



# Compliance Testing, LLC

Previously Flom Test Lab

EMI, EMC, RF Testing Experts Since 1963

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## Test Report

Prepared for: US Digital Media

Model: College Flash Drive

Description: USB Drives

To

FCC Part 15B

Class B

And

IC ICES-003

Date of Issue: May 3, 2012

On the behalf of the applicant:

US Digital Media  
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Attention of:

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Project ID: p1240001

John Erhard  
Project Test Engineer

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All results contained herein relate only to the sample tested.



### Test Report Revision History

Revision	Date	Revised By	Reason for Revision
1.0	5/3/12	John Erhard	Original Document



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**The applicant has been cautioned as to the following**

**FCC**

15.21 – Information to user

The user's manual or instruction manual for an intentional radiator shall caution the user that changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

15.27(a) – Special Accessories

Equipment marketed to a consumer must be capable of complying with the necessary regulations in the configuration in which the equipment is marketed. Where special accessories such as shielded cables and/or special connectors are required to enable an unintentional or intentional radiator to comply with the emission limits in the part, the equipment must be marketed with, i.e. shipped and sold with, those special accessories. However, in lieu of shipping or packaging the special accessories with the unintentional or intentional radiator, the responsible party may employ other methods of ensuring that the special accessories are provided to the consumer without an additional charge.

Information detailing any alternative method used to supply the special accessories for a grant of equipment authorization or retained in the verification records, as appropriate. The party responsible for the equipment, as detailed in §2.909 of this chapter, shall ensure that these special accessories are provided with the equipment. The instruction manual for such devices shall include appropriate instructions on the first page of text concerned with the installation of the device that these special accessories must be used with the device. It is the responsibility of the user to use the needed special accessories supplied with the equipment.

**Industry Canada**

Products subject to Industry Canada ICES-003 must be labeled in English and/or French (based on the intended market and any other applicable provincial or federal regulations) as follows:

This Class B digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classes B est conforme à la norme NMB-o003 du Canada.



## ILAC / A2LA

Compliance Testing, LLC, has been accredited in accordance with the recognized International Standard ISO/IEC 17025:2005. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer joint ISO-ILAC-IAF Communiqué dated January 2009)

The tests results contained within this test report all fall within our scope of accreditation, unless noted below.

Please refer to <http://www.compliancetesting.com/labscope.html> for current scope of accreditation.

Testing Certificate Number: **2152.01**



FCC OATS Reg, #933597

IC Reg. #2044A-1

**Non-accredited tests contained in this report:**

N/A



**Test and Measurement Data**

Sub-part 2.1033(b)

All tests and measurement data shown were performed in accordance with FCC Rule Parts: 15.107, 15.109; Unintentional Radiators.

All tests and measurement data shown are deemed satisfactory evidence of compliance with Industry Canada Interference-Causing Equipment Standard ICES-003.

Name of Test	FCC Section	ICES-003
A/C Powerline Conducted Emissions	15.107	Section 5
Radiated Emissions	15.109	Section 5

**Standard Test Conditions and Engineering Practices**

Except as noted herein, the following conditions and procedures were observed during the testing

In accordance with ANSI C63.4-2009, and unless otherwise indicated in the specific measurement results, the ambient temperature of the actual EUT was maintained within the range of 10° to 40 ° C (50 ° to 104 ° F) unless the particular equipment requirements specify testing over a different temperature range. Also, unless otherwise indicated, the humidity levels were in the range of 10% to 90% relative humidity.

Environmental Conditions	
Temperature Range (° C)	Humidity Range (%)
26.37 C	19.72%

Prior to testing, the EUT was tuned up in accordance with the manufacturer’s alignment procedures. All external gain controls were maintained at the position of maximum and/or optimum gain throughout the testing.

Measurement results, unless otherwise noted, are worst case measurement.



## **EUT Description**

**Model:** College Flash Drive

**Description:** USB Drives

**Firmware:** N/A

**Software:** N/A

**Additional Information:** USB drive model numbers

### **Short PCB**

U4100X – Dog Tag (Military) Case

C0041X – Rubber Shaped Case

U1200X – Credit Card Style Case

U3000X – Key Style Case

### **Long PCB**

U1300X – Supreme (White Capped) Case

## **EUT Operation during Tests**

Two devices were tested for radiated emissions: the U1300X and the U3000X, which exhibited the worst case emissions for each PCB size and package style. All devices were tested simultaneously for AC conducted emissions.

A commercially available software drive imaging package (imageUSB) was utilized for testing as it could write to all drives simultaneously and verify the status of the drive after the completion of the write process.



**Accessories:**

Qty	Description	Mfg	Model	S/N
1	Laptop	HP	G62	N/A
1	USB Hub	D-Link	DUB-17	B10B3A5001217

**Cables:**

Qty	Description	Length (M)	Shielding Y/N	Shielded Hood Y/N	Termination
4	USB	12 in	No	No	N/A

**Modifications: None**

**15.203: Antenna Requirement:**

- The antenna is permanently attached to the EUT
- The antenna uses a unique coupling
- The EUT must be professionally installed
- The antenna requirement does not apply





## Test Summary

Specification	Test Name	Pass, Fail, N/A	Comments
15.107	A/C Powerline Conducted Emissions	Pass	
15.109	Radiated Emissions	Pass	



### 15.107 A/C Powerline Conducted Emissions

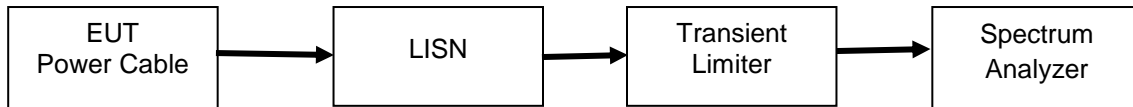
Name of Test: A/C Powerline Conducted Emissions  
Test Equipment Utilized: i00123, i00270, i00362, i00379

Engineer: John Erhard  
Test Date: 5/1/2012

#### Test Procedure

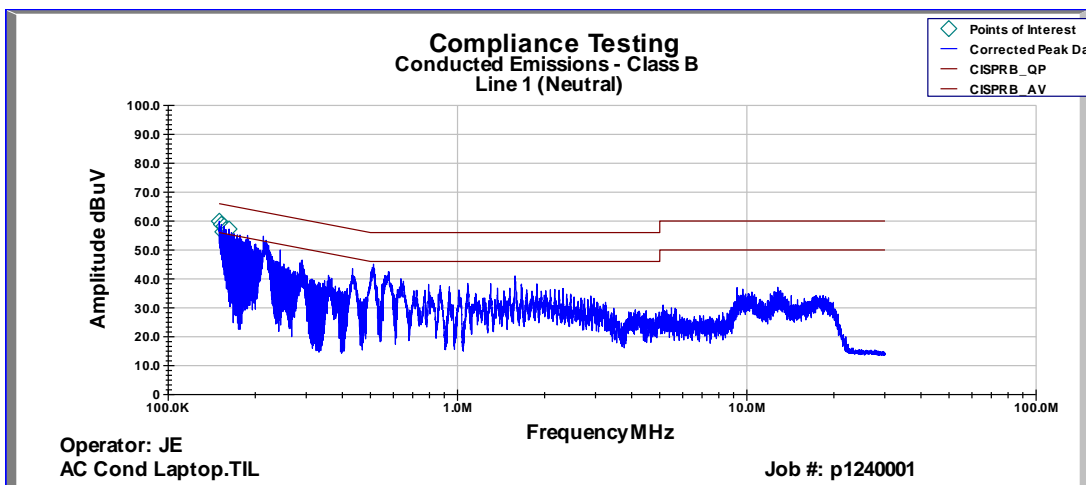
The EUT power cable was connected to a LISN and the monitored output of the LISN was connected to a transient limiter, which then connected directly to a spectrum analyzer. The conducted emissions from 150 kHz to 30 MHz were measured and compared to the specification limits.

#### Test Setup

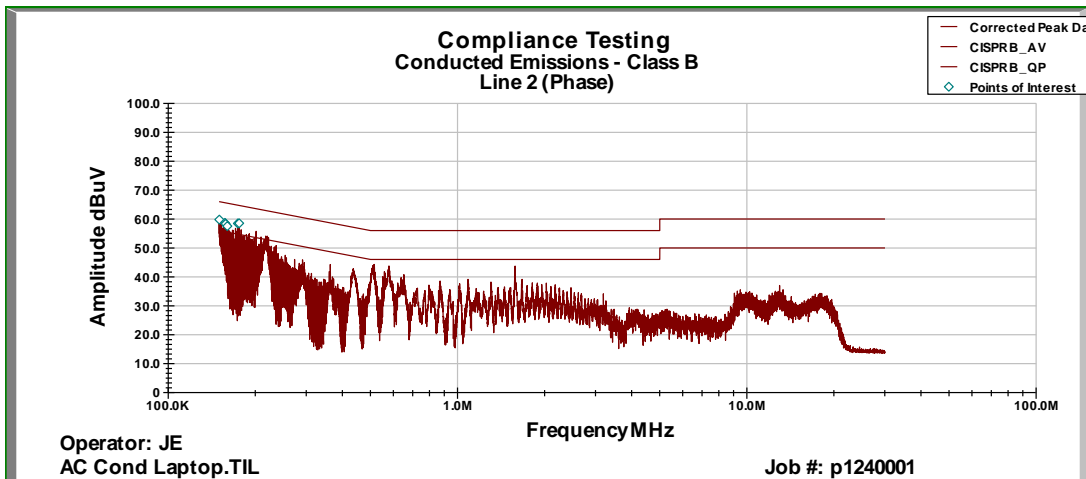


#### Laptop AC Conducted Emissions

##### Line 1 Peak Plot



##### Line 2 Peak Plot





**Line 1 Neutral Avg. Detector**

Frequency	Measured Value (dBuV)	LISN Corr. Factor (dB)	Cable Loss (dB)	Transient Limiter (dB)	L1 Final Data (dBuV)	Limit (dBuV)	Avg. Margin (dB)
150.82 KHz	27.16	0.29	0.020	10.200	37.675	55.977	-18.301
150.63 KHz	27.81	0.29	0.020	10.200	38.324	55.982	-17.658
150.61 KHz	27.97	0.29	0.020	10.200	38.481	55.983	-17.502
150.16 KHz	29.03	0.30	0.020	10.200	39.545	55.996	-16.450
150.01 KHz	29.16	0.30	0.020	10.200	39.683	56.000	-16.317
150.0 KHz	29.89	0.30	0.020	10.200	40.410	56.000	-15.590

**Line 2 Phase Avg. Detector**

Frequency	Measured Value (dBuV)	LISN Corr. Factor (dB)	Cable Loss (dB)	Transient Limiter (dB)	L2 Final Data (dBuV)	Limit (dBuV)	Avg. Margin (dB)
157.91 KHz	16.02	0.22	0.020	10.200	26.464	55.774	-29.310
154.95 KHz	19.92	0.25	0.020	10.200	30.394	55.859	-25.465
151.02 KHz	28.00	0.29	0.020	10.200	38.506	55.971	-17.464
150.3 KHz	29.59	0.30	0.020	10.200	40.110	55.992	-15.881
150.24 KHz	29.92	0.30	0.020	10.200	40.441	55.993	-15.552
150.11 KHz	30.20	0.30	0.020	10.200	40.719	55.997	-15.278

**Line 1 Neutral QP Detector**

Frequency	Measured Value (dBuV)	LISN Corr. Factor (dB)	Cable Loss (dB)	Transient Limiter (dB)	L1 Final Data (dBuV)	Limit (dBuV)	QP Margin (dB)
150.82 KHz	42.720	0.292	0.020	10.200	53.232	65.977	-12.745
150.63 KHz	43.330	0.294	0.020	10.200	53.844	65.982	-12.138
150.61 KHz	43.490	0.294	0.020	10.200	54.004	65.983	-11.979
150.16 KHz	44.330	0.298	0.020	10.200	54.848	65.996	-11.147
150.01 KHz	44.240	0.300	0.020	10.200	54.760	66.000	-11.240
150.0 KHz	45.250	0.300	0.020	10.200	55.770	66.000	-10.230

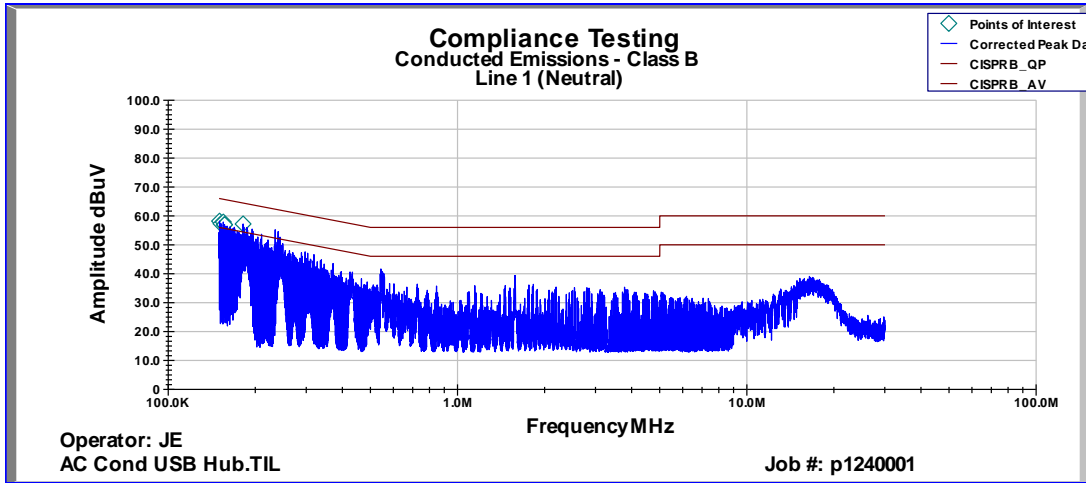
**Line 2 Phase QP Detector**

Frequency	Measured Value (dBuV)	LISN Corr. Factor (dB)	Cable Loss (dB)	Transient Limiter (dB)	L2 Final Data (dBuV)	Limit (dBuV)	QP Margin (dB)
157.91 KHz	38.22	0.22	0.020	10.200	48.661	65.774	-17.113
154.95 KHz	39.39	0.25	0.020	10.200	49.861	65.859	-15.998
151.02 KHz	42.79	0.29	0.020	10.200	53.300	65.971	-12.671
150.3 KHz	44.35	0.30	0.020	10.200	54.867	65.992	-11.125
150.24 KHz	44.13	0.30	0.020	10.200	54.648	65.993	-11.346
150.11 KHz	44.63	0.30	0.020	10.200	55.149	65.997	-10.848

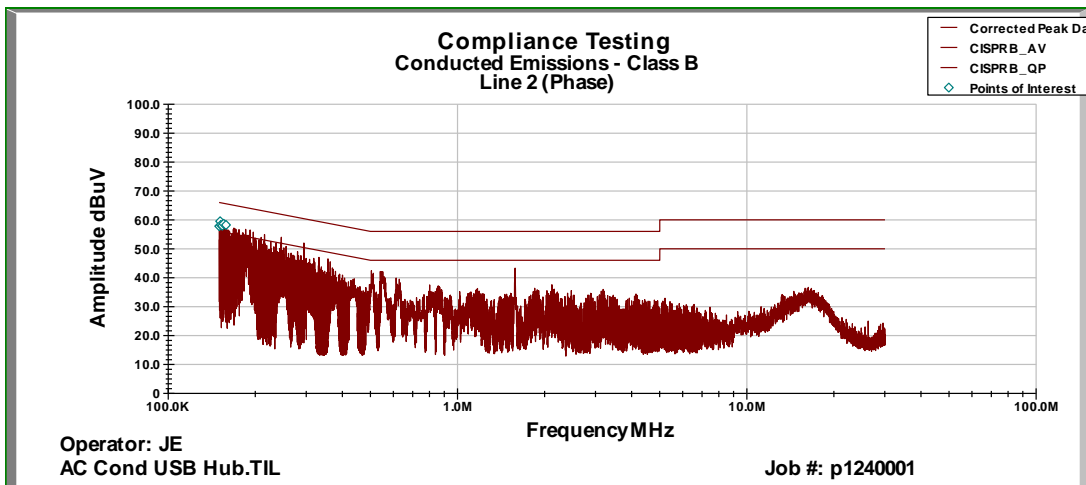


### USB HUB AC Conducted Emissions

#### Line 1 Peak Plot



#### Line 2 Peak Plot





**Line 1 Neutral Avg. Detector**

Frequency	Measured Value (dBuV)	LISN Corr. Factor (dB)	Cable Loss (dB)	Transient Limiter (dB)	L1 Final Data (dBuV)	Limit (dBuV)	Avg. Margin (dB)
181.54 KHz	29.48	0.20	0.020	10.100	39.797	55.099	-15.302
156.39 KHz	12.11	0.24	0.020	10.200	22.563	55.817	-33.255
153.37 KHz	12.69	0.27	0.020	10.200	23.180	55.904	-32.724
153.07 KHz	12.68	0.27	0.020	10.200	23.173	55.912	-32.740
152.46 KHz	12.83	0.28	0.020	10.200	23.325	55.930	-32.604
151.91 KHz	12.83	0.28	0.020	10.200	23.331	55.945	-32.615

**Line 2 Phase Avg. Detector**

Frequency	Measured Value (dBuV)	LISN Corr. Factor (dB)	Cable Loss (dB)	Transient Limiter (dB)	L2 Final Data (dBuV)	Limit (dBuV)	Avg. Margin (dB)
153.59 KHz	13.06	0.26	0.020	10.200	23.547	55.897	-32.350
152.46 KHz	13.06	0.28	0.020	10.200	23.559	55.930	-32.371
152.06 KHz	12.93	0.28	0.020	10.200	23.426	55.941	-32.515
151.01 KHz	13.79	0.29	0.020	10.200	24.297	55.971	-31.675
150.45 KHz	13.86	0.30	0.020	10.200	24.379	55.987	-31.608
150.15 KHz	13.46	0.30	0.020	10.200	23.979	55.996	-32.017

**Line 1 Neutral QP Detector**

Frequency	Measured Value (dBuV)	LISN Corr. Factor (dB)	Cable Loss (dB)	Transient Limiter (dB)	L1 Final Data (dBuV)	Limit (dBuV)	QP Margin (dB)
181.54 KHz	39.510	0.200	0.020	10.100	49.830	65.099	-15.269
156.39 KHz	38.640	0.236	0.020	10.200	49.096	65.817	-16.721
153.37 KHz	38.490	0.266	0.020	10.200	48.976	65.904	-16.927
153.07 KHz	39.570	0.269	0.020	10.200	50.059	65.912	-15.853
152.46 KHz	38.790	0.275	0.020	10.200	49.285	65.930	-16.644
151.91 KHz	39.140	0.281	0.020	10.200	49.641	65.945	-16.305

**Line 2 Phase QP Detector**

Frequency	Measured Value (dBuV)	LISN Corr. Factor (dB)	Cable Loss (dB)	Transient Limiter (dB)	L2 Final Data (dBuV)	Limit (dBuV)	QP Margin (dB)
153.59 KHz	38.79	0.26	0.020	10.200	49.274	65.897	-16.623
152.46 KHz	39.90	0.28	0.020	10.200	50.395	65.930	-15.534
152.06 KHz	39.50	0.28	0.020	10.200	49.999	65.941	-15.942
151.01 KHz	39.94	0.29	0.020	10.200	50.450	65.971	-15.521
150.45 KHz	39.42	0.30	0.020	10.200	49.935	65.987	-16.052
150.15 KHz	39.80	0.30	0.020	10.200	50.319	65.996	-15.677



### 15.109 Radiated Emissions

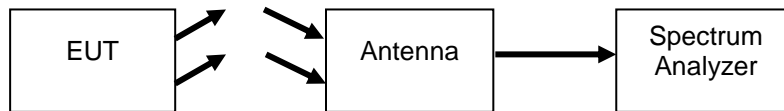
**Name of Test:** Radiated Emissions  
**Test Equipment Utilized:** i00033, i00267

**Engineer:** John Erhard  
**Test Date:** 5/2/2012

#### Test Procedure

The EUT was tested in an Open Area Test Site (OATS) set 3m from the receiving antenna. A spectrum analyzer was used to verify that the EUT met the requirements for Radiated Emissions. The EUT was tested by rotating it 360 degrees with the antennas in both the vertical and horizontal orientation while raised from 1 to 4 meters to ensure the signal levels were maximized. All emissions from 30 MHz to 1 GHz were examined.

#### Test Setup



#### Settings

RBW = 120 KHz

VBW = 300 KHz

Detector – Quasi Peak

#### Sample Calculations

Corrected Value = Measured Value + Correction factor

Correction factor = ACF + Cable loss



### U3000X Radiated Emissions

Emission Freq (MHz)	Measured Value (dBuV/m)	Corr Factor (dB)	Corr Value (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Polarity (V/H)	Antenna Height (cm)	Turntable Position (deg)
166.023	15.790	11.684	27.474	43.500	-16.026	H	103	90
232.698	19.280	12.403	31.683	46.000	-14.317	H	165	311
291.665	21.640	15.016	36.656	46.000	-9.344	H	183	361
500.030	15.830	20.357	36.187	46.000	-9.813	H	98	296
722.680	5.470	23.519	28.989	46.000	-17.011	H	98	296
960.037	24.530	27.191	51.721	53.900	-2.179	H	201	29

### U1300X Radiated Emissions

Emission Freq (MHz)	Measured Value (dBuV/m)	Corr Factor (dB)	Corr Value (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Polarity (V/H)	Antenna Height (cm)	Turntable Position (deg)
37.100	6.390	16.414	22.804	40.000	-17.196	H	98	296
237.100	10.350	12.787	23.137	46.000	-22.863	H	98	296
272.900	12.370	14.783	27.153	46.000	-18.847	H	98	296
441.850	7.510	18.748	26.258	46.000	-19.742	H	98	296
653.100	5.090	22.525	27.615	46.000	-18.385	H	98	296
832.650	6.370	25.242	31.612	46.000	-14.388	H	98	296



### A/C Conducted Emissions Test Setup Photos







### Radiated Emissions Test Setup Photos





### Test Equipment Utilized

Description	Manufacturer	Model Number	CT Asset #	Last Cal Date	Cal Due Date
EMI Receiver	HP	8546A	i00033	12/20/11	12/20/12
Transient Limiter	Com-Power	LIT-930	i00123	Verified on:5/1/2012	
Bilog Antenna	Schaffner	CBL6111C	i00267	12/19/11	12/19/13
LISN	FCC	FCC-LISN-50-32-2-01	i00270	9/30/10	9/30/12
Humidity / Temp Meter	Newport	IBTHX-W-5	i00282	11/5/11	11/5/12
Humidity / Temp Meter	Control Company	4189CC	i00355	1/11/12	1/11/13
AC Power Source	Behlman	BL 6000	i00362	Verified on:5/1/2012	
Spectrum Analyzer	Agilent	E7405A	i00379	12/14/11	12/14/12

In addition to the above listed equipment standard RF connectors and cables were utilized in the testing of the described equipment. Prior to testing these components were tested to verify proper operation.

END OF TEST REPORT