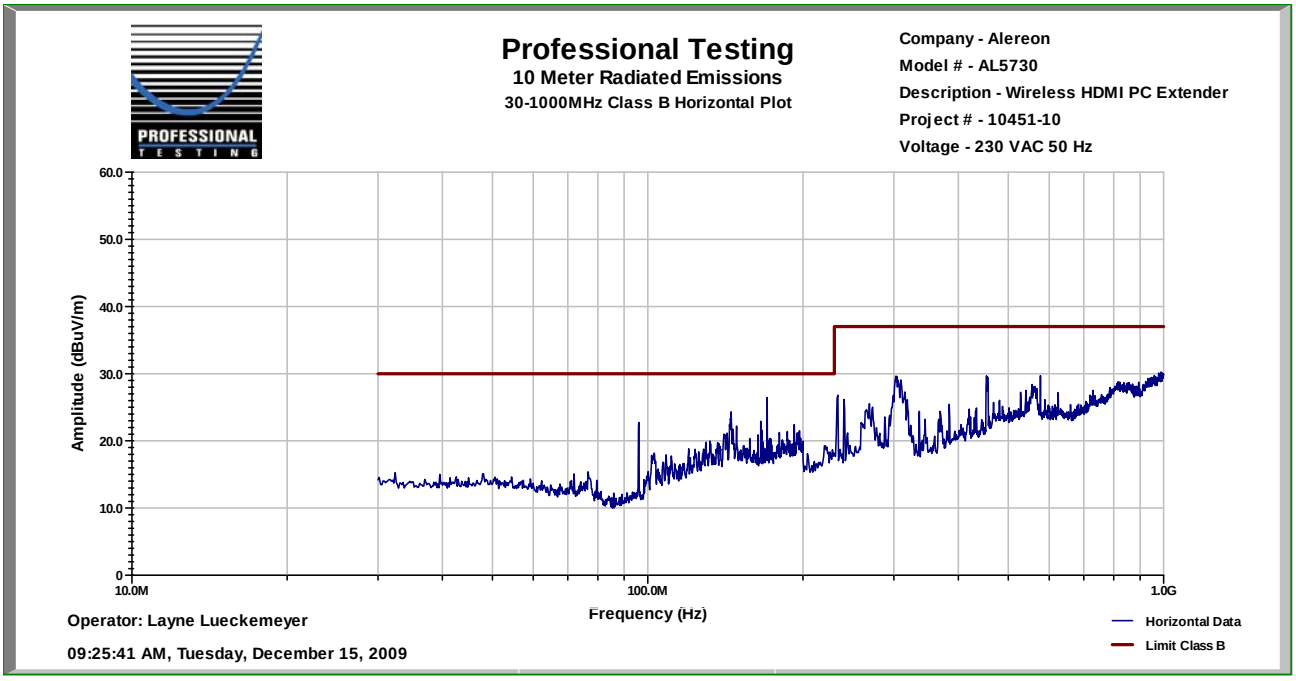
Radiated Emissions Data Sheet
Emissions 30 MHz … 960 MHz

PROJECT #	DATE	CLASS	DISTANCE	ANTENNA	RBW	VBW	DETECTOR
10451-10	December 15, 2009	FCC B	10 m	Bicon | Log	CISPR 120 kHz	1 MHz	Quasi Peak

COMMENT	Transmitting UWB BG 1

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
96.13	324	1	26.8	26.149	8.4	1.0	10.1	30	-19.9	QP
145.09	270	1	28.3	26.5	12.1	1.5	15.4	30	-14.6	QP
170.42	180	1	32.5	25.9	12.5	1.7	20.8	30	-9.2	QP
233.6	140	1	32.8	30.9	11.6	2.1	15.6	30	-14.4	QP
302.4	259	1	35.7	31.3	13.9	2.5	20.8	37	-16.2	QP
453.6	329	1	35.8	31.5	18.1	3.2	25.7	37	-11.3	QP



Result = Pass

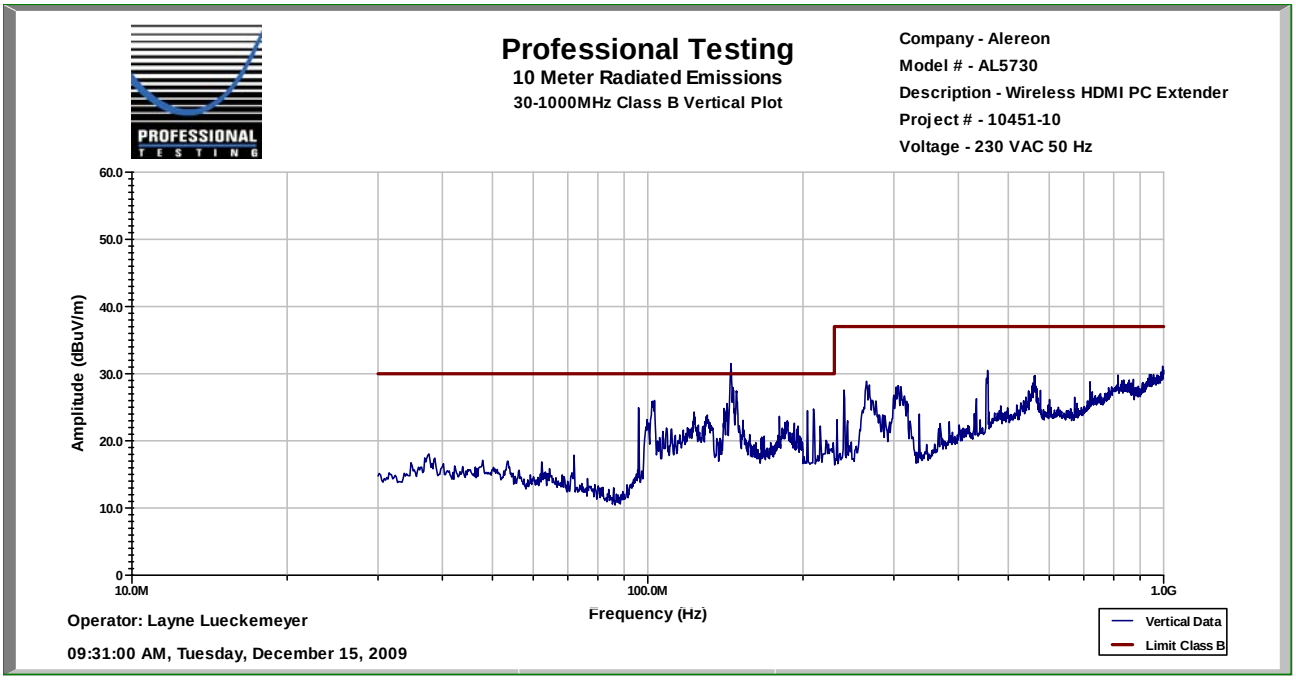
Radiated Emissions Data Sheet
Emissions 30 MHz … 1 GHz

PROJECT #	DATE	CLASS	DISTANCE	ANTENNA	RBW	VBW	DETECTOR
10451-10	December 15, 2009	FCC B	10 m	Bicon | Log	CISPR 120 kHz	1 MHz	Quasi Peak

COMMENT	Transmitting UWB BG 1

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
95.96	267	1	29.9	26.1	8.4	1.0	13.1	30	-16.9	QP
103.1	180	1	33.2	26.3	9.3	1.1	17.3	30	-12.7	QP
144.84	324	1	40.3	26.5	12.1	1.5	27.4	30	-2.6	QP
240	329	1	33.5	30.9	12.0	2.1	16.7	37	-20.3	QP
265.6	256	1	34.9	31.3	13.1	2.4	19.1	37	-17.9	QP
305.6	140	1	34.2	31.3	14.0	2.5	19.4	37	-17.6	QP



Result = Pass

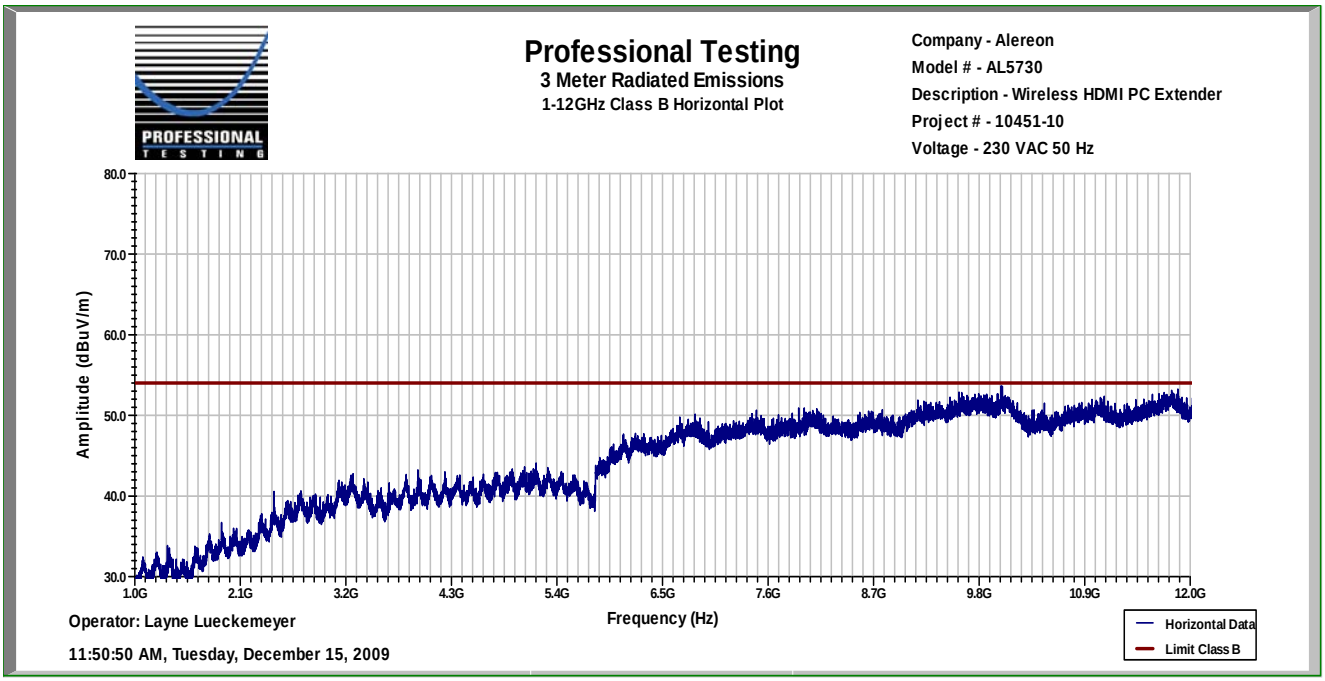
Radiated Emissions Data Sheet
1 GHz…12 GHz

PROJECT #	DATE	CLASS	DISTANCE	ANTENNA	RBW	VBW	DETECTOR
10451-10	December 15, 2009	FCC B	3 m	Horn	1 MHz	1 MHz	Average

COMMENT	Transmitting UWB BG 1

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
6090	noise	floor	47.7	54.2	35.3	6.8	35.6	54	-18.4	Avg
7480	noise	floor	50.6	54.5	37.2	7.9	41.1	54	-12.9	Avg
8550	noise	floor	50.4	53.1	37.4	8.1	42.7	54	-11.3	Avg
9160	noise	floor	51.9	53.8	37.4	8.6	44.1	54	-9.9	Avg
10003	noise	floor	53.7	54.3	38.1	9.2	46.7	54	-7.3	Avg
11100	noise	floor	52.4	53.7	38.9	9.4	47.0	54	-7.0	Avg



Result = Pass

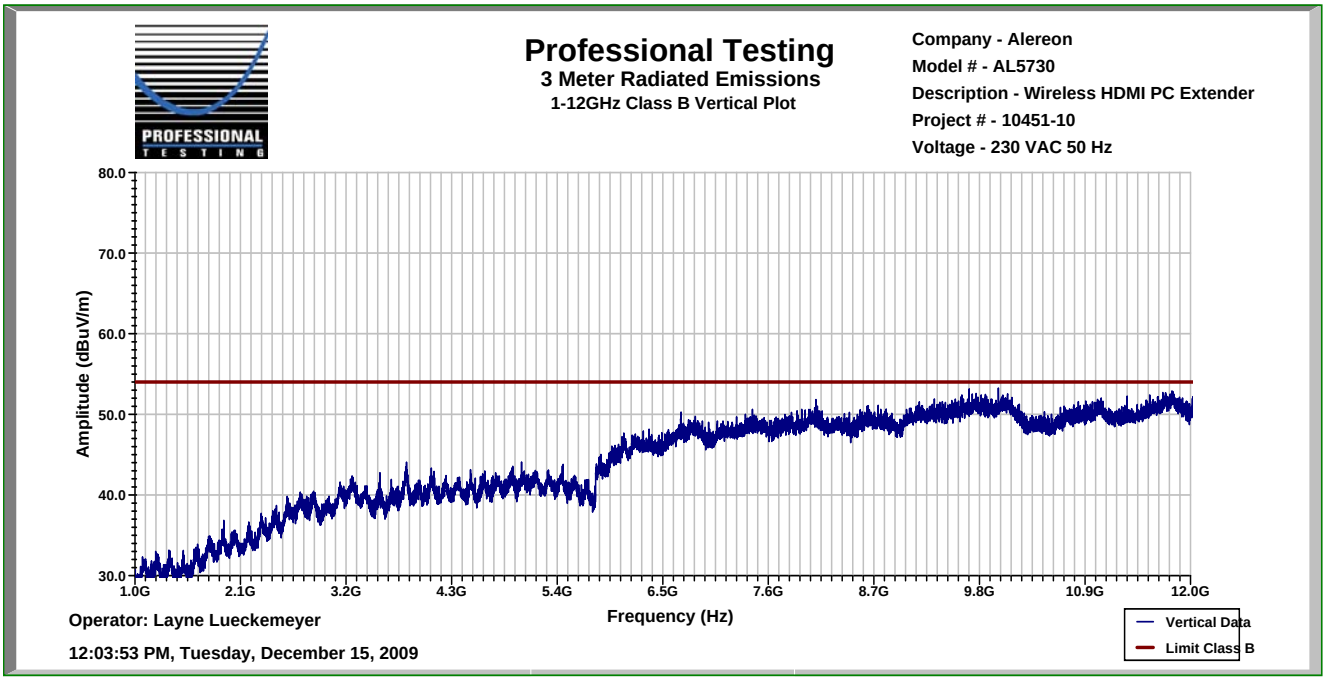
Radiated Emissions Data Sheet
1 GHz…12 GHz

PROJECT #	DATE	CLASS	DISTANCE	ANTENNA	RBW	VBW	DETECTOR
10451-10	December 15, 2009	FCC B	3 m	Horn	1 MHz	1 MHz	Average

COMMENT	Transmitting UWB BG 1

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
6690	noise	floor	50.2	53.9	35.6	7.1	39.0	54	-15.0	Avg
7430	noise	floor	50.5	54.5	37.1	7.8	41.0	54	-13.0	Avg
8090	noise	floor	51.8	53.9	37.6	8.0	43.5	54	-10.5	Avg
9330	noise	floor	51.9	53.9	37.6	8.8	44.4	54	-9.6	Avg
9990	noise	floor	53.2	54.3	38.1	9.2	46.2	54	-7.8	Avg
11340	noise	floor	52.2	54.1	39.4	9.6	47.2	54	-6.8	Avg



Result = Pass

Spurious/Harmonic Emissions
1 GHz … 40 GHz

PROJECT #	DATE	CLASS	DISTANCE	ANTENNA	RBW	VBW	DETECTOR
10451-10	December 17, 2009	FCC B	1 m	Horn	1 MHz	3 MHz	Peak

COMMENT	Transmitting Low Channel Investigated up to 40 GHz.

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	45.9	43.1	36.7	4.6	44.1	63.4	-19.3	Peak
10.296	noise	floor	38.8	38.4	38.8	6.6	45.8	63.4	-17.6	Peak
13.728	noise	floor	39.6	39.5	41.5	6.8	48.4	53.4	-5.0	Peak
17.16	noise	floor	39.97	41.4	43.8	8.4	50.8	53.4	-2.6	Peak
20.592	noise	floor	40.1	43.9	37.1	9.0	42.3	53.4	-11.1	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	45.9	43.1	36.7	4.6	44.1	63.4	-19.3	Peak
10.296	noise	floor	38.8	38.4	38.8	6.6	45.8	63.4	-17.6	Peak
13.728	noise	floor	39.6	39.5	41.5	6.8	48.4	53.4	-5.0	Peak
17.16	noise	floor	39.97	41.4	43.8	8.4	50.8	53.4	-2.6	Peak
20.592	noise	floor	40.1	43.9	37.1	9.0	42.3	53.4	-11.1	Peak

Result = Pass

Spurious/Harmonic Emissions
1 GHz … 40 GHz

PROJECT #	DATE	CLASS	DISTANCE	ANTENNA	RBW	VBW	DETECTOR
10451-10	December 17, 2009	FCC B	1 m	Horn	1 MHz	3 MHz	Peak

COMMENT	Transmitting Middle Channel Investigated up to 40 GHz.

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	42	42.1	37.0	4.9	41.7	63.4	-21.7	Peak
11.88	noise	floor	40.5	37.1	40.2	6.1	49.7	53.4	-3.7	Peak
15.84	noise	floor	39.4	39.6	38.0	7.4	45.3	53.4	-8.1	Peak
19.8	noise	floor	39.7	43.7	36.5	8.2	40.8	53.4	-12.6	Peak
23.76	noise	floor	40.2	41.8	37.1	10.8	46.4	53.4	-7.0	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	42	42.1	37.0	4.9	41.7	63.4	-21.7	Peak
11.88	noise	floor	40.5	37.1	40.2	6.1	49.7	53.4	-3.7	Peak
15.84	noise	floor	39.4	39.6	38.0	7.4	45.3	53.4	-8.1	Peak
19.8	noise	floor	39.7	43.7	36.5	8.2	40.8	53.4	-12.6	Peak
23.76	noise	floor	40.2	41.8	37.1	10.8	46.4	53.4	-7.0	Peak

Result = Pass

Spurious/Harmonic Emissions
1 GHz to 40 GHz

PROJECT #	DATE	CLASS	DISTANCE	ANTENNA	RBW	VBW	DETECTOR
10451-10	December 17, 2009	FCC B	1 m	Horn	1 MHz	3 MHz	Peak

COMMENT	Transmitting High Channel Investigated up to 40 GHz.

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	43.3	40.5	37.6	4.9	45.3	63.4	-18.1	Peak
13.464	noise	floor	38.7	38.6	41.4	7.0	48.5	53.4	-4.9	Peak
17.952	noise	floor	39.6	42.7	46.8	9.0	52.7	53.4	-0.7	Peak
22.44	noise	floor	39.2	40.5	37.1	9.4	45.2	53.4	-8.2	Peak
26.928	noise	floor	40.2	20	45.7	8.96	74.9	53.4	-21.5	Peak

Vertical

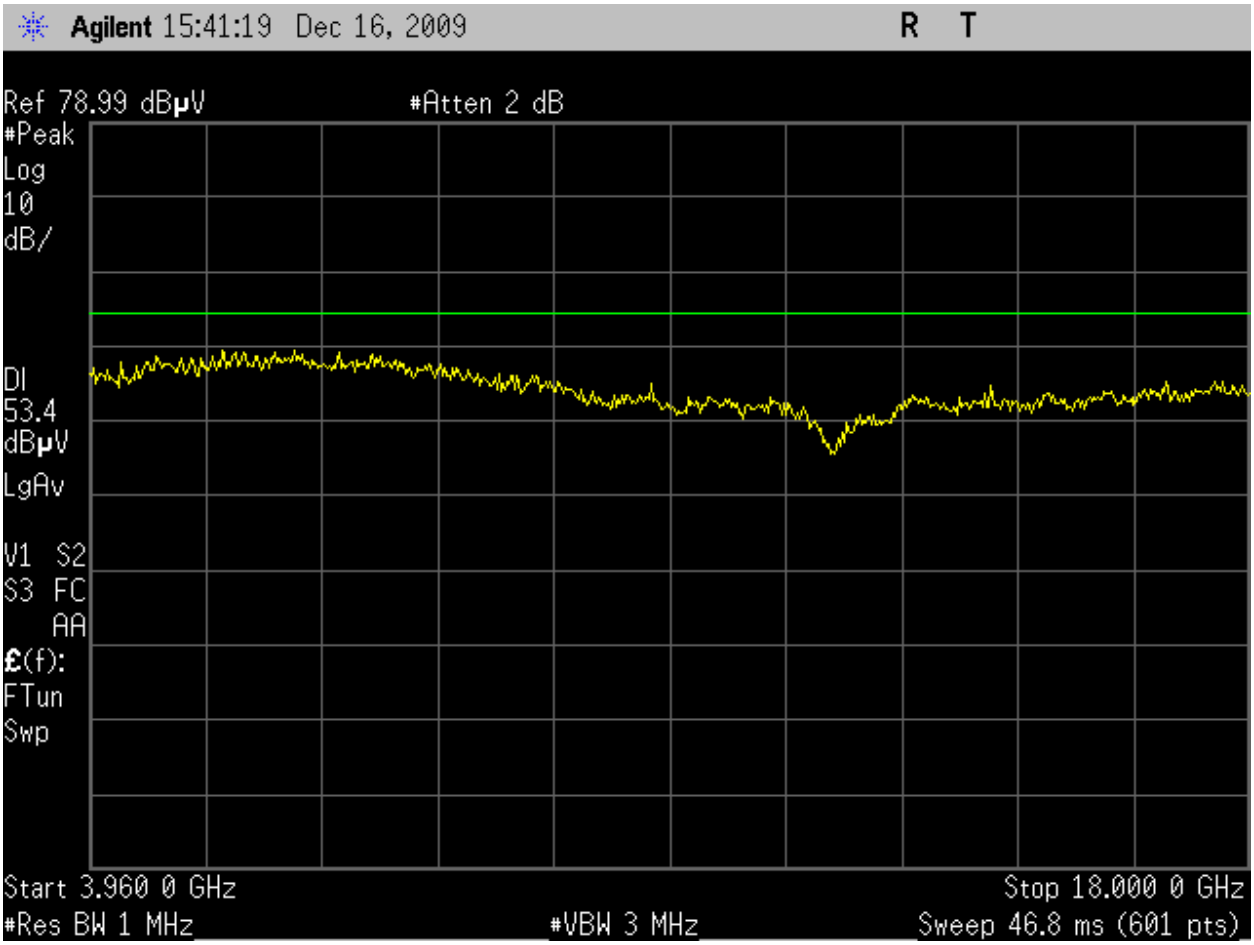
Frequency (GHz)	EUT Direction (degrees)	Antenna Elevation (Meters)	Recorded Level (dBµV)	Amplifier Gain (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Corrected Level (dBµV /m)	Limit (dBµV /m)	Margin (dB)	Detector Function
8.976	noise	floor	43.3	40.5	37.6	4.9	45.3	63.4	-18.1	Peak
13.464	noise	floor	38.7	38.6	41.4	7.0	48.5	53.4	-4.9	Peak
17.952	noise	floor	39.6	42.7	46.8	9.0	52.7	53.4	-0.7	Peak
22.44	noise	floor	39.2	40.5	37.1	9.4	45.2	53.4	-8.2	Peak
26.928	noise	floor	40.2	20	45.7	8.96	74.9	53.4	-21.5	Peak

Result = Pass

Spurious/Harmonic Emissions
1 GHz to 40 GHz

PROJECT #	DATE	RULE	DISTANCE	ANTENNA	RBW	VBW	DETECTOR
10451-10	December 17, 2009	15.519	1 m	Horn	1 MHz	3 MHz	Peak

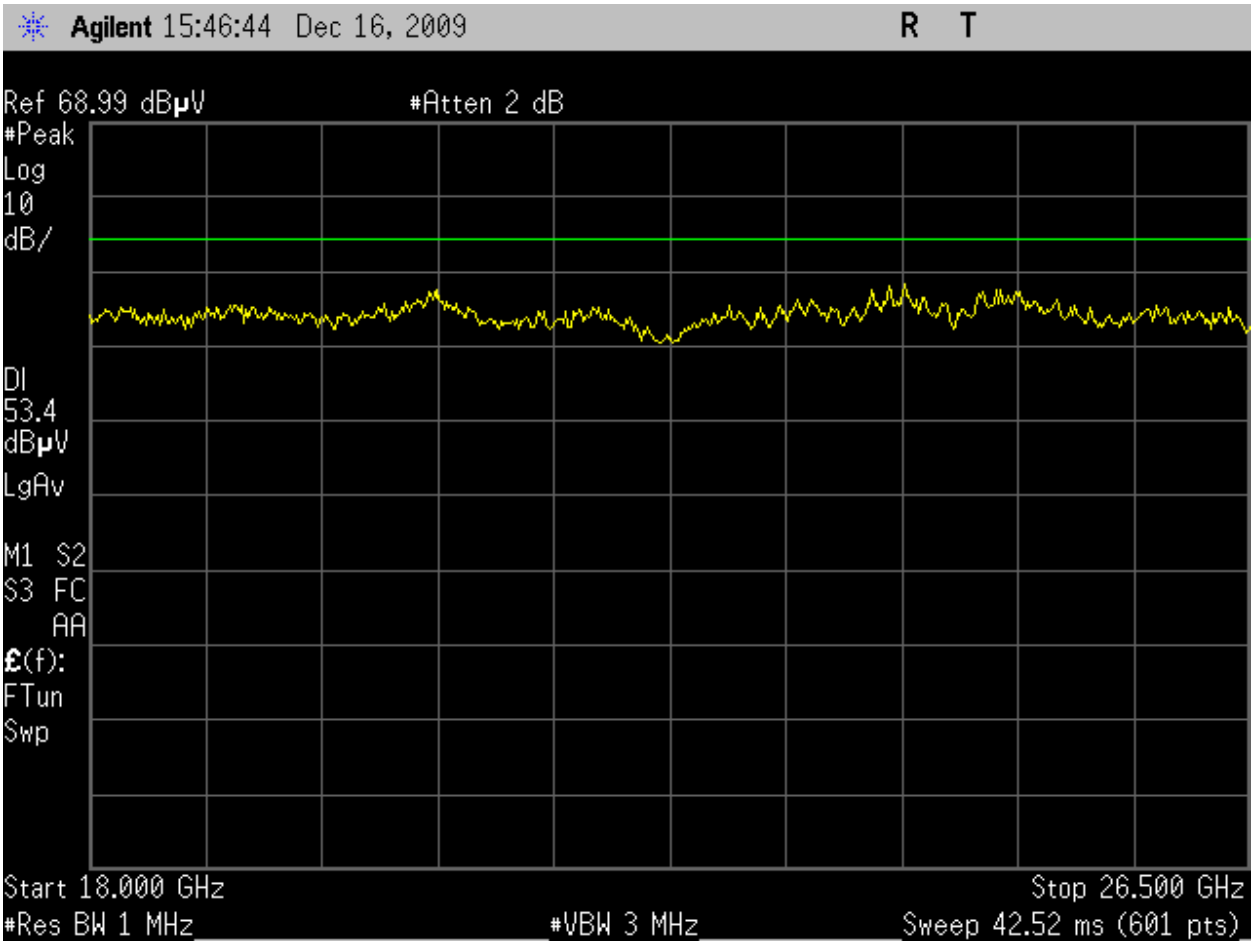
COMMENT	.



Spurious/Harmonic Emissions
1 GHz to 40 GHz

PROJECT #	DATE	RULE	DISTANCE	ANTENNA	RBW	VBW	DETECTOR
10451-10	December 17, 2009	15.519	1 m	Horn	1 MHz	3 MHz	Peak

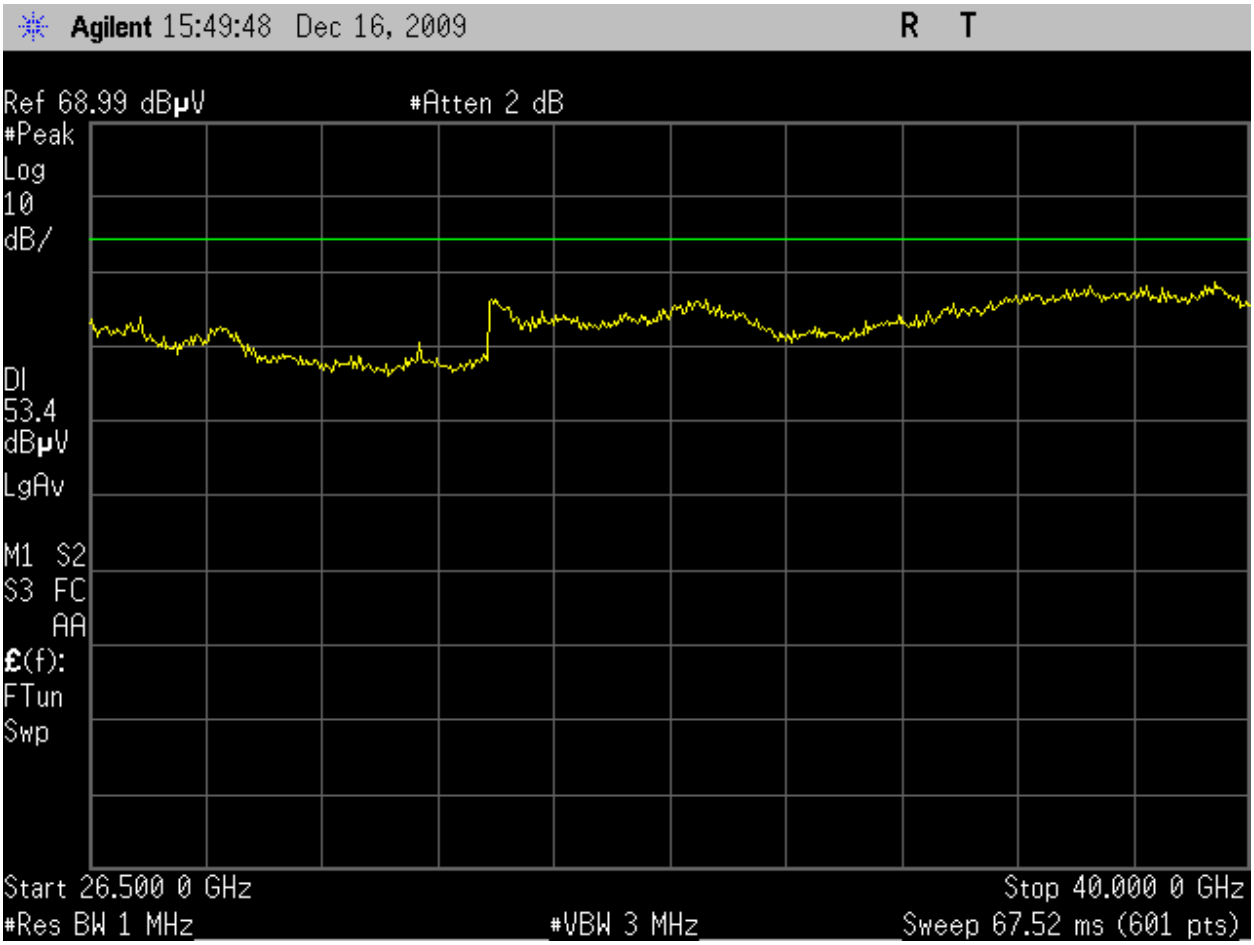
COMMENT	



Spurious/Harmonic Emissions
1 GHz … 40 GHz

PROJECT #	DATE	RULE	DISTANCE	ANTENNA	RBW	VBW	DETECTOR
10451-10	December 17, 2009	15.519	1 m	Horn	1 MHz	3 MHz	Peak

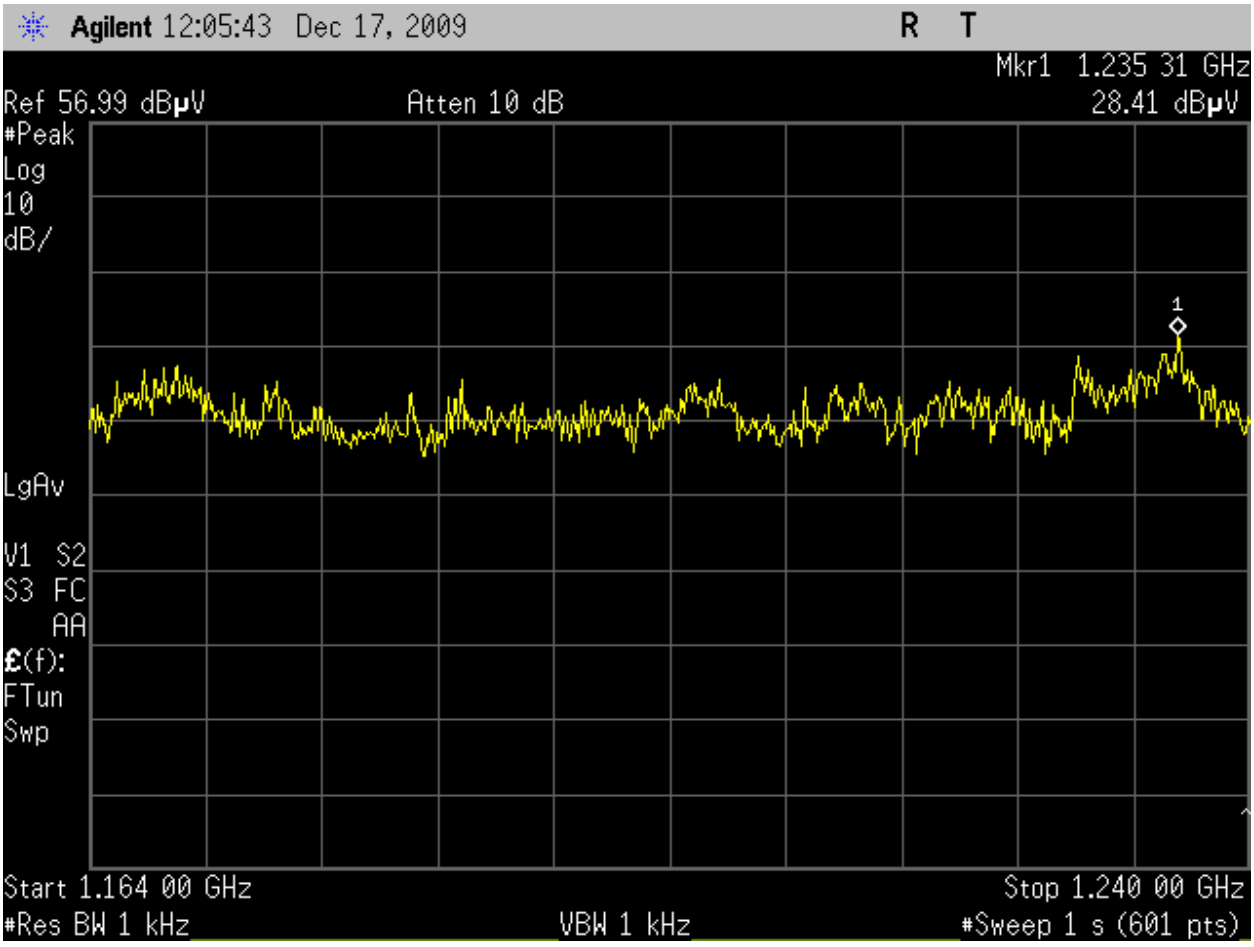
COMMENT	



Spurious Radiated Emissions in GPS Bands

PROJECT #	DATE	RULE	DISTANCE	ANTENNA	RBW	VBW	DETECTOR
10451-10	December 17, 2009	15.519(d)	1 m	Horn	1 kHz	1 kHz	Peak

COMMENT	Transmitting 1164 MHz to 1240 MHz

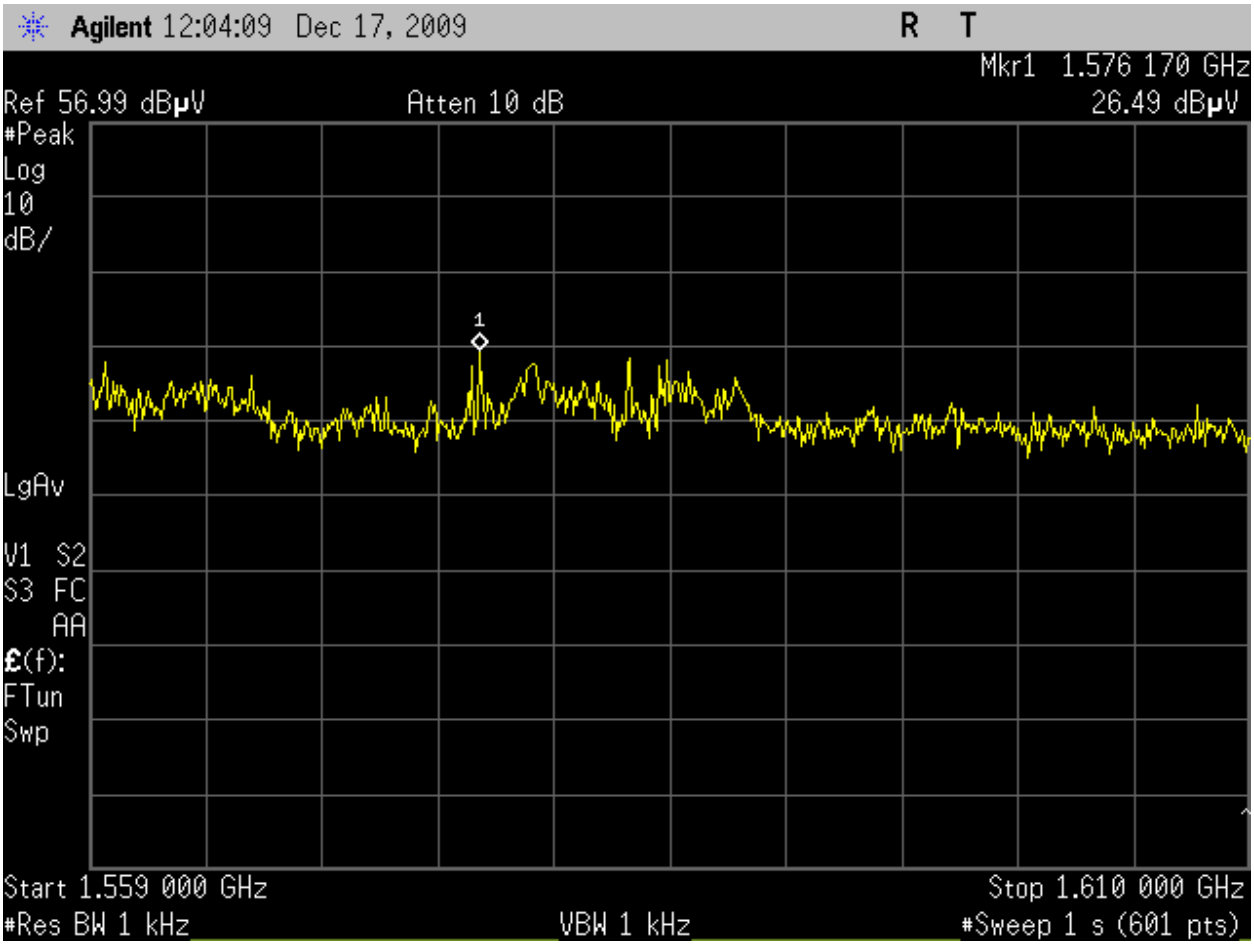


Result = Pass

Spurious Radiated Emissions in GPS Bands

PROJECT #	DATE	RULE	DISTANCE	ANTENNA	RBW	VBW	DETECTOR
10451-10	December 17, 2009	15.519(d)	1 m	Horn	1 kHz	1 kHz	Peak

COMMENT	Transmitting 1559 MHz to 1610 MHz



Result = Pass

Peak Emissions within 50 MHz Bandwidth

PROJECT #	DATE	RULE	DISTANCE	ANTENNA	RBW	VBW	DETECTOR
10451-10	December 17, 2009	15.519(e)	1 m	Horn	8 MHz	8 MHz	Peak

COMMENT	Low 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(8/50) = -15.9dBm

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
3.635	0	1	51	0.0	32.1	3.3	86.4	88.8	-2.4	Peak

Result = Pass

Peak Emissions within 50 MHz Bandwidth

PROJECT #	DATE	RULE	DISTANCE	ANTENNA	RBW	VBW	DETECTOR
10451-10	December 17, 2009	15.519(e)	1 m	Horn	8 MHz	8 MHz	Peak

COMMENT	Mid 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(8/50) = -15.9dBm

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
3.881	0	1	48.8	0.0	32.8	3.5	85.1	88.8	-3.7	Peak

Result = Pass

Peak Emissions within 50 MHz Bandwidth

PROJECT #	DATE	RULE	DISTANCE	ANTENNA	RBW	VBW	DETECTOR
10451-10	December 17, 2009	15.519(e)	1 m	Horn	8 MHz	8 MHz	Peak

COMMENT	High 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(8/50) = -15.9dBm

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
4.327	0	1	49.7	0.0	32.5	3.8	85.9	88.8	-2.9	Peak

Result = Pass

End of Report

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