

# Graphic Products

**DLTORO**

**Report No. GRAP0001**

Report Prepared By



[www.nwemc.com](http://www.nwemc.com)  
1-888-EMI-CERT

© 2011 Northwest EMC, Inc

**EMC Test Report**

**Certificate of Test**  
**Last Date of Test: May 20, 2011**  
**Graphic Products**  
**Model: DLTORO**

<b>Emissions</b>			
<b>Test Description</b>	<b>Specification</b>	<b>Test Method</b>	<b>Pass/Fail</b>
Field Strength of Fundamental	FCC 15.225:2011	ANSI C63.10:2009	Pass
Field Strength of Spurious Emissions	FCC 15.225:2011	ANSI C63.10:2009	Pass
Occupied Bandwidth	FCC 15.225:2011	ANSI C63.10:2009	Pass
Frequency Stability	FCC 15.225:2011	ANSI C63.10:2009	Pass
AC Powerline Conducted Emissions	FCC 15.225:2011	ANSI C63.10:2009	Pass

**Modifications made to the product**

See the Modifications section of this report

**Test Facility**

The measurement facility used to collect the data is located at:

Northwest EMC, Inc.  
22975 NW Evergreen Parkway, Suite 400  
Hillsboro, OR 97124

Phone: (503) 844-4066      Fax: 844-3826

This site has been fully described in a report filed with and accepted by the FCC (Federal Communications Commission) and Industry Canada (Site filing #2834D-2).

**Approved By:**



Don Fecteau, IS Manager



NVLAP Lab Code: 200630-0

*This report must not be used to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the federal government of the United States of America.*

*Product compliance is the responsibility of the client, therefore the tests and equipment modes of operation represented in this report were agreed upon by the client, prior to testing. This Report may only be duplicated in its entirety. The results of this test pertain only to the sample(s) tested. The specific description is noted in each of the individual sections of the test report supporting this certificate of test.*

Revision Number	Description	Date	Page Number
00	None		

**Barometric Pressure**

The recorded barometric pressure has been normalized to sea level.



# Accreditations and Authorizations

---

## FCC

Accredited by NVLAP for performance of FCC radio, digital, and ISM device testing. Our Open Area Test Sites, certification chambers, and conducted measurement facilities have been fully described in reports filed with the FCC and accepted by the FCC in letters maintained in our files. Northwest EMC has been accredited by ANSI to ISO / IEC Guide 65 as a product certifier. We have been designated by the FCC as a Telecommunications Certification Body (TCB). This allows Northwest EMC to certify transmitters to FCC specifications in accordance with 47 CFR 2.960 and 2.962.

---

## NVLAP

Northwest EMC, Inc. is accredited under the National Voluntary Laboratory Accreditation Program (NVLAP) for satisfactory compliance with the requirements of ISO/IEC 17025 for Testing Laboratories. NVLAP is administered by the National Institute of Standards and Technology (NIST), an agency of the U.S. Commerce Department. The NVLAP accreditation encompasses Electromagnetic Compatibility Testing in accordance with the European Union EMC Directive 2004/108/EC, and ANSI C63.4. Additionally, Northwest EMC is accredited by NVLAP to perform radio testing in accordance with the European Union R&TTE Directive 1999/5/EEC, the requirements of FCC, and the RSS radio standards for Industry Canada.

---

## Industry Canada

Accredited by NVLAP for performance of Industry Canada RSS and ICES testing. Our Open Area Test Sites and certification chambers comply with RSS-Gen, Issue 2 and have been filed with Industry Canada and accepted. Northwest EMC has been accredited by ANSI to ISO / IEC Guide 65 as a product certifier. We have been designated by NIST and recognized by Industry Canada as a Certification Body (CB) per the APEC Mutual Recognition Arrangement (MRA). This allows Northwest EMC to certify transmitters to Industry Canada technical requirements. (Site Filing Numbers - Hillsboro: 2834D-1, 2834D-2, Sultan: 2834C-1, Irvine: 2834B-1, 2834B-2, Brooklyn Park: 2834E-1)

---

## CAB

Designated by NIST and validated by the European Commission as a Conformity Assessment Body (CAB) to conduct tests and approve products to the EMC directive and transmitters to the R&TTE directive, as described in the U.S. - EU Mutual Recognition Agreement.

---

## Australia/New Zealand

The National Association of Testing Authorities (NATA), Australia has been appointed by the ACA as an accreditation body to accredit test laboratories and competent bodies for EMC standards. Accredited test reports or assessments by competent bodies must carry the NATA logo. Test reports made by an overseas laboratory that has been accredited for the relevant standards by an overseas accreditation body that has a Mutual Recognition Agreement (MRA) with NATA are also accepted as technical grounds for product conformity. The report should be endorsed with the respective logo of the accreditation body (NVLAP).

---



# Accreditations and Authorizations

---

## VCCI

Accepted as an Associate Member to the VCCI, Acceptance No. 564. Conducted and radiated measurement facilities have been registered in accordance with Regulations for Voluntary Control Measures, Article 8. (*Registration Numbers. - Hillsboro: C-1071, R-1025, G-84, C-2687, T-1658, and R-2318, Irvine: R-1943, G-85, C-2766, and T-1659, Sultan: R-871, G-83, C-1784, and T-1511, Brooklyn Park: R-3125, G-86, G-141, C-3464, and T-1634*).

---

## BSMI

Northwest EMC has been designated by NIST and validated by C-Taipei (BSMI) as a CAB to conduct tests as described in the APEC Mutual Recognition Agreement (US0017).

---

## GOST

Northwest EMC, Inc. has been assessed and accredited by the Russian Certification bodies Certinform VNIINMASH, CERTINFO, SAMTES, and Federal CHEC, to perform EMC and Hygienic testing for Information Technology Products. As a result of their laboratory assessment, they will accept test results from Northwest EMC, Inc. for product certification

---

## KCC

Northwest EMC, Inc is a CAB designated by MRA partners and recognized by Korea. (*Assigned Lab Numbers: Hillsboro: US0017, Irvine: US0158, Sultan: US0157, Brooklyn Park: US0175*)

---

## VIETNAM

Vietnam MIC has approved Northwest EMC as an accredited test lab. Per Decision No. 194/QD-QLCL (dated December 15, 2009), Northwest EMC test reports can be used for Vietnam approval submissions.

---

## SCOPE

For details on the Scopes of our Accreditations, please visit:  
<http://www.nwemc.com/accreditations/>



## Northwest EMC Locations



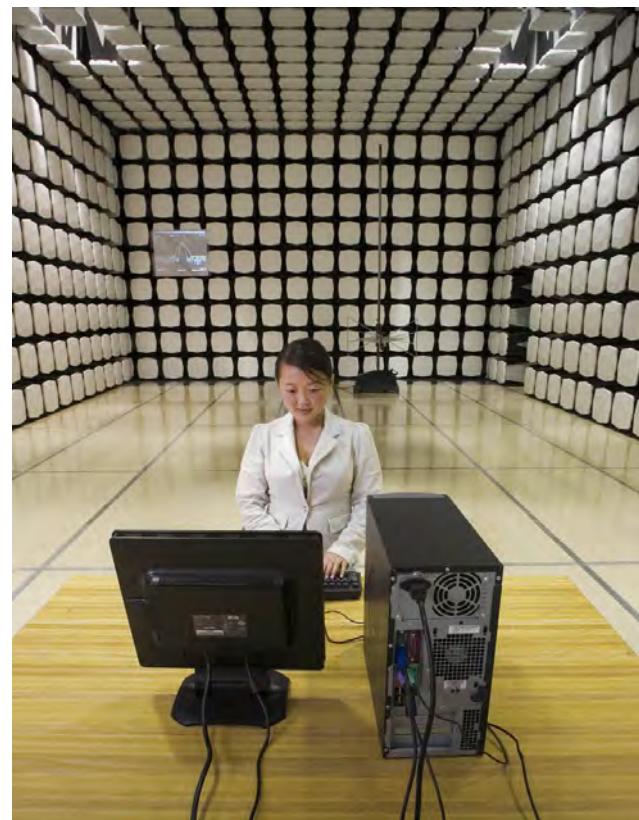
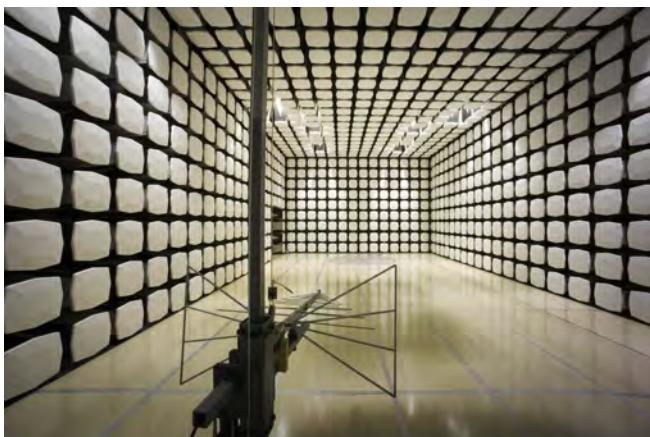
Oregon  
Labs EV01-EV12  
22975 NW Evergreen Pkwy  
Suite 400  
Hillsboro, OR 97124  
(503) 844-4066

California  
Labs OC01-OC13  
41 Tesla  
Irvine, CA 92618  
(949) 861-8918

Minnesota  
Labs MN01-MN08  
9349 W Broadway Ave.  
Brooklyn Park,  
MN 55445  
(763) 425-2281

Washington  
Labs SU01-SU07  
14128 339<sup>th</sup> Ave. SE  
Sultan, WA 98294  
(360) 793-8675

New York  
Labs WA01-WA04  
4939 Jordan Rd.  
Elbridge, NY 13060  
(315) 685-0796



**Party Requesting the Test**

<b>Company Name:</b>	Graphic Products
<b>Address:</b>	9730 SW Sunshine Court
<b>City, State, Zip:</b>	Beaverton, OR 97005
<b>Test Requested By:</b>	Bob Martell
<b>Model:</b>	DLTORO
<b>First Date of Test:</b>	May 19, 2011
<b>Last Date of Test:</b>	May 20, 2011
<b>Receipt Date of Samples:</b>	May 19, 2011
<b>Equipment Design Stage:</b>	Prototype
<b>Equipment Condition:</b>	No Damage

**Information Provided by the Party Requesting the Test****Functional Description of the EUT (Equipment Under Test):**

13.56 MHz RFID. This is a low Power Part 15 transmitter. Less than 0dBm output power

**Testing Objective:**

RFID seeking TCB certification under FCC 15.225

**CONFIGURATION 1 GRAP0001**

Software/Firmware Running during test	
Description	Version
Printer firmware	0Z2
EMI Test	1.0

EUT			
Description	Manufacturer	Model/Part Number	Serial Number
Label/Sign Printer	Graphic Products	DLTORO	B4

Peripherals in test setup boundary			
Description	Manufacturer	Model/Part Number	Serial Number
Power Adapter	Wearnes	WDS120240	100600000012

Cables					
Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
DC leads	No	1.5m	PA	Label/Sign Printer	Power Adapter
AC Power	No	1.8m	No	Power Adapter	AC Mains
PA = Cable is permanently attached to the device. Shielding and/or presence of ferrite may be unknown.					

**CONFIGURATION 3 GRAP0001**

Software/Firmware Running during test	
Description	Version
Printer firmware	0Z2
EMI Test	1.0

EUT			
Description	Manufacturer	Model/Part Number	Serial Number
Label/Sign Printer	Graphic Products	DLTORO	A02

Peripherals in test setup boundary			
Description	Manufacturer	Model/Part Number	Serial Number
Power Adapter	Wearnes	WDS120240	100600000012

Cables					
Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
DC leads	No	1.5m	PA	Label/Sign Printer	Power Adapter
AC Power	No	1.8m	No	Power Adapter	AC Mains
PA = Cable is permanently attached to the device. Shielding and/or presence of ferrite may be unknown.					

<b>Equipment modifications</b>					
Item	Date	Test	Modification	Note	Disposition of EUT
1	5/19/2011	Field Strength of Fundamental	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Northwest EMC following the test.
2	5/19/2011	Occupied Bandwidth	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Northwest EMC following the test.
3	5/20/2011	Field Strength of Spurious Emissions	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Northwest EMC following the test.
4	5/20/2011	Frequency Stability	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Northwest EMC following the test.
5	5/20/2011	AC Powerline Conducted Emissions	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	Scheduled testing was completed.

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

**MODES OF OPERATION**

Tx without RFID receiver

**POWER SETTINGS INVESTIGATED**

120VAC/60Hz

**FREQUENCY RANGE INVESTIGATED**

Start Frequency	13 MHz	Stop Frequency	14.1 MHz
-----------------	--------	----------------	----------

**SAMPLE CALCULATIONS**

Radiated Emissions: Field Strength = Measured Level + Antenna Factor + Cable Factor - Amplifier Gain + Distance Adjustment Factor + External Attenuation

**TEST EQUIPMENT**

Description	Manufacturer	Model	ID	Last Cal.	Interval
Antenna, Loop	EMCO	6502	AZC	8/3/2009	24
EV12 Cables	N/A	Bilog Cables	EVS	7/14/2010	12
Spectrum Analyzer	Agilent	E4440A	AAW	4/19/2011	12

**MEASUREMENT BANDWIDTHS**

	Frequency Range	Peak Data	Quasi-Peak Data	Average Data
	(MHz)	(kHz)	(kHz)	(kHz)
	0.01 - 0.15	1.0	0.2	0.2
	0.15 - 30.0	10.0	9.0	9.0
	30.0 - 1000	100.0	120.0	120.0
	Above 1000	1000.0	N/A	1000.0

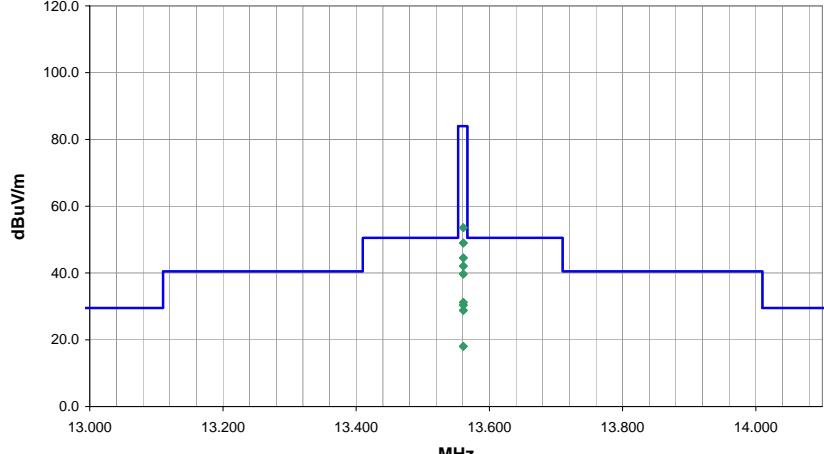
Measurements were made using the bandwidths and detectors specified. No video filter was used.

**MEASUREMENT UNCERTAINTY**

A measurement uncertainty estimation has been performed for each test per our internal quality document WP 342. The estimation is used to compare the measured result with its "true" or theoretically correct value. Our measurement data meets or exceeds the measurement uncertainty requirements of CISPR 16-4. The measurement uncertainty estimation is available upon request.

**TEST DESCRIPTION**

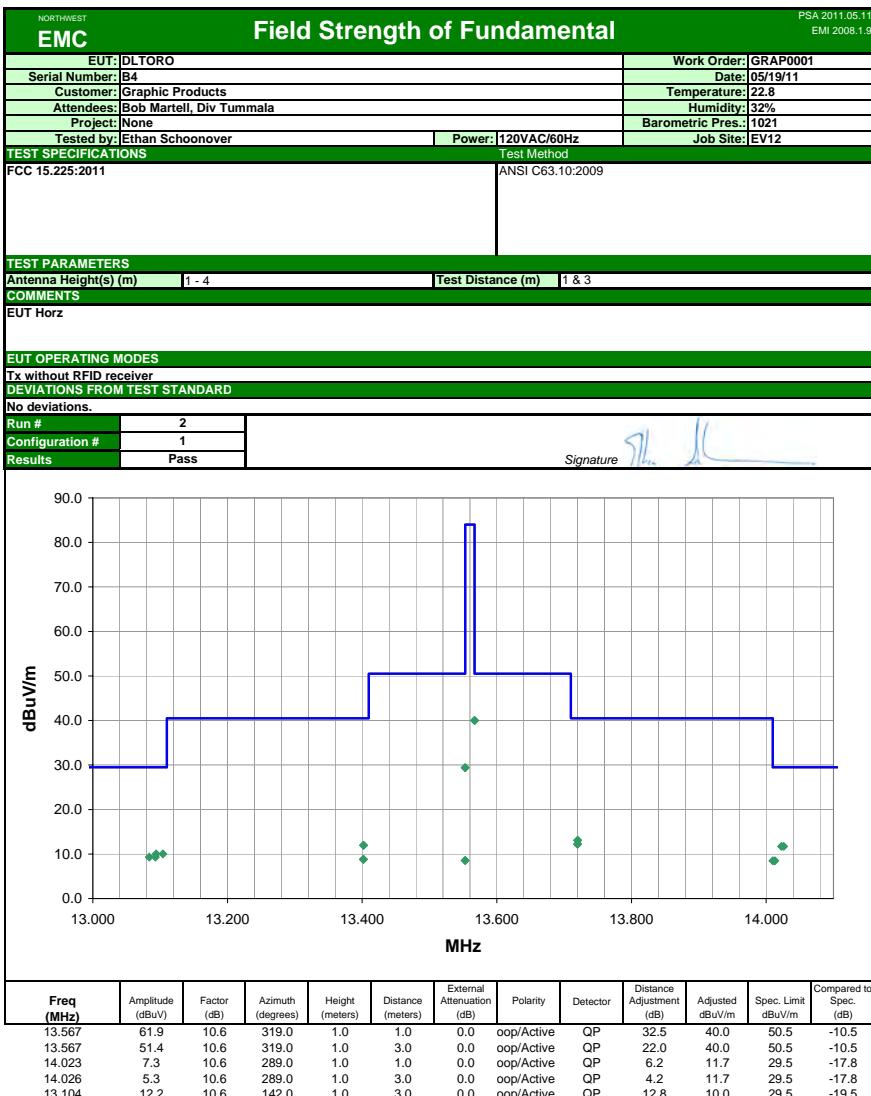
The antennas to be used with the EUT were tested. The EUT was transmitting and receiving while set at the lowest channel, a middle channel, and the highest channel available. While scanning, emissions from the EUT were maximized by rotating the EUT, adjusting the measurement antenna height and polarization, and manipulating the EUT antenna in 3 orthogonal planes (per ANSI C63.10:2009).

Field Strength of Fundamental												PSA 2011.05.11	EMI 2008.1.9	
EUT: DLTORO						Work Order: GRAP0001								
Serial Number: B4						Date: 05/19/11								
Customer: Graphic Products						Temperature: 22.8								
Attendee: Bob Martelli, Div Tummala						Humidity: 32%								
Project: None						Barometric Pres.: 1021								
Tested by: Ethan Schoonover			Power: 120VAC/60Hz			Job Site: EV12								
TEST SPECIFICATIONS												Test Method		
FCC 15.225:2011												ANSI C63.10:2009		
TEST PARAMETERS														
Antenna Height(s) (m)			1 - 4			Test Distance (m)			1 & 3					
COMMENTS												See Below		
EUT OPERATING MODES														
Tx without RFID receiver														
DEVIATIONS FROM TEST STANDARD												No deviations.		
Run #	1												Signature 	
Configuration #	1													
Results	Pass													
														
Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Azimuth (degrees)	Height (meters)	Distance (meters)	External Attenuation (dB)	Polarity	Detector	Distance Adjustment (dB)	Adjusted dBuV/m	Spec. Limit dBuV/m	Compared to Spec. (dB)	Comments	
13.561	55.2	10.6	135.0	1.0	3.0	0.0	oop/Active	QP	12.2	53.6	84.0	-30.4	EUT Vert Antenna Perp to EUT, Perp to ground. 3m	
13.561	61.0	10.6	135.0	1.0	1.0	0.0	oop/Active	QP	18.0	53.6	84.0	-30.4	EUT Vert Antenna Perp to EUT, Perp to ground. 1m	
13.561	67.5	10.6	234.0	1.0	1.0	0.0	oop/Active	QP	29.1	49.0	84.0	-35.0	EUT Horz. Antenna Perp to EUT, Perp to ground. 1m	
13.561	58.1	10.6	234.0	1.0	3.0	0.0	oop/Active	QP	19.7	49.0	84.0	-35.0	EUT Horz. Antenna Perp to EUT, Perp to ground. 3m	
13.561	60.5	10.6	338.0	1.0	3.0	0.0	oop/Active	QP	26.6	44.5	84.0	-39.5	EUT Onside Antenna Perp to EUT, Perp to ground. 3m	
13.561	73.2	10.6	338.0	1.0	1.0	0.0	oop/Active	QP	39.3	44.5	84.0	-39.5	EUT Onside Antenna Perp to EUT, Perp to ground. 1m	
13.561	62.5	10.6	342.0	1.8	1.0	0.0	oop/Active l	QP	31.0	42.1	84.0	-41.9	EUT Horz. Antenna Perp to EUT, Par to ground. 1m	
13.561	52.5	10.6	342.0	2.3	3.0	0.0	oop/Active l	QP	21.0	42.1	84.0	-41.9	EUT Horz. Antenna Perp to EUT, Par to ground. 3m	
13.561	71.8	10.6	162.0	1.0	1.0	0.0	oop/Active	QP	42.7	39.7	84.0	-44.3	EUT Horz. Antenna Par to EUT, Perp to ground. 1m	
13.561	58.0	10.6	162.0	1.0	3.0	0.0	oop/Active	QP	28.9	39.7	84.0	-44.3	EUT Horz. Antenna Par to EUT, Perp to ground. 3m	
13.561	50.8	10.6	330.0	1.0	3.0	0.0	oop/Active	QP	30.2	31.2	84.0	-52.8	EUT Vert. Antenna Par to EUT, Perp to ground. 3m	
13.561	65.2	10.6	330.0	1.7	1.0	0.0	oop/Active	QP	44.6	31.2	84.0	-52.8	EUT Vert. Antenna Par to EUT, Perp to ground. 1m	
13.561	53.5	10.6	352.0	2.6	3.0	0.0	oop/Active l	QP	33.7	30.4	84.0	-53.6	EUT Onside Antenna Perp to EUT, Par to ground. 3m	
13.561	69.6	10.6	352.0	1.0	1.0	0.0	oop/Active l	QP	49.8	30.4	84.0	-53.6	EUT Onside Antenna Perp to EUT, Par to ground. 1m	
13.561	75.8	10.6	246.0	1.0	1.0	0.0	oop/Active	QP	57.6	28.8	84.0	-55.2	EUT Onside Antenna Par to EUT, Perp to ground. 1m	
13.561	57.2	10.6	246.0	1.0	3.0	0.0	oop/Active	QP	39.0	28.8	84.0	-55.2	EUT Onside Antenna Par to EUT, Perp to ground. 3m	
13.561	51.2	10.6	360.0	1.6	3.0	0.0	oop/Active l	QP	43.8	18.0	84.0	-66.0	EUT Vert. Antenna Perp to EUT, Par to ground. 3m	
13.561	72.1	10.6	360.0	1.0	1.0	0.0	oop/Active l	QP	64.7	18.0	84.0	-66.0	EUT Vert. Antenna Perp to EUT, Par to ground. 1m	

## Distance Adjustment Factor for Radiated Emissions below 30 MHz

<b>Method:</b>	Per 47 CFR 15.31(f)(2), the data was extrapolated based upon a the measured fall-off (at each frequency / polarity).
<b>EUT:</b>	DLTORO
<b>S/N:</b>	B4
<b>Date:</b>	5/19/2011
<b>Job Number:</b>	GRAP0001

Frequency (MHz)	EUT Orientation	Loop Antenna Polarity	Test Distance (meters)	Adjusted Level (dBuV/m)	Fall-Off from 1 to 3 m (dB)	Extrapolation Factor for Specification Limit (dB / decade)	Test Distance of Spec. Limit (meters)	Distance Adjustment Factor (dB)
13.561	Horz	Par/Gnd, Perp/EUT	1.00	73.1	10.0	21.0	30.0	31.0
13.561	Horz	Par/Gnd, Perp/EUT	3.00	63.1				21.0
13.561	Horz	Perp/Gnd, Perp/EUT	1.00	78.1	9.4	19.7	30.0	29.1
13.561	Horz	Perp/Gnd, Perp/EUT	3.00	68.7				19.7
13.561	Horz	Perp/Gnd, Par/EUT	1.00	82.4	13.8	28.9	30.0	42.7
13.561	Horz	Perp/Gnd, Par/EUT	3.00	68.6				28.9
13.561	Vert	Par/Gnd, Perp/EUT	1.00	82.7	20.9	43.8	30.0	64.7
13.561	Vert	Par/Gnd, Perp/EUT	3.00	61.8				43.8
13.561	Vert	Perp/Gnd, Perp/EUT	1.00	71.6	5.8	12.2	30.0	18.0
13.561	Vert	Perp/Gnd, Perp/EUT	3.00	65.8				12.2
13.561	Vert	Perp/Gnd, Par/EUT	1.00	75.8	14.4	30.2	30.0	44.6
13.561	Vert	Perp/Gnd, Par/EUT	3.00	61.4				30.2
13.561	On Side	Par/Gnd, Perp/EUT	1.00	80.2	16.1	33.7	30.0	49.8
13.561	On Side	Par/Gnd, Perp/EUT	3.00	64.1				33.7
13.561	On Side	Perp/Gnd, Perp/EUT	1.00	83.8	12.7	26.6	30.0	39.3
13.561	On Side	Perp/Gnd, Perp/EUT	3.00	71.1				26.6
13.561	On Side	Perp/Gnd, Par/EUT	1.00	86.4	18.6	39.0	30.0	57.6
13.561	On Side	Perp/Gnd, Par/EUT	3.00	67.8				39.0



## Distance Adjustment Factor for Radiated Emissions below 30 MHz

Method: Per 47 CFR 15.31(f)(2), the data was extrapolated based upon a the measured fall-off (at each frequency / polarity).

EUT: DLTORO  
 S/N: B4  
 Date: 5/19/2011  
 Job Number: GRAP0001

Frequency (MHz)	EUT Orientation	Loop Antenna Polarity	Test Distance (meters)	Adjusted Level (dBuV/m)	Fall-Off from 1 to 3 m (dB)	Extrapolation Factor for Specification Limit (dB / decade)	Test Distance of Spec. Limit (meters)	Distance Adjustment Factor (dB)
13.110	Horz	Perp/Gnd, Perp/EUT	1.00	37.8	15.9	33.3	30.0	49.2
13.110		Perp/Gnd, Perp/EUT	3.00	21.9				33.3
13.410	Horz	Perp/Gnd, Perp/EUT	1.00	43.0	17.3	36.3	30.0	53.6
13.410		Perp/Gnd, Perp/EUT	3.00	25.7				36.3
13.710	Horz	Perp/Gnd, Perp/EUT	1.00	39.9	16.8	35.2	30.0	52.0
13.710		Perp/Gnd, Perp/EUT	3.00	23.1				35.2
14.010	Horz	Perp/Gnd, Perp/EUT	1.00	20.3	3.8	8.0	30.0	11.8
14.010		Perp/Gnd, Perp/EUT	3.00	16.5				8.0

13.110	On Side	Perp/Gnd, Perp/EUT	1.00	34.7	8.2	17.2	30.0	25.4
13.110	On Side	Perp/Gnd, Perp/EUT	3.00	26.5				17.2
13.410	On Side	Perp/Gnd, Perp/EUT	1.00	42.3	9.8	20.5	30.0	30.3
13.410		Perp/Gnd, Perp/EUT	3.00	32.5				20.5
13.553	On Side	Perp/Gnd, Perp/EUT	1.00	68.0	19.2	40.2	30.0	59.4
13.553		Perp/Gnd, Perp/EUT	3.00	48.8				40.2
13.567	On Side	Perp/Gnd, Perp/EUT	1.00	72.5	10.5	22.0	30.0	32.5
13.567		Perp/Gnd, Perp/EUT	3.00	62.0				22.0
13.710	On Side	Perp/Gnd, Perp/EUT	1.00	37.3	8.1	17.0	30.0	25.1
13.710		Perp/Gnd, Perp/EUT	3.00	29.2				17.0
14.010	On Side	Perp/Gnd, Perp/EUT	1.00	28.6	9.9	20.7	30.0	30.6
14.010		Perp/Gnd, Perp/EUT	3.00	18.7				20.7

13.110	Vert	Perp/Gnd, Perp/EUT	1.00	28.9	6.1	12.8	30.0	18.9
13.110	Vert	Perp/Gnd, Perp/EUT	3.00	22.8				12.8
13.410	Vert	Perp/Gnd, Perp/EUT	1.00	31.4	7.3	15.3	30.0	22.6
13.410		Perp/Gnd, Perp/EUT	3.00	24.1				15.3
13.553	Vert	Perp/Gnd, Perp/EUT	1.00	52.0	7.3	15.3	30.0	22.6
13.553		Perp/Gnd, Perp/EUT	3.00	44.7				15.3
13.710	Vert	Perp/Gnd, Perp/EUT	1.00	27.7	4.7	9.9	30.0	14.6
13.710		Perp/Gnd, Perp/EUT	3.00	23.0				9.9
14.010	Vert	Perp/Gnd, Perp/EUT	1.00	17.9	2.0	4.2	30.0	6.2
14.010		Perp/Gnd, Perp/EUT	3.00	15.9				4.2

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

**MODES OF OPERATION**

Tx without RFID receiver

**POWER SETTINGS INVESTIGATED**

120VAC/60Hz

**FREQUENCY RANGE INVESTIGATED**

Start Frequency 490kHz Stop Frequency 1000 MHz

**SAMPLE CALCULATIONS**

Radiated Emissions: Field Strength = Measured Level + Antenna Factor + Cable Factor - Amplifier Gain + Distance Adjustment Factor + External Attenuation

**TEST EQUIPMENT**

Description	Manufacturer	Model	ID	Last Cal.	Interval
Antenna, Loop	EMCO	6502	AZC	8/3/2009	24
Antenna, Biconilog	EMCO	3141	AXG	3/15/2010	24
EV12 Cables	N/A	Bilog Cables	EVS	7/14/2010	12
Pre-Amplifier	Miteq	AM-1616-1000	AVM	7/14/2010	12
Spectrum Analyzer	Agilent	E4440A	AAW	4/19/2011	12

**MEASUREMENT BANDWIDTHS**

	Frequency Range	Peak Data	Quasi-Peak Data	Average Data
	(MHz)	(kHz)	(kHz)	(kHz)
	0.01 - 0.15	1.0	0.2	0.2
	0.15 - 30.0	10.0	9.0	9.0
	30.0 - 1000	100.0	120.0	120.0
	Above 1000	1000.0	N/A	1000.0

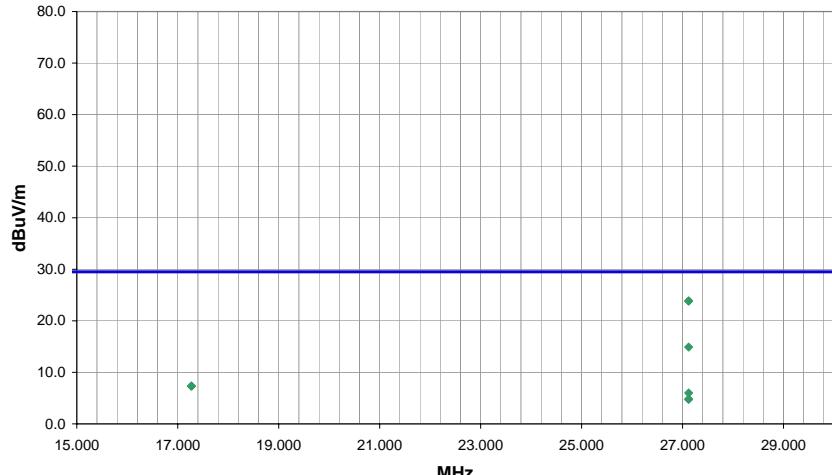
Measurements were made using the bandwidths and detectors specified. No video filter was used.

**MEASUREMENT UNCERTAINTY**

A measurement uncertainty estimation has been performed for each test per our internal quality document WP 342. The estimation is used to compare the measured result with its "true" or theoretically correct value. Our measurement data meets or exceeds the measurement uncertainty requirements of CISPR 16-4. The measurement uncertainty estimation is available upon request.

**TEST DESCRIPTION**

The antennas to be used with the EUT were tested. The EUT was transmitting and receiving while set at the lowest channel, a middle channel, and the highest channel available. While scanning, emissions from the EUT were maximized by rotating the EUT, adjusting the measurement antenna height and polarization, and manipulating the EUT antenna in 3 orthogonal planes (per ANSI C63.10:2009).

Field Strength of Spurious Emissions												PSA 2011.05.11 EMI 2008.1.9	
EUT: DLTORO Serial Number: B4 Customer: Graphic Products Attendees: Bob Martell, Div Tummala Project: None Tested by: Ethan Schoonover						Work Order: GRAP0001 Date: 05/19/11 Temperature: 22.8 Humidity: 32% Barometric Pres.: 1021 Power: 120VAC/60Hz Job Site: EV12							
TEST SPECIFICATIONS												Test Method FCC 15.225:2011 ANSI C63.10:2009	
TEST PARAMETERS												Antenna Height(s) (m) 1 - 4 Test Distance (m) 3	
COMMENTS													EUT Horz
EUT OPERATING MODES													Tx without RFID receiver
DEVIATIONS FROM TEST STANDARD													No deviations.
Run #	3	Configuration #	1	Results	Pass	Signature 							
													
Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Azimuth (degrees)	Height (meters)	Distance (meters)	External Attenuation (dB)	Polarity	Detector	Distance Adjustment (dB)	Adjusted dBuV/m	Spec. Limit dBuV/m	Compared to Spec. (dB)	Comments
17.271	9.1	10.3	162.0	1.0	1.0	0.0	oop/Active	QP	12.1	7.3	29.5	-22.2	EUT Horz Antenna Perp to EUT, Perp to ground. 1m
17.272	5.2	10.3	162.0	1.0	3.0	0.0	oop/Active	QP	8.2	7.3	29.5	-22.2	EUT Horz Antenna Perp to EUT, Perp to ground. 3m
27.122	32.0	9.5	232.0	1.0	1.0	0.0	oop/Active	QP	17.6	23.9	29.5	-5.6	EUT Horz Antenna Par to EUT, Perp to ground. 1m
27.122	26.3	9.5	232.0	1.0	3.0	0.0	oop/Active	QP	11.9	23.9	29.5	-5.6	EUT Horz Antenna Par to EUT, Perp to ground. 3m
12.716	23.2	10.6	260.0	1.0	1.0	0.0	oop/Active	QP	28.8	5.0	29.5	-24.5	EUT Horz Antenna Perp to EUT, Perp to ground. 1m
12.693	13.9	10.6	260.0	1.0	3.0	0.0	oop/Active	QP	19.5	5.0	29.5	-24.5	EUT Horz Antenna Perp to EUT, Perp to ground. 3m
27.122	35.5	9.5	305.0	1.0	1.0	0.0	oop/Active	QP	39.0	6.0	29.5	-23.5	EUT Horz Antenna Perp to EUT, Par to ground. 1m
27.122	31.8	9.5	305.0	1.0	3.0	0.0	oop/Active	QP	26.4	14.9	29.5	-14.6	EUT Horz Antenna Perp to EUT, Par to ground. 3m
27.122	43.9	9.5	354.0	1.0	1.0	0.0	oop/Active	QP	48.6	4.8	29.5	-24.7	EUT Horz Antenna Perp to EUT, Perp to ground. 1m
27.122	28.2	9.5	354.0	1.0	3.0	0.0	oop/Active	QP	32.9	4.8	29.5	-24.7	EUT Horz Antenna Perp to EUT, Perp to ground. 3m

## Distance Adjustment Factor for Radiated Emissions below 30 MHz

**Method:** Per 47 CFR 15.31(f)(2), the data was extrapolated based upon the measured fall-off (at each frequency / polarity).

**EUT:** DLTORO  
**S/N:** B4  
**Date:** 5/19/2011  
**Job Number:** GRAP0001

Frequency (MHz)	EUT Orientation	Loop Antenna Polarity	Test Distance (meters)	Adjusted Level (dBuV/m)	Fall-Off from 1 to 3 m (dB)	Extrapolation Factor for Specification Limit (dB / decade)	Test Distance of Spec. Limit (meters)	Distance Adjustment Factor (dB)
17.272	Horz	Perp/Gnd, Perp/EUT	1.00	19.4	3.9	8.2	30.0	12.1
17.271	Horz	Perp/Gnd, Perp/EUT	3.00	15.5				8.2
27.122	Horz	Perp/Gnd, Par/EUT	1.00	41.5	5.7	11.9	30.0	17.6
27.122	Horz	Perp/Gnd, Par/EUT	3.00	35.8				11.9
12.716	Horz	Perp/Gnd, Perp/EUT	1.00	33.8	9.3	19.5	30.0	28.8
12.693	Horz	Perp/Gnd, Perp/EUT	3.00	24.5				19.5
27.122	Horz	Par/Gnd, Perp/EUT	1.00	53.9	12.6	26.4	30.0	39.0
27.122	Horz	Par/Gnd, Perp/EUT	3.00	41.3				26.4
27.122	Horz	Perp/Gnd, Perp/EUT	1.00	53.4	15.7	32.9	30.0	48.6
27.122	Horz	Perp/Gnd, Perp/EUT	3.00	37.7				32.9

## Field Strength of Spurious Emissions

EUT: DLTORO	Work Order: GRAP0001
Serial Number: B4	Date: 05/20/11
Customer: Graphic Products	Temperature: 22.8
Attendees: Bob Martell, Div Tummala	Humidity: 32%
Project: None	Barometric Pres.: 1021
Tested by: Ethan Schoonover	Power: 120VAC/60Hz
	Job Site: EV12

## TEST SPECIFICATIONS

FCC 15.225:2011 | ANSI C63.10:2009

## TEST PARAMETERS

Antenna Height(s) (m) | 1 - 4 | Test Distance (m) | 3

## COMMENTS

EUT Horz

## EUT OPERATING MODES

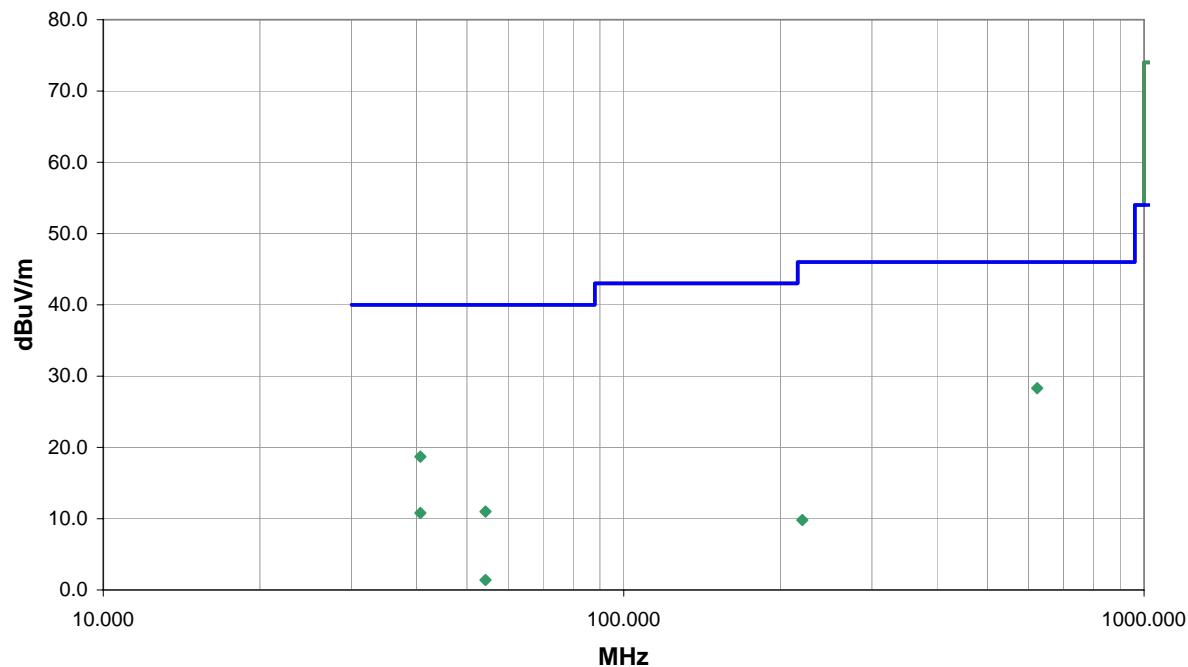
Tx without RFID receiver

## DEVIATIONS FROM TEST STANDARD

No deviations.

Run #	4
Configuration #	1
Results	Pass

Signature

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Azimuth (degrees)	Height (meters)	Distance (meters)	External Attenuation (dB)	Polarity	Detector	Distance Adjustment (dB)	Adjusted dBuV/m	Spec. Limit dBuV/m	Compared to Spec. (dB)
623.059	39.0	9.3	240.0	1.2	3.0	0.0	H-Bilog	QP	-20.0	28.3	46.0	-17.7
40.685	41.4	-2.7	131.0	1.2	3.0	0.0	V-Bilog	QP	-20.0	18.7	40.0	-21.3
54.247	37.2	-6.2	333.0	1.0	3.0	0.0	V-Bilog	QP	-20.0	11.0	40.0	-29.0
40.684	33.5	-2.7	192.0	3.5	3.0	0.0	H-Bilog	QP	-20.0	10.8	40.0	-29.2
220.376	32.0	-2.2	13.0	1.8	3.0	0.0	H-Bilog	QP	-20.0	9.8	46.0	-36.2
54.245	27.6	-6.2	66.0	2.3	3.0	0.0	H-Bilog	QP	-20.0	1.4	40.0	-38.6

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

**TEST EQUIPMENT**

Description	Manufacturer	Model	ID	Last Cal.	Interval
Antenna, Loop	EMCO	6502	AZC	8/3/2009	24
Spectrum Analyzer	Agilent	E4440A	AAW	4/19/2011	12

**MEASUREMENT UNCERTAINTY**

A measurement uncertainty estimation has been performed for each test per our internal quality document WP 342. The estimation is used to compare the measured result with its "true" or theoretically correct value. The expanded measurement uncertainty for radiated emissions measurements is less than +/- 4 dB, and for conducted emissions measurements is less than +/- 2.7 dB. Our measurement data meets or exceeds the measurement uncertainty requirements of CISPR 16-4; therefore, the test data can be compared directly to the specification limit to determine compliance. The calculations for measurement uncertainty are available upon request.

**TEST DESCRIPTION**

The occupied bandwidth was measured utilizing the analyzer's peak detector and measuring the carrier's 20 dB occupied bandwidth.

The antenna is integral to the EUT, so a measurement was made with a probe configuration. The resolution bandwidth was >1% of the 20dB bandwidth and the video bandwidth was greater than the resolution bandwidth.

The occupied bandwidth was measured with the EUT configured for continuous modulated operation of the operational band.

## EMC

## OCCUPIED BANDWIDTH

EUT: DLTORO

Work Order: GRAP0001

Serial Number: B4

Date: 05/19/11

Customer: Graphic Products

Temperature: 22.8°C

Attendees: Bob Martell, Div Tummala

Humidity: 32%

Project: None

Barometric Pres.: 1021

Tested by: Ethan Schoonover

Power: 120VAC/ 60Hz

Job Site: EV12

## TEST SPECIFICATIONS

## Test Method

FCC 15.225:2011

ANSI C63.10:2009

## COMMENTS

Printer On

## DEVIATIONS FROM TEST STANDARD

No Deviations

Configuration #

1

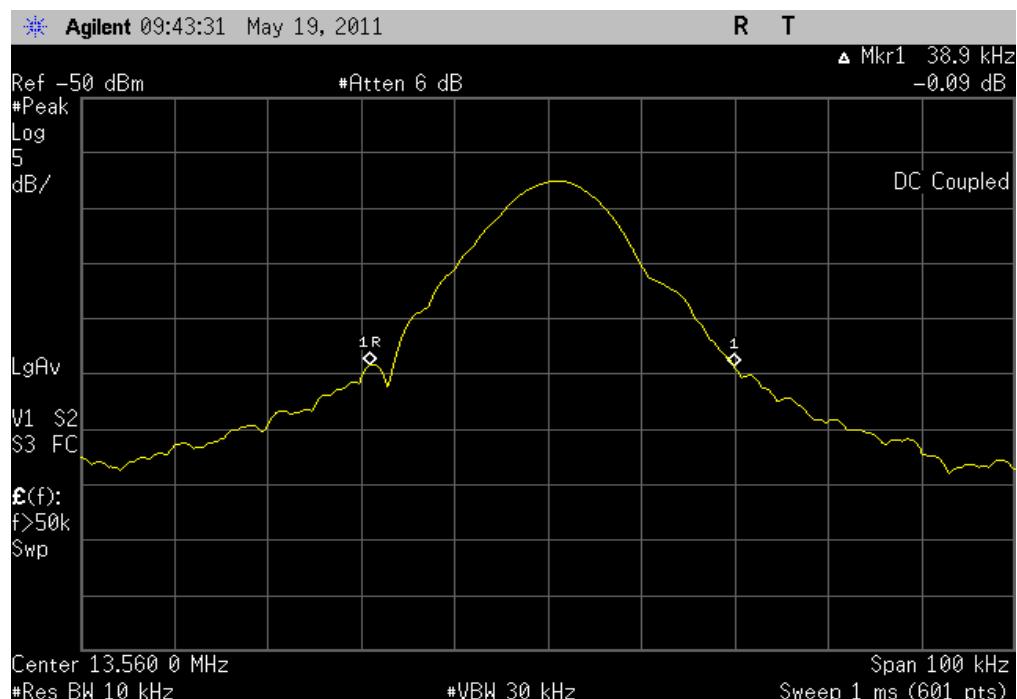
Signature



OCCUPIED BANDWIDTH

	Value	Limit	Results
	38.9 kHz	≤ 500 kHz	Pass

OCCUPIED BANDWIDTH		
Result: Pass	Value: 38.9 kHz	Limit: ≤ 500 kHz



Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

TEST EQUIPMENT						
Description	Manufacturer	Model	ID	Last Cal.	Interval	
Spectrum Analyzer	Agilent	E4440A	AFD	6/1/2009	24	
Near Field Probe	EMCO	7405	IPD	NCR	0	
40GHz DC Block	Miteq	DCB4000	AMD	8/5/2010	13	
EV06 Direct Connect Cable	ESM Cable Corp.	TT	ECA	NCR	0	
Multimeter	Tektronix	DMM912	MMH	1/28/2011	24	
DC Power Supply	Topward	TPS-2000	TPD	NCR	0	
Chamber Temp. & Humidity Controller	ESZ / Eurotherm	Dimension II	TBC	NCR	0	
Chamber, Temp./Humidity Chamber	Cincinnati Sub Zero (CSZ)	ZH-32-2-2-H/AC	TBA	8/20/2010	24	

#### MEASUREMENT UNCERTAINTY

A measurement uncertainty estimation has been performed for each test per our internal quality document WP 342. The estimation is used to compare the measured result with its "true" or theoretically correct value. The expanded measurement uncertainty for radiated emissions measurements is less than +/- 4 dB, and for conducted emissions measurements is less than +/- 2.7 dB. Our measurement data meets or exceeds the measurement uncertainty requirements of CISPR 16-4; therefore, the test data can be compared directly to the specification limit to determine compliance. The calculations for measurement uncertainty are available upon request.

#### TEST DESCRIPTION

##### Variation of Supply Voltage

The primary supply voltage was varied from the nominal of 24 VDC. The EUT can only be battery operated, so a DC lab supply was used to vary the supply voltage up to the maximum of the battery voltage and the EUT's voltage end point.

##### Variation of Ambient Temperature

Using a temperature chamber, the transmit frequency was recorded at the extremes of the specified temperature range (-30° to +50° C) and at 10°C intervals.

The antenna is integral to the EUT, so a radiated measurement was made using a spectrum analyzer and a near field probe. The spectrum analyzer is equipped with a precision frequency reference that exceeds the stability requirement of the EUT.

## FREQUENCY STABILITY

EUT: DLTORO	Work Order: GRAP0001
Serial Number: B4	Date: 05/20/11
Customer: Graphic Products	Temperature: 23.3°C
Attendees: Bob Martell, Div Tummala	Humidity: 29%
Project: None	Barometric Pres.: 30.11 in
Tested by: Rod Peloquin	Job Site: EV06 & EV09
TEST SPECIFICATIONS	
FCC 15.225:2011	
ANSI C63.10:2009	
COMMENTS	
Transmit mode with modulation, no RFID Tag. Manufacturer's declared maximum of battery pack and low dc endpoint of operation.	
DEVIATIONS FROM TEST STANDARD	
No Deviations	
Configuration #	1
 Signature	

## FREQUENCY STABILITY

Frequency Stability with Variation of DC Voltage (Ambient Temperature = 20°C)

Voltage (VDC)	Assigned Frequency (MHz)	Measured Frequency (MHz)	Tolerance (ppm)	Specification (ppm)
25 (Max)	13.560000	13.560730	53.83	100
24 (100%)	13.560000	13.560730	53.83	100
22 (Min)	13.560000	13.560730	53.83	100

Frequency Stability with Variation of Ambient Temperature (Primary Supply = 24 VDC)

Temp (°C)	Assigned Frequency (MHz)	Measured Frequency (MHz)	Tolerance (ppm)	Specification (ppm)
50	13.560000	13.560730	53.83	100
40	13.560000	13.560730	53.83	100
30	13.560000	13.560730	53.83	100
20	13.560000	13.560730	53.83	100
10	13.560000	13.560727	53.61	100
0	13.560000	13.560730	53.83	100
-10	13.560000	13.560740	54.57	100
-20	13.560000	13.560750	55.31	100
-30	13.560000	13.560750	55.31	100

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

**MODES OF OPERATION**

RFID Tx.

**POWER SETTINGS INVESTIGATED**

120VAC/60Hz

**CONFIGURATIONS INVESTIGATED**

GRAP0001 - 1

GRAP0001 - 3

**SAMPLE CALCULATIONS**

Conducted Emissions: Adjusted Level = Measured Level + Transducer Factor + Cable Attenuation Factor + External Attenuator

**TEST EQUIPMENT**

Description	Manufacturer	Model	ID	Last Cal.	Interval
Receiver	Rohde & Schwarz	ESCI	ARH	3/30/2011	12 mo
High Pass Filter	TTE	H97-100K-50-720B	HFX	2/9/2011	24 mo
Attenuator	Coaxicom	66702 2910-20	ATO	8/6/2010	12 mo
EV07 Cables	N/A	Conducted Cables	EVG	6/21/2010	12 mo
LISN	Solar	9252-50-R-24-BNC	LIN	5/9/2011	12 mo

**MEASUREMENT BANDWIDTHS**

	Frequency Range	Peak Data	Quasi-Peak Data	Average Data
	(MHz)	(kHz)	(kHz)	(kHz)
0.01 - 0.15	1.0	0.2	0.2	0.2
0.15 - 30.0	10.0	9.0	9.0	9.0
30.0 - 1000	100.0	120.0	120.0	120.0
Above 1000	1000.0	N/A	N/A	1000.0

Measurements were made using the bandwidths and detectors specified. No video filter was used.

**MEASUREMENT UNCERTAINTY**

A measurement uncertainty estimation has been performed for each test per our internal quality document WP 342. The estimation is used to compare the measured result with its "true" or theoretically correct value. The expanded measurement uncertainty for radiated emissions measurements is less than +/- 4 dB, and for conducted emissions measurements is less than +/- 2.7 dB. Our measurement data meets or exceeds the measurement uncertainty requirements of CISPR 16-4; therefore, the test data can be compared directly to the specification limit to determine compliance. The calculations for measurement uncertainty are available upon request.

**TEST DESCRIPTION**

Using the mode of operation and configuration noted within this report, conducted emissions tests were performed. The frequency range investigated (scanned), is also noted in this report. Conducted power line measurements are made, unless otherwise specified, over the frequency range from 150 kHz to 30 MHz to determine the line-to-ground radio-noise voltage that is conducted from the EUT power-input terminals that are directly (or indirectly via separate transformer or power supplies) connected to a public power network. Equipment is tested with power cords that are normally used or that have electrical or shielding characteristics that are the same as those cords normally used. Typically those measurements are made using a LISN (Line Impedance Stabilization Network), the 50ohm measuring port is terminated by a 50ohm EMI meter or a 50ohm resistive load. All 50ohm measuring ports of the LISN are terminated by 50ohm.

Per FCC KDB Publication #174176, for devices transmitting below 30 MHz that have permanent non-detachable antennas, the FCC will accept measurements done with a suitable dummy load, in lieu of the permanent antenna under the following conditions: (1) perform the AC line conducted tests with the permanent antenna to determine compliance with the Section 15.207 limits outside the transmitter's fundamental emission band; (2) retest with a dummy load in lieu of the permanent antenna to determine compliance with the Section 15.207 limits within the transmitter's fundamental emission band.

Work Order:	GRAP0001	Date:	05/20/11	
Project:	None	Temperature:	23.5 °C	
Job Site:	EV07	Humidity:	29.1	
Serial Number:	B4	Barometric Pres.:	1017.7 mb	
				
EUT:	DLTORO	Tested by:	Dan Haas	
Configuration:	1 - Basic Config			
Customer:	Graphic Products			
Attendees:	Bob Martell, Div Tummala			
EUT Power:	120VAC/60Hz			
Operating Mode:	RFID Tx			
Deviations:	None			
Comments:	None			

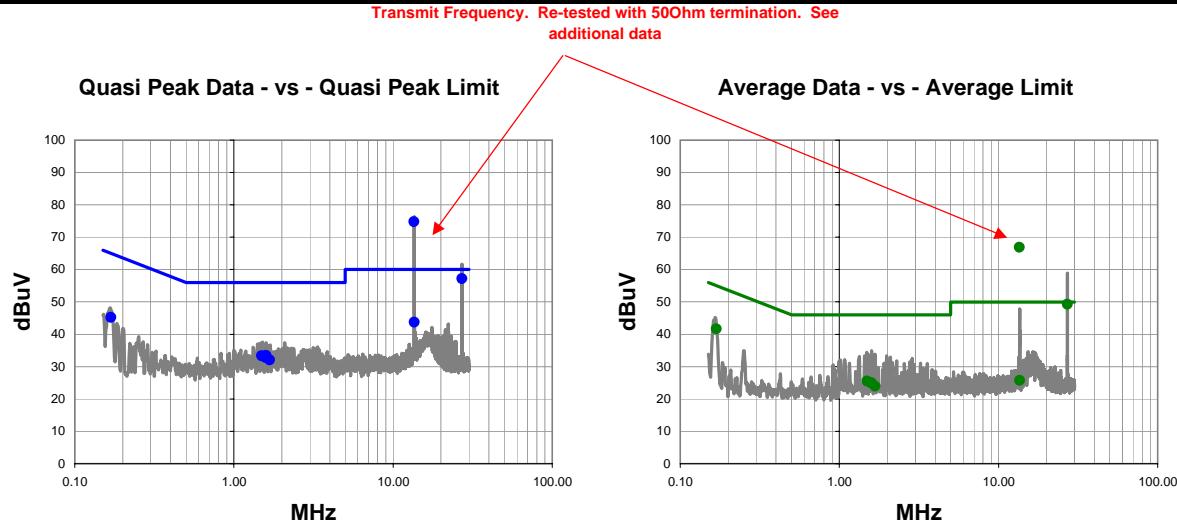
## Test Specifications

FCC 15.207:2011

## Test Method

ANSI C63.10:2009

Run #	1	Line:	High Line	Ext. Attenuation:	20	Results	Pass
Transmit Frequency. Re-tested with 50Ω termination. See additional data							



Quasi Peak Data - vs - Quasi Peak Limit						Average Data - vs - Average Limit					
Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)	Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
13.562	54.1	20.7	74.8	60.0	14.8	13.562	46.2	20.7	66.9	50.0	16.9
27.120	35.8	21.4	57.2	60.0	-2.8	27.120	27.9	21.4	49.3	50.0	-0.7
13.598	23.0	20.7	43.7	60.0	-16.3	0.169	21.5	20.2	41.7	55.0	-13.3
0.169	25.0	20.2	45.2	65.0	-19.8	1.492	5.3	20.2	25.5	46.0	-20.5
1.596	13.2	20.2	33.4	56.0	-22.6	1.576	4.8	20.2	25.0	46.0	-21.0
1.492	13.1	20.2	33.3	56.0	-22.7	1.596	4.7	20.2	24.9	46.0	-21.1
1.576	12.6	20.2	32.8	56.0	-23.2	1.680	3.7	20.2	23.9	46.0	-22.1
1.680	11.9	20.2	32.1	56.0	-23.9	13.598	5.0	20.7	25.7	50.0	-24.3

Work Order:	GRAP0001	Date:	05/20/11	
Project:	None	Temperature:	23.5 °C	
Job Site:	EV07	Humidity:	29.1	
Serial Number:	B4	Barometric Pres.:	1017.7 mb	
				
EUT:	DLTORO	Tested by:	Dan Haas	
Configuration:	1 - Basic Config			
Customer:	Graphic Products			
Attendees:	Bob Martell, Div Tummala			
EUT Power:	120VAC/60Hz			
Operating Mode:	RFID Tx			
Deviations:	None			
Comments:	None			

## Test Specifications

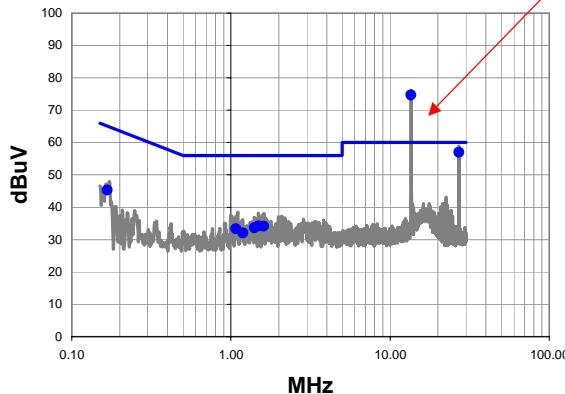
FCC 15.207:2011

## Test Method

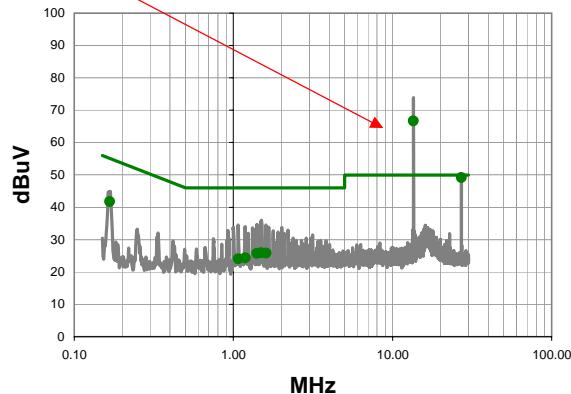
ANSI C63.10:2009

Run #	2	Line:	Neutral	Ext. Attenuation:	20	Results	Pass
Transmit Frequency. Re-tested with 50Ω termination. See additional data							

Quasi Peak Data - vs - Quasi Peak Limit



Average Data - vs - Average Limit



Quasi Peak Data - vs - Quasi Peak Limit

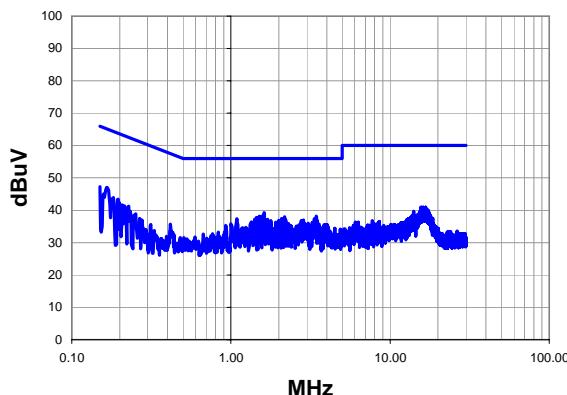
Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
13.560	54.0	20.7	74.7	60.0	14.7
27.120	35.6	21.4	57.0	60.0	-3.0
0.167	25.1	20.2	45.3	65.1	-19.8
1.492	14.0	20.2	34.2	56.0	-21.8
1.612	13.9	20.2	34.1	56.0	-21.9
1.408	13.4	20.2	33.6	56.0	-22.4
1.076	13.1	20.2	33.3	56.0	-22.7
1.188	11.9	20.2	32.1	56.0	-23.9

Average Data - vs - Average Limit

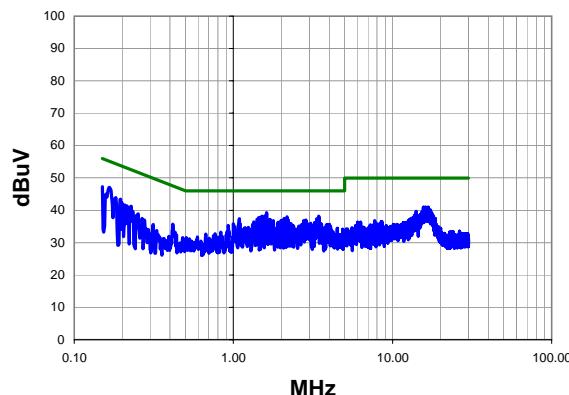
Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
13.560	46.0	20.7	66.7	50.0	16.7
27.120	27.8	21.4	49.2	50.0	-0.8
0.167	21.6	20.2	41.8	55.1	-13.3
1.492	5.7	20.2	25.9	46.0	-20.1
1.612	5.6	20.2	25.8	46.0	-20.2
1.408	5.5	20.2	25.7	46.0	-20.3
1.188	4.1	20.2	24.3	46.0	-21.7
1.076	3.9	20.2	24.1	46.0	-21.9

Work Order:	GRAP0001	Date:	05/20/11		
Project:	None	Temperature:	23.5 °C		
Job Site:	EV07	Humidity:	29.1		
Serial Number:	A2	Barometric Pres.:	1017.7 mb	 <b>Tested by:</b> Dan Haas	
EUT:	DLTORO				
Configuration:	3 - Conducted Emissions Configuration, 50ohm termination				
Customer:	Graphic Products				
Attendees:	Bob Martell, Div Tummala				
EUT Power:	120VAC/60Hz				
Operating Mode:	RFID Tx.				
Deviations:	None				
Comments:	50ohm termination in place of antenna.				
<b>Test Specifications</b> FCC 15.207:2011			<b>Test Method</b> ANSI C63.10:2009		
Run #	4	Line:	High Line	Ext. Attenuation:	20
				Results	Pass

Peak Data - vs - Quasi Peak Limit



Peak Data - vs - Average Limit



Peak Data - vs - Quasi Peak Limit

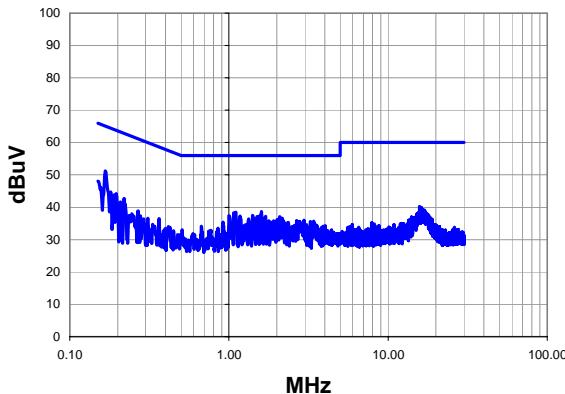
Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
1.616	19.1	20.2	39.3	56.0	-16.7
3.440	18.0	20.2	38.2	56.0	-17.8
1.512	18.0	20.2	38.2	56.0	-17.8
2.176	17.8	20.2	38.0	56.0	-18.0
0.165	26.9	20.2	47.1	65.2	-18.1
1.448	17.6	20.2	37.8	56.0	-18.2
2.088	17.3	20.2	37.5	56.0	-18.5
3.336	17.2	20.2	37.4	56.0	-18.6
1.088	17.2	20.2	37.4	56.0	-18.6
0.150	27.1	20.2	47.3	66.0	-18.7
1.704	17.0	20.2	37.2	56.0	-18.8
2.856	16.8	20.2	37.0	56.0	-19.0
16.720	20.1	20.9	41.0	60.0	-19.0
16.130	20.1	20.8	40.9	60.0	-19.1
15.710	20.1	20.8	40.9	60.0	-19.1
2.824	16.6	20.2	36.8	56.0	-19.2
2.768	16.6	20.2	36.8	56.0	-19.2
15.630	20.0	20.8	40.8	60.0	-19.2
1.784	16.6	20.2	36.8	56.0	-19.2
1.992	16.6	20.2	36.8	56.0	-19.2

Peak Data - vs - Average Limit

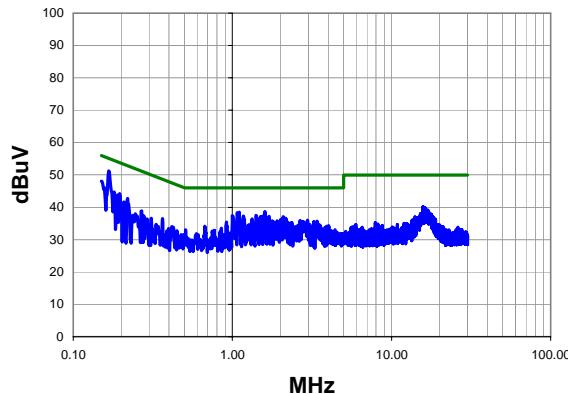
Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
1.616	19.1	20.2	39.3	46.0	-6.7
3.440	18.0	20.2	38.2	46.0	-7.8
1.512	18.0	20.2	38.2	46.0	-7.8
2.176	17.8	20.2	38.0	46.0	-8.0
0.165	26.9	20.2	47.1	55.2	-8.1
1.448	17.6	20.2	37.8	46.0	-8.2
2.088	17.3	20.2	37.5	46.0	-8.5
3.336	17.2	20.2	37.4	46.0	-8.6
1.088	17.2	20.2	37.4	46.0	-8.6
0.150	27.1	20.2	47.3	56.0	-8.7
1.704	17.0	20.2	37.2	46.0	-8.8
2.856	16.8	20.2	37.0	46.0	-9.0
16.720	20.1	20.9	41.0	50.0	-9.0
16.130	20.1	20.8	40.9	50.0	-9.1
15.710	20.1	20.8	40.9	50.0	-9.1
2.824	16.6	20.2	36.8	46.0	-9.2
2.768	16.6	20.2	36.8	46.0	-9.2
15.630	20.0	20.8	40.8	50.0	-9.2
1.784	16.6	20.2	36.8	46.0	-9.2
1.992	16.6	20.2	36.8	46.0	-9.2

Work Order:	GRAP0001	Date:	05/20/11	
Project:	None	Temperature:	23.5 °C	
Job Site:	EV07	Humidity:	29.1	
Serial Number:	A2	Barometric Pres.:	1017.7 mb	Tested by: Dan Haas
EUT:	DLTORO			
Configuration:	3 - Conducted Emissions Configuration, 50ohm termination			
Customer:	Graphic Products			
Attendees:	Bob Martell, Div Tummala			
EUT Power:	120VAC/60Hz			
Operating Mode:	RFID Tx.			
Deviations:	None			
Comments:	50ohm termination in place of antenna.			
Test Specifications		Test Method		
FCC 15.207:2011		ANSI C63.10:2009		
Run #	5	Line:	Neutral	Ext. Attenuation:
			20	Results
				Pass

Peak Data - vs - Quasi Peak Limit



Peak Data - vs - Average Limit



Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
0.167	31.1	20.2	51.3	65.1	-13.8
1.600	18.5	20.2	38.7	56.0	-17.3
1.104	18.3	20.2	38.5	56.0	-17.5
0.150	27.9	20.2	48.1	66.0	-17.9
1.408	17.3	20.2	37.5	56.0	-18.5
1.000	17.2	20.2	37.4	56.0	-18.6
1.176	17.1	20.2	37.3	56.0	-18.7
1.704	17.0	20.2	37.2	56.0	-18.8
1.528	17.0	20.2	37.2	56.0	-18.8
2.088	16.9	20.2	37.1	56.0	-18.9
2.160	16.4	20.2	36.6	56.0	-19.4
0.196	24.1	20.2	44.3	63.8	-19.5
1.328	16.2	20.2	36.4	56.0	-19.6
0.181	24.5	20.2	44.7	64.5	-19.8
2.008	16.0	20.2	36.2	56.0	-19.8
15.770	19.3	20.8	40.1	60.0	-19.9
2.968	15.8	20.2	36.0	56.0	-20.0
0.220	22.6	20.2	42.8	62.8	-20.1
2.664	15.7	20.2	35.9	56.0	-20.1
16.210	19.0	20.8	39.8	60.0	-20.2

Peak Data - vs - Average Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
0.167	31.1	20.2	51.3	55.1	-3.8
1.600	18.5	20.2	38.7	46.0	-7.3
1.104	18.3	20.2	38.5	46.0	-7.5
0.150	27.9	20.2	48.1	56.0	-7.9
1.408	17.3	20.2	37.5	46.0	-8.5
1.000	17.2	20.2	37.4	46.0	-8.6
1.176	17.1	20.2	37.3	46.0	-8.7
1.704	17.0	20.2	37.2	46.0	-8.8
1.528	17.0	20.2	37.2	46.0	-8.8
2.088	16.9	20.2	37.1	46.0	-8.9
2.160	16.4	20.2	36.6	46.0	-9.4
0.196	24.1	20.2	44.3	53.8	-9.5
1.328	16.2	20.2	36.4	46.0	-9.6
0.181	24.5	20.2	44.7	54.5	-9.8
2.008	16.0	20.2	36.2	46.0	-9.8
15.770	19.3	20.8	40.1	50.0	-9.9
2.968	15.8	20.2	36.0	46.0	-10.0
0.220	22.6	20.2	42.8	52.8	-10.1
2.664	15.7	20.2	35.9	46.0	-10.1
16.210	19.0	20.8	39.8	50.0	-10.2