Test Report

Curtis-Straus LLC, *a wholly owned subsidiary of BV CPS*

Report No	EP2079-1
Client	Tyco Safety Products/Sensormatic
Address	6 Technology Pk Drive Westford, Ma 01886
Phone	978 577-4000
Items tested	RM2L-4000-P126, RM2-4000-P126
Standards	FCC 15.209: GENERAL, FCC 15.225: 13.110-14.010MHz, Canada (RSS-210)
Test Dates	August 31 to September 2, 2015
Results	As detailed within this report
Prepared by	Evan Griffith – EMC Engineer
Authorized by	Arik Zwirner – EMC Supervisor
Issue Date	September 8, 2015
Conditions of Issue	This Test Report is issued subject to the conditions stated in the '*Conditions of Testing*' section on page 19 of this report.

Contents

Form CPS Final Report REV 28-MAR-12 (KK)

Regulatory Information

FRN number	0005052626
FCC ID	BVC-4000-PI26
IC	3506A-4000-PI26

Release Control Record

Issue No.	Reason for change	Date Issued
1	Original Issue	Spetmeber 8, 2015

Summary

On August 31st, September 1st and 2nd 2015 and we tested the RM2L-4000-P126 (4000 Enclosure) for compliance with the following requirements:

EMC Emissions:

- CFR 47 FCC Part 15.207 – Conducted limits
- CFR 47 FCC Part 15.209 - Radiated emission limits; general requirements
- CFR 47 FCC Part 15.225 - Radiated emission limits; general requirements
- RSS GEN - General Requirements and Information for the Certification of Radio Apparatus – Issue 3
- RSS 210 – License - exempt Radio Apparatus (All Frequency Bands): Category I Equipment -Issue 8

Two models of the 4000 Enclosure are represented in this report. Model RM2L-4000-P126 was tested, and the test results are considered representative of the second model, RM2-4000-P126. The difference between these is that the RM2L-4000-P126 has an LCD screen while the RM2-4000-P126 does not. All components of the RM2-4000-P126 (non-LCD) are included in the RM2L-4000-P126 (with LCD).

Product is an RFID system which operates at 125kHz and 13.56MHz. EUT emissions were maximized by rotating product around its axis and around 3 orthogonal axes. EUT antenna could not be maximized separately.

Testing was performed according to procedures outlined in Per ANSI C63.10 (2013)

Release Control Record

Issue No.	Reason for change	Date Issued
1	Original Issue	Spetmeber 8, 2015

Product Tested - Configuration Documentation

EUT Configuration			
Work Order:	P2079		
Company:	Software House, a Division of Sensormatic		
Company Address:	6 Technology Pk Drive		
	Westford, MA, 01886		
Contact:	Matt Burman		
	MN	**PN**	**SN**
EUT:	4000 Enclosure		
EUT Description:			
EUT Max Frequency:	185 MHz		
EUT Min Frequency:	0.125 MHz		
EUT ISM Frequency:			

EUT Components	**MN**	**SN**
4000 Enclosure	RM2L-4000-P126	651A1528 000839
4000 Enclosure	RM2-4000-P126	651A1517 000238

Port Label	Port Type	# ports	# populated	cable type	shielded	ferrites	length (m)	max length (m)	in/out	under test	comment
IN 1	other	1	1	other	No	No	1		in	yes	
IN 2	other	1	1	other	No	No	1		in	yes	
AC/DC Brick	Power AC	1	1	Power AC	Yes	No	1	3	in	yes	MN: PSAA15W-120V SN: P22704528A0
OUT 1	other	1	1	other	No	No	2		in	yes	
Out 2	other	1	1	other	No	No	2		in	yes	

Software Operating Mode Description:

Constantly transmitting at 125KHz and 13.56MHz searching for an RFID Response.

Performance Criteria:

Emissions Only.

Compliance Statement

RSS GEN	RSS 210	FCC §15.225		Compliant (Yes) / (No) / (NA)
	A2.6(a)	15.225(a)	The field strength of any emissions within the band 13.553-13.567 MHz shall not exceed 15,848 microvolts/meter at 30 meters.	Yes
	A2.6(b)	15.225(b)	Within the bands 13.410-13.553 MHz and 13.567-13.710 MHz, the field strength of any emissions shall not exceed 334 microvolts/meter at 30 meters.	Yes
	A2.6(c)	15.225(c)	Within the bands 13.110-13.410 MHz and 13.710-14.010 MHz the field strength of any emissions shall not exceed 106 microvolts/meter at 30 meters.	Yes
	A2.6(d)	15.225(d)	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.	Yes
		15.225(e)	The frequency tolerance of the carrier signal shall be maintained within ±0.01% of the operating frequency over a temperature variation of −20 degrees to +50 degrees C at normal supply voltage, and for a variation in the primary supply voltage from 85% to 115% of the rated supply voltage at a temperature of 20 degrees C. For battery operated equipment, the equipment tests shall be performed using a new battery.	Yes
4.7	A2.6	15.225(f)	In the case of radio frequency powered tags designed to operate with a device authorized under this section, the tag may be approved with the device or be considered as a separate device subject to its own authorization. Powered tags approved with a device under a single application shall be labeled with the same identification number as the device.	Yes, Tags were tested with the Device
5.3		15.15(b)	There are no controls accessible to the user that varies the output power above specified limits.	Yes
5.2		15.19	The label is shown in the label exhibit.	Yes
7.1.5		15.21	Information to the user is shown in the instruction manual.	Yes

		15.27	No special accessories are required for compliance.	Yes
		15.31	The EUT was tested in accordance with the measurement standards in this section.	Yes
		15.33	Frequency range was investigated according to this section, unless noted in specific rule section under which the equipment operates.	Yes
		15.35	The EUT emissions were measured using the measurement detector and bandwidth specified in this section, unless noted in specific rule section under which the equipment operates.	Yes
7.1.4		15.203	EUT employs an integral antenna.	Yes
	2.6	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.	Yes
7.2.2		15.207	EUT meets the AC Line conducted emissions requirements of	Yes
4.6.1			Occupied Bandwidth measurements were made	Yes

Test Results

AC Mains Conducted Emissions

Test Method

Per ANSI c63.10 (2013)

Test Data

AC Conducted Emissions

Date: 02-Sep-15 **Company:** Software House **Work Order:** P2079
Engineer: Evan Griffith **EUT Desc:** 4000 Enclosure
Temp: 23.1 ºC **Humidity:** 55% **Pressure:** 1007 mBar
Notes: Antenna Not Removed
Frequency Range: .15-30 MHz **EUT Input Voltage/Frequency:** 120V 60 Hz

	Quasi-Peak Readings		Average Readings		LISN Factors				FCC/CISPR Class B			FCC/CISPR Class B		
Frequency (MHz)	QP1 (dBµV)	QP2 (dBµV)	AVG1 (dBµV)	AVG2 (dBµV)	L1 (dB)	L2 (dB)	Cable Factor (dB)	ATTN Factor (dB)	QP Limit (dBµV)	Margin (dB)	Result (Pass/Fail)	AVG Limit (dBµV)	Margin (dB)	Result (Pass/Fail)
0.15	29.6	23.5	10.5	18.3	-0.2	-0.1	-0.1	-20.5	66.0	-15.6	Pass	56.0	-17.0	Pass
0.18	28.3	28.2	15.3	21.4	-0.1	-0.1	-0.1	-20.5	64.7	-15.7	Pass	54.7	-12.7	Pass
13.56	29.1	26.2	14.8	24.6	-0.1	-0.1	-0.2	-20.5	60.0	-10.1	Pass	50.0	-4.6	Pass
27.40	15.5	13.2	5.5	4.8	-0.1	-0.1	-0.3	-20.5	60.0	-23.6	Pass	50.0	-23.6	Pass
18.29	12.4	12.6	2.4	1.7	-0.1	-0.1	-0.3	-20.5	60.0	-26.6	Pass	50.0	-26.8	Pass
0.30	22.0	24.4	2.5	2.7	-0.1	0.0	-0.1	-20.5	60.4	-15.4	Pass	50.4	-27.1	Pass
									---	---	---	---	---	---

Result: Pass ***Worst Margin:*** -4.6 dB ***Frequency:*** 13.560 MHz

Measurement Device: LISN ASSET 1728(Line 1) LISN ASSET 1729(Line 2) **Cable:** CEMI-01 **Spectrum Analyzer:** Reference EMI Test Receiver
Attenuator: 20dB Attenuator-07 **Site:** CEMI 3

C-S CEMI Calculator Version 3.0.13 *Equipment Factor Sheet rev: 8/26/2015*

Rev. 8/27/2015

Spectrum Analyzers / Receivers /Preselectors	Range	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
MXE EMI Receiver	20Hz-8.4GHz	N9038A	Agilent	MY53290009	1168255	I	42537	42171
LISNs/Measurement Probes	Range	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
LISN Asset 1728	150kHz-30MHz	LI-150A	Com-Power	201084	1728	I	42467	42101
LISN Asset 1729	150kHz-30MHz	LI-150A	Com-Power	201085	1729	I	42467	42101
Conducted Test Sites (Mains / Telco)	FCC Code		VCCI Code			Cat	Calibration Due	Calibrated on
CEMI 3	719150		A-0015			III	NA	N/A
Meteorological Meters		MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
Weather Clock (Pressure Only)		BA928	Oregon Scientific	C3166-1	831	I	42448	41717
TH A#2085		HTC-1	HDE		2085	II	42462	42096
Cables	Range		Mfr			Cat	Calibration Due	Calibrated on
CEMI-01	9kHz - 2GHz		C-S			II	42261	41896
Attenuators	Range	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
20dB Attenuator-07	9kHz-2GHz	BW-N20W+	MCL	N/A		II	42471	42105

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

AC Mains Setup Pictures

See exhibit for test setup pictures.

Spurious Radiated Emissions

Test Method

Per ANSI c63.10 (2013)

Test Data

Radiated Emissions Table

Date: 31-Aug-15 **Company:** Software House, a Division of Sensormatic **Work Order:** P2079
Engineer: Ryan Brown **EUT Desc:** RM2L-4000 **EUT Operating Voltage/Frequency:** 120V/60Hz
Temp: 23.3°C **Humidity:** 56% **Pressure:** mBar
Frequency Range: .009-5MHz **Measurement Distance:** 3 m
Notes: EUT Standing up

Antenna Polarization (0° - 90°)	Frequency (MHz)	Reading (dBµV)	Preamp Factor (dB)	Antenna Factor (dB/m)	Cable Factor (dB)	Adjusted Reading (dBµV/m)	FCC Title 47 §15.209 Limit (dBµV/m)	FCC Title 47 §15.209 Margin (dB)	FCC Title 47 §15.209 Result (Pass/Fail)	--- Limit (dBµV/m)	--- Margin (dB)	--- Result (Pass/Fail)
0	0.009	11.4	-8.1	66.6	0.0	86.1	128.5	-42.4	---	---	---	---
0	0.061	7.9	25.6	53.0	0.0	35.3	111.9	-76.6	---	---	---	---
0	0.125	34.2	26.2	50.1	0.9	59.0	105.7	-46.7	---	---	---	---
0	0.241	9.8	26.0	49.0	0.8	33.6	100.0	-66.4	---	---	---	---
0	3.51	11.9	25.2	48.0	1.0	35.7	69.5	-33.8	---	---	---	---
0	1.91	11.4	25.3	48.0	0.6	34.7	69.5	-34.8	---	---	---	---
			---	---	---	---	---	---	---	---	---	---
90	4.34	12.5	25.1	48.2	0.8	36.4	69.5	-33.1	---	---	---	---
90	0.349	9.5	25.9	48.7	0.7	33.0	96.7	-63.7	---	---	---	---
90	0.125	29.5	26.2	50.1	0.9	54.3	105.7	-51.4	---	---	---	---
90	0.077	7.9	26.0	51.4	0.0	33.3	109.9	-76.6	---	---	---	---
90	0.012	10.8	0.6	64.6	0.0	74.8	126.0	-51.2	---	---	---	---
90	0.031	8.6	21.6	58.4	0.0	45.4	117.8	-72.4	---	---	---	---

Table Result: Pass by -33.1 dB ***Worst Freq:*** 4.34 MHz

Test Site: EMI Chamber 1 **Cable 1:** Asset #2054 **Cable 2:** Asset #2051 **Cable 3:** ---
Analyzer: Rental SA#2 **Preamp:** Red-White **Antenna:** Lg Loop **Preselector:** Asset #1511
CSsoft Radiated Emissions Calculator v 1.017.146

Adjusted Reading = Reading - Preamp Factor + Antenna Factor + Cable Factor

Radiated Emissions Table

Date: 31-Aug-15 **Company:** Software House, a Division of Sensormatic **Work Order:** P2079
Engineer: Ryan Brown **EUT Desc:** RM2L-4000 **EUT Operating Voltage/Frequency:** 120V/60Hz
Temp: 23.3°C **Humidity:** 56% **Pressure:** mBar
Frequency Range: 5-30MHz **Measurement Distance:** 3 m
Notes: EUT Standing up 185MHz

Antenna Polarization (0° - 90°)	Frequency (MHz)	Reading (dBµV)	Preamp Factor (dB)	Antenna Factor (dB/m)	Cable Factor (dB)	Adjusted Reading (dBµV/m)	--- Limit (dBµV/m)	--- Margin (dB)	--- Result (Pass/Fail)	FCC Title 47 §15.209 Limit (dBµV/m)	FCC Title 47 §15.209 Margin (dB)	FCC Title 47 §15.209 Result (Pass/Fail)
90	7.15	13.5	25.1	41.7	1.0	31.1			---	69.5	-38.4	Pass
0	22.12	16.5	25.1	37.8	1.2	30.4			---	69.5	-39.1	Pass

Table Result: Pass by -38.4 dB ***Worst Freq:*** 7.15 MHz

Test Site: EMI Chamber 1 **Cable 1:** Asset #2054 **Cable 2:** Asset #2051 **Cable 3:** ---
Analyzer: Rental SA#2 **Preamp:** Red-White **Antenna:** Sm Loop (high) **Preselector:** Asset #1511
CSsoft Radiated Emissions Calculator v 1.017.146

Adjusted Reading = Reading - Preamp Factor + Antenna Factor + Cable Factor

Radiated Emissions Table

Date: 31-Aug-15 **Company:** Software House, a Division of Sensormatic **Work Order:** P2079
Engineer: Ryan Brown **EUT Desc:** RM2L-4000 **EUT Operating Voltage/Frequency:** 120V/60Hz
Temp: 23.3°C **Humidity:** 56% **Pressure:** mBar
Frequency Range: 30-1000MHz **Measurement Distance:** 3 m
Notes: EUT Standing up **EUT Max Freq:** 185MHz

Antenna Polarization (H / V)	Frequency (MHz)	Reading (dBµV)	Preamp Factor (dB)	Antenna Factor (dB/m)	Cable Factor (dB)	Adjusted Reading (dBµV/m)	--- Limit (dBµV/m)	--- Margin (dB)	--- Result (Pass/Fail)	FCC Class B Limit (dBµV/m)	FCC Class B Margin (dB)	FCC Class B Result (Pass/Fail)
V	169.5	52.2	25.6	11.6	2.4	40.6	---	---	---	43.5	-2.9	Pass
V	158.5	49.2	25.5	12.3	2.5	38.5	---	---	---	43.5	-5.0	Pass
V	147.5	52.0	25.5	12.6	2.4	41.5	---	---	---	43.5	-2.0	Pass
			---	---	---	---	---	---	---	---	---	---
H	88.4	47.3	25.3	7.7	1.6	31.3	---	---	---	43.5	-12.2	Pass
H	110.5	46.4	25.3	12.7	1.9	35.7	---	---	---	43.5	-7.8	Pass
			---	---	---	---	---	---	---	---	---	---
RFIDs Turned Off			---	---	---	---	---	---	---	---	---	---
V	169.5	51.1	25.6	11.6	2.4	39.5	---	---	---	43.5	-4.0	Pass
V	158.5	49.0	25.5	12.3	2.5	38.3	---	---	---	43.5	-5.2	Pass
V	147.5	51.8	25.5	12.6	2.4	41.3	---	---	---	43.5	-2.2	Pass
V			---	---	---	---	---	---	---	---	---	---
			---	---	---	---	---	---	---	---	---	---
H	88.4	47.2	25.3	7.7	1.6	31.2	---	---	---	43.5	-12.3	Pass
H	110.5	45.9	25.3	12.7	1.9	35.2	---	---	---	43.5	-8.3	Pass
			---	---	---	---	---	---	---	---	---	---
Harmonics of 13.56MHz			---	---	---	---	---	---	---	---	---	---
V	40.68	28.4	25.1	13.3	1.4	18.0	---	---	---	40.0	-22.0	Pass
V	54.24	37.1	25.2	7.3	1.4	20.6	---	---	---	40.0	-19.4	Pass
V	67.8	36.0	25.4	8.1	1.5	20.2	---	---	---	40.0	-19.8	Pass
V	81.36	42.8	25.4	7.6	1.6	26.6	---	---	---	40.0	-13.4	Pass
V	94.92	48.6	25.3	8.9	1.6	33.8	---	---	---	43.5	-9.7	Pass
V	108.5	37.3	25.3	12.3	1.8	26.1	---	---	---	43.5	-17.4	Pass
V	122.04	27.6	25.4	14.1	2.0	18.3	---	---	---	43.5	-25.2	Pass
V	135.6	32.1	25.6	13.6	2.2	22.3	---	---	---	43.5	-21.2	Pass
			---	---	---	---	---	---	---	---	---	---
H	40.68	24.2	25.1	13.3	1.4	13.8	---	---	---	40.0	-26.2	Pass
H	54.24	34.1	25.2	7.3	1.4	17.6	---	---	---	40.0	-22.4	Pass
H	67.8	38.1	25.4	8.1	1.5	22.3	---	---	---	40.0	-17.7	Pass
H	81.36	49.1	25.4	7.6	1.6	32.9	---	---	---	40.0	-7.1	Pass
H	94.92	46.2	25.3	8.9	1.6	31.4	---	---	---	43.5	-12.1	Pass
H	108.5	31.0	25.3	12.3	1.8	19.8	---	---	---	43.5	-23.7	Pass
H	122.04	22.3	25.4	14.1	2.0	13.0	---	---	---	43.5	-30.5	Pass
H	135.6	28.0	25.6	13.6	2.2	18.2	---	---	---	43.5	-25.3	Pass
			---	---	---	---	---	---	---	---	---	---

Table Result: Pass by -2.0 dB ***Worst Freq:*** 147.5 MHz

Test Site: EMI Chamber 1 **Cable 1:** Asset #2054 **Cable 2:** Asset #2051 **Cable 3:** ---
Analyzer: Rental SA#2 **Preamp:** Red-White **Antenna:** Red-Brown **Preselector:** Asset #1511
CSsoft Radiated Emissions Calculator v 1.017.146

Adjusted Reading = Reading - Preamp Factor + Antenna Factor + Cable Factor

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Spectrum Analyzers / Receivers /Preselectors	Range	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
SA #2 (1860)	9kHz-26.5 GHz	E7405A	Agilent	MY45104916	1860	I	7/30/2016	7/30/2015

Radiated Emissions Sites	FCC Code	IC Code	VCCI Code	Range		Cat	Calibration Due	Calibrated on
EMI Chamber 1	719150	2762A-6	A-0015	30-1000MHz		II	3/21/2017	3/21/2015

Preamps /Couplers Attenuators / Filters	Range	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
Red-White	0.009-2000MHz	ZFL-1000-LN	CS	N/A	1258	II	12/26/2015	12/26/2014

Antennas	Range	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
Red-Brown Bilog	30-2000MHz	JB1	Sunol	A0032406	1218	I	12/4/2016	12/4/2014
Small Loop	10kHz-30MHz	PLA-130/A	ARA	1024	755	I	5/29/2016	5/29/2014
Large Loop	20Hz-5MHz	6511	EMCO	9704-1154	67	I	5/29/2016	5/29/2014

Meteorological Meters		MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
Weather Clock (Pressure Only)		BA928	Oregon Scientific	C3166-1	831	I	3/19/2016	3/19/2014
TH A#2080		HTC-1	HDE		2080	II	4/2/2016	4/2/2015

Cables	Range	Mfr	Cat	Calibration Due	Calibrated on
Asset #2051	9kHz - 18GHz	Florida RF	II	3/8/2016	3/8/2015
Asset #2054	9kHz - 18GHz	Florida RF	II	3/8/2016	3/8/2015

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

Spurious Radiated Emissions Setup Pictures

See exhibit for test setup pictures.

Frequency Stability

Test Method

Per ANSI c63.10 (2013)

Test Data

Frequency Stability — *Curtis-Straus LLC*

Engineer: Evan Griffith **Company:** Software House
Date: 1-Sep-15 **EUT:** 4000 Enclosure
Spectrum Analyzer: 1328 **Work Order:** P2079
Set Frequency: 13561000 Hz
Notes: Reference Conditions: 120Vac/60Hz, 20°C

Temperature (°C)	Supply Voltage (60Hz)	Nominal Center Frequency (Hz)	Measured Center Frequency (Hz)	Frequency Deviation (ppm)
-30	120 VAC	13561000	13561115	8.5
-20	120 VAC	13561000	13561145	10.7
-10	120 VAC	13561000	13561145	10.7
0	120 VAC	13561000	13561122	9.0
10	120 VAC	13561000	13561100	7.4
20	138 VAC	13561000	13561085	6.3
20	120 VAC	13561000	13561077	5.7
20	102 VAC	13561000	13561085	6.3
30	120 VAC	13561000	13561032	2.4
40	120 VAC	13561000	13561002	0.1
50	120 VAC	13561000	13560987	1.0
	Spectrum Analyzer:	1328		

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Spectrum Analyzers / Receivers /Preselectors	Range	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
SA EMI Chamber (1328)	9kHz-13.2 GHz	E4405B	Agilent	MY44210241	1328	I	8/19/2016	8/19/2015
Antennas	**Range**	**MN**	**Mfr**	**SN**	**Asset**	**Cat**	**Calibration Due**	**Calibrated on**
Small Loop	10kHz-30MHz	PLA-130/A	ARA	1024	755	I	5/29/2016	5/29/2014
Cables	**Range**		**Mfr**			**Cat**	**Calibration Due**	**Calibrated on**
Asset #1787	9kHz - 18GHz		Florida RF			II	3/21/2016	3/21/2015
Chamber		**MN**	**Mfr**	**SN**	**Asset**	**Cat**	**Calibration Due**	**Calibrated on**
Environmental (Safety)		GTH-31S	B-M-A Inc	2245	321	I	8/10/2015	8/10/2016

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

Frequency Stability Setup Pictures

See exhibit for test setup pictures.

Spectrum Mask

Test Method

Per ANSI c63.10 (2013)

Test Data

Radiated Emissions Table

Date: 31-Aug-15 **Company:** Software House, a Division of Sensormatic **Work Order:** P2079
Engineer: Ryan Brown **EUT Desc:** RM2L-4000 **EUT Operating Voltage/Frequency:** 120V/60Hz
Temp: 23.3°C **Humidity:** 56% **Pressure:** mBar
Frequency Range: 13.56MHz **Measurement Distance:** 3 m
Notes: EUT Standing up

Antenna Polarization (0° - 90°)	Frequency (MHz)	Reading (dBµV)	Preamp Factor (dB)	Antenna Factor (dB/m)	Cable Factor (dB)	Adjusted Reading (dBµV/m)	--- Limit (dBµV/m)	--- Margin (dB)	--- Result (Pass/Fail)	FCC 15.209 Limit (dBµV/m)	FCC 15.209 Margin (dB)	FCC 15.209 Result (Pass/Fail)
0	13.56	70.1	25.0	39.2	0.2	84.5	---	---	---	124.0	-39.5	---
90	13.56	68.4	25.0	39.2	0.2	82.8	---	---	---	124.0	-41.2	---

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

Test Site: EMI Chamber 1 **Cable 1:** Asset #2054 **Cable 2:** Asset #2051 **Cable 3:** ---
Analyzer: Rental SA#2 **Preamp:** Red-White **Antenna:** Sm Loop (high) **Preselector:** ---
CSsoft Radiated Emissions Calculator v 1.017.146

Adjusted Reading = Reading - Preamp Factor + Antenna Factor + Cable Factor

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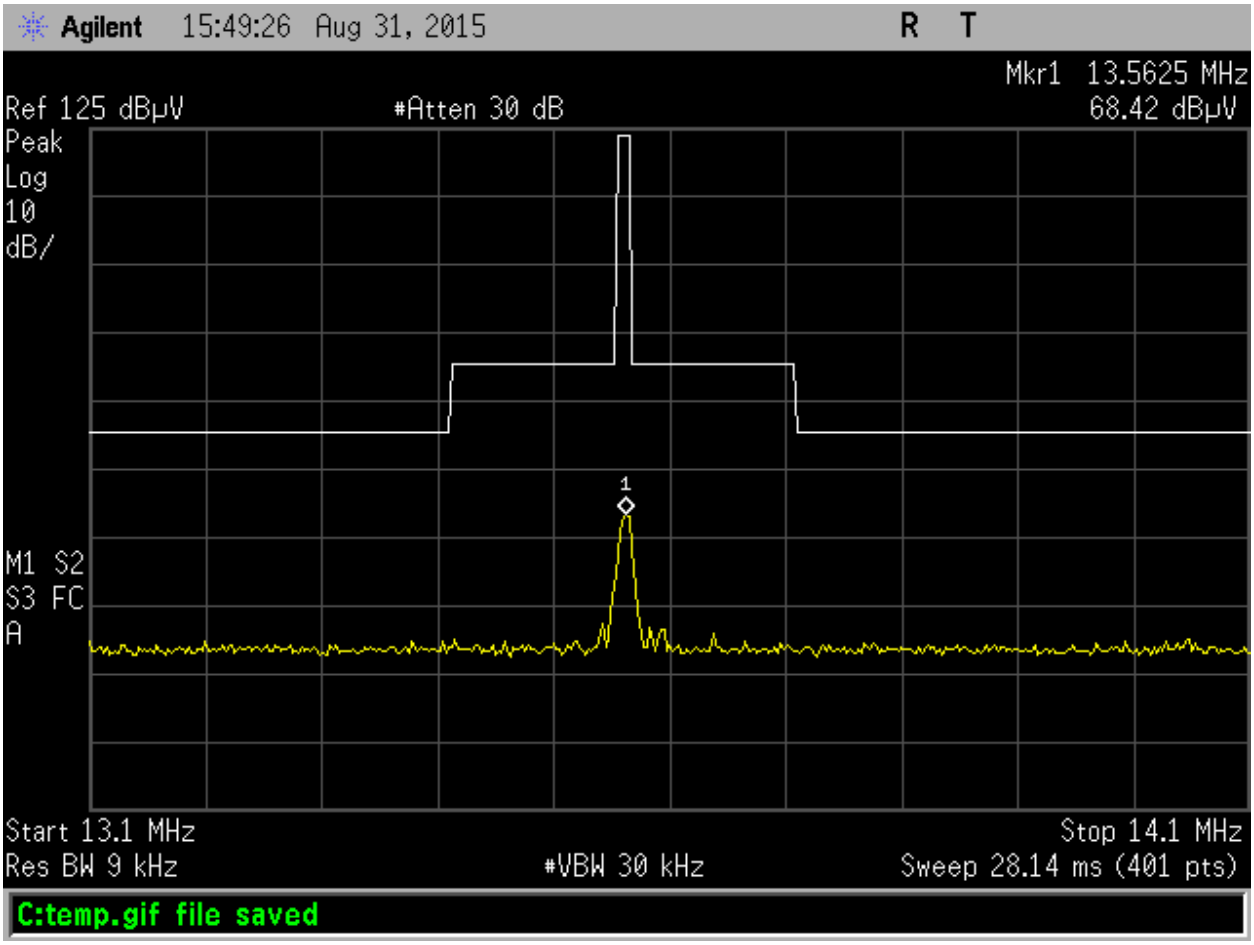
Spectrum Analyzers / Receivers /Preselectors	Range	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
SA #2 (1860)	9kHz-26.5 GHz	E7405A	Agilent	MY45104916	1860	I	7/30/2016	7/30/2015
Radiated Emissions Sites	**FCC Code**	**IC Code**	**VCCI Code**	**Range**		**Cat**	**Calibration Due**	**Calibrated on**
EMI Chamber 1	719150	2762A-6	A-0015	30-1000MHz		II	3/21/2017	3/21/2015
Preamps /Couplers Attenuators / Filters	**Range**	**MN**	**Mfr**	**SN**	**Asset**	**Cat**	**Calibration Due**	**Calibrated on**
Red-White	0.009-2000MHz	ZFL-1000-LN	CS	N/A	1258	II	12/26/2015	12/26/2014
Antennas	**Range**	**MN**	**Mfr**	**SN**	**Asset**	**Cat**	**Calibration Due**	**Calibrated on**
Red-Brown Bilog	30-2000MHz	JB1	Sunol	A0032406	1218	I	12/4/2016	12/4/2014
Meteorological Meters		**MN**	**Mfr**	**SN**	**Asset**	**Cat**	**Calibration Due**	**Calibrated on**
Weather Clock (Pressure Only)		BA928	Oregon Scientific	C3166-1	831	I	3/19/2016	3/19/2014
TH A#2080		HTC-1	HDE		2080	II	4/2/2016	4/2/2015
Cables	**Range**		**Mfr**			**Cat**	**Calibration Due**	**Calibrated on**
Asset #2051	9kHz - 18GHz		Florida RF			II	3/8/2016	3/8/2015
Asset #2054	9kHz - 18GHz		Florida RF			II	3/8/2016	3/8/2015

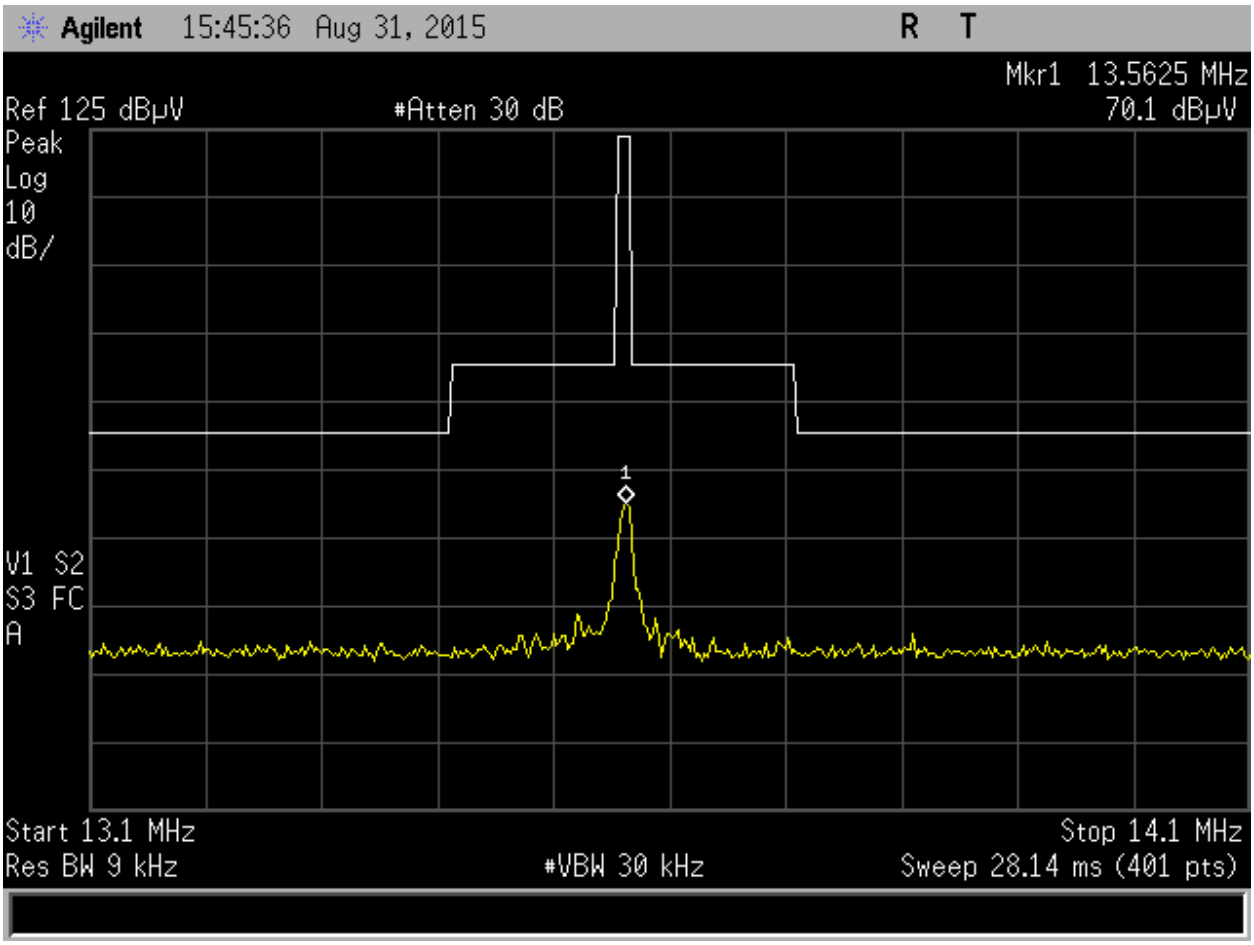
All equipment is calibrated using standards traceable to NIST or other nationally recognized calibration standard.

Plots

Correction Factors included in measurements shown.



90 Degrees



0 Degrees

Spectrum Mask Setup Pictures

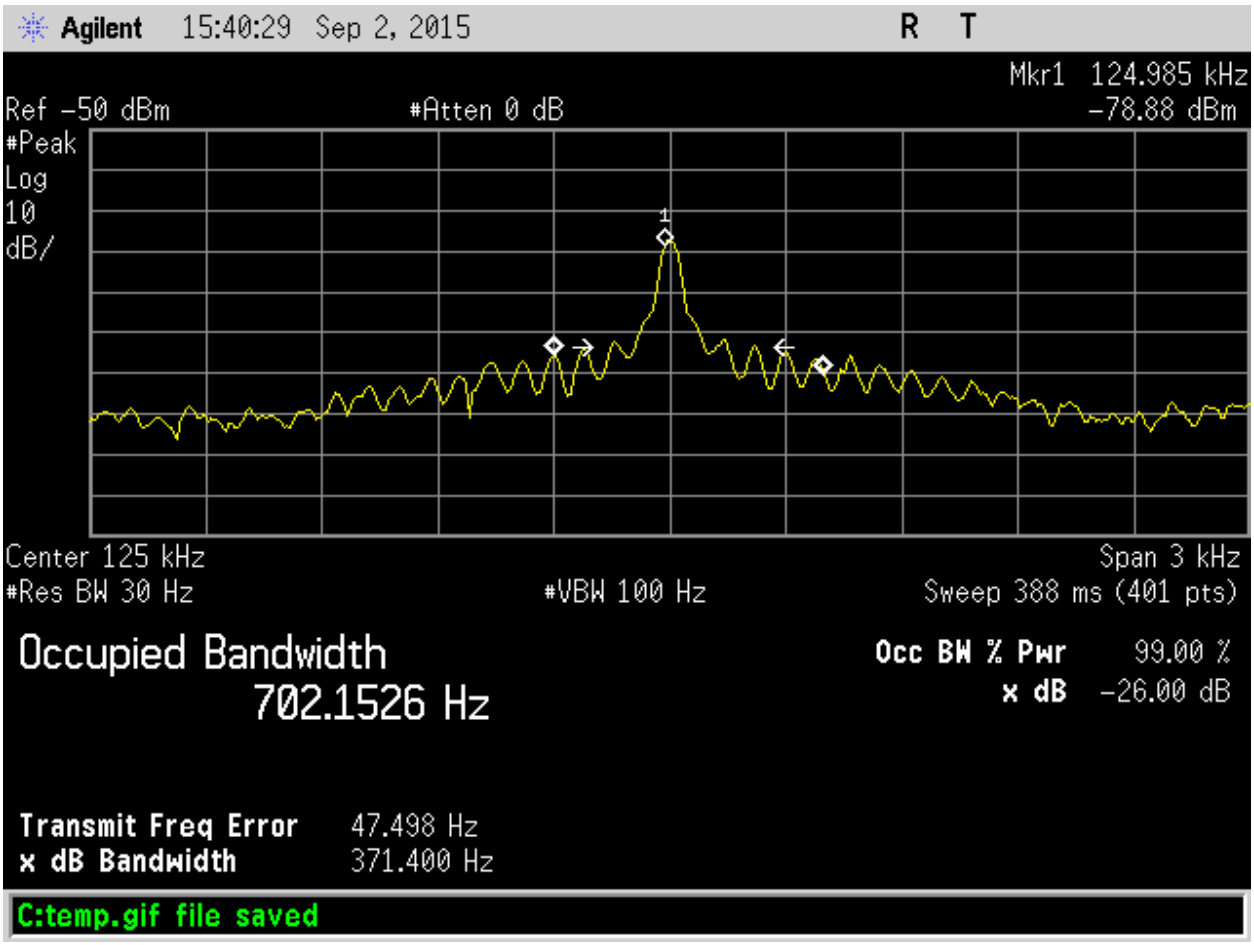
See exhibit for test setup pictures.

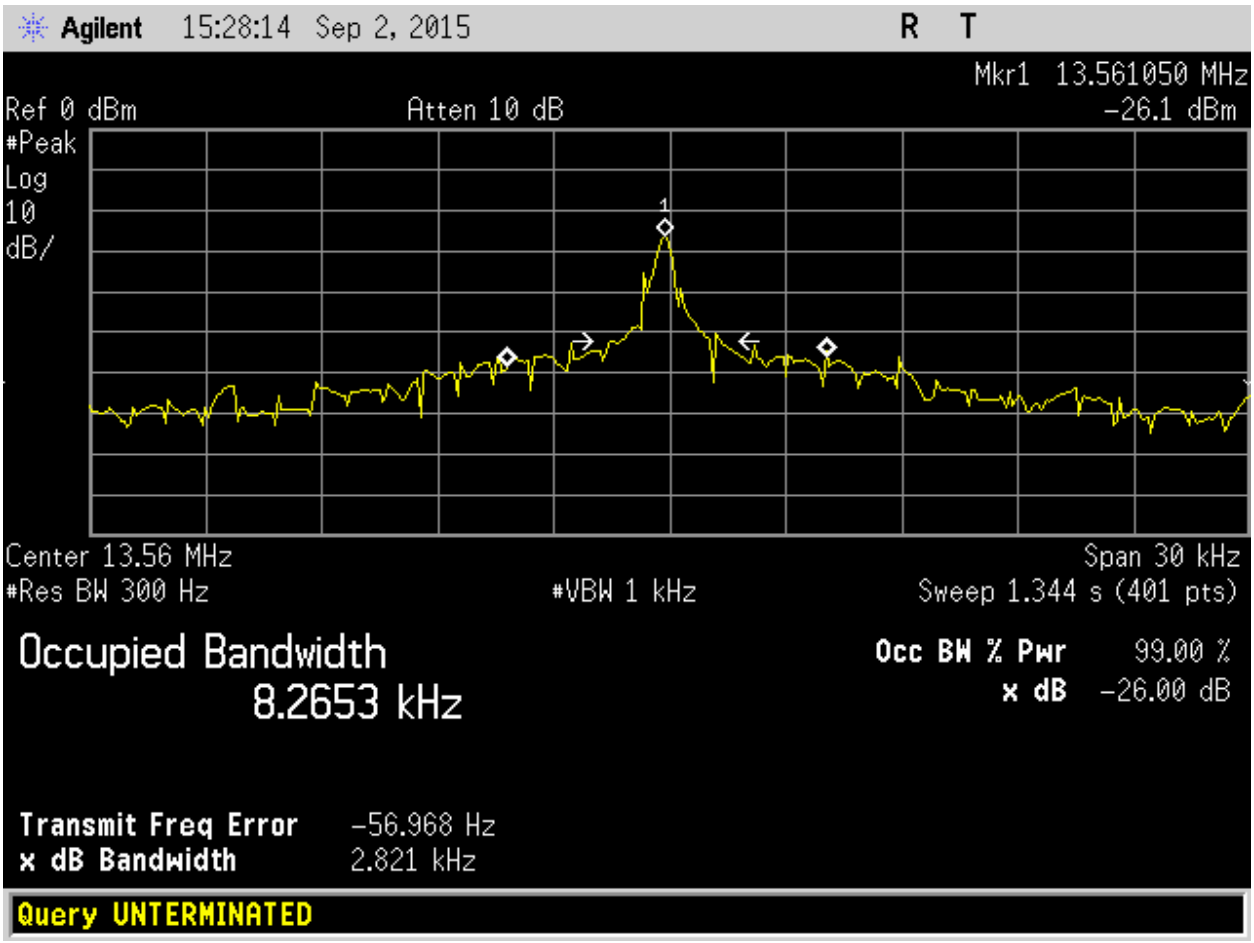
Occupied Bandwidth

Test Method

Per RSS GEN – Issue 3

Plots




Agilent 15:28:14 Sep 2, 2015
R T
Mkr1 13.561050 MHz
Ref 0 dBm
Atten 10 dB
-26.1 dBm
#Peak
Log
10
dB/
1
Center 13.56 MHz
Span 30 kHz
#Res BW 300 Hz
#VBW 1 kHz
Sweep 1.344 s (401 pts)
Occupied Bandwidth
8.2653 kHz
Occ BW % Pwr 99.00 %
x dB -26.00 dB
Transmit Freq Error -56.968 Hz
x dB Bandwidth 2.821 kHz
Query UNTERMINATED

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 CISPR	 5.6dB 4.6dB	 N/A 5.2dB (Ucispr)
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 CISPR	 3.9dB 3.6dB	 N/A 3.6dB (Ucispr)
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)	3.23×10^{-8}	1×10^{-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		

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 were 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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