PROFESSIONAL TESTING

1601 FM 1460, Suite B
Round Rock, TX 78664
e-mail: info@ptitest.com
(512)244-3371 Fax: (512)244-1846

May 3, 2006

Don Powrie
DLP Design, Inc.
1605 Roma Lane
Austin, TX 78728

Dear Mr. Powrie:

Enclosed is the Electromagnetic Compatibility Test Report for DLP Design, Inc. RFID Product.

This report can be utilized to demonstrate compliance with FCC Part 15, Class B.

If you have any questions, please contact me.

Sincerely,

Michael A. Royer

Michael A. Royer
EMC Department Manager

Enclosure

Project 06425-10

DLP Design, Inc.
RFID Product

Electromagnetic Compatibility Test Report

Prepared for:

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

By

Professional Testing (EMI), Inc.
1601 FM 1460, Suite B
Round Rock, Texas 78664

MAY 3, 2006

Reviewed by	Written by
Michael A. Royer	Eric Lifsey
Michael Royer EMC Department Manager	Eric Lifsey EMC Engineer

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Certificate Of Compliance

Applicant: DLP Design, Inc.

Applicant's Address: 605 Roma Lane
Allen, TX 75013

Project Number: 06425-10

Test Dates: April 10th – 12th, 2006

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

The **DLP Design, Inc. RFID Product** was tested to and found to be in compliance with FCC Part 15 Subpart C for an Intentional Radiator.

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

Fundamental	Frequency (MHz)	Level (dB µV/m) at 30 m	Limit (dB µV/m) at 30 m	Limit (µV/m) at 30 m	Margin (dB)
Paragraph 15.225(a)	13.56 (peak)	29.8	84	15,848	-54.2

Other	Frequency (MHz)	Level (dB µV/m)	Limit (dB µV/m)	Margin (dB)
Harmonics	27.12 (peak)	-5.2	29.5	-34.7
Spurious	200.6 (peak)	34.5	40.0	-5.5
Conducted	0.199 (avg)	38.8	54.6	-15.8

Michael A. Royer

Michael A. Royer, BSEE, NCE
EMC Department Manager

This report has been reviewed and accepted by the applicant. The undersigned is responsible for ensuring that **DLP Design, Inc.'s, RFID Product** will continue to comply with the FCC rules.

1.0 EUT Description

The Equipment Under Test (EUT) is the DLP Design, Inc., RFID1. The RFID1 is a USB-powered module for reading from and writing to ISO 15693, ISO 18000-3, and Tag-it™ intelligent RFID transponder tags. It has the ability to both read and write up to 256 bytes of data in addition to reading the unique identifier (UID/SID). All of the DLP-RFID1's electronics and 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 range of the internal antenna is up to 4 inches depending upon the size of the transponder tag used.

The system tested consisted of the following:

Manufacturer & Model	FCC ID Number	IC Identifier
DLP Design, Inc. RFID Product	SX90RFID1	5675A-0RFID1

1.1 Applicable Rules

Guidelines	FCC Rules, Part 15	IC Rules	
		RSS-GEN Issue 1	RSS-210 Issue 6
Transmitter Characteristics	15.225	4.1, 4.2, 4.4-4.6, 4.9, 7.2.4	2.2-2.2, 2.5-2.7, Annex 2 A2.6
Spurious Radiated Power*	15.225, 15.209	4.2, 4.7, 7.2.2	2.2-2.2, 2.5-2.7, Annex 2 A2.6
Powerline Conducted Limit	15.207	4.2, 4.7	
Antenna Requirement	15.203	7.1, 7.1.4	

* Exempt from the 13.36 MHz to 14.41 MHz restricted band per FCC 15.205(d) paragraph (7).

1.2 EUT Operation

The EUT was operated in continuous transmit mode at maximum power to measure fundamental, harmonics, and spurious radiation.

As an RFID device, the transmitter operates continually and data reception is accomplished by detecting the loading induced on the transmitted field by the RFID tag.

Fundamental frequency EUT emissions were measured in all orthogonal orientations being X, Y and Z.

1.3 Test Facility

Conducted emissions measurements on the mains terminals were performed at Professional Testing, located in Round Rock, Texas.

Professional Testing (EMI), Inc. (PTI), follows the guidelines of NIST for all uncertainty calculations, estimates and expressions thereof for EMC testing. A copy of PTI's policy for EMC Measurement Uncertainty is provided in Appendix C.

2.0 Powerline 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 12' x 16' 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.

As an intentional transmitter operating below 30 MHz, emissions were measured with the antenna attached and driven as designed. Since fundamental emissions below 30 MHz usually exceed the conducted limits, the conducted emissions are then measured again with a resistive load substituted for the antenna. Both test conditions are reported for comparison.

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.

2.3 Test Results

The conducted emissions data is included as Appendix A. The conducted emissions generated by the EUT as measured on the mains terminals with the substituted resistive load were found to satisfy the test criteria.

2.4 Test Equipment

Asset #	Manufacturer	Model #	Description	Calibration Due
C025	Belden	RG223	Coaxial Cable	Calibrate Before Use
0572	PTI	CISPR16	High Pass Filter	September 16, 2006
0759	Solar	8012	LISN	October 5, 2006
0027	EMCO	3825/2	Auxiliary LISN	July 11, 2006
0045	HP	85662A	Spectrum Analyzer Display	Not Required
0237	HP	8568B	Spectrum Analyzer	December 14, 2006
0239	HP	85650A	Quasi-peak Adapter	December 14, 2006
0990	HP	85685A	RF Preselector	December 14, 2006
0474	PTI	3dB	Limiter	September 16, 2006
0081	Elgar	1751SL	Variable AC Power Source	Calibrate Before Use

3.0 Carrier Field Strength

3.1 Test Procedure

Tests of the fundamental for the device were performed to determine the worst case polarization of the devices. 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 3 meters as measured from the closest point of the EUT. The radiated emissions were maximized by rotating the EUT.

A drawing showing the test setup is given as Figure 1.

3.2 Test Criteria

The table below shows the relevant FCC radiated limits and measurement distance for the EUT. The actual measurement distance and adjusted limit is determined and applied.

Fundamental Frequency MHz	Fundamental Field Strength at Distance	
	FCC Section 15.225(a) µV/m at 30 m	As Measured dB µV/m at 30 m
13.56	15,848	84

Note: The fundamental limit is expressed in peak field strength.

3.3 Test Results

The radiated test data for the fundamental is included in Appendix A. The radiated emissions satisfy the test criteria.

3.4 Test Equipment

Asset #	Manufacturer	Model #	Description	Calibration Due
C005	None	None	Underground Coaxial Cable	December 8, 2006
0950	HP	8566B	Spectrum Analyzer	April 24, 2006
0949	HP	8566B	Spectrum Analyzer Display	April 24, 2006
0275	HP	85650A	Quasi-peak Adapter	April 24, 2006
0006	EMCO	6502	Active Loop Antenna	November 9, 2006

4.0 Spurious and Harmonic Radiated Emissions

4.1 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 spurious/harmonic radiated emissions, a measurement antenna was positioned at a distance of 3 meters as measured from the closest point of the EUT. The radiated emissions were maximized by rotating the EUT.

A Spectrum Analyzer with quasi-peak detection was used to find the maximums of the radiated emissions during the variability testing. A drawing showing the test setup is given as Figure 2.

Note that the 2nd harmonic is measured with the same test equipment as the fundamental as this harmonic is below 30 MHz.

4.2 Test Criteria

The FCC Class B radiated limits are given below.

Frequency MHz	Test Distance (Meters)	Field Strength (uV/m)	(dBuV/m)
1.705 to 30	30	30	29.5
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 lower limit shall apply at the transition frequency.

4.3 Test Results

The radiated test data is included in Appendix B. The emissions identified from the EUT were maximized at each frequency. The radiated emissions generated by EUT were below the FCC Class B maximum criteria.

4.4 Test Equipment

Asset #	Manufacturer	Model #	Description	Calibration Due
C005	None	None	Underground Coaxial Cable	December 8, 2006
0754	Compliance Design	B100	Biconical Antenna	June 3, 2006
0238	HP	85685A	RF Preselector	April 24, 2006
0950	HP	8566B	Spectrum Analyzer	April 24, 2006
0949	HP	8566B	Spectrum Analyzer Display	April 24, 2006
0275	HP	85650A	Quasi-peak Adapter	April 24, 2006
0483	HP	8447D	RF Preamplifier	January 12, 2007
0755	EMCO	3146	Log Periodic Dipole Array Antenna	June 8, 2006

5.0 Frequency Tolerance

5.1 Test Procedure

The EUT operating frequency is measured with a frequency counter for the following conditions:

1. At air temperatures of -20 ° C to 50 ° C with a nominal operating voltage, or if battery operated with a new battery.

2. At an air temperature of 20 ° C over a primary supply voltage variation of 85% to 115% of nominal supply voltage.

5.2 Test Criteria

Carrier signal shall remain within +/- 0.01% (+/- 1.356 kHz).

5.3 Test Results

This device is powered exclusively from USB. The primary supply voltage variation procedure does not apply.

The frequency tolerance test data is included in Appendix B of this report. The EUT satisfies the frequency tolerance criteria.

5.4 Test Equipment

Asset #	Manufacturer	Model #	Description	Calibration Due
0410	Hewlett Packard	8591E	Spectrum Analyzer	October 18, 2006
0717	EIP	548A	Frequency Counter	Cal Before Use - WWV
0881	Thermotron	S-1.2C	Temperature Chamber	October 18, 2006

6.0 Emissions Mask

6.1 Test Procedure

Radiated emissions are measured in the RFID allocated band as stipulated in the relevant FCC rules. The emission mask is determined from the FCC rules and sections applicable to the EUT.

6.2 Test Criteria

Per FCC Rules, Section 15.225 Operation within the band 13.110 – 14.010 MHz. The following limits apply forming an emission mask around the carrier.

Frequency (MHz)	13.110-13.410	13.410-13.553	13.553-13.567	13.567-13.710	13.710-14.010
Limit Level (µV/m)	106	334	15,848	334	106

The field strength of any emissions appearing outside of the 13.110-14.010 MHz band shall not exceed the general radiated emission limits in § 15.209.

6.3 Test Results

A graphical mask was overlaid with the measured fundamental emissions. A tabular summary was derived of the highest emissions in each sub-band around the fundamental. This data is presented in Appendix B. The EUT emissions met the emission mask criteria.

6.4 Test Equipment

Asset #	Manufacturer	Model #	Description	Calibration Due
C005	None	None	Underground Coaxial Cable	December 8, 2006
0950	HP	8566B	Spectrum Analyzer	April 24, 2006
0949	HP	8566B	Spectrum Analyzer Display	April 24, 2006
0275	HP	85650A	Quasi-peak Adapter	April 24, 2006
0006	EMCO	6502	Active Loop Antenna	November 9, 2006

7.0 Occupied Bandwidth

7.1 Test Procedure

The EUT was placed on a non-conductive table 0.8 meters above the floor. The occupied bandwidth was based on a 20 dB criteria (20 dB down either side of the emission from the peak emission).

7.2 Test Criteria

Measure the 20 dB bandwidth to verify emissions are within the allocated band by comparing bandwidth to the allocated band within the edges of 13.110 MHz to 14.010 MHz.

7.3 Test Results

The occupied bandwidth and band edge test data is included in Appendix B of this report. The EUT satisfies the criteria.

7.4 Test Equipment

Asset #	Manufacturer	Model #	Description	Calibration Due
C005	None	None	Underground Coaxial Cable	December 8, 2006
0950	HP	8566B	Spectrum Analyzer	April 24, 2006
0949	HP	8566B	Spectrum Analyzer Display	April 24, 2006
0275	HP	85650A	Quasi-peak Adapter	April 24, 2006
0006	EMCO	6502	Active Loop Antenna	November 9, 2006

8.0 Modifications

No modifications were made to the EUT during the performance of the test program.

Appendix A Test Setup Figures

FIGURE 1: Conducted Emissions Mains Terminal Measurements

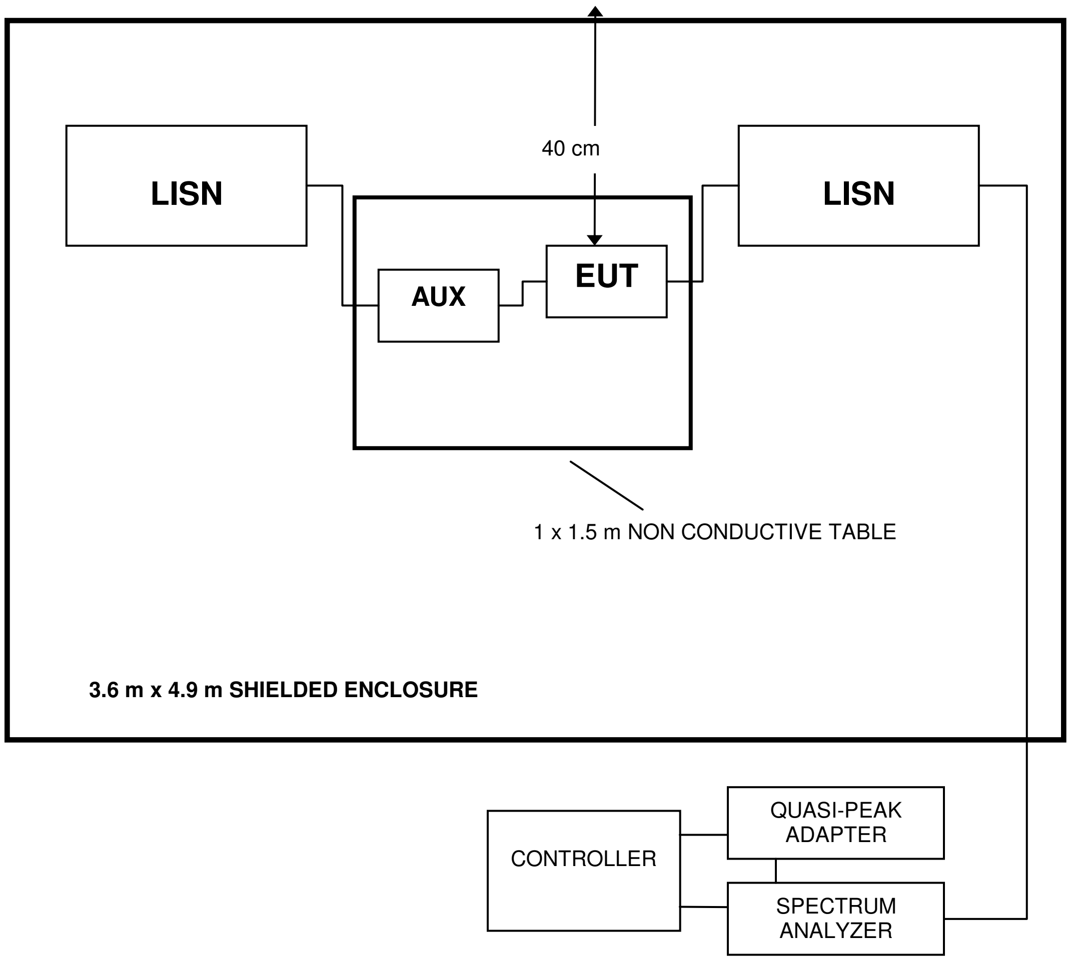
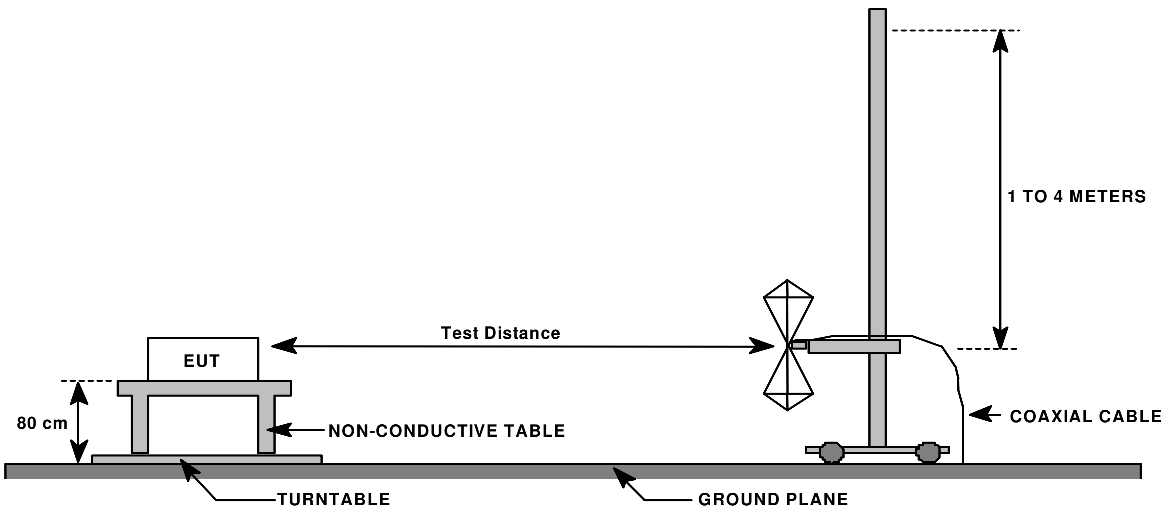


FIGURE 2: Radiated Emissions Test Setup

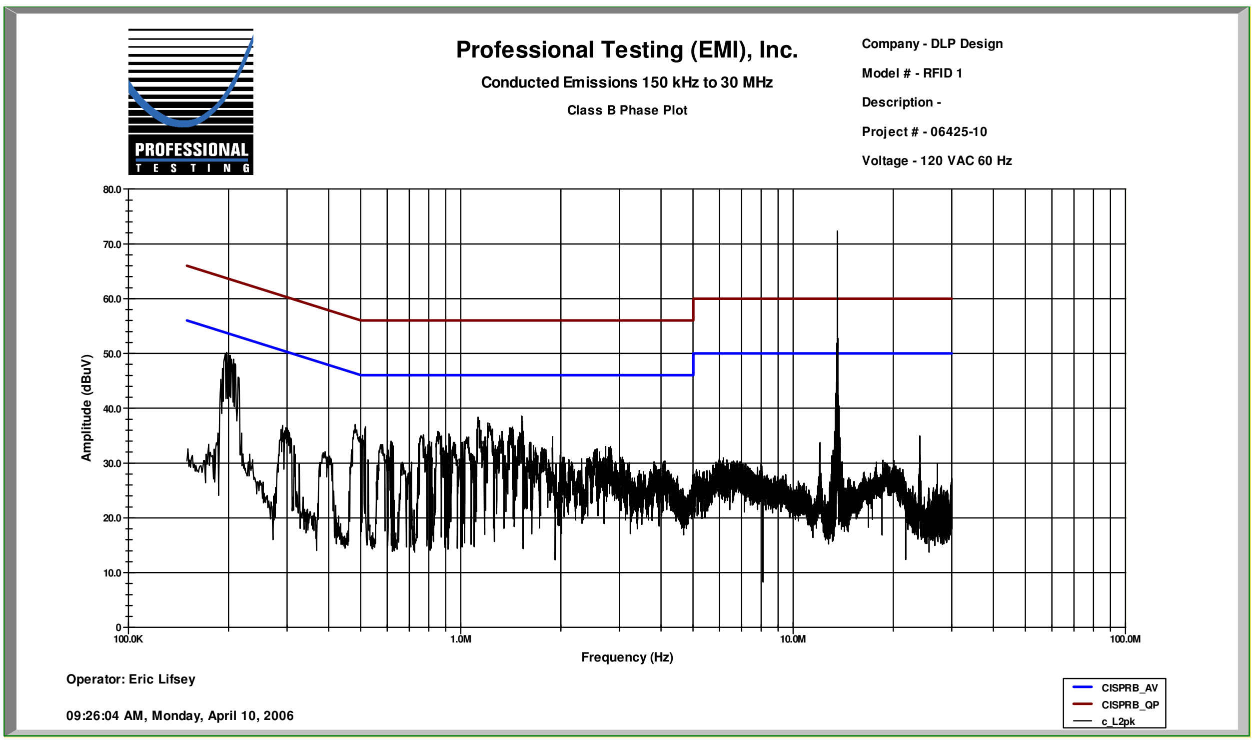


Appendix B Test Results

Conducted Emissions Data Sheet
DLP Design, Inc.
RFID Product
FCC

LINE MEASURED: Class B-Phase-Solar
DESCRIPTION: CE115 w/Antenna
DATE: April 10, 2006
PROJECT #: 06425-10

Frequency Reading (MHz)	Quasi-peak Reading (dBuV)	Average Reading (dBuV)	Quasi-peak Limit (dBuV)	Quasi-peak Margin (dB)	Average Limit (dBuV)	Average Margin (dB)
0.19683	47.9	38.8	64.7	-16.8	54.7	-15.9
0.19724	48.1	38.9	64.7	-16.6	54.7	-15.8
0.19858	48	38.9	64.6	-16.6	54.6	-15.7
0.19878	47.8	38.8	64.6	-16.8	54.6	-15.8
0.19912	47.9	38.8	64.6	-16.7	54.6	-15.8
13.5195	43	23.8	60	-17	50	-26.2
13.5333	44.4	37.3	60	-15.6	50	-12.7
13.5727	72.2	70.6	60	12.2	50	20.6
13.5737	72.2	70.6	60	12.2	50	20.6
13.5994	72.1	70.7	60	12.1	50	20.7



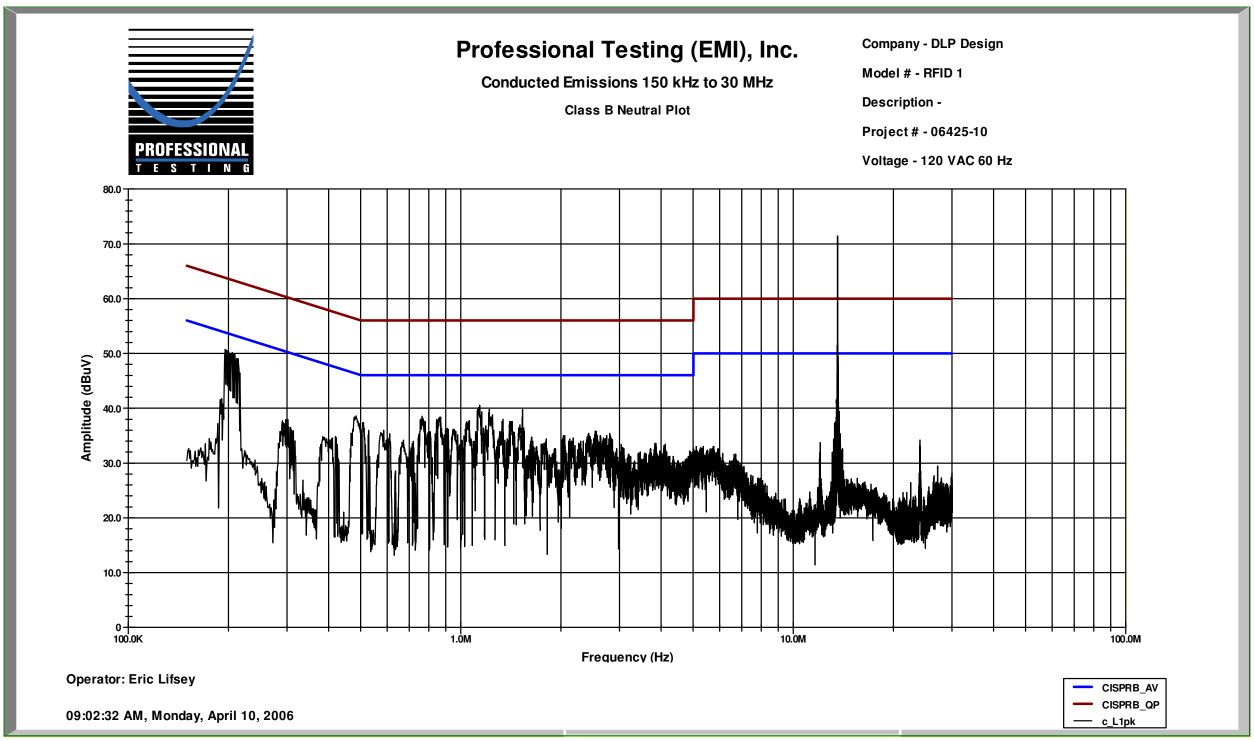
COMMENT #1: Voltage - 120 VAC 60 Hz
Graphical data for overview only.

TEST TECHNICIAN: Eric Lifsey

Conducted Emissions Data Sheet
DLP Design, Inc.
RFID Product
FCC

LINE MEASURED: Class B-Neutral-Solar
DESCRIPTION: CE115 w/Antenna
DATE: April 10, 2006
PROJECT #: 06425-10

Frequency Reading (MHz)	Quasi-peak Reading (dBuV)	Average Reading (dBuV)	Quasi-peak Limit (dBuV)	Quasi-peak Margin (dB)	Average Limit (dBuV)	Average Margin (dB)
0.19688	48.4	38.1	64.7	-16.3	54.7	-16.6
0.19844	48.3	38	64.6	-16.4	54.6	-16.7
0.19849	48.5	37.9	64.6	-16.1	54.6	-16.7
0.19967	48.3	37.9	64.6	-16.3	54.6	-16.7
0.20157	48.2	37.9	64.5	-16.3	54.5	-16.6
13.5632	71.3	69.8	60	11.3	50	19.8
13.5726	71.3	69.7	60	11.3	50	19.7
13.573	71.3	69.7	60	11.3	50	19.7
13.5737	71.3	69.8	60	11.3	50	19.8
13.5938	71.3	69.8	60	11.3	50	19.8



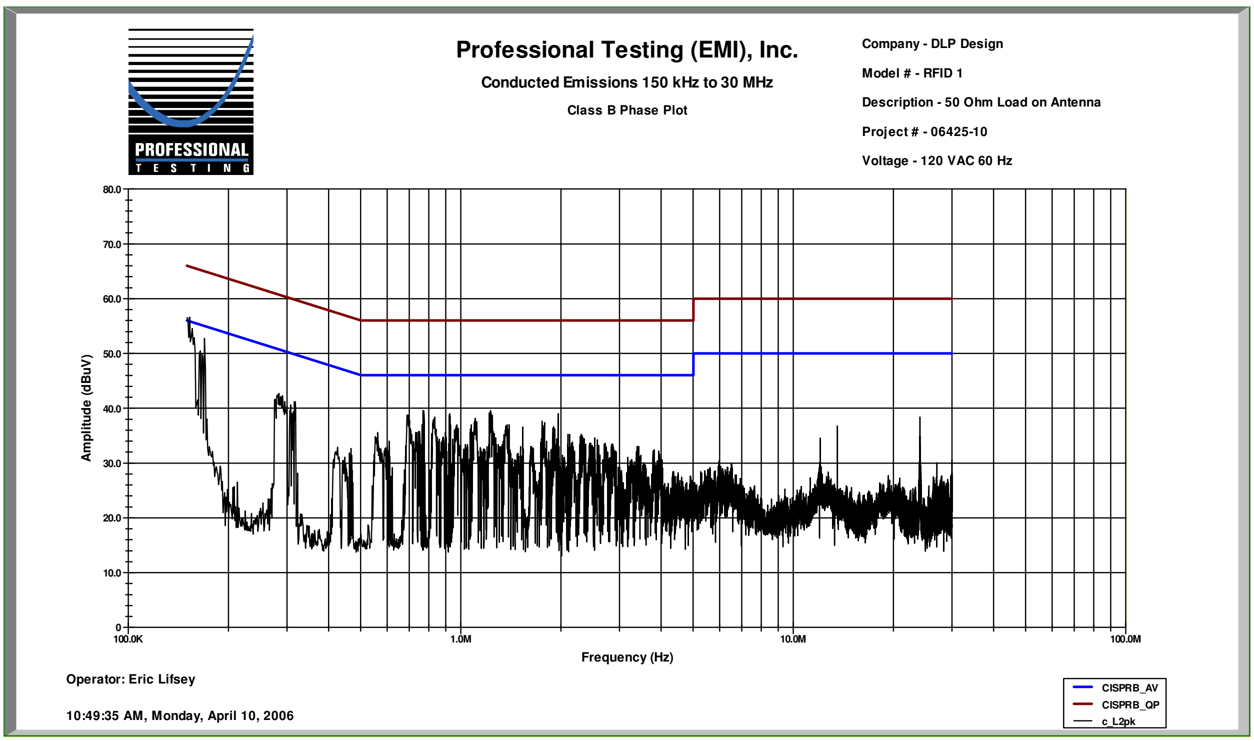
COMMENT #1: Voltage - 120 VAC 60 Hz
Graphical data for overview only.

TEST TECHNICIAN: Eric Lifsey

Conducted Emissions Data Sheet
DLP Design, Inc.
RFID Product
FCC

LINE MEASURED: Class B-Phase-Solar
DESCRIPTION: CE115 w/Load
DATE: April 10, 2006
PROJECT #: 06425-10

Frequency Reading (MHz)	Quasi-peak Reading (dBuV)	Average Reading (dBuV)	Quasi-peak Limit (dBuV)	Quasi-peak Margin (dB)	Average Limit (dBuV)	Average Margin (dB)
0.15274	53.7	47.8	65.9	-12.3	55.9	-8.1
0.153353	54.2	49	65.9	-11.7	55.9	-6.9
0.15929	46.9	26.9	65.7	-18.9	55.7	-28.9
0.16997	50.9	46.2	65.4	-14.5	55.4	-9.2
0.31661	40.8	36.1	61.2	-20.5	51.2	-15.1
12.0153	16.7	7	60	-43.3	50	-43
12.0452	16.6	7.2	60	-43.4	50	-42.8
13.5715	36.5	34.7	60	-23.5	50	-15.3
24.0169	19.3	7.6	60	-40.7	50	-42.4
24.0504	19.2	7.5	60	-40.8	50	-42.5



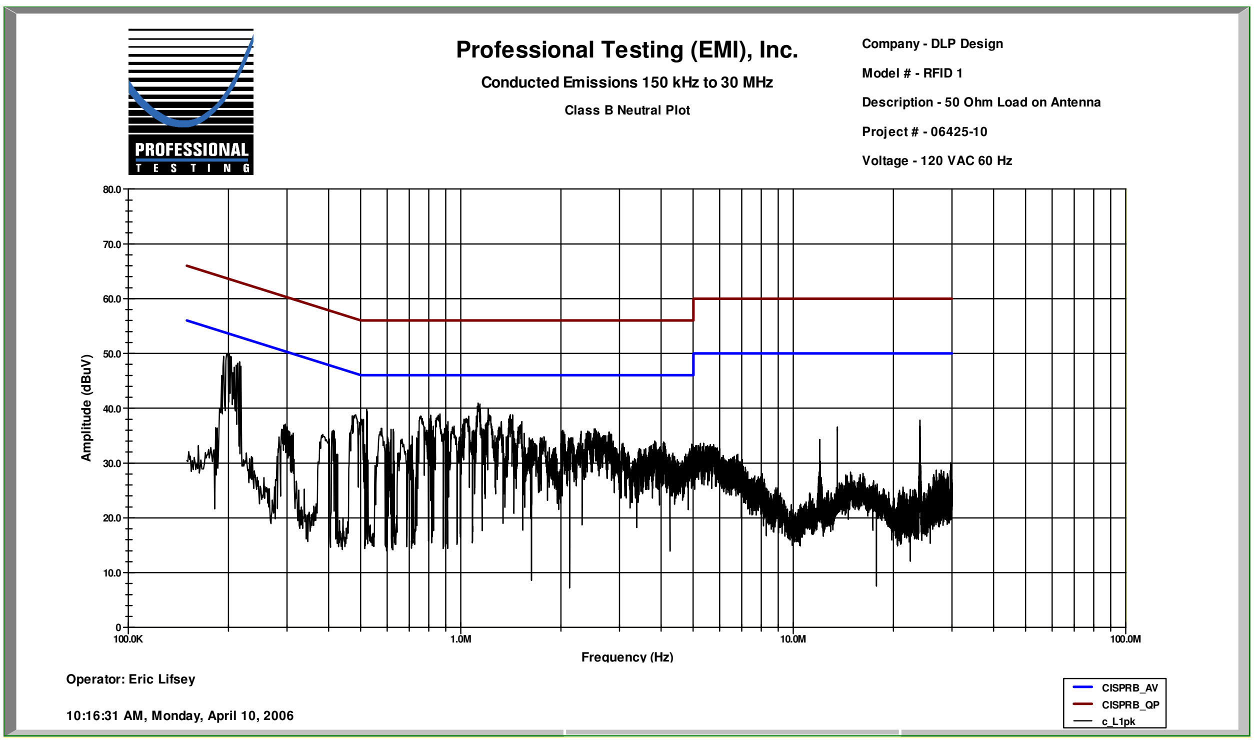
COMMENT #1: Voltage - 120 VAC 60 Hz
Graphical data for overview only.

TEST TECHNICIAN: Eric Lifsey

Conducted Emissions Data Sheet
DLP Design, Inc.
RFID Product
FCC

LINE MEASURED: Class B-Neutral-Solar
DESCRIPTION: CE115 w/Load
DATE: April 10, 2006
PROJECT #: 06425-10

Frequency Reading (MHz)	Quasi-peak Reading (dBuV)	Average Reading (dBuV)	Quasi-peak Limit (dBuV)	Quasi-peak Margin (dB)	Average Limit (dBuV)	Average Margin (dB)
0.19875	47.7	37.7	64.6	-16.9	54.6	-16.9
0.1994	47.9	38.2	64.6	-16.7	54.6	-16.4
0.20646	47	37.3	64.4	-17.4	54.4	-17
0.2121	46.3	37.2	64.2	-17.9	54.2	-17
0.21666	45.6	36.9	64.1	-18.5	54.1	-17.2
12.0123	25.9	20.6	60	-34.1	50	-29.4
13.5732	35.7	33.8	60	-24.3	50	-16.2
24.008	29.9	23.2	60	-30.1	50	-26.8
24.0131	29.5	23.2	60	-30.5	50	-26.8
24.0306	29.5	23.4	60	-30.5	50	-26.6



COMMENT #1: Voltage - 120 VAC 60 Hz
Graphical data for overview only.

TEST TECHNICIAN: Eric Lifsey

Fundamental Radiated Emissions Data Sheet
13.56 MHz Carrier
DLP Design
RFID Product

MEASUREMENT DISTANCE (m): 3
DETECTOR FUNCTION: Peak
ANTENNA: Loop
RBW: CISPR 9 kHz
VBW: 1 MHz

DATE: April 10, 2006
PROJECT #: 06425-10

ANTENNA ORIENTATION: **Face On**

Frequency (MHz)	EUT Direction (degrees)	Antenna Elevation (Meters)	Recorded Level (dB uV)	Amplifier Gain (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Distance Factor (dB)	Corrected Level (dB uV/m)	Limit (dB uV/m)	Margin (dB)
13.56	0	1	82.6	24.4	7.6	1.2	-40.0	27.0	84	-57.0
13.56	180	1	85.4	24.4	7.6	1.2	-40.0	29.8	84	-54.2
13.56	90	1	77.9	24.4	7.6	1.2	-40.0	22.3	84	-61.7

ANTENNA ORIENTATION: **Edge On**

Frequency (MHz)	EUT Direction (degrees)	Antenna Elevation (Meters)	Recorded Level (dB uV)	Amplifier Gain (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Distance Factor (dB)	Corrected Level (dB uV/m)	Limit (dB uV/m)	Margin (dB)
13.56	90	1	82.2	24.4	7.6	1.2	-40.0	26.6	84	-57.4
13.56	90	1	84.2	24.4	7.6	1.2	-40.0	28.6	84	-55.4
13.56	90	1	82.3	24.4	7.6	1.2	-40.0	26.7	84	-57.3

TEST TECHNICIAN: Eric Lifsey

Spurious Radiated Emissions Data Sheet
Emissions 13.56 MHz to 30 MHz
DLP Design, Inc.
RFID Product

MEASUREMENT DISTANCE (M): 3 meters DATE: April 11, 2006
PROJECT: 06425-10
DETECTOR FUNCTION: Peak
ANTENNA: Loop
RBW: CISPR 9 kHz
VBW: 1 MHz

ANTENNA ORIENTATION: **Face On**

Frequency (MHz)	EUT Direction (degrees)	Antenna Elevation (Meters)	Recorded Level (dBuV)	Amplifier Gain (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Distance Factor (dB)	Corrected Level (dB uV/m)	Limit (dB uV/m)	Margin (dB)
14.00	noise	floor	35.5	24.4	7.6	1.2	-40.0	-20.1	29.5	-49.6
17.00	noise	floor	34.3	24.4	8.5	1.3	-40.0	-20.4	29.5	-49.9
21.00	noise	floor	33.2	24.5	11.3	1.3	-40.0	-18.6	29.5	-48.1
23.00	noise	floor	32.4	24.5	10.2	1.4	-40.0	-20.5	29.5	-50.0
28.00	noise	floor	35.7	24.6	5.7	1.5	-40.0	-21.7	29.5	-51.2
29.50	noise	floor	35.0	24.6	3.7	1.6	-40.0	-24.4	29.5	-53.9

ANTENNA ORIENTATION: **Edge On**

Frequency (MHz)	EUT Direction (degrees)	Antenna Elevation (Meters)	Recorded Level (dBuV)	Amplifier Gain (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Distance Factor (dB)	Corrected Level (dB uV/m)	Limit (dB uV/m)	Margin (dB)
14.50	noise	floor	37.4	24.4	7.4	1.2	-40.0	-18.4	29.5	-47.9
16.00	noise	floor	45.5	24.4	7.6	1.2	-40.0	-10.1	29.5	-39.6
17.00	noise	floor	34.4	24.4	8.5	1.3	-40.0	-20.3	29.5	-49.8
18.00	noise	floor	39.2	24.5	9.4	1.3	-40.0	-14.6	29.5	-44.1
21.00	noise	floor	35.5	24.5	11.3	1.3	-40.0	-16.3	29.5	-45.8
25.00	noise	floor	35.7	24.5	9.9	1.4	-40.0	-17.4	29.5	-46.9

TEST TECHNICIAN: Eric Lifsey

Spurious Radiated Emissions Data Sheet
Emissions Above 30 MHz
DLP Design
RFID Product

MEASUREMENT DISTANCE (m): 10
DETECTOR FUNCTION: Quasi-Peak
RBW: CISPR 120 kHz
VBW: 1 MHz

DATE: April 10, 2006
PROJECT #: 06425-10

ANTENNA POLARIZATION: Horizontal

Freq. (MHz)	EUT Dir (Deg.)	Antenna Elev. (Meters)	Recorded Level (dBuV)	Amplifier Gain (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Corrected Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
120	noise	floor	32	26.7	12.0	3.7	21.0	40	-19.0
160	noise	floor	32.2	26.9	13.4	4.9	23.6	40	-16.4
180	noise	floor	30.4	26.8	16.3	5.4	25.3	40	-14.7
200.6	90	1.5	45.1	26.9	11.6	4.7	34.5	40	-5.5
257.6	90	1.5	44.3	27.0	12.8	5.8	35.8	47	-11.2
284.7	90	1	42.7	27.0	14.6	5.7	36.0	47	-11.0
311.9	90	1	39.8	27.1	15.3	6.0	34.0	47	-13.0

ANTENNA POLARIZATION: Vertical

Freq. (MHz)	EUT Dir (Deg.)	Antenna Elev. (Meters)	Recorded Level (dBuV)	Amplifier Gain (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Corrected Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
40	noise	floor	29	26.5	11.3	2.2	16.0	40	-24.0
150	noise	floor	30.5	26.9	12.2	4.5	20.3	40	-19.7
190	noise	floor	29.9	26.8	17.0	4.8	24.9	40	-15.1
393.2	180	1	39.1	27.3	15.7	6.7	34.1	47	-12.9
420.4	180	1	35.8	27.5	16.0	7.1	31.4	47	-15.6
660	noise	floor	27.3	26.9	20.4	8.2	29.1	47	-17.9
850	noise	floor	28	25.9	22.2	9.8	34.0	47	-13.0

TEST TECHNICIAN: Eric Lifsey

Radiated Emissions Data Sheet
Harmonics Below 30 MHz (2nd Only)
DLP Design, Inc.
RFID Product

MEASUREMENT DISTANCE (M): 3 meters DATE: April 10, 2006
PROJECT: 06425-10
DETECTOR FUNCTION: Peak
ANTENNA: Loop
RBW: CISPR 9 kHz
VBW: 1 MHz

ANTENNA ORIENTATION: **Face On**

Frequency (MHz)	EUT Direction (degrees)	Antenna Elevation (Meters)	Recorded Level (dB uV)	Amplifier Gain (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Distance Factor (dB)	Corrected Level (dB uV/m)	Limit (dB uV/m)	Margin (dB)
27.12	noise	floor	41.5	24.6	7.9	1.5	-40.0	-13.6	29.5	-43.1
27.12	noise	floor	43.3	24.6	7.9	1.5	-40.0	-11.8	29.5	-41.3
27.12	noise	floor	41.5	24.6	7.9	1.5	-40.0	-13.6	29.5	-43.1

ANTENNA ORIENTATION: **Edge On**

Frequency (MHz)	EUT Direction (degrees)	Antenna Elevation (Meters)	Recorded Level (dB uV)	Amplifier Gain (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Distance Factor (dB)	Corrected Level (dB uV/m)	Limit (dB uV/m)	Margin (dB)
27.12	noise	floor	39.7	24.6	7.9	1.5	-40.0	-15.4	29.5	-44.9
27.12	noise	floor	49.2	24.6	7.9	1.5	-40.0	-5.9	29.5	-35.4
27.12	noise	floor	49.9	24.6	7.9	1.5	-40.0	-5.2	29.5	-34.7

TEST TECHNICIAN: Eric Lifsey

Radiated Emissions Data Sheet
Harmonics Above 30 MHz (3rd to 10th)
DLP Design, Inc.
RFID Product

MEASUREMENT DISTANCE (m): 3 DATE: April 10, 2006
PROJECT #: 06425-10
DETECTOR FUNCTION: Quasi-Peak
RBW: CISPR 120 kHz
VBW: 1 MHz

ANTENNA POLARIZATION: Horizontal

Frequency (MHz)	EUT Direction (degrees)	Antenna Elevation (Meters)	Recorded Level (dB µV)	Amplifier Gain (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Corrected Level (dB µV/m)	Limit (dB µV/m)	Margin (dB)	Detector Function
40.68	noise	floor	33.7	26.5	11.5	2.2	20.9	40	-19.1	peak
54.24	noise	floor	33.5	26.6	10.3	2.4	19.6	40	-20.4	peak
67.80	noise	floor	33.6	26.7	7.1	2.7	16.7	40	-23.3	peak
81.36	noise	floor	33	26.7	7.3	2.9	16.6	40	-23.4	peak
94.92	noise	floor	32.6	26.6	10.8	3.2	20.0	43.5	-23.5	peak
108.48	noise	floor	33.4	26.7	12.1	3.5	22.3	43.5	-21.2	peak
122.04	noise	floor	33.9	26.7	11.9	3.7	22.9	43.5	-20.6	peak
135.60	noise	floor	33.5	26.7	10.8	4.1	21.7	43.5	-21.8	peak

ANTENNA POLARIZATION: Vertical

Frequency (MHz)	EUT Direction (degrees)	Antenna Elevation (Meters)	Recorded Level (dB µV)	Amplifier Gain (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Corrected Level (dB µV/m)	Limit (dB µV/m)	Margin (dB)	Detector Function
40.68	noise	floor	33.4	26.5	11.5	2.2	20.6	40	-19.4	peak
54.24	noise	floor	33.5	26.6	10.3	2.4	19.6	40	-20.4	peak
67.80	noise	floor	33.9	26.7	7.1	2.7	17.0	40	-23.0	peak
81.36	noise	floor	33.5	26.7	7.3	2.9	17.1	40	-22.9	peak
94.92	noise	floor	33.1	26.6	10.8	3.2	20.5	43.5	-23.0	peak
108.48	noise	floor	33.3	26.7	12.1	3.5	22.2	43.5	-21.3	peak
122.04	noise	floor	32.8	26.7	11.9	3.7	21.8	43.5	-21.7	peak
135.60	noise	floor	33.5	26.7	10.8	4.1	21.7	43.5	-21.8	peak

TEST TECHNICIAN: Eric Lifsey

Frequency Tolerance Datasheet
DLP Design, Inc.
RFID Product

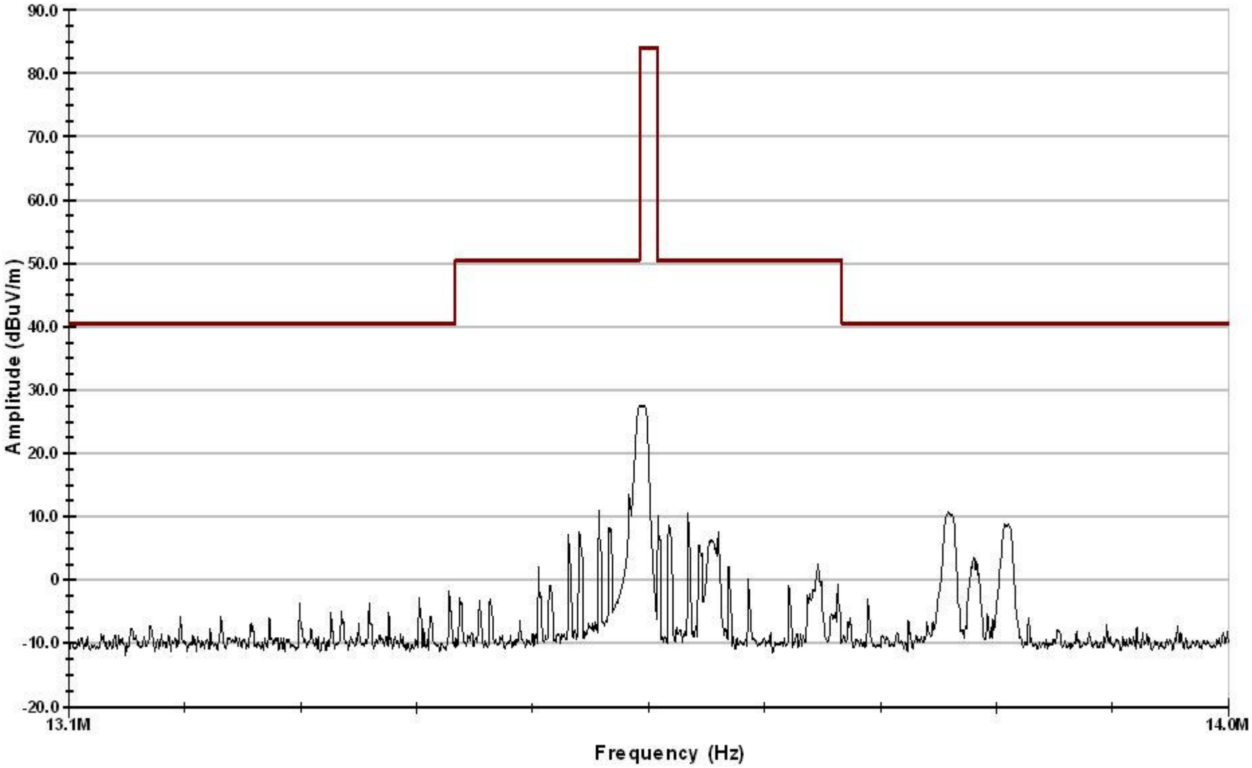
Test Date: April 12, 2006

Temperature °C	Frequency MHz	Error Hz
55	13.559337	**-663**
50	13.559348	**-652**
40	13.559386	**-614**
30	13.559434	**-566**
23	**13.559470**	**-530**
20	13.559489	**-511**
10	13.559542	**-458**
0	13.559580	**-420**
-10	13.559592	**-408**
-20	13.559586	**-414**

TEST TECHNICIAN: Eric Lifsey

Emission Mask Datasheet
DLP Design, Inc.
RFID Product

Test Date: April 11, 2006



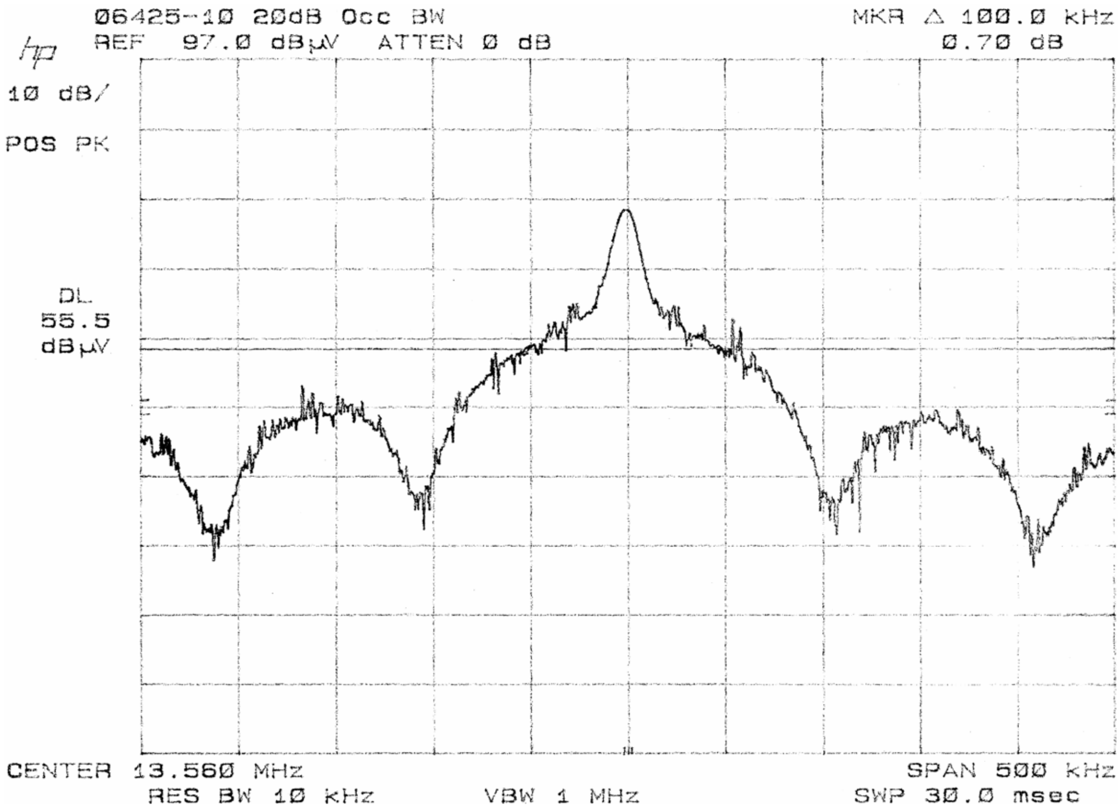
Tabular Summary
Maximum Emissions for FCC 15.225(a)-(c) Sub-Bands

Frequency (MHz)	13.110-13.410	13.410-13.553	13.553-13.567	13.567-13.710	13.710-14.010
Limit Level (µV/m)	106	334	15,848	334	106
Limit Level (dB µV/m)	40.5	50.5	84.0	50.5	40.5
Measured Maximums, Frequency & Level	13.405 MHz -1.6 dB µV/m	13.553 MHz 27.5 dB µV/m	13.560 MHz 27.4 dB µV/m	13.591 MHz 10.6 dB µV/m	13.792 MHz 10.6 dB µV/m
Margins (dB)	-42.1	-23.0	-56.6	-39.9	-29.9

TEST TECHNICIAN: Eric Lifsey

Occupied Bandwidth Datasheet
DLP Design, Inc.
RFID Product

Test Date: April 11, 2006



TEST TECHNICIAN: Eric Lifsey

Appendix C Policy, Rationale and Evaluation of EMC Measurement Uncertainty

Professional Testing (EMI) Inc. (PTI) Policy, Rationale and Evaluation of EMC Measurement Uncertainty

All uncertainty calculations, estimates and expressions thereof shall be in accordance with NIST policy stated in Appendix E to NIST Technical Communications Program, Subchapter 4.09 of the Administrative Manual, as reproduced in Appendix C of NIST Technical Note (TN) 1297, 1994 Edition [1]1. The NIST policy is based on ISO Guide to the Expression of Uncertainty in Measurement [2] (herein after called the Guide), which shall take precedence in the event of disputes. The Guide is explained in TN 1297. Other notable explanations for the Guide are NAMAS Publications NIS 80 [3] and NIS 81 [4]; the latter being specifically for EMC measurements, and the easiest to understand. Since PTI operates in accordance with NIST (NVLAP) Handbook 150-11 [5], all instrumentation having an effect on the accuracy or validity of tests shall be periodically calibrated or verified traceable to national standards by a competent calibration laboratory. The certificates of calibration or verification on this instrumentation shall include estimates of uncertainty as required by NIST Handbook 150-11.

1. Rationale and Summary of Expanded Uncertainty.

Each piece of instrumentation at PTI that is used in making measurements for determining conformance to a standard (or limit), shall be assessed to evaluate its contribution to the overall uncertainty of the measurement in which it is used. The assessment of each item will be based on either a type A evaluation or a type B evaluation. Most of the evaluations will be type B, since they will be based on the manufacture's statements or specifications of the calibration tolerances or uncertainty will be stated along with a brief rationale for the type of evaluation and the resulting state uncertainties.

The individual uncertainties included in the combined standard uncertainty for a specific test result will depend on the configuration in which the item of instrumentation is used. The combination will always be based on the law of propagation of uncertainty discussed in TN 1297, NIS 81, and the Guide. Any systematic effects will be accommodated by including their uncertainties, in the calculation of the combined standard uncertainty; except that if the direction and amount of the systematic effect cannot be determined and separated from its uncertainty, the whole effect will be treated as uncertainty and combined along with the other elements of the test setup.

Type A evaluations of standard uncertainty will usually be based on calculating the standard deviation of the mean of a series of independent observations, but may be based on a least-squares curve fit or the analysis of variance for unusual situations. Type B evaluations of standard uncertainty will usually be based on manufacturer's specifications, data provided in calibration reports, and experience. The type of probability distribution used (normal, rectangular, a-priori, or u-shaped) will be stated for each Type B evaluation.

[1] Numbers in square brackets identify documents listed in the reference section.

In the evaluation of the uncertainty of each type of measurement, the uncertainty caused by the operator will be estimated. One notable operator contribution to measurement uncertainty is the manipulation of cables to maximize the measured values of radiated emissions. The operator contribution to measurement uncertainty is evaluated by having several operators independently repeat the same test. This results in a Type A evaluation of operator-contributed measurement uncertainty.

A summary of the expanded uncertainties of PTI measurements if shown is Table 1. These are the worst-case uncertainties considering all operative influence factors.

Table 1-1
Summary of Measurement Uncertainties

Type of Measurement	Frequency Range	Meas. Dist.	Expanded Uncertainty U, dB (k=2)
Conducted Emissions	150 kHz to 30 MHz	N/A	2.9
Radiated Emissions, Site #1	30 to 200 MHz	3 m	4.7
		10 m	4.4
	200 to 1000 MHz	3 m	4.6
		10 m	4.0
	1 to 2.5 GHz	1 m	2.5
	2.5 to 12.5 GHz	1 m	3.6
	12.5 to 18 GHz	1 m	4.0
Radiated Emissions, Site #2	30 to 200 MHz	3 m	3.5
		10 m	3.7
	200 to 500 MHz	3 m	3.5
		10 m	3.1
	500 to 1000 MHz	3 m	4.0
		10 m	3.9
Radiated Emissions, Site #3	30 to 200 MHz	3 m	3.9
	200 to 500 MHz	3 m	4.0
	500 to 1000 MHz	3 m	4.3