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# Test Report

Report No EL0846-1

Client Mobile Aspects  
Khang Le

Address 24 South 18<sup>th</sup> Suite 300  
Pittsburgh, PA 15203

Phone 412-325-1690

Items tested iRISupply 5.0 RFID supply cabinet system  
FCC ID R4FIRISUPPLY50  
FRN 0010877447  
Standards FCC 47 CFR Part 15.225

Test Dates June 21<sup>st</sup>, 22<sup>rd</sup>, and August 9<sup>th</sup>, 2011

Results As detailed within this report

Prepared by

John Cushing – Test Engineer

Authorized by

Mairaj Hussain – EMC Supervisor

Issue Date

August 11, 2011

Conditions of Issue

This Test Report is issued subject to the conditions stated in the 'Conditions of Testing' section on page 17 of this report.

Curtis-Straus LLC is accredited by the American Association for Laboratory Accreditation for the specific scope of accreditation under Certificate Number 1627-01. This report may contain data which is not covered by the A2LA accreditation.



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Form Final Report REV 8-18-08 (DW)



**Summary**

This test report supports an application for certification of a transmitter operating pursuant to 47 CFR 15.225. The product is the Mobile Aspects iRISupply 5.0 RFID supply cabinet system. The transmitter operates at 13.56MHz.

The unit consists of a master cabinet and as many as six auxiliary cabinets, each containing one of two possible antennas. Under operation, only one antenna will function at a time, so a two-cabinet system utilizing one of each type of antenna was used for testing. Fundamental readings were taken on both antennas, and spurious emissions were taken on the worst offender.

The transmitter used is the FEIG Electronic ID ISC.LRM2500-A/B Reader Module (FCC ID PJMLRM2500). Frequency stability was not performed on the iRISupply 5.0 because Mobile Aspects uses the FEIG radio with their own antennas. The test report for the FEIG radio is attached with this application.

**Test Methodology**

Radiated emission testing was performed according to the procedures specified in ANSI C63.4 (2003). Emissions were maximized by rotating the system around its vertical axis as well as varying the test antenna’s height and polarity. The EUT antenna was maximized separately by varying the height at which it was installed in the cabinet.

Frequency range investigated:	0.009MHz – 10.6GHz	
Measurement distance:	0.15 - 30MHz	Conducted
	0.09 – 30MHz	3m (loop antenna)
	30MHz – 10.6GHz	3m

AC Line conducted emissions testing was performed with a 50Ω/50μH LISN.



**Statement of Conformity**

The iRISupply 5.0 RFID supply cabinet system has been found to conform to the following parts of 47 CFR as detailed below:

Part 2	Part 15	Comments
	15.15(b)	There are no controls accessible to the user that vary the output power.
2.925	15.19	The label is shown in the label exhibit.
	15.21	Information to the user is shown in the instruction manual exhibit.
	15.27	No special accessories are required for compliance.
	15.31(e)	Frequency stability and voltage variation were performed on the system. Please see attached test report for Feig radio.
	15.203	This product is professionally installed.
	15.205 15.209	The fundamental is not in a Restricted band and the spurious and harmonic emissions in the Restricted bands comply with the general emission limits of 15.209.
	15.207	The unit meets the AC conducted emissions requirements of 15.207.
	15.225(a-d)	The unit complies with these requirements as shown in this test report
	15.225(e)	See attached PJMLRM2500 Test Report for frequency stability test data (p 33).



### EUT Configuration

EUT Configuration											
Work Order: L0846 Company: Mobile Aspects Company Address: 24 South 18th, Suite 300 Pittsburgh, PA 15203, Contact: Khang Le Person Present: Khang Le											
<b>MN</b>			<b>PN</b>				<b>SN</b>				
EUT:			iRISupply 5.0				--				Test Sample 1
EUT Description: Mobile Inventory Cabinet Using RFID Technology EUT Max Frequency: 13.56 MHz (RFID Reader) and 2.4 GHz (PC)											
<b>Support Equipment:</b>			<b>MN</b>				<b>SN</b>				
PC			OT7570				1XQ8L61				
<b>EUT Ports:</b>											
Port Label	Port Type	No. of ports	No. Populated	Cable Type	Shielded	Ferrites	Length	Max Length	In/Out NEBS Type	Unpopulated Reason	
AC Main	AC	1	All	3-wire AC	No	None	3m	3m	In		
Ethernet	Ethernet	1	All	Cat5	No	None	10m	100m	In		
<b>Software / Operating Mode Description:</b>											
Transmitting on each of the two available antennas at EUT's highest output power.											



**Fundamental Measurements**

**LIMITS**

Frequency Range (MHz)	Limit @ 30m (µV/m)	Limit @ 30m (dBµV/m)
13.553-13.567	15,848	83.9
13.410-13.553 13.567-13.710	334	50.4
13.110-13.410 13.710-14.010	106	40.5

[15.225(a-c)]

**Note:** If Peak measurements meet Quasi-Peak limits, then Quasi-Peak measurements are not required.

The limits of 15.209 apply outside the range 13.110-14.010 MHz.

**MEASUREMENTS**

<b>Radiated Emissions Table</b>									
Date: 09-Aug-11		Company: Mobile Aspects			Work Order: L0846				
Engineer: John Cushing		EUT Desc: iRISupply 5.0			EUT Operating Voltage/Frequency: 120V/60Hz				
Temp: 25.0 °C		Humidity: 34%			Pressure: 1000mBar				
Frequency Range: 13.56MHz					Measurement Distance: 3 m				
Notes:					EUT Max Freq: 2.4GHz				
Antenna Polarization (0° - 90°)	Frequency (MHz)	Reading (dBµV)	Preamp Factor (dB)	Antenna Factor (dB/m)	Cable Factor (dB)	Adjusted Reading (dBµV/m)	47 CFR 15.225		
							Limit (dBµV/m)	Margin (dB)	Result (Pass/Fail)
Antenna A1	0	63.5	25.5	39.6	0.4	78.0	123.99	-46.0	Pass
	90	57.9	25.5	39.6	0.4	72.4	123.99	-51.6	Pass
Antenna A2	0	60.8	25.5	39.6	0.4	75.3	123.99	-48.7	Pass
	90	59.4	25.5	39.6	0.4	73.9	123.99	-50.1	Pass
<b>Table Result:</b> Pass by -48.8 dB									
Test Site: EMI Chamber 1		Cable 1: Asset #1505			Cable 2: EMIR-HIGH-21				
Analyzer: Asset #1328		Preamp: Orange			Antenna: Sm Loop (high)				

Peak measurements were taken using each antenna in the two-antenna system. Subsequent testing was performed with Antenna A1 active, as it generated the worst case emissions.

No other emissions were detected in any of the other frequency ranges listed above.

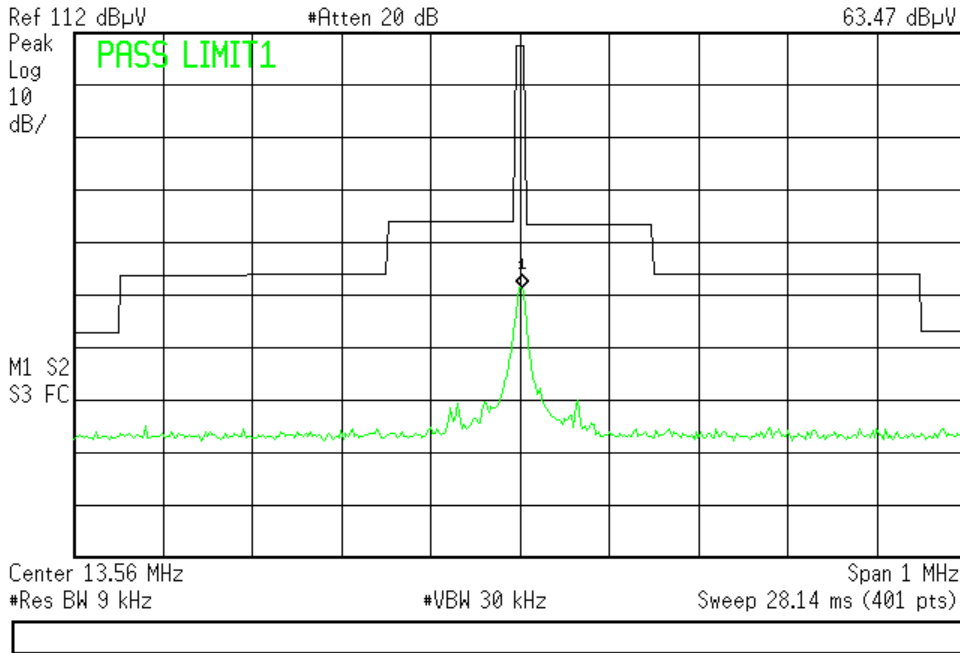


### EMISSION MASK

Agilent 14:10:57 Aug 9, 2011

R T

Mkr1 13.5625 MHz  
63.47 dB $\mu$ V

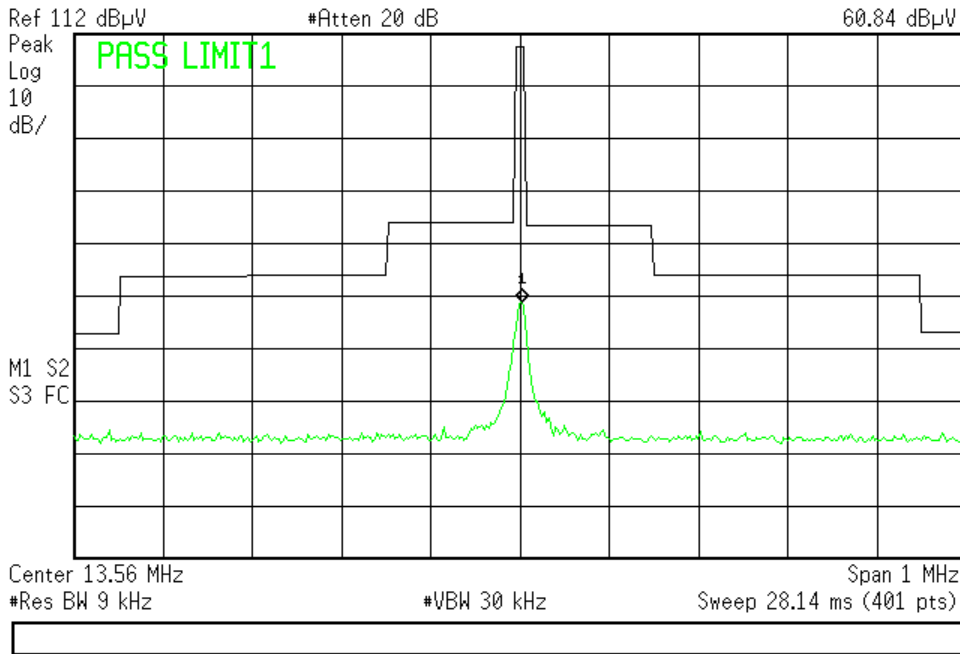


Antenna A1

Agilent 14:43:57 Aug 9, 2011

R T

Mkr1 13.5625 MHz  
60.84 dB $\mu$ V



Antenna A2



### Radiated Spurious Emissions

#### LIMITS

“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” [15.225(d)]

Bandwidth Settings:

0.009-30MHz                      RBW= 9 kHz, VBW= 30 kHz  
 30-140MHz                        RBW= 120 kHz, VBW= 300 kHz

“...Field strength of radiated emissions from *unintentional radiators* at a distance of 3 meters shall not exceed the following values: .etc in § 15.109(a)

Bandwidth Settings:

30-1000MHz                      RBW= 120 kHz, VBW= 1 MHz  
 Above 1000MHz                RBW= 1 MHz, VBW= 3 MHz

#### MEASUREMENTS

##### Intentional Radiator - 0.01 to 135.6 MHz

Radiated Emissions Table									
Date: 09-Aug-11		Company: Mobile Aspects			Work Order: L0846				
Engineer: John Cushing		EUT Desc: iRISupply 5.0			EUT Operating Voltage/Frequency: 120V/60Hz				
Temp: 25.0°C		Humidity: 34%			Pressure: 1000mBar				
Frequency Range: 13.56 - 30MHz					Measurement Distance: 3 m				
Notes: Antenna A1 active									
Antenna Polarization (0° - 90°)	Frequency (MHz)	Reading (dBµV)	Preamp Factor (dB)	Antenna Factor (dB/m)	Cable Factor (dB)	Adjusted Reading (dBµV/m)	47 CFR 15.209 (a)		
							Limit (dBµV/m)	Margin (dB)	Result (Pass/Fail)
90	27.12	25.2	25.4	38.0	0.5	38.3	69.5	-31.2	Pass
<b>Table Result:</b>		Pass		by		-31.2 dB		<b>Worst Freq:</b> 27.12 MHz	
Test Site: EMI Chamber 1		Cable 1: Asset #1505			Cable 2: EMIR-HIGH-21				
Analyzer: Gold		Preamp: Orange			Antenna: Sm Loop (high)				





<b>Radiated Emissions Table</b>									
<b>Date:</b> 05-Aug-11		<b>Company:</b> Mobile Aspects			<b>Work Order:</b> L0846				
<b>Engineer:</b> John Cushing		<b>EUT Desc:</b> iRISupply 5.0			<b>EUT Operating Voltage/Frequency:</b> 120V/60Hz				
<b>Temp:</b> 24.4°C		<b>Humidity:</b> 38%			<b>Pressure:</b> 1011mBar				
<b>Frequency Range:</b> 30 - 135.6MHz					<b>Measurement Distance:</b> 3 m				
<b>Notes:</b> Antenna A1 active									
Antenna Polarization (H / V)	Frequency (MHz)	Reading (dBµV)	Preamp Factor (dB)	Antenna Factor (dB/m)	Cable Factor (dB)	Adjusted Reading (dBµV/m)	47 CFR 15.209 (a)		
							Limit (dBµV/m)	Margin (dB)	Result (Pass/Fail)
V	40.68	44.1	25.4	13.2	0.6	32.5	40.0	-7.5	Pass
V	54.24	41.3	25.3	7.1	0.7	23.8	40.0	-16.2	Pass
V	67.8	43.6	25.3	8.1	0.7	27.1	40.0	-12.9	Pass
H	81.36	32.7	25.3	7.6	0.7	15.7	40.0	-24.3	Pass
V	94.92	39.2	25.3	8.7	0.8	23.4	43.5	-20.1	Pass
H	108.48	33.1	25.3	12.1	0.8	20.7	43.5	-22.8	Pass
H	122.04	39.3	25.3	13.9	0.9	28.8	43.5	-14.7	Pass
H	135.6	36.9	25.4	13.6	0.9	26.0	43.5	-17.5	Pass
<b>Table Result:</b> Pass by -7.5 dB <b>Worst Freq:</b> 40.68 MHz									
<b>Test Site:</b> EMI Chamber 1			<b>Cable 1:</b> Asset #1505			<b>Cable 2:</b> EMIR-HIGH-21			
<b>Analyzer:</b> Gold			<b>Preamp:</b> Orange			<b>Antenna:</b> Red-Black			



### Unintentional Radiator - 30 – 12000 MHz

Radiated Emissions Table												
Date: 21-Jun-11			Company: Mobile Aspects				Work Order: L0846					
Engineer: Ahmed Ahmed			EUT Desc: iRISupply 5.0				EUT Operating Voltage/Frequency: 120V/60Hz					
Temp: 25°C			Humidity: 28%				Pressure: 1003mBar					
Frequency Range: 30-1000MHz						Measurement Distance: 3 m						
Notes: Antenna A1 active.												EUT Max Freq: 2.4GHz
Antenna Polarization (H/V)	Frequency (MHz)	Reading (dBuV)	Preamp Factor (dB)	Antenna Factor (dB/m)	Cable Factor (dB)	Adjusted Reading (dBuV/m)	---			FCC Class B		
							Limit (dBuV/m)	Margin (dB)	Result (Pass/Fail)	Limit (dBuV/m)	Margin (dB)	Result (Pass/Fail)
V	31.37	38.4	22.8	20.1	0.4	36.1	---	---	---	40.0	-3.9	Pass
V	36.32	36.9	22.8	16.5	0.4	31.0	---	---	---	40.0	-9.0	Pass
V	45.78	44.1	22.9	9.9	0.4	31.5	---	---	---	40.0	-8.5	Pass
V	47.1	42.3	22.9	9.2	0.4	29.0	---	---	---	40.0	-11.0	Pass
V	49.38	46.2	22.9	8.1	0.4	31.8	---	---	---	40.0	-8.2	Pass
V	50.42	48.4	22.8	7.8	0.4	33.7	---	---	---	40.0	-6.3	Pass
V	60.1	41.0	22.8	7.7	0.4	26.3	---	---	---	40.0	-13.7	Pass
V	69.04	40.0	22.8	8.0	0.4	25.6	---	---	---	40.0	-14.4	Pass
V	79.91	43.6	22.8	7.7	0.5	29.0	---	---	---	40.0	-11.0	Pass
H	87.4	38.0	22.8	7.4	0.5	23.1	---	---	---	40.0	-16.9	Pass
V	92.62	51.0	22.8	8.1	0.5	36.8	---	---	---	43.5	-6.7	Pass
V	244.1	48.2	22.8	11.6	0.8	37.8	---	---	---	46.0	-8.2	Pass
V	271.0	48.0	22.8	13.1	0.9	39.2	---	---	---	46.0	-6.8	Pass
V	298.3	45.6	22.8	13.3	0.9	37.0	---	---	---	46.0	-9.0	Pass
V	300.0	41.0	22.8	13.3	0.9	32.4	---	---	---	46.0	-13.6	Pass
V	366.7	48.5	22.6	14.9	1.0	41.8	---	---	---	46.0	-4.2	Pass
Vbb	417.6	44.6	22.7	16.2	1.0	39.1	---	---	---	46.0	-6.9	Pass
V	639.9	36.0	22.4	19.6	1.3	34.5	---	---	---	46.0	-11.5	Pass
H	745.8	36.3	22.1	20.5	1.6	36.3	---	---	---	46.0	-9.7	Pass

**Table Result:** Pass by -3.9 dB **Worst Freq:** 31.37 MHz

Test Site: EMI Chamber 1 **Cable 1:** Asset #1522 **Cable 2:** Asset #1505  
 Analyzer: Asset #1328 **Preamp:** Blue **Antenna:** Red-Black

Radiated Emissions Table														
Date: 21-Jun-11			Company: Mobile Aspects				Mobile Aspects				Work Order: L0846			
Engineer: Ahmed Ahmed			EUT Desc: iRISupply 5.0				iRISupply 5.0				EUT Operating Voltage/Frequency: 120V/60Hz			
Temp: 25°C			Humidity: 28%				Pressure: 1003mBar							
Frequency Range: 1-6GHz						Measurement Distance: 3 m								
Notes: Antenna A1 active.												EUT Max Freq: 2.4GHz		
Antenna Polarization (H/V)	Frequency (MHz)	Peak Reading (dBuV)	Average Reading (dBuV)	Preamp Factor (dB)	Antenna Factor (dB/m)	Cable Factor (dB)	Adjusted Peak Reading (dBuV/m)	Adjusted Avg Reading (dBuV/m)	FCC Class B High Frequency - Peak			FCC Class B High Frequency - Average		
									Limit (dBuV/m)	Margin (dB)	Result (Pass/Fail)	Limit (dBuV/m)	Margin (dB)	Result (Pass/Fail)
V	1012.5	48.35	24.0	22.0	24.7	2.4	53.5	29.1	74.0	-20.5	Pass	54.0	-24.9	Pass
V	1120.0	42.0	26.0	21.1	26.0	2.6	49.5	33.5	74.0	-24.5	Pass	54.0	-20.5	Pass
V	1395.0	40.0	23.0	20.6	26.0	2.5	47.9	30.9	74.0	-26.1	Pass	54.0	-23.1	Pass
V	1600.0	38.0	27.0	20.0	26.1	2.7	46.8	35.8	74.0	-27.2	Pass	54.0	-18.2	Pass
V	1745.0	48.0	21.0	20.0	26.8	3.2	58.0	31.0	74.0	-16.0	Pass	54.0	-23.0	Pass
V	3000.0	39.0	24.3	21.9	30.5	3.9	51.5	36.8	74.0	-22.5	Pass	54.0	-17.2	Pass

**Table Result:** Pass by -16.0 dB **Worst Freq:** 1745.0 MHz

Test Site: EMI Chamber 1 **Cable 1:** Asset #1507 **Cable 2:** Asset #1505  
 Analyzer: Asset #1328 **Preamp:** Brown **Antenna:** Black Horn

Radiated Emissions Table														
Date: 21-Jun-11			Company: Mobile Aspects				Mobile Aspects				Work Order: L0846			
Engineer: Ahmed Ahmed			EUT Desc: iRISupply 5.0				iRISupply 5.0				EUT Operating Voltage/Frequency: 120V/60Hz			
Temp: 25°C			Humidity: 28%				Pressure: 1003mBar							
Frequency Range: 6-12GHz						Measurement Distance: 1 m								
Notes: Antenna A1 active.												EUT Max Freq: 2.4GHz		
Antenna Polarization (H/V)	Frequency (MHz)	Peak Reading (dBuV)	Average Reading (dBuV)	Preamp Factor (dB)	Antenna Factor (dB/m)	Cable Factor (dB)	Adjusted Peak Reading (dBuV/m)	Adjusted Avg Reading (dBuV/m)	CISPR Class B High Frequency - Peak			FCC Class B High Frequency - Average		
									Limit (dBuV/m)	Margin (dB)	Result (Pass/Fail)	Limit (dBuV/m)	Margin (dB)	Result (Pass/Fail)
No emissions found														

**Table Result:** --- by --- dB **Worst Freq:** --- MHz

Test Site: EMI Chamber 1 **Cable 1:** Asset #1507 **Cable 2:** Asset #1505  
 Analyzer: Asset #1328 **Preamp:** Brown **Antenna:** Black Horn



### AC Line Conducted Emission Measurements

#### LIMITS

Frequency of emission (MHz)	Quasi-peak limit (dBµV)	Average limit (dBµV)
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

\*Decreases with the logarithm of the frequency.

[47 CFR 15.207(a)]

#### MEASUREMENTS

AC Mains Conducted Emissions											
Date: 22-Jun-11			Company: Mobile Aspects			Work Order: L0846					
Engineer: John Cushing			EUT Desc: iRISupply 5.0			Test Site: CEM11					
Temp: 23.8°C			Humidity: 39%			Pressure: 1010mBar					
Notes:											
Measurement Device: Asset #1492 LISN						EUT Operating Voltage/Frequency: 120V/60Hz					
Range: 0.15-30MHz						Spectrum Analyzer: Yellow					
Frequency (MHz)	Q.P. Readings		Ave. Readings		Impedance Factor (dB)	FCC/CISPR B		FCC/CISPR B		Overall Result (Pass/Fail)	
	QP1 (dBµV)	QP2 (dBµV)	AV1 (dBµV)	AV2 (dBµV)		qp Limit (dBµV)	qp Margin dB	AVE Limit (dBµV)	AVE Margin dB		
Antenna A1 is active											
0.17	32.3	32.6	31.8	32.1	20.3	65.0	-12.1	55.0	-2.6	Pass	
0.27	7.9	8.3	4.8	6.2	20.2	61.0	-32.5	51.0	-24.6	Pass	
10.84	1.6	3.3	-6.0	-5.3	20.3	60.0	-36.4	50.0	-35.0	Pass	
13.56	42.9	42.5									
16.89	17.4	17.3	7.6	7.7	20.4	60.0	-22.2	50.0	-21.9	Pass	
25.20	30.2	30.3	21.9	22.0	20.6	60.0	-9.1	50.0	-7.4	Pass	
28.37	26.6	26.7	19.8	19.9	20.6	60.0	-12.7	50.0	-9.5	Pass	
Feed terminated with 50Ω											
13.56	7.9	7.6	3.0	2.9	20.3	60.0	-31.8	50.0	-26.7	Pass	
<b>Table Result:</b>		Pass	by	-2.60 dB	<b>Worst Freq:</b>				0.17 MHz		



### Measurement Uncertainty

The listed uncertainties are the worst case uncertainty for the entire range of measurement. Please note that the uncertainty values are provided for informational purposes only and are not used in determining the PASS/FAIL results.

Measurement	Expanded Uncertainty k=2	Maximum allowable uncertainty
Radiated Emissions (30-1000MHz)		
NIST	5.6dB	N/A
CISPR	4.6dB	5.2dB (Ucisp)
Radiated Emissions (1-26.5GHz)	4.6dB	N/A
Radiated Emissions (above 26.5GHz)	4.9dB	N/A
Magnetic Radiated Emissions	5.6dB	N/A
Conducted Emissions		
NIST	3.9dB	N/A
CISPR	3.6dB	3.6dB (Ucisp)
Telco Conducted Emissions (Current)	2.9dB	N/A
Telco Conducted Emissions (Voltage)	4.4dB	N/A
Electrostatic Discharge	11.5%	N/A
Radiated RF Immunity (Uniform Field)	1.6dB	N/A
Electrical Fast Transients	23.1%	N/A
Surge	23.1%	N/A
Conducted RF Immunity	3dB	N/A
Magnetic Immunity	12.8%	N/A
Dips and Interrupts	2.3V	N/A
Harmonics	3.5%	N/A
Flicker	3.5%	N/A
Radio frequency (@ 2.4GHz)	$3.23 \times 10^{-8}$	$1 \times 10^{-7}$
RF power, conducted	0.40dB	0.75dB
Maximum frequency deviation:		
• Within 300Hz and 6kHz of audio frequency / Within 6kHz and 25kHz of audio frequency	3.4% 0.3dB	5% 3dB
Adjacent channel power	1.9dB	3dB
Conducted spurious emission of transmitter, valid up to 12.75GHz	2.39dB	3dB
Conducted emission of receivers	1.3dB	3dB
Radiated emission of transmitter, valid up to 26.5GHz	3.9dB	6dB
Radiated emission of transmitter, valid up to 80GHz	3.3dB	6dB
Radiated emission of receiver, valid up to 26.5GHz	3.9dB	6dB
Radiated emission of receiver, valid up to 80GHz	3.3dB	6dB
Humidity	2.37%	5%
Temperature	0.7°C	1.0°C
Time	4.1%	10%
RF Power Density, Conducted	0.4dB	3dB
DC and low frequency voltages	1.3%	3%
Voltage (AC, <10kHz)	1.3%	2%
Voltage (DC)	0.62%	1%

The above reflects a 95% confidence level



### Test Equipment Used

Rev: 9-Aug-2011

Spectrum Analyzers / Receivers /Preselectors		Range	MN	Mfr	SN	Asset	Cat	Calibration Due
Yellow		9kHz-2.9GHz	8594E	Agilent	3523A01958	100	I	21-Mar-2012
Gold		100Hz-26.5 GHz	E4407B	Agilent	MY45113816	1284	I	Out of Service
SA EMI Chamber (1328)		9kHz-13.2 GHz	E4405B	Agilent	MY44210241	1328	I	4-Mar-2012
Radiated Emissions Sites		FCC Code	IC Code	VCCI Code			Cat	Calibration Due
EMI Chamber 1		719150	2762A-6	R-3032, G-106			I	12-Mar-2013
Antennas		Range	MN	Mfr	SN	Asset	Cat	Calibration Due
Red-Black Bilog		30-2000MHz	JB1	Sunol	A091604-2	1106	I	3-Dec-2012
Black Horn		1-18GHz	3115	EMCO	9703-5148	56	I	29-Jun-2013
Small Loop		10kHz-30MHz	PLA-130/A	ARA	1024	755	I	26-Mar-2012
Large Loop		20Hz-5MHz	6511	EMCO	9704-1154	67	I	29-Mar-2012
Meteorological Meters			MN	Mfr	SN	Asset	Cat	Calibration Due
Temp./Humidity/Atm. Pressure Gauge			7400 Perception II	Davis	N/A	965	I	4-Apr-2013
CEMI1 Thermohygrometer			35519-044	Control Company	72457738	1335	II	18-Aug-2011
CHAMBER1 Thermohygrometer			35519-044	Control Company	72457642	1345	II	18-Aug-2011
Conducted Test Sites (Mains / Telco)		FCC Code		VCCI Code			Cat	Calibration Due
CEMI 1		719150		C-3360, T-1575			III	NA
LISNs/Measurement Probes		Range	MN	Mfr	SN	Asset	Cat	Calibration Due
230VAC LISN Asset 1492		10kHz-50MHz	9252-50-R-24-BNC	Solar	84713	1492	I	19-Apr-2012
Preamps /Couplers Attenuators / Filters		Range	MN	Mfr	SN	Asset	Cat	Calibration Due
Blue		0.009-2000MHz	ZFL-1000-LN	CS	N/A	759	II	1-Jun-2012
Orange		0.009-2000MHz	ZFL-1000-LN	CS	N/A	765	II	20-Jun-2012
Brown		1-18GHz	CS	CS	N/A	1523	II	1-Aug-2012
Cables		Range		Mfr			Cat	Calibration Due
Asset #1505		9kHz - 18GHz		Florida RF			II	18-Aug-2011
Asset #1522		9kHz - 26.5GHz		Florida RF			II	17-Sep-2011
CEMI-03		9kHz - 2GHz		C-S			II	23-Sep-2011
REMI-High-21		9kHz - 26.5GHz		C-S			II	18-Jan-2012

All equipment is calibrated using standards traceable to NIST or other nationally recognized calibration standard.



## Jurisdictional Labeling and Required Instruction Manual Inserts

### FCC Requirements

#### Required Equipment Authorization for Device Type

Type of Device	Equipment Authorization Required
TV broadcast receiver	Verification
FM broadcast receiver	Verification
CB receiver	Declaration of Conformity or Certification
Superregenerative receiver	Declaration of Conformity or Certification
Scanning receiver	Certification
Radar detector	Certification
All other receivers subject to part 15	Declaration of Conformity or Certification
TV interface device	Declaration of Conformity or Certification
Cable system terminal device	Declaration of Conformity
Stand-alone cable input selector switch	Verification
Class B personal computers and peripherals	Declaration of Conformity or Certification
CPU boards and internal power supplies used with Class B personal computers	Declaration of Conformity or Certification
Class B personal computers assembled using authorized CPU boards or power supplies	Declaration of Conformity
Class B external switching power supplies	Verification
Other Class B digital devices & peripherals	Verification
Class A digital devices, peripherals & external switching power supplies	Verification
Access Broadband over Power Line (Access BPL)	Certification
All other devices	Verification

#### FCC Required labeling for Verified Devices 47 CFR Part 15.19

Verified devices must have the following label permanently affixed in a location accessible to the user:

*This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.*

No distinction is made between Class A or Class B devices on the label.

When the device is so small or for such use that it is not practicable to place label on it, the information shall be placed in a prominent location in the instruction manual supplied to the user or, alternatively, shall be placed on the container in which the device is marketed.

Where a device is constructed in two or more sections connected by wires and marketed together, the label is only required to be affixed to the main control unit.

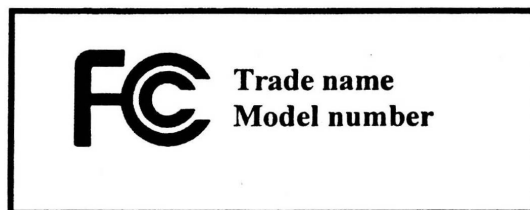


## FCC Required labeling for Class B Personal Computers and Peripherals Devices 47 CFR Part 15.19 subject to Declaration of Conformity

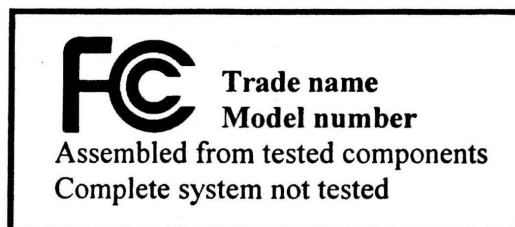
Personal computers and peripherals subject to authorization under a Declaration of Conformity shall be labeled as follows:

(1) The label shall be located in a conspicuous location on the device and shall contain the unique identification described in Section 2.1074 and the following logo:

(i) If the product is authorized based on testing of the product or system:



(ii) If the product is authorized based on assembly using separately authorized components and the resulting product is not separately tested:



(2) When the device is so small or for such use that it is not practicable to place the statement specified under paragraph (b)(1) of this section on it, such as for a CPU board or a plug-in circuit board peripheral device, the text associated with the logo may be placed in a prominent location in the instruction manual or pamphlet supplied to the user. However, the unique identification (trade name and model number) and the logo must be displayed on the device.

(3) The label shall not be a stick-on, paper label. The label on these products shall be permanently affixed to the product and shall be readily visible to the purchaser at the time of purchase, as described in Section 2.925(d). "Permanently affixed" means that the label is etched, engraved, stamped, silk-screened, indelibly printed, or otherwise permanently marked on a permanently attached part of the equipment or on a nameplate of metal, plastic, or other material fastened to the equipment by welding, riveting, or a permanent adhesive. The label must be designed to last the expected lifetime of the equipment in the environment in which the equipment may be operated and must not be readily detachable.

## FCC Required Instruction Manual Inserts CFR 47 Part 15.21 and 15.105

The user's manual must caution the user that changes or modifications not expressly approved by the manufacturer could void the user's FCC granted authority to operate the equipment. In addition the following information should be inserted:

(a) For a Class A digital device or peripheral, the instructions furnished the user shall include the following or similar statement, placed in a prominent location in the text of the manual:

*Note: this equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.*

(b) For a Class B digital device or peripheral, the instructions furnished the user shall include the following or similar statement, placed in a prominent location in the text of the manual:

*Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:*

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

(c) The provisions of paragraphs (a) and (b) of this section do not apply to digital devices exempted from the technical standards under the provisions of § 15.103.

(d) For systems incorporating several digital devices, the statement shown in paragraph (a) or (b) of this section needs to be contained only in the instruction manual for the main control unit.

Our facility codes can be found in the *Test Equipment Used* Section starting on page 12.





## Conditions Of Testing

**[Bureau Veritas Consumer Products Services, Inc., a Massachusetts corporation]**, and/or its affiliates (collectively, the "Company") will conduct, at the request of the Submitter ("**Client**"), the tests specified on the submitted Test Request Form or equivalent in accordance with, and subject to, the following terms and conditions (collectively, "**Conditions**"):

1. All orders for tests are subject to acceptance by the Company, and no order will constitute a binding commitment of the Company unless and until such order is accepted by it, as evidenced by the issuance of a written report ("**Test Report**") by the Company. The Test Report is issued solely by the Company, is intended for the exclusive use of Client and shall not be published, used for advertising purposes, copied or replicated for distribution to any other person or entity or otherwise publicly disclosed without the prior written consent of the Company. By submitting a request for services to the Company, Client consents to the disclosure to accreditation bodies of those records of Client relevant to the accreditation body's assessment of the Company's competence and compliance with relevant accreditation criteria. The Company shall not be liable for any loss or damage whatsoever resulting from the failure of the Company to provide its services within any time period for completion estimated by the Company. If Client anticipates using the Test Report in any legal proceeding, arbitration, dispute resolution forum or other proceeding, it shall so notify the Company prior to submitting the Test Report in such proceeding. The Company has no obligation to provide a fact or expert witness at such proceeding unless the Company agrees in advance to do so for a separate and additional fee.
2. The Test Report will set forth the findings of the Company solely with respect to the test samples identified therein. Unless specifically and expressly indicated in the Test Report, the results set forth in such Test Report are not intended to be indicative or representative of the quality or characteristics of the lot from which a test sample is taken, and Client shall not rely upon the Test Report as being so indicative or representative of the lot or of the tested product in general. The Test Report will reflect the findings of the Company at the time of testing only, and the Company shall have no obligation to update the Test Report after its issuance. The Test Report will set forth the results of the tests performed by the Company based upon the written information provided to the Company. The Test Report will be based solely on the samples and written information submitted to the Company by Client, and the Company shall not be obligated to conduct any independent investigation or inquiry with respect thereto.
3. The Company may, in its sole discretion, destroy samples which have been furnished to the Company for testing and which have not been destroyed in the course of testing. The Company may delegate the performance of all or a portion of the services contemplated hereunder to an affiliate, agent or subcontractor of the Company, and Client consents to such delegation.
4. These Conditions and the Test Report represent the entire understanding of the parties hereto with respect to the subject matter hereof and of the Test Report, and no modification, variance or extrapolation with respect thereto shall be permitted without the prior written consent of the Company.
5. The names, service marks, trademarks and copyrights of the Company and its affiliates, including the names "**BUREAU VERITAS**," "**BUREAU VERITAS CONSUMER PRODUCTS SERVICES**," "**BVCPS**," "**MTL**," "**ACTS**," "**MTL-ACTS**" and "**CURTIS-STRAUS**" (collectively, the "**Marks**") are and shall remain the sole property of the Company or its affiliates and shall not be used by Client except solely to the extent that Client obtains the prior written approval of the Company and then only in the manner prescribed by the Company. Client shall not contest the validity of the Marks or take any action that might impair the value or goodwill associated with the Marks or the image or reputation of the Company or its affiliates.
6. Payment in full shall be due 30 days after the date of invoice. Interest shall be due on overdue amounts from the due date until paid at an interest rate of 1.5% per month or, if less, the maximum rate permitted by law. The Company reserves the right, at any time and from time to time, to revoke any credit extended to Client. Client shall reimburse the Company for any costs it incurs in collecting past due amounts, including court costs and fees and expenses of attorneys and collection agencies. The Test Report may not be used or relied upon by Client if and for so long as Client fails to pay when due any invoice issued by the Company or any affiliate of it to Client or any affiliate or subsidiary of Client together with interest and penalties, if any, accrued thereon.
7. The Company disclaims any and all responsibility or liability arising out of or in connection with e-mail transmissions of such information.
8. Client understands and agrees that the Company is neither an insurer nor a guarantor, that the Company does not take the place of Client or any designer, manufacturer, agent, buyer, distributor or transportation or shipping company, and that the Company disclaims all liability in such capacities. Client further understands that if it seeks assurance against loss or damage, it should obtain appropriate insurance.
9. Client agrees that the Company, by providing the services, does not take the place of Client nor any third party, nor does the Company release them from any of their obligations, nor does the Company otherwise assume, abridge, abrogate or undertake to discharge any duty of any third party to Client or any duty of Client or any third party to any other third party, and Client will not release any third party from its obligations and duties with respect to the tested goods.
10. Client shall, on a timely basis, (a) provide adequate instructions to the Company in order to enable the Company to perform properly its services, (b) provide, or cause Client's suppliers and contractors to provide, the Company with all documents necessary to enable the Company to perform its services, (c) furnish the Company with all relevant information regarding Client's intended use and purposes of the tested goods, (d) advise the Company of essential dates and deadlines relevant to the tested goods and (e) fully exercise all rights and remedies available to Client against third parties in respect of the tested goods.
11. The Company shall undertake due care and ordinary skill in the performance of its services to Client, and the Company shall accept responsibility only where such skill has not been exercised and, even in such event, only to the extent of the limitation of liability set forth herein.
12. If Client desires to assert a claim arising from or relating to (i) the performance, purported performance or non-performance of any services by the Company or (ii) the sale, resale, manufacture, distribution or use of any tested goods, it must submit that claim to the Company in a writing that sets forth with particularity the basis for such claim within 60 days from discovery of the potential claim and not more than six months after the date of issuance of the Test Report to Client. Client waives any and all such claims including, without limitation, claims that the Test Report is inaccurate, incomplete or misleading or that additional or different testing is required, unless and then only to the extent that Client submits a written claim to the Company within both such time periods.



13. CLIENT SHALL, EXCEPT TO THE EXTENT OF COMPANY'S LIABILITY TO CLIENT HEREUNDER (WHICH IN NO EVENT SHALL EXCEED THE LIMITATION OF LIABILITY HEREIN), HOLD HARMLESS AND INDEMNIFY THE COMPANY, ITS AFFILIATES AND THEIR RESPECTIVE DIRECTORS, OFFICERS, EMPLOYEES, AGENTS AND SUBCONTRACTORS AGAINST ALL ACTUAL OR ALLEGED THIRD PARTY CLAIMS FOR LOSS, DAMAGE OR EXPENSE OF WHATSOEVER NATURE AND HOWSOEVER ARISING FROM OR RELATING TO (i) THE PERFORMANCE, PURPORTED PERFORMANCE OR NON-PERFORMANCE OF ANY SERVICES BY THE COMPANY OR (ii) THE SALE, RESALE, MANUFACTURE, DISTRIBUTION OR USE OF ANY TESTED GOODS.

14. EXCEPT AS MAY OTHERWISE BE EXPRESSLY AGREED TO IN WRITING BY THE COMPANY AND NOTWITHSTANDING ANY PROVISION TO THE CONTRARY CONTAINED HEREIN OR IN ANY TEST REPORT, NO WARRANTY OR GUARANTEE, EXPRESS OR IMPLIED, INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR USE, IS MADE.

15. (A) IN NO EVENT WHATSOEVER SHALL THE COMPANY BE LIABLE FOR ANY CONSEQUENTIAL, SPECIAL, INCIDENTAL, EXEMPLARY OR PUNITIVE DAMAGES IN CONNECTION WITH, RELATING TO OR ARISING OUT OF THE TEST REPORT OR THE SERVICES PROVIDED BY THE COMPANY HEREUNDER, INCLUDING WITHOUT LIMITATION LOSS OF OR DAMAGE TO PROPERTY; LOSS OF INCOME, PROFIT OR USE; OR ANY CLAIMS OR DEMANDS MADE AGAINST CLIENT OR ANY OTHER PERSON BY ANY THIRD PARTY IN CONNECTION WITH, RELATING TO OR ARISING OUT OF THE SERVICES PROVIDED BY THE COMPANY HEREUNDER.

(B) NOTWITHSTANDING ANY PROVISION TO THE CONTRARY CONTAINED HEREIN, AND IN RECOGNITION OF THE RELATIVE RISKS AND BENEFITS TO CLIENT AND THE COMPANY ASSOCIATED WITH THE TESTING SERVICES CONTEMPLATED HEREBY, THE RISKS HAVE BEEN ALLOCATED SUCH THAT UNDER NO CIRCUMSTANCES WHATSOEVER SHALL THE LIABILITY OF THE COMPANY TO CLIENT OR ANY THIRD PARTY IN RESPECT OF ANY CLAIM FOR LOSS, DAMAGE OR EXPENSE, OF WHATSOEVER NATURE OR MAGNITUDE, AND HOWSOEVER ARISING, EXCEED AN AMOUNT EQUAL TO FIVE (5) TIMES THE AMOUNT OF THE FEES PAID TO THE COMPANY FOR THE SPECIFIC SERVICES WHICH GAVE RISE TO SUCH CLAIM OR U.S.\$10,000, WHICHEVER IS THE LESSER AMOUNT.

16. The Company shall not be liable for any loss or damage resulting from any delay or failure in performance of its obligations hereunder resulting directly or indirectly from any event of force majeure or any event outside the control of the Company. If any such event occurs, the Company may immediately cancel or suspend its performance hereunder without incurring any liability whatsoever to Client.

17. Company's services, including these Conditions, shall be governed by, and construed in accordance with, the local laws of the country where the Company performs the tests or, in the case of tests performed in the United States of America, the laws of Massachusetts without regard to conflicts of laws principles. If any aspect(s) of these Conditions is found to be illegal or unenforceable, the validity, legality and enforceability of all remaining aspects of these Conditions shall not in any way be affected or impaired thereby. Any proceeding related to the subject matter hereof shall be brought, if at all, in the courts of the country where the Company performs the tests or, in the case of tests performed in the United States of America, in the courts of Massachusetts. Client waives the right to interpose any counterclaim or setoffs of any nature in any litigation arising hereunder.

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