Project 09522-10

Prepared for:

DLP Design, Inc.
1605 Roma Lane
Allen, Texas 75013

By

Professional Testing (EMI), Inc.
1601 N. A.W. Grimes Blvd., Suite B
Round Rock, Texas 78665

May 6, 2009

Revised
June 25, 2009

CERTIFICATION
Wireless Test Report
DLP Design, Inc.
UHF1

Table of Contents

Applicant:	DLP Design, Inc.
Applicant's Address:	1605 Roma Lane
	Allen, TX 75013
FCC ID:	SX9UHF1
IC Number:	5675A-UHF1
Project Number:	09522-10
Test Dates:	April 6-8, 2009; June 2, 2009; June 25, 2009

The **DLP Design, Inc. UHF1** was tested to and found to be in compliance with FCC 47 CFR Part 15 and IC RSS-210 issue 7.

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

Parameter	Frequency (MHz)	Level		Limit	Margin (dB)
Mains Conducted	4.86	37.8		46	-8.2
Radiated Spurious	2706	62.8 dBµV/m		63.5 dBµV/m	-0.7
Peak Power	2480	14.4 dBm	27.5 mW	+30 dBm	-15.6

Occupied Bandwidth		Emission Designator	Channel Separation	Number of Hopping Channels
20 dB	26 dB			
86.2 kHz	112.8 kHz	113KF1D	200 kHz	125

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
Director of Testing Services

This report has been reviewed and accepted by DLP Design, 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 DLP Design, Inc. UHF1 is a Modular RFID transmitter intended for the simple development of RFID reader systems. The modular design allows for easy integration into the operators system. All of the DLP-RFID-UHF1's electronics (excluding the antenna) reside within the compact unit, and all operational power is taken from the host Windows/Windows CE/Linux PC via the USB interface. The EUT employs FHSS techniques while operating in the 902 to 928 MHz band. The EUT was configured with special scripts which allowed the device to be tuned to any channel and control the modulation.

1.3 EUT Operation

The EUT was configured as a peripheral device with the host being a laptop computer. The host device was populated with at least two types of I/O per ANSI C63.4. The EUT was tested while in a continuous transmit mode. The EUT was tuned to a low, middle, and high channel to perform power, occupied bandwidth, and spurious/harmonic tests. For conducted emissions the device was tuned to its center frequency. The EUT continuously transmitted at maximum power. The system tested consisted of the following:

Manufacturer	Model	FCC ID Number	IC Identifier
DLP Design, Inc.	UHF1	SX9UHF1	5675A-UHF1

The following rules apply to the operation of the EUT:

Guidelines	FCC Rules	IC Rules	
	Part 15	RSS-GEN Issue 1	RSS-210 Issue 7
Transmitter Characteristics	15.247	4.1-4.6, 7	2.2, 2.6-2.7, A2.9, A8, A9
Spurious Radiated Power	15.209	4.2, 4.7, 4.8, 6, 7	2.2, 2.6-2.7, A2.9, A8, A9
Power Line Conducted	15.207	4.2, 4.7, 7.2	
Antenna Requirement	15.203	7.1, 7.1.4	

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 C63.4:2003 and FCC Public Notice DA 00-705 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.	2003
47 CFR	Part 15 – Radio Frequency Devices Subpart C -Intentional Radiators	
FCC Public Notice DA 00-705	Filing and Measurement Guidelines for Frequency Hopping Spread Spectrum Systems	March 30, 2000
RSS-210	Low-power License-exempt Radio communication Devices (All Frequency Bands): Category I Equipment	Issue 7
RSS-Gen	General Requirements and Information for the Certification of Radio communication Equipment	Issue 2

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 a 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 Peak Output Power

Peak power measurements were made on selected fundamental transmit frequencies of the EUT for the lowest, most center, and highest transmit frequency.

3.1 Test Procedure

The EUT was directly connected to a spectrum analyzer with a calibrated measurement cable. The RBW of the Spectrum analyzer was 1 MHz and the peak detector was employed.

3.2 Test Criteria

The maximum peak output power is 0.25 W for FHSS devices operating in the frequency range 902-928 MHz employing greater than 50 hopping channels according to FCC 15.247and RSS-210.

4.0 Occupied Bandwidth

Occupied bandwidth measurements were performed on the EUT to determine compliance with FCC 15.247(a)(2) and RSS-210.

4.1 Test Procedure

The occupied 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. Display line and marker delta functions were used to measure the occupied bandwidth of the EUT. However, the 20 or 26 dB bandwidth is referenced to a peak power measurement taken at the entire bandwidth or more for RBW, then using 1% RBW for the 20 or 26 dB bandwidth. Measurements were made at three frequencies.

4.2 Test Criteria

The 20 dB bandwidth must be measured and reported for the FCC and the 26 dB bandwidth must be measured and reported for IC.

5.0 Timing, Channel Separation and Number of Hopping Channels

Plots were captured of the all hopping channels and the time occupied on each channel. The bandwidth between the channels was measured from the plot of all the hopping channels in order to determine compliance with FCC 15.247and RSS-210.

5.1 Test Procedure

In order to measure the number of channels and the channel separation the EUT was transmitting in its normal mode the spectrum analyzer was set to max hold while being tuned across the entire band.. Approximately 10 minutes is given to allow all of the channels to be captured. Delta markers were used to measure the channel separation.

In order to measure the timing the spectrum analyzer was set to the frequency of one of the channels while in zero span. The occupancy time on the channel was also monitored for a total of 30 seconds to ensure all transmissions in a 20 second period are accounted for. Plots are given in Appendix B.

5.2 Test Criteria

According to section FCC 15.247 and RSS-210 the system must use at least 50 hopping channels since the channel bandwidth is less than 250 kHz (determined by the 20 dB occupied bandwidth). The channels must be separated by at least the channel bandwidth. The maximum occupancy time on nay channel may not exceed 0.4 seconds in any 20 second period.

6.0 Conducted Spurious Emissions

Peak spurious measurements were made in the frequency range of 500 MHz to 10 GHz while the EUT was tuned to the lowest, middle, and highest channels.

6.1 Test Procedure

The EUT was directly connected to a spectrum analyzer with a calibrated measurement cable. The RBW of the Spectrum analyzer was 1 MHz and the peak detector was employed.

6.2 Test Criteria

All spurious emissions emanating from the antenna port of the EUT must be 20 dB below the fundamental.

7.0 Band Edge Spurious Emissions

Band edge spurious emissions measurements were performed on the EUT to determine compliance to FCC 15.247(c) and RSS-210.

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 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.

7.2 Test Criteria

The band edge spurious emissions will meet criteria if they are attenuated below the limits specified in FCC 15.209 or RSS-210 Table 3. For this test the adjacent restricted band measurement included measurements of the band edge emissions and compared to 15.209.

8.0 Out of Band Spurious Emissions

Out of band spurious/harmonic emissions measurements were performed on the EUT to determine compliance to FCC sections 15.247(c), 15.209 and RSS-210.

8.1 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.

Above 1 GHz testing was completed at 3 transmit frequencies to determine compliance.

8.2 Test Criteria

The radiated limits of FCC 15.209 and RSS-210 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

9.0 Antenna Requirements

An antenna evaluation was performed on the EUT determine compliance with FCC sections 15.203, 15.247(b) and RSS-210.

9.1 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.

9.2 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.

10.0 Limit for SAR Waiver

The peak power was evaluated for exemption with the SAR limits.

11.0 Receiver Spurious Emissions

This device does not contain a separate receive function. The nature of this RFID system is that it will only receive while transmitting. Therefore, the spurious emissions produced in transmit mode are the spurious emissions produced in receive mode.

12.0 Modifications

N/A

13.0 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
1281	HP	85650A	Quasi-peak Adapter	January 05, 2010
0045	HP	85662A	Spectrum Analyzer Display	NCR
1284	HP	8568B	Spectrum Analyzer	January 05, 2010
1087	PTI	PTI-ALF3	Attenuator, Limiter, Filter	June 7, 2009
1185	Emco	3825/2	Line Impedance Stabilization Network	September 13, 2009
0081	ELGAR	1751SL	AC Power Supply	NCR
1173	PTI	100KHz HPF	High Pass Filter	January 26, 2010

Radiated Test Equipment

Asset #	Manufacturer	Model #	Description	Calibration Due
1277	HP	85650A	Quasi-peak Adapter (high band)	October 21, 2009
1273	HP	85662A	Spectrum Analyzer Display (high band)	NCR
0084	HP	8566B	Spectrum Analyzer (high band)	February 23, 2010
1035	HP	85685A	RF Preselector (high band)	January 29, 2010
0085	HP	85650A	Quasi-peak Adapter (low band)	July 7, 2009
1629	HP	85662A	Spectrum Analyzer Display (low band)	NCR
1145	HP	8568B	Spectrum Analyzer (low band)	July 7, 2009
0238	HP	85685A	RF Preselector (low band)	July 30, 2009
1454	HP	8447D	RF Preamplifier	June 17, 2009
1497	Emco	3108	Biconical Antenna	April 16, 2009
1486	Emco	3147	Log Periodic Dipole Array Antenna	April 16, 2009
C026	none	none	Coaxial Cable (low band)	July 02, 2009
C027	none	none	Coaxial Cable (high band)	July 02, 2009

Radiated Test Equipment (retest)

Asset #	Manufacturer	Model #	Description	Calibration Due
1277	HP	85650A	Quasi-peak Adapter (high band)	October 21, 2009
1273	HP	85662A	Spectrum Analyzer Display (high band)	NCR
0084	HP	8566B	Spectrum Analyzer (high band)	February 23, 2010
1035	HP	85685A	RF Preselector (high band)	January 29, 2010
0085	HP	85650A	Quasi-peak Adapter (low band)	July 7, 2009
1629	HP	85662A	Spectrum Analyzer Display (low band)	NCR
1145	HP	8568B	Spectrum Analyzer (low band)	July 7, 2009
0238	HP	85685A	RF Preselector (low band)	July 30, 2009
1454	HP	8447D	RF Preamplifier	June 17, 2009
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 02, 2009
C027	none	none	Coaxial Cable (high band)	July 02, 2009

Microwave Radiated Test Equipment

Asset #	Manufacturer	Model #	Description	Calibration Due
0582	EMCO	3115	Ridge Guide Antenna	September 30, 2009
1529	Miteq	Antenna Mounted	Microwave Preamplifier (preamp 1)	June 30, 2009
0084	HP	8566B	Spectrum Analyzer	February 23, 2010
1273	HP	85662A	Spectrum Analyzer Display	NCR
1530	Miteq	None	Microwave Preamplifier (preamp 2)	June 30, 2009
C030	None	None	Coaxial Cable (MRE band)	June 30, 2009

Asset #	Manufacturer	Model #	Description	Calibration Due
XXXX	Pasternack	LLS	2 sections, total 12ft	Janaury 21, 2010
0582	EMCO	3115	Ridge Guide Antenna	September 30, 2009
1594	Miteq	AFS44-00102650	Microwave Preamplifier (preamp 1)	February 25, 2010
1342	Rohde & Schwarz	ESMI	EMI Test Receiver	December 4, 2010
1343	Rohde & Schwarz	ESMI	EMI Test Receiver Display	December 4, 2010

Appendix A Test Setup Diagrams

FIGURE 1: Conducted Emissions Test Setup

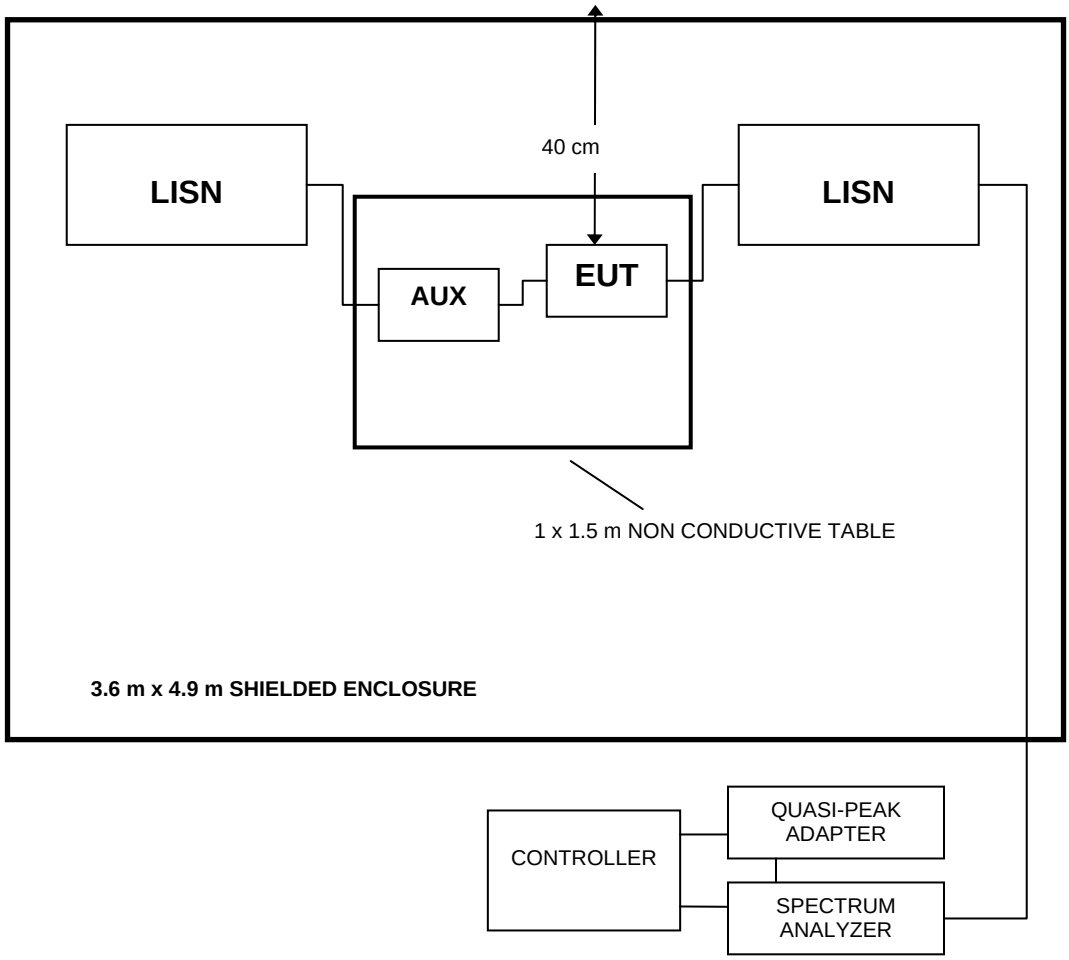
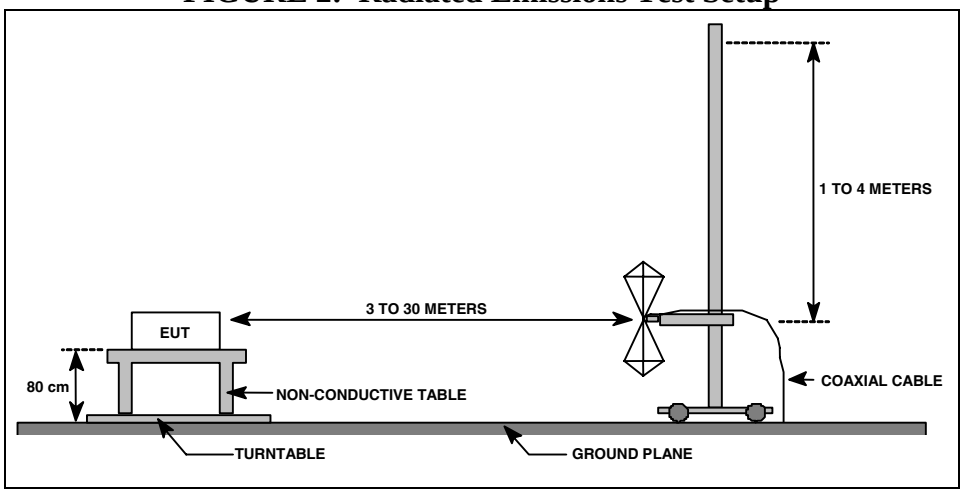


FIGURE 2: Radiated Emissions Test Setup



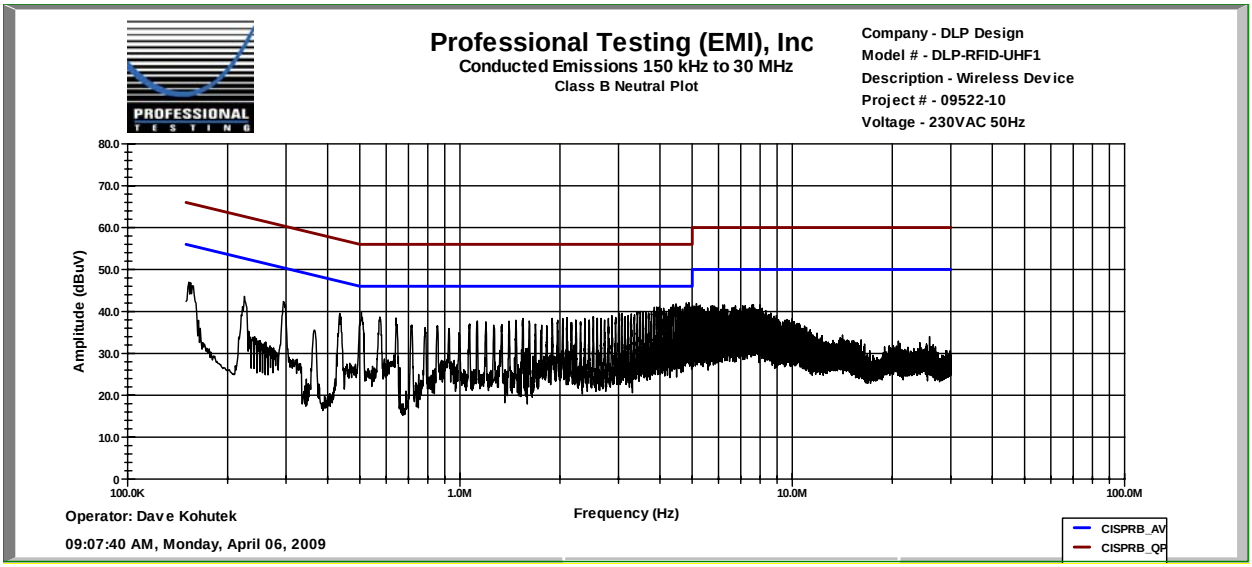
Appendix B Test Results

Mains Conducted Emissions Data Sheet
150 kHz … 30 MHz

PROJECT #	DATE	CLASS	LINE	RBW	VBW	DETECTOR
09522-10	April 6, 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)
0.153753	44.4	42.2	65.9	-21.5	55.9	-13.7
0.22279	40.1	37.3	63.9	-23.8	53.9	-16.6
4.44905	40	37.1	56	-16	46	-8.9
4.78662	40	36.8	56	-16	46	-9.2
4.8623	40.3	37.8	56	-15.7	46	-8.2
5.12997	37.1	30.9	60	-22.9	50	-19.1
5.2767	39.9	36.7	60	-20.1	50	-13.3
6.17728	39.3	35.1	60	-20.7	50	-14.9
6.2477	39.7	36.6	60	-20.3	50	-13.4
7.97352	37.6	31.7	60	-22.4	50	-18.3

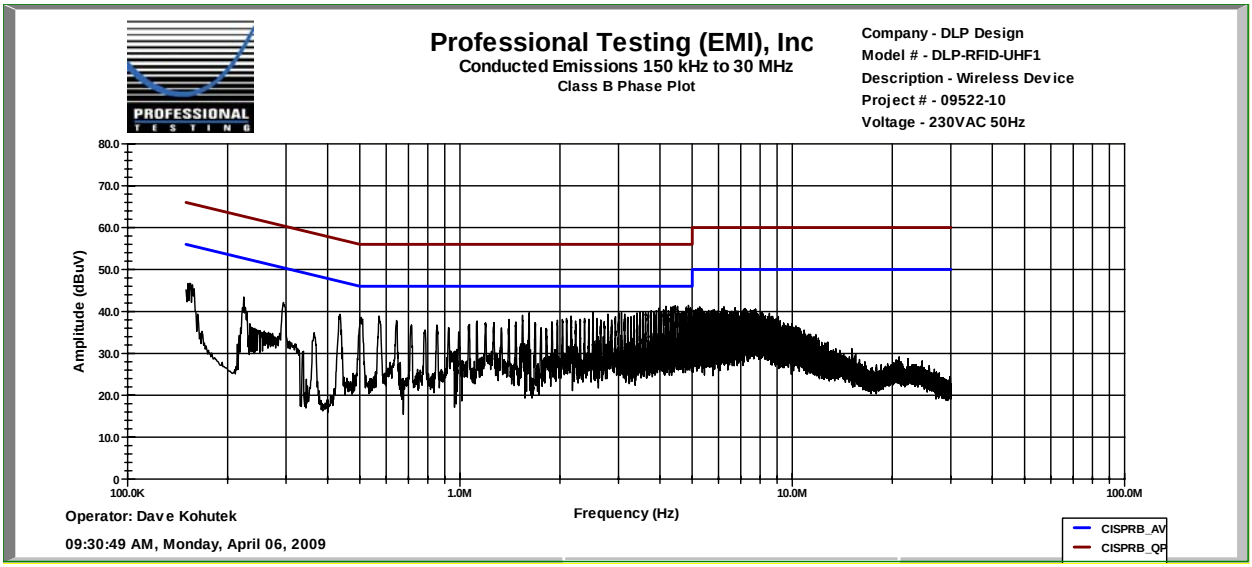


Mains Conducted Emissions Data Sheet
150 kHz … 30 MHz

PROJECT #	DATE	CLASS	LINE	RBW	VBW	DETECTOR
09522-10	April 6, 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)
0.15409	44.7	40.8	65.9	-21.2	55.9	-15.1
0.22327	39.7	35.8	63.9	-24.2	53.9	-18.1
4.16176	37	28.9	56	-19	46	-17.1
4.43804	39.8	37.5	56	-16.2	46	-8.5
4.85903	40	37.5	56	-16	46	-8.5
5.20682	38.4	34.6	60	-21.6	50	-15.4
5.27062	39.9	37.1	60	-20.1	50	-12.9
6.24458	39.4	36.2	60	-20.6	50	-13.8
6.72272	39.1	35.8	60	-20.9	50	-14.2
7.21023	39.1	35.9	60	-20.9	50	-14.1



Peak Power Data Sheet

PROJECT #	DATE	RULE	DISTANCE	ANTENNA	RBW	VBW	DETECTOR
09522-10	April 8, 2009	15.247	N/A	Direct	1 MHz	1 MHz	Peak

COMMENT	Transmitting

Conducted

Frequency (MHz)	Recorded Level (dBm)	Cable Loss (dB)	Corrected Level (dBm)	Limit (dBm)	Margin (dB)
902.6	12.08	2.3	14.4	30	-15.6
915	11.85	2.3	14.2	30	-15.9
927.4	11.42	2.3	13.7	30	-16.3

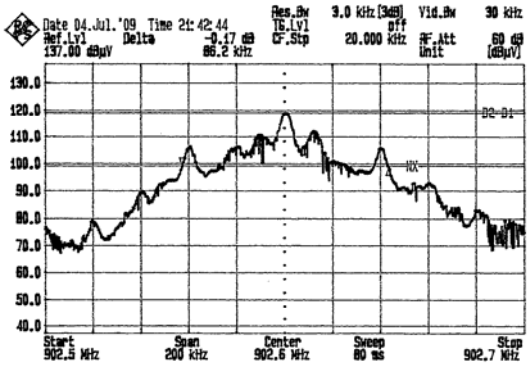
Result: PASS

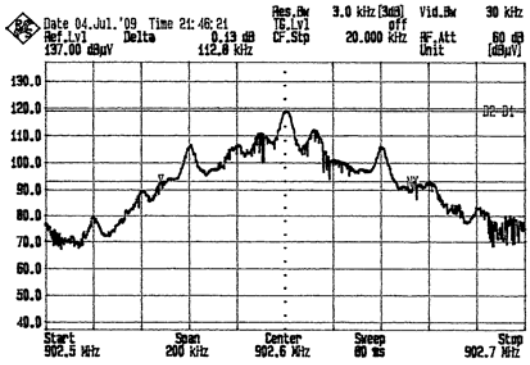
Occupied Bandwidth Data Sheet

PROJECT #	DATE	RULE	DISTANCE	ANTENNA	RBW	VBW	DETECTOR
09522-10	April 8, 2009	15.247	N/A	Direct	3 kHz	30 kHz	Peak

COMMENT	Transmitting 20 dB Bandwidth – 86.2 kHz 26 dB Bandwidth – 112.8 kHz

Low Channel



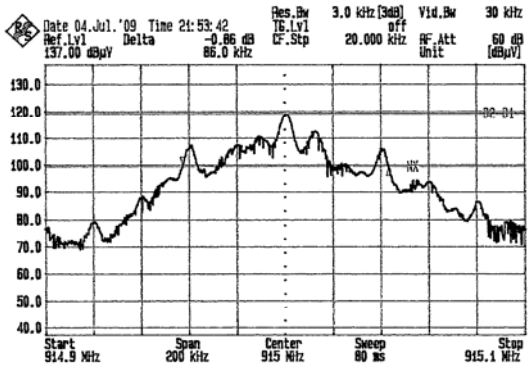


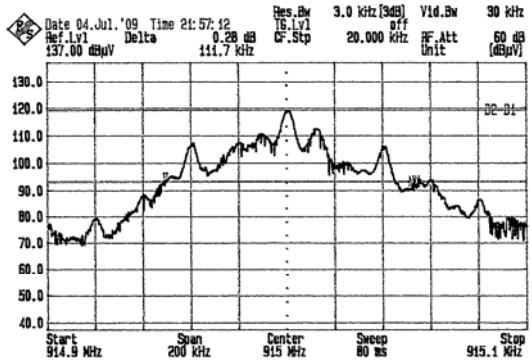
Occupied Bandwidth Data Sheet

PROJECT #	DATE	RULE	DISTANCE	ANTENNA	RBW	VBW	DETECTOR
09522-10	April 8, 2009	15.247	N/A	Direct	3 kHz	30 kHz	Peak

COMMENT	Transmitting 20 dB Bandwidth – 86.0 kHz 26 dB Bandwidth – 111.7 kHz

Middle Channel



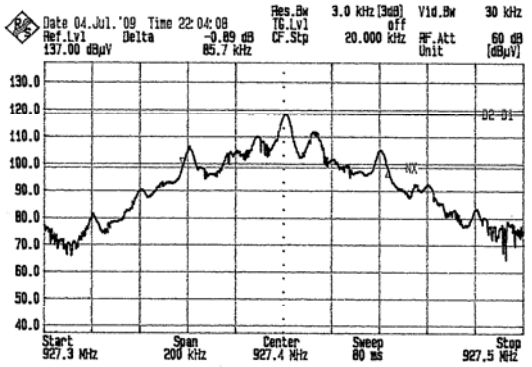


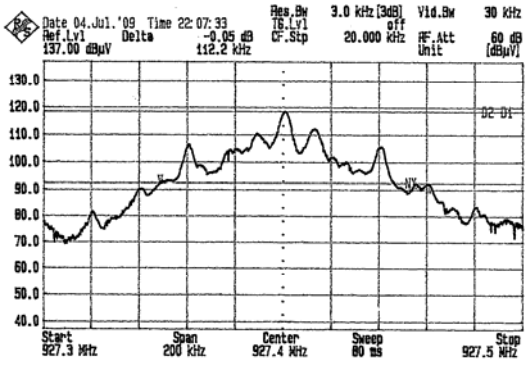
Occupied Bandwidth Data Sheet

PROJECT #	DATE	RULE	DISTANCE	ANTENNA	RBW	VBW	DETECTOR
09522-10	April 8, 2009	15.247	N/A	Direct	3 kHz	30 kHz	Peak

COMMENT	Transmitting 20 dB Bandwidth – 85.7 kHz 26 dB Bandwidth – 112.2kHz

High Channel

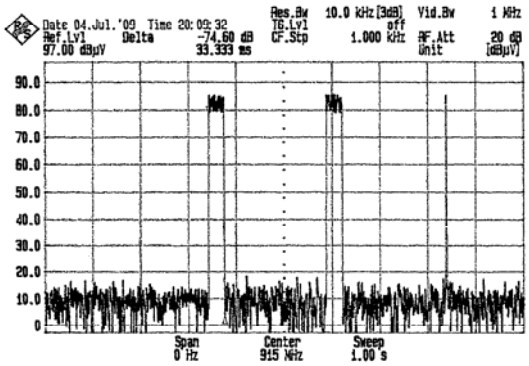


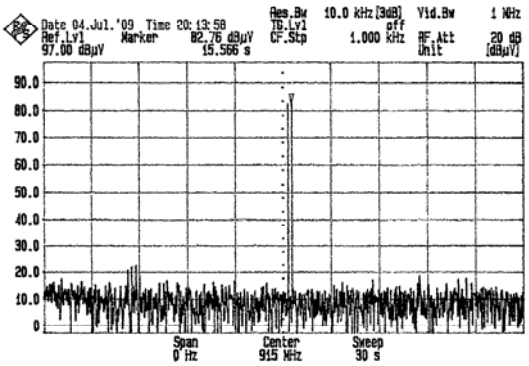


Timing Data Sheet

PROJECT #	DATE	RULE	DISTANCE	ANTENNA	RBW	VBW	DETECTOR
09522-10	April 8, 2009	15.247	N/A	Direct	10 kHz	1 MHz	Peak

COMMENT	Transmitting Channel occupation in a 20 second period: 0.067 S



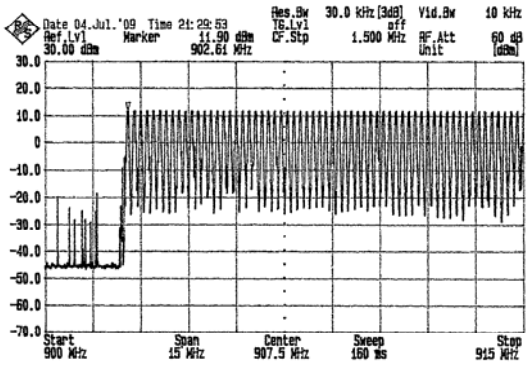


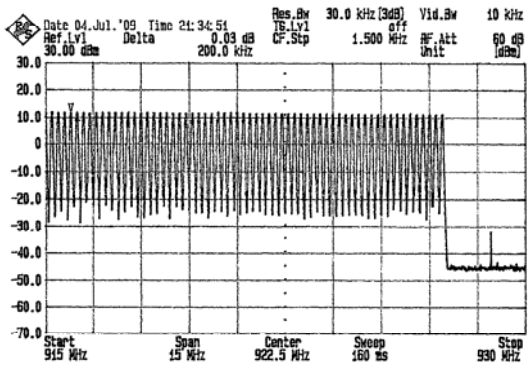
Result: PASS

Number of Hopping Channels and Channel Separation Data Sheet

PROJECT #	DATE	RULE	DISTANCE	ANTENNA	RBW	VBW	DETECTOR
09522-10	April 8, 2009	15.247	N/A	Direct	10 kHz	1 MHz	Peak

COMMENT	Transmitting Number of Channels: 125 Channel Separation: 200 kHz



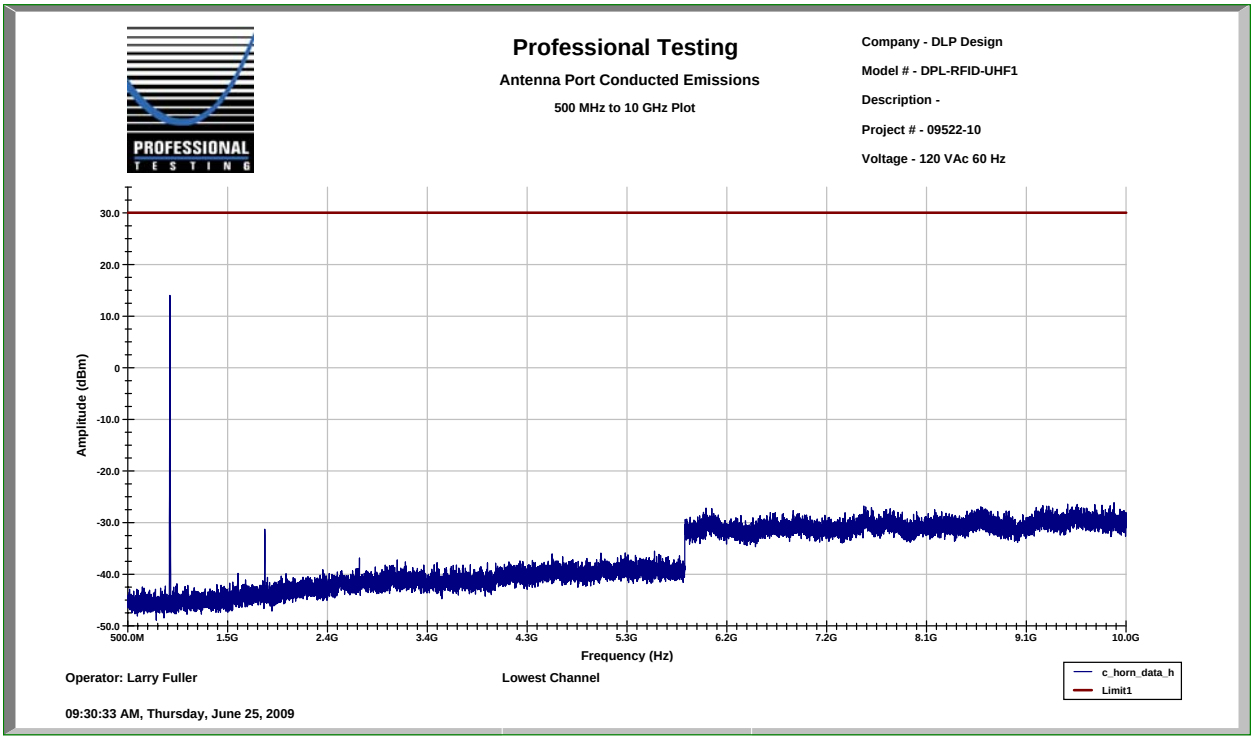


Result: PASS

Conducted Spurious Emissions Data Sheet
500 MHz … 10 GHz

PROJECT #	DATE	CLASS	DISTANCE	ANTENNA	RBW	VBW	DETECTOR
09522-10	June 25, 2009	N/A	Direct Connect	N/A	1 MHz	1 MHz	Peak

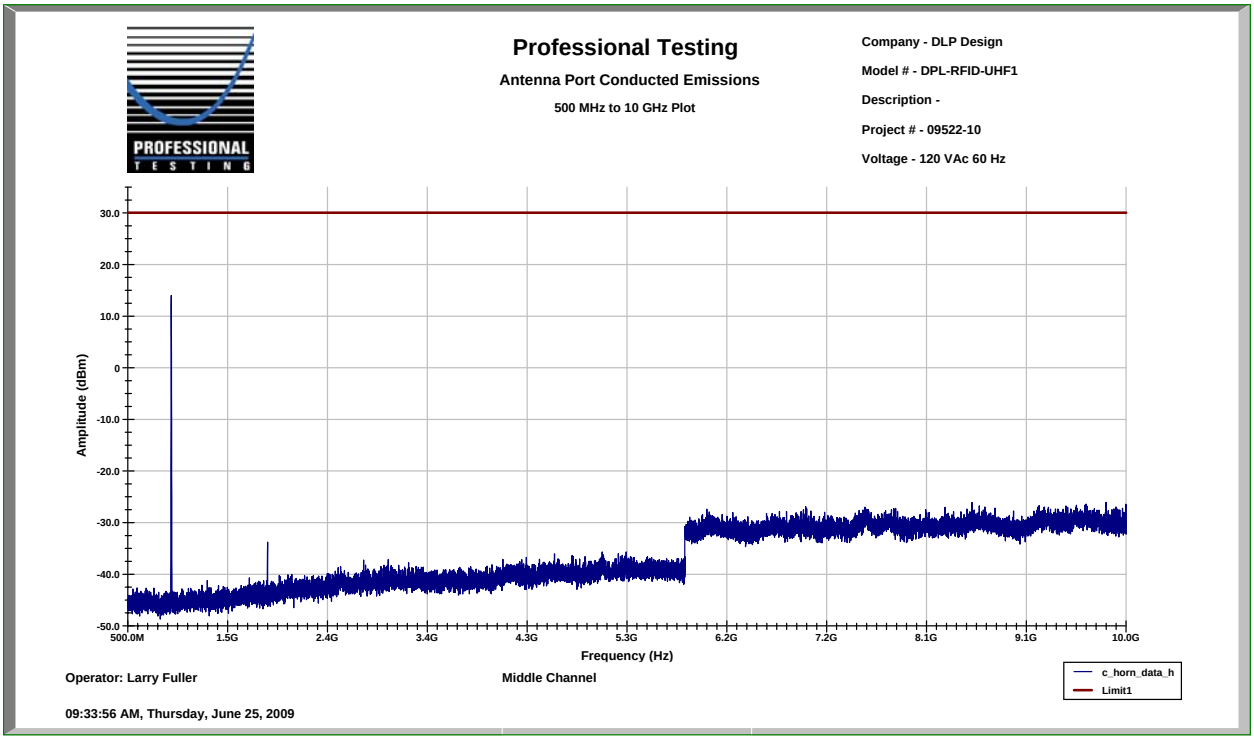
COMMENT	Transmitting Low Channel



Conducted Spurious Emissions Data Sheet
500 MHz … 10 GHz

PROJECT #	DATE	CLASS	DISTANCE	ANTENNA	RBW	VBW	DETECTOR
09522-10	June 25, 2009	N/A	Direct Connect	N/A	1 MHz	1 MHz	Peak

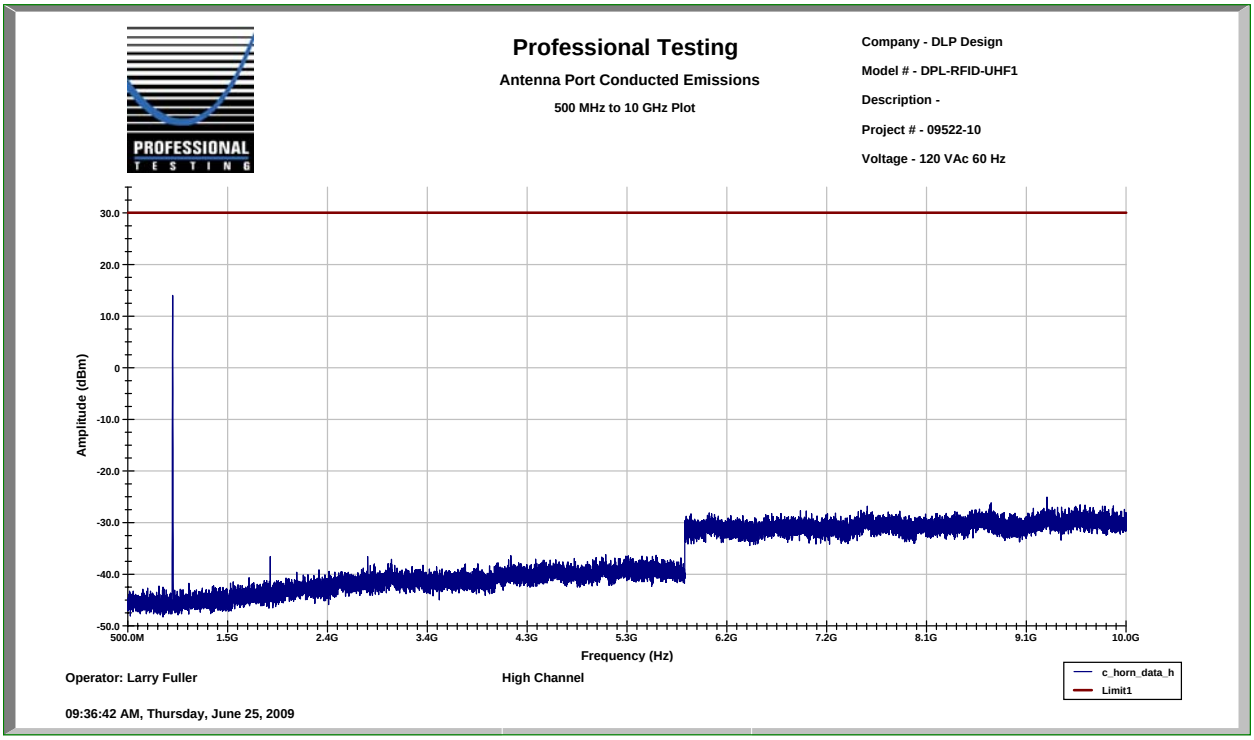
COMMENT	Transmitting Middle Channel



Conducted Spurious Emissions Data Sheet
500 MHz … 10 GHz

PROJECT #	DATE	CLASS	DISTANCE	ANTENNA	RBW	VBW	DETECTOR
09522-10	June 25, 2009	N/A	Direct Connect	N/A	1 MHz	1 MHz	Peak

COMMENT	Transmitting High Channel



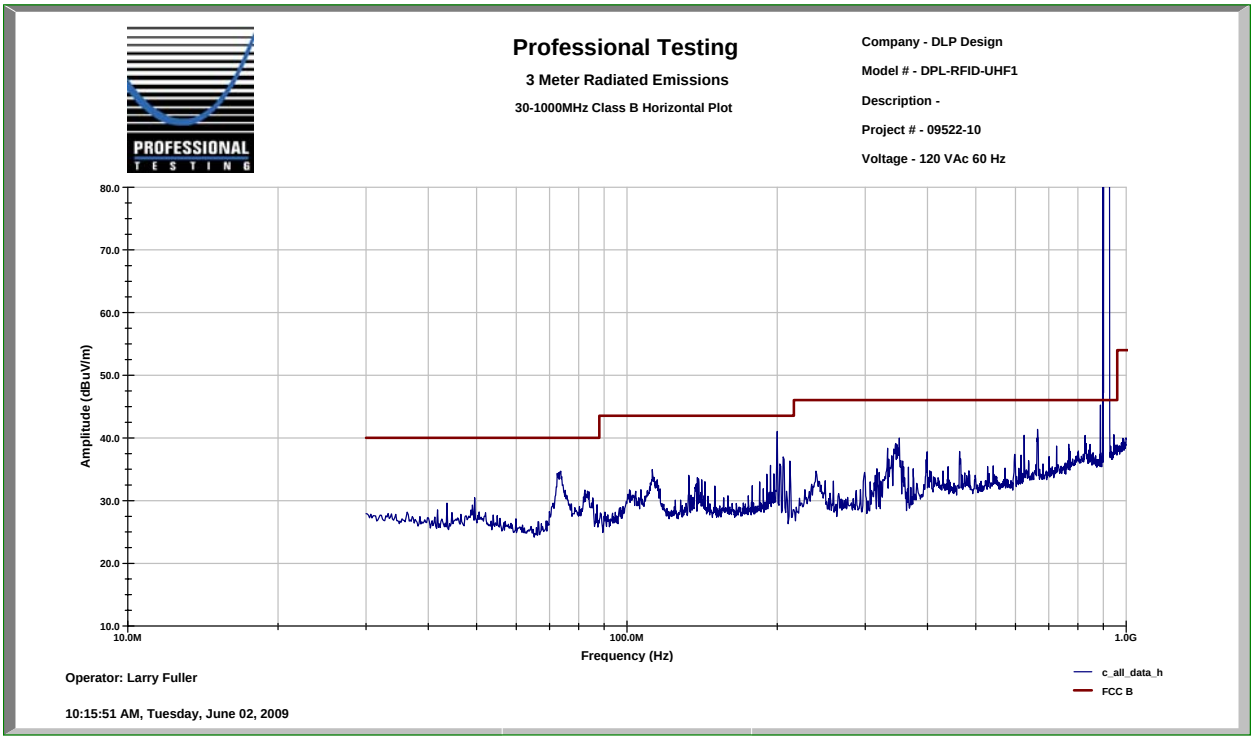
Spurious Radiated Emissions Data Sheet
30 MHz … 1 GHz

PROJECT #	DATE	CLASS	DISTANCE	ANTENNA	RBW	VBW	DETECTOR
09522-10	June 2, 2009	FCC B	3 m	Bicon | Log	CISPR 120 kHz	1 MHz	Quasi-Peak

COMMENT	Transmitting

Horizontal

Frequency (MHz)	EUT Direction (degrees)	Antenna Elevation (Meters)	Recorded Level (dBuV)	Amplifier Gain (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Distance Correction (dB)	Corrected Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
199.95	221	1	38.2	25.5	13.7	1.9	10.5	38.8	43.5	-4.7
625.03	136	3.3	41.8	36.5	20.0	4.0	10.5	39.8	46	-6.2



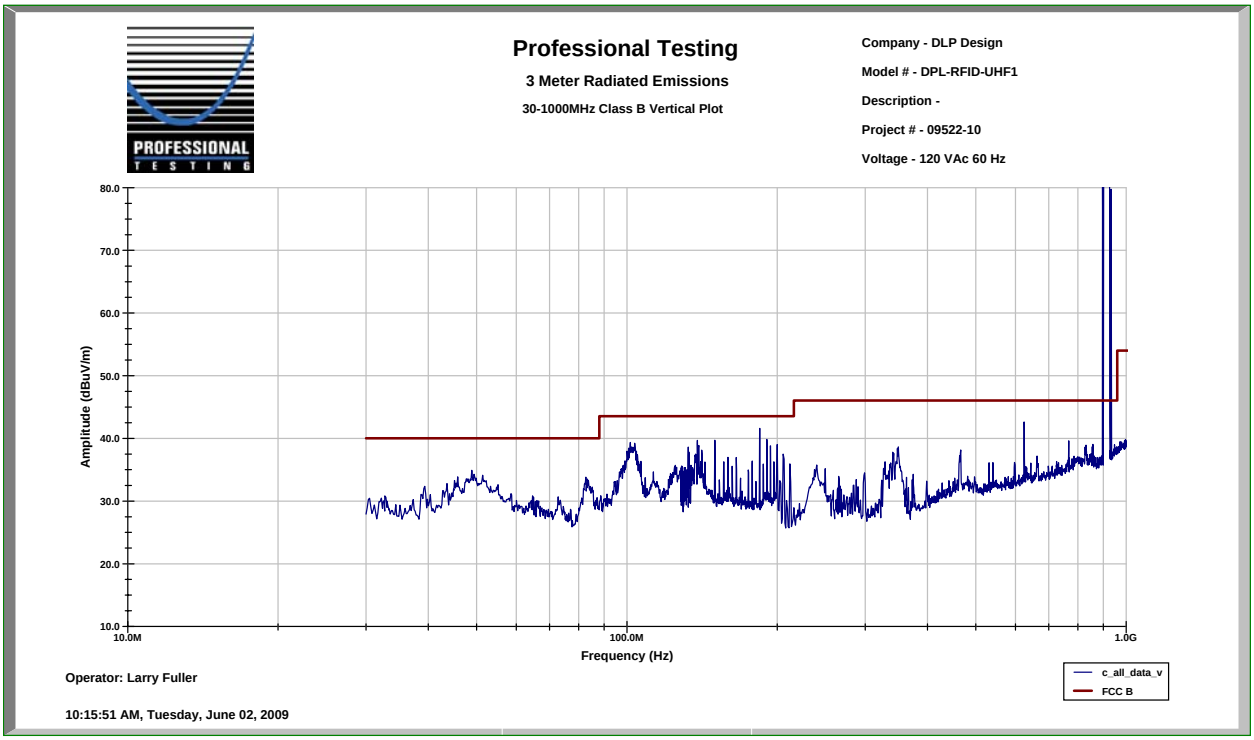
Spurious Radiated Emissions Data Sheet
30 MHz … 1 GHz

PROJECT #	DATE	CLASS	DISTANCE	ANTENNA	RBW	VBW	DETECTOR
09522-10	June 2, 2009	FCC B	3 m	Bicon | Log	CISPR 120 kHz	1 MHz	Quasi-Peak

COMMENT	Transmitting

Vertical

Frequency (MHz)	EUT Direction (degrees)	Antenna Elevation (Meters)	Recorded Level (dBuV)	Amplifier Gain (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Distance Correction (dB)	Corrected Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
138.4	93	1	39.5	25.8	12.1	1.3	10.5	37.7	43.5	-5.8
149.968	40	1	40.3	25.7	12.3	1.4	10.5	38.7	43.5	-4.8
184.335	6	1	42.6	25.5	12.9	1.8	10.5	42.3	43.5	-1.2
625.03	136	3.3	41.8	36.5	20.0	4.0	10.5	39.8	46	-6.2



Band Edge Spurious Emissions Data Sheet
902 to 928 MHz

PROJECT #	DATE	CLASS	DISTANCE	ANTENNA	RBW	VBW	DETECTOR
09522-10	June 2, 2009	FCC B	3 m	Log	CISPR 120 kHz	1 MHz	Peak

COMMENT	Transmitting

Horizontal

Frequency (MHz)	EUT Direction (degrees)	Antenna Elevation (Meters)	Recorded Level (dBuV)	Amplifier Gain (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Distance Correction (dB)	Corrected Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
902	16	2.6	35.4	36.4	23.1	5.2	10.5	37.8	46	-8.2
928	294	3	34.9	36.4	23.8	5.3	10.5	38.0	46	-8.0

Vertical

Frequency (MHz)	EUT Direction (degrees)	Antenna Elevation (Meters)	Recorded Level (dBuV)	Amplifier Gain (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Distance Correction (dB)	Corrected Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
902	86	1.2	37.4	36.4	23.1	5.2	10.5	39.8	46	-6.2
928	45	1.2	36.8	36.4	23.8	5.3	10.5	39.9	46	-6.1

Spurious/Harmonic Emissions Data Sheet
1 GHz … 10 GHz

PROJECT #	DATE	CLASS	DISTANCE	ANTENNA	RBW	VBW	DETECTOR
09522-10	April 7, 2009	FCC B	1 m	Horn	1 MHz	1 MHz	Peak

COMMENT	Transmitting Low Channel

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)
1.804	max	1	56.05	40.2	27.6	2.9	46.3	63.5	-17.2
2.706	max	1	66.84	40.6	29.6	3.0	58.8	63.5	-4.7
3.608	max	1	54.39	40.7	32.2	3.3	49.2	63.5	-14.3
4.51	max	1	54.72	41.5	33.9	3.9	51.0	63.5	-12.5
5.412	max	1	58.64	42.3	34.8	4.7	55.9	63.5	-7.6
6.314	max	1	56.58	42.9	35.5	4.7	53.9	63.5	-9.6
7.216	max	1	52.21	42.5	37.3	5.0	52.1	63.5	-11.4
8.118	max	1	54.57	41.9	38.5	4.7	55.9	63.5	-7.6
9.02	max	1	52.49	40.5	38.0	4.9	54.9	63.5	-8.6

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)
1.804	max	1	65.92	40.2	27.6	2.9	56.2	63.5	-7.3
2.706	max	1	70.85	40.6	29.6	3.0	62.8	63.5	-0.7
3.608	max	1	60.11	40.7	32.2	3.3	54.9	63.5	-8.6
4.51	max	1	59.09	41.5	33.9	3.9	55.4	63.5	-8.1
5.412	max	1	61.68	42.3	34.8	4.7	58.9	63.5	-4.6
6.314	max	1	57.9	42.9	35.5	4.7	55.2	63.5	-8.3
7.216	max	1	54.14	42.5	37.3	5.0	54.0	63.5	-9.5
8.118	max	1	55.72	41.9	38.5	4.7	57.1	63.5	-6.4
9.02	max	1	53.53	40.5	38.0	4.9	55.9	63.5	-7.6

Spurious/Harmonic Emissions Data Sheet
1 GHz … 10 GHz

PROJECT #	DATE	CLASS	DISTANCE	ANTENNA	RBW	VBW	DETECTOR
09522-10	April 7, 2009	FCC B	1 m	Horn	1 MHz	1 MHz	Peak

COMMENT	Transmitting Middle Channel

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)
1.83	max	1	66.48	40.2	27.6	2.9	56.8	63.5	-6.7
2.745	max	1	61.48	40.6	29.6	3.0	53.5	63.5	-10.0
3.66	max	1	55.03	40.7	32.3	3.3	49.9	63.5	-13.6
4.575	max	1	53.71	41.5	33.9	3.9	50.0	63.5	-13.5
5.49	max	1	53.79	42.3	34.8	4.7	51.0	63.5	-12.5
6.405	max	1	52.64	42.9	35.9	4.5	50.1	63.5	-13.4
7.32	max	1	52.21	42.5	37.3	5.1	52.1	63.5	-11.4
8.235	max	1	52.16	41.4	38.4	5.0	54.1	63.5	-9.4
9.15	max	1	50.48	40.5	38.0	4.9	52.9	63.5	-10.6

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)
1.83	max	1	71.21	40.2	27.6	2.9	61.5	63.5	-2.0
2.745	max	1	66.41	40.6	29.6	3.0	58.4	63.5	-5.1
3.66	max	1	56.07	40.7	32.3	3.3	50.9	63.5	-12.6
4.575	max	1	53.99	41.5	33.9	3.9	50.3	63.5	-13.2
5.49	max	1	59.9	42.3	34.8	4.7	57.1	63.5	-6.4
6.405	max	1	53.81	42.9	35.9	4.5	51.2	63.5	-12.3
7.32	max	1	53.96	42.5	37.3	5.1	53.8	63.5	-9.7
8.235	max	1	52.06	41.4	38.4	5.0	54.0	63.5	-9.5
9.15	max	1	50.64	40.5	38.0	4.9	53.1	63.5	-10.4

Spurious/Harmonic Emissions Data Sheet
1 GHz … 10 GHz

PROJECT #	DATE	CLASS	DISTANCE	ANTENNA	RBW	VBW	DETECTOR
09522-10	April 7, 2009	FCC B	1 m	Horn	1 MHz	1 MHz	Peak

COMMENT	Transmitting High Channel

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)
1.856	max	1	67.78	40.2	27.6	2.9	58.1	63.5	-5.4
2.784	max	1	56.68	40.6	29.6	3.0	48.7	63.5	-14.8
3.712	max	1	52.79	40.7	32.3	3.3	47.6	63.5	-15.9
4.64	max	1	53.71	41.6	34.1	4.2	50.4	63.5	-13.1
5.568	max	1	53.63	42.3	34.8	4.7	50.9	63.5	-12.6
6.496	max	1	53.53	42.9	35.9	4.5	51.0	63.5	-12.5
7.424	max	1	52.13	42.6	37.6	4.5	51.6	63.5	-11.9
8.352	max	1	51.42	41.4	38.4	5.0	53.4	63.5	-10.1
9.28	max	1	50.38	40.4	38.1	5.2	53.3	63.5	-10.2

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)
1.856	max	1	72.3	40.2	27.6	2.9	62.6	63.5	-0.9
2.784	max	1	59.96	40.6	29.6	3.0	52.0	63.5	-11.5
3.712	max	1	54.88	40.7	32.3	3.3	49.7	63.5	-13.8
4.64	max	1	55.64	41.6	34.1	4.2	52.3	63.5	-11.2
5.568	max	1	58.89	42.3	34.8	4.7	56.2	63.5	-7.3
6.496	max	1	54.42	42.9	35.9	4.5	51.9	63.5	-11.6
7.424	max	1	52.11	42.6	37.6	4.5	51.6	63.5	-11.9
8.352	max	1	51.3	41.4	38.4	5.0	53.3	63.5	-10.2
9.28	max	1	51.09	40.4	38.1	5.2	54.0	63.5	-9.5

Antenna Assessment

PROJECT #	DATE
09522-10	April 8, 2009

COMMENT	Reverse Polarity SMA connector

Result: Pass

SAR Waiver Calculation

PROJECT #	DATE
09522-10	June 19, 2009

COMMENT	Center frequency of band utilized to calculate SAR waiver limit.

SAR Waiver equation

P=60/f (GHz)
P=60/915=65.5 mW

Results Table

Frequency (MHz)	Power (dBm)	Power (mW)	Limit (mW)
902.6	14.4	27.5	65.5
915	14.2	26.3	65.5
927.4	13.7	23.4	65.5

Result: Pass