Test Report

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

Report No	ES0408-3
Client	Hologic
Address	36 Apple Ridge Rd Danbury, CT 06810
Phone	1-508-263-2471
Items tested	RFID interface board for Selenia Dimensions / 3Dimensions Product line
FCC ID	YUJ-PCB01647
IC	9281A-PCB01647
FRN	0020208542
Equipment Type	Part 15 Low Power Transceiver, Rx Verified
Equipment Code	DXT
Emission Designator	267HA1D
Standards	47 CFR Part 15.225, ISED Canada RSS-210 Issue 9 Annex B.6
Test Dates	April 9th to 20th, 2018
Results	As detailed within this report
Prepared by	Zachary Johnson – Test Engineer
Authorized by	Yunus Faziloglu – Sr. Engineer
Issue Date	5/29/2018
Conditions of Issue	This Test Report is issued subject to the conditions stated in the '*Conditions of Testing*' section on page 15 of this report.

Contents

Form Final Report REV 2-16-07 (DW)

Summary and Test Methodology

This test report supports a certification application for Hologic “RFID interface board for Selenia Dimensions / 3Dimensions Product line” operating under:

47 CFR Part 15.225, ISED Canada RSS-210 Issue 9 Annex B.6

EUT is an RFID reader operating at 13.56MHz. All testing was performed in accordance with ANSI C63.10 2013. Emissions were maximized around 3 orthogonal planes (X, Y and Z). EUT has a PCB loop antenna.

EUT operating voltage is 120V/60Hz.

We found that the product complied with the requirements above without modification. Test sample was received in good condition.

The environmental conditions during testing are documented on the associated data tables.

The following bandwidths were used during emissions testing.

Frequency	RBW	VBW
9kHz-150kHz	200Hz	1kHz
150kHz-30MHz	9kHz	30kHz
30MHz-1GHz	120kHz	1MHz

Issue No.	Reason for change	Date Issued
1	Original Release	May 29, 2018

Product Tested - Configuration Documentation

EUT Configuration										
Work Order:	S0408									
Company:	Hologic (CT)									
Company Address:	36 Apple Ridge Rd									
	Danbury, CT, 06810									
Contact:	Mairaj Hussain									
	MN			**PN**			**SN**			
EUT:	PCB-01647									
EUT Description:	RFID interface board for Selenia Dimensions / 3Dimensions Product line									
EUT Max Frequency:	13.56 MHz									
EUT Min Frequency:	13.56 MHz									
Port Label	**Port Type**	**# ports**	**# populated**	**cable type**	**shielded**	**ferrites**	**length (m)**	**in/out**	**under test**	**comment**
Power AC	Power AC	1	1	Power AC	Yes	No	1	in	yes	
Software Operating Mode Description:										
Test										
Performance Criteria:										
Monitor 13.56MHz transmission to remain active.										

Clock Frequencies

Clock Frequencies	
frequencies (MHz)	13.56

Issue No.	Reason for change	Date Issued
1	Original Release	May 29, 2018

Statement of Conformity

RFID interface board for Selenia Dimensions / 3Dimensions Product line complied with the following requirements:

RSS-GEN	RSP-100	RSS 210	Part 15	Comments
6.3			15.15(b)	There are no controls accessible to the user that varies the output power to operate in violation of the regulatory requirements.
	3.1		15.19	The label is shown in the label exhibit.
	4		15.21	Information to the user is shown in the instruction manual exhibit.
			15.27	No special accessories are required for compliance.
3, 6.1			15.31	The EUT was tested in accordance with the measurement standards in this section.
6.13			15.33	Frequency range was investigated according to this section, unless noted in specific rule section under which the equipment operates.
8.1			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.
8.3			15.203	EUT has a PCB loop antenna
8.10			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 or RSS-Gen as applicable
8.8			15.207	EUT complies with AC line conducted emissions limits
			15.225	EUT complies with the requirements of 15.225
		Annex B.6		EUT complies with the requirements of RSS-210 Issue 9 Annex B.6
6.6				Occupied Bandwidth measurements were made.

Issue No.	Reason for change	Date Issued
1	Original Release	May 29, 2018

Test Results

Fundamental Emission

LIMIT

The field strength of any emissions within the band 13.553-13.567 MHz shall not exceed 15,848 microvolts/meter at 30 meters, (124 dBuV/m at 3m.)
[15.225 (a)]

MEASUREMENTS / RESULTS

Please refer to Radiated Spurious Emissions data tables.
Fundamental complies with 15.209 limits.

Emission Mask

MEASUREMENTS / RESULTS

Not applicable.
Fundamental complies with 15.209 limits.

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)]

MEASUREMENTS / RESULTS

No emissions found within 9kHz to 1MHz frequency range. Measurement system noise floor was more than 20dB below the limits.

Curtis Straus - a Bureau Veritas Company
Radiated Emissions Magnetic Field 3m Distance
1-30MHz Parallel Data
Operator: ZJ
Notes:

Work Order - S0408
EUT Power Input - 120V / 60Hz
Test Site - CH-2
Conditions - 23.3°C; 23%RH; 1012mBar

Data Taken at 10:30:31 AM, Tuesday, April 10, 2018

Frequency (MHz)	Raw Peak Reading (dBµV)	Raw Avg Reading (dBµV)	Raw QP Reading (dBµV)	Correction Factor (dB/m)	Lim: FCC_pt15_209 (dBµV/m)	Adjusted Peak Amplitude (dBµV/m)	Peak Margin (dB)	Peak Test Results (Pass/Fail)	Worst Peak Margin (dB)	Adjusted Avg Amplitude (dBµV/m)	Avg Margin (dB)	Avg Test Results (Pass/Fail)	Worst Avg Margin (dB)	Adjusted QP Amplitude (dBµV/m)	QP Margin (dB)	QP Test Results (Pass/Fail)	Worst QP Margin (dB)	EUT Azimuth (degrees)
1.141	12.1	7.3	14.2	27	66.5	39.1	-27.3	PASS		34.2	-32.2	PASS		41.2	-25.3	PASS		74
1.627	11.6	5.7	12.7	24.2	63.4	35.8	-27.6	PASS		29.9	-33.5	PASS		36.9	-26.4	PASS		203
2.169	12.3	5.1	12	21.5	69.5	33.8	-35.7	PASS		26.6	-43	PASS		33.5	-36.1	PASS		80
2.974	9.9	2.8	9.7	18.8	69.5	28.7	-40.9	PASS		21.6	-47.9	PASS		28.5	-41	PASS		273
13.544	38.4	34.5	38.5	9.9	69.5	48.3	-21.2	PASS	-21.2	44.4	-25.1	PASS	-25.1	48.4	-21.1	PASS	-21.1	292
29.947	8.5	3.7	10.8	7.3	69.5	15.9	-53.7	PASS		11	-58.5	PASS		18.1	-51.5	PASS		204

Curtis Straus - a Bureau Veritas Company
Radiated Emissions Magnetic Field 3m Distance
1-30MHz Perpendicular Data
Operator: ZJ
Notes:

Work Order - S0408
EUT Power Input - 120V / 60Hz
Test Site - CH-2
Conditions - 23.3°C; 23%RH; 1012mBar

Data Taken at 11:04:38 AM, Tuesday, April 10, 2018

Frequency (MHz)	Raw Peak Reading (dBµV)	Raw Avg Reading (dBµV)	Raw QP Reading (dBµV)	Correction Factor (dB/m)	Lim: FCC_pt15_209 (dBµV/m)	Adjusted Peak Amplitude (dBµV/m)	Peak Margin (dB)	Peak Test Results (Pass/Fail)	Worst Peak Margin (dB)	Adjusted Avg Amplitude (dBµV/m)	Avg Margin (dB)	Avg Test Results (Pass/Fail)	Worst Avg Margin (dB)	Adjusted QP Amplitude (dBµV/m)	QP Margin (dB)	QP Test Results (Pass/Fail)	Worst QP Margin (dB)	EUT Azimuth (degrees)
1.157	7.2	7.2	13.9	26.9	66.3	34.1	-32.2	PASS	-32.2	34.1	-32.3	PASS	-32.3	40.8	-25.5	PASS	-25.5	0
2.076	11.4	5.2	12.4	21.8	69.5	33.2	-36.4	PASS		27	-42.5	PASS		34.2	-35.3	PASS		249
3.278	9.3	2.4	9.4	18.1	69.5	27.4	-42.2	PASS		20.5	-49.1	PASS		27.5	-42.1	PASS		158
3.917	6.8	2.3	9.3	16.5	69.5	23.4	-46.2	PASS		18.8	-50.7	PASS		25.8	-43.7	PASS		135
13.568	25.9	21.9	25.9	9.9	69.5	35.8	-33.7	PASS		31.8	-37.7	PASS		35.8	-33.7	PASS		193
29.976	3.6	3.9	10.8	7.3	69.5	10.9	-58.6	PASS		11.2	-58.4	PASS		18.2	-51.4	PASS		48

1-30MHz

Curtis Straus - a Bureau Veritas Company	Work Order - S0408
Radiated Emissions Electric Field 3m Distance	EUT Power Input - 120V / 60Hz
30-1000MHz Vertical Data	Test Site - CH-1
Operator: ZJ	Conditions - 22.9°C; 24%RH; 1013mBar
Notes:	0
0	0

Data Taken at 03:23:31 PM, Monday, April 09, 2018

Frequency (MHz)	Raw QP Reading (dBµV)	Correction Factor (dB/m)	Adjusted QP Amplitude (dBµV/m)	Lim1: FCC_pt15_109_Class_B (dBµV/m)	Margin to Lim1 (dB)	Test Results Lim1 (Pass/Fail)	Worst Margin Lim1 (dB)	Lim2: FCC_pt15_109_Class_B (dBµV/m)	Margin to Lim2 (dB)	Test Results Lim2 (Pass/Fail)	Worst Margin Lim2 (dB)	Antenna Height (cm)	EUT Azimuth (degrees)
43.64	30.9	-10.8	20.1	40	-19.9	PASS		40	-19.9	PASS		107	207
46.063	32.8	-12.3	20.5	40	-19.5	PASS		40	-19.5	PASS		111	250
48.863	32.5	-13.6	18.9	40	-21.1	PASS		40	-21.1	PASS		118	290
325.053	33.4	-7.2	26.2	46	-19.8	PASS		46	-19.8	PASS		198	273
636.975	27.4	-1.1	26.3	46	-19.7	PASS		46	-19.7	PASS		172	10
935.494	24	3.4	27.4	46	-18.6	PASS	-18.6	46	-18.6	PASS	-18.6	148	305

Curtis Straus - a Bureau Veritas Company	Work Order - S0408
Radiated Emissions Electric Field 3m Distance	EUT Power Input - 120V / 60Hz
30-1000MHz Horizontal Data	Test Site - CH-1
Operator: ZJ	Conditions - 22.9°C; 24%RH; 1013mBar
Notes:	0
0	0

Data Taken at 03:23:31 PM, Monday, April 09, 2018

Frequency (MHz)	Raw QP Reading (dBµV)	Correction Factor (dB/m)	Adjusted QP Amplitude (dBµV/m)	Lim1: FCC_pt15_109_Class_B (dbµV/m)	Margin to Lim1 (dB)	Test Results Lim1 (Pass/Fail)	Worst Margin Lim1 (dB)	Lim2: FCC_pt15_109_Class_B (dBµV/m)	Margin to Lim2 (dB)	Test Results Lim2 (Pass/Fail)	Worst Margin Lim2 (dB)	Antenna Height (cm)	EUT Azimuth (degrees)
177.263	32	-10.5	21.5	43.5	-22	PASS		43.5	-22	PASS		159	270
200.03	46.3	-9	37.3	43.5	-6.3	PASS	-6.3	43.5	-6.3	PASS	-6.3	136	231
636.366	24.7	-1	23.7	46	-22.3	PASS		46	-22.3	PASS		175	250
651.777	24.6	-0.5	24.1	46	-21.9	PASS		46	-21.9	PASS		183	0
664.843	23.8	-0.2	23.6	46	-22.4	PASS		46	-22.4	PASS		124	11
907.669	22.4	2.8	25.2	46	-20.8	PASS		46	-20.8	PASS		189	194

30-1000MHz

Rev. 4/9/2018

Spectrum Analyzers / Receivers /Preselectors	Range	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
2093 MXE EMI Receiver	20Hz-26.5GHz	N9038A	Agilent	MY51210181	2093	I	11/16/2018	11/16/2017
Preamps /Couplers Attenuators / Filters	**Range**	**MN**	**Mfr**	**SN**	**Asset**	**Cat**	**Calibration Due**	**Calibrated on**
2443 PA	9KHz-6GHz	BBV9744	SCWARZBECK	63	2443	I	2/5/2019	2/5/2018
Antennas	**Range**	**MN**	**Mfr**	**SN**	**Asset**	**Cat**	**Calibration Due**	**Calibrated on**
Red-White Bilog	30-2000MHz	JB1	Sunol	A091604-1	1105	I	8/21/2019	8/21/2017
Small Loop	10kHz-30MHz	PLA-130/A	ARA	1024	755	I	6/14/2018	6/14/2016
Large Loop	20Hz-5MHz	6511	EMCO	9704-1154	67	I	6/14/2018	6/14/2016
Meteorological Meters/Chambers		**MN**	**Mfr**	**SN**	**Asset**	**Cat**	**Calibration Due**	**Calibrated on**
Weather Clock (Pressure Only)		BA928	Oregon Scientific	C3166-1	831	I	4/28/2018	4/28/2016
TH A#2084		HTC-1	HDE		2084	II	3/22/2019	3/22/2018
Cables	**Range**		**Mfr**			**Cat**	**Calibration Due**	**Calibrated on**
Asset #2456	9KHz-18GHz		MegaPhase			II	10/29/2018	10/29/2017
Asset #2480	9KHz-18GHz		MegaPhase			II	10/29/2018	10/29/2017

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

Frequency Tolerance

LIMITS

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.
[15.225(e)]

MEASUREMENTS / RESULTS

FCC 15.225 Extreme Conditions

Date: 20-Apr-18 **Company:** Hologic **Work Order:** S0408
Engineer: AKZ

Notes:

Temperature	Voltage	Amplitude	Amplitude Delta	Frequency	Frequency Delta
°C	AC / 60Hz	(dBm)	(dB)	(Hz)	(Hz)
-30	120	-39.92	1.86	13558865	62
-20	120	-40.22	1.56	13558905	22
-10	120	-40.72	1.06	13558957	-30
0	120	-41.12	0.66	13558962	-35
10	120	-41.57	0.21	13558952	-25
20	*102*	-41.82	-0.04	13558925	2
20	120	-41.78	Reference	13558927	Reference
20	*138*	-41.90	-0.12	13558927	0
30	120	-42.44	-0.66	13558897	30
40	120	-42.73	-0.95	13558870	57
50	120	-42.75	-0.97	13558855	72

Test Site: ENV Chamber 18 **Antenna** Small Loop **Analyzer:** #1328
Cable 1: CEMI-15

13.56MHz * 0.01% = 1356Hz allowable tolerance

Rev. 4/17/2018

Spectrum Analyzers / Receivers /Preselectors	Range	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
SA (1328)	9kHz-13.2 GHz	E4405B	Agilent	MY44210241	1328	I	11/18/2018	11/18/2017

Cables	Range	Mfr	Cat	Calibration Due	Calibrated on
REMI-15	9kHz - 2GHz	C-S	II	2/12/2019	2/12/2018

Antennas	Range	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
Small Loop	10kHz-30MHz	PLA-130/A	ARA	1024	755	I	6/14/2018	6/14/2016

Meteorological Meters/Chambers	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
Temp/Humidity Chamber #18	EPX-2H	Espec	137664	1645	I	1/5/2019	1/5/2018

RMS Voltmeters/Current Clamp	MN	Mnfr	SN	Asset	Cat	Calibration Due	Calibrated on
DMM	325	Fluke	38120842WS	2428	I	8/2/2018	8/2/2017

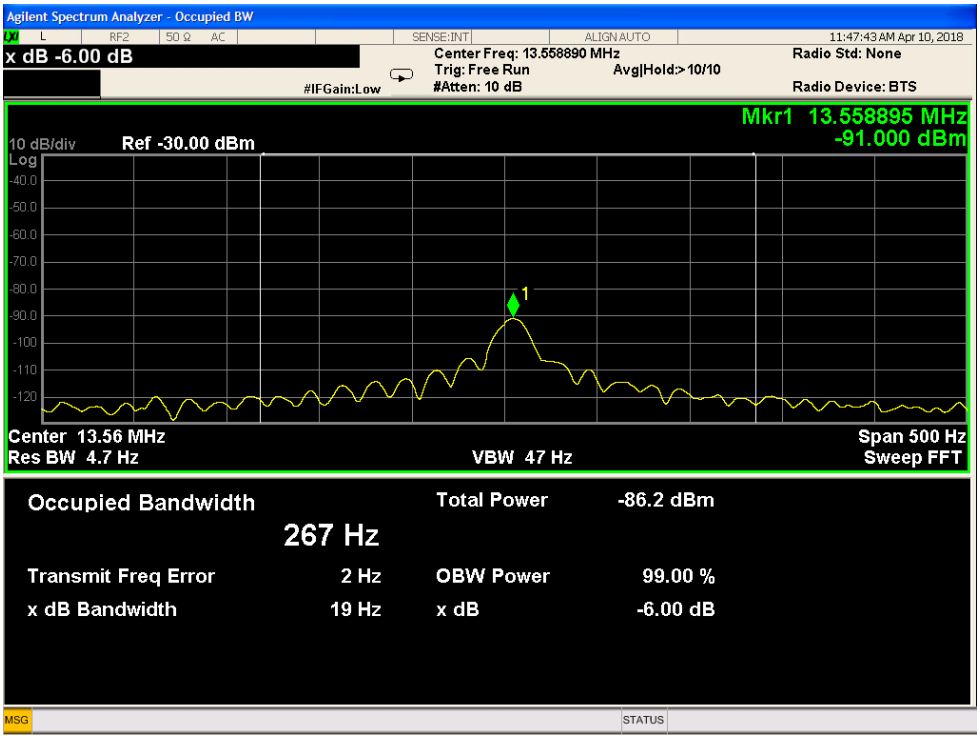
All equipment is calibrated using standards traceable to NIST or other nationally recognized calibration standard.

Occupied Bandwidth

REQUIREMENT

When an occupied bandwidth is not specified in the applicable RSS, the transmitted signal bandwidth to be reported is its 99% emission bandwidth, as calculated or measured. [RSS-GEN 6.6]

99% Occupied Bandwidth = 267Hz



99% Occupied Bandwidth

Conducted Emissions

MEASUREMENTS / RESULTS

Measurements performed with antenna in place as well as antenna replaced with resistive load. Both sets of readings presented below:

Curtis Straus - a Bureau Veritas Company	Work Order # - S0408
Conducted Emissions per CISPR 16-2-1	EUT Power Input - 120VAC/ 60Hz
Peak Detector Data	Test Site - CEMI-5
Notes:	Conditions: - 21°C; 31%RH; 1010mBar
EUT Line tested: 120VAC/60Hz; Neutral	Test Engineer - MG
EUT Mode of Operation: WITH ANTENNA	0

Data Taken at 03:49:02 PM, Friday, April 13, 2018

Frequency (MHz)	Raw Pk Reading (dBµV)	Correction Factor (dB)	Adjusted Pk Amplitude (dBµV)	QP Lim: Mains_FCC&CISPR_QP_Class_B (dBµV)	Margin to the QP Limit (dB)	Pk to QP Limit Results (Pass/Fail)	Worst Margin (QP Limit) (dB)	Av Lim: Mains_FCC&CISPR_Avg_Class_B (dBµV)	Margin to Avg Limit (dB)	Pk to Avg Limit Results (Pass/Fail)	Worst Margin (Avg Limit) (dB)
0.339	23.8	20	43.8	59.2	-15.4	PASS	-15.4	49.2	-5.4	PASS	-5.4
13.307	17.3	20.4	37.7	60	-22.3	PASS		50	-12.3	PASS	
13.644	22.2	20.4	42.6	60	-17.4	PASS		50	-7.4	PASS	
15.582	15.6	20.4	36	60	-24	PASS		50	-14	PASS	
27.089	15.2	20.5	35.7	60	-24.3	PASS		50	-14.3	PASS	

Curtis Straus - a Bureau Veritas Company	Work Order # - s0408
Conducted Emissions per CISPR 16-2-1	EUT Power Input - 120VAC/ 60Hz
Peak Detector Data	Test Site - CEMI-5
Notes:	Conditions: - 21°C; 31%RH; 1010mBar
EUT Line tested: 120VAC/60Hz; Phase	Test Engineer - MG
EUT Mode of Operation: WITH ANTENNA	0

Data Taken at 04:21:28 PM, Friday, April 13, 2018

Frequency (MHz)	Raw Pk Reading (dBµV)	Correction Factor (dB)	Adjusted Pk Amplitude (dBµV)	QP Lim: Mains_FCC&CISPR_QP_Class_B (dBµV)	Margin to the QP Limit (dB)	Pk to QP Limit Results (Pass/Fail)	Worst Margin (QP Limit) (dB)	Av Lim: Mains_FCC&CISPR_Avg_Class_B (dBµV)	Margin to Avg Limit (dB)	Pk to Avg Limit Results (Pass/Fail)	Worst Margin (Avg Limit) (dB)
0.339	25.8	20	45.8	59.2	-13.4	PASS		49.2	-3.4	PASS	
13.409	26.4	20.3	46.8	60	-13.2	PASS	-13.2	50	-3.2	PASS	-3.2
13.476	24.3	20.3	44.6	60	-15.4	PASS		50	-5.4	PASS	
13.639	24.8	20.3	45.1	60	-14.9	PASS		50	-4.9	PASS	

Antenna in place

Curtis Straus - a Bureau Veritas Company	Work Order # - S0408
Conducted Emissions per CISPR 16-2-1	EUT Power Input - 120VAC/ 60Hz
Peak Detector Data	Test Site - CEMI-5
Notes:	Conditions: - 21°C; 31%RH; 1010mBar
0	Test Engineer - MG
EUT Line tested: 120VAC/60Hz; Neutral	0
EUT Mode of Operation: replaced antenna with 26 ohm resistor	

Frequency (MHz)	Raw Pk Reading (dBµV)	Correction Factor (dB)	Adjusted Pk Amplitude (dBµV)	QP Lim: Mains_FCC&CISPR_QP_Class_B (dBµV)	Margin to the QP Limit (dB)	Pk to QP Limit Results (Pass/Fail)	Worst Margin (QP Limit) (dB)	Av Lim: Mains_FCC&CISPR_Avg_Class_B (dBµV)	Margin to Avg Limit (dB)	Pk to Avg Limit Results (Pass/Fail)	Worst Margin (Avg Limit) (dB)
(MHz)	(dBµV)	(dB)	(dBµV)	(dBµV)	(dB)	(Pass/Fail)	(dB)	(dBµV)	(dB)	(Pass/Fail)	(dB)
0.19	19.3	20	39.3	64	-24.8	PASS		54	-14.8	PASS	
0.299	16.9	20	37	60.3	-23.3	PASS		50.3	-13.3	PASS	
0.34	23.8	20	43.8	59.2	-15.4	PASS	-15.4	49.2	-5.4	PASS	-5.4
0.654	12.6	20.1	32.7	56	-23.3	PASS		46	-13.3	PASS	
2.584	11	20.2	31.2	56	-24.8	PASS		46	-14.8	PASS	
15.059	14.4	20.4	34.8	60	-25.2	PASS		50	-15.2	PASS	

Curtis Straus - a Bureau Veritas Company	Work Order # - s0408
Conducted Emissions per CISPR 16-2-1	EUT Power Input - 120VAC/ 60Hz
Peak Detector Data	Test Site - CEMI-5
Notes:	Conditions: - 21.7°C; 31%RH; 1010mBar
0	Test Engineer - MG
EUT Line tested: 120VAC/60Hz; Line	0
EUT Mode of Operation: replaced antenna with 26 ohm resistor	

Frequency	Raw Pk Reading	Correction Factor	Adjusted Pk Amplitude	QP Lim: Mains_FCC&CISPR_QP_Class_B	Margin to the QP Limit	Pk to QP Limit Results	Worst Margin (QP Limit)	Av Lim: Mains_FCC&CISPR_Avg_Class_B	Margin to Avg Limit	Pk to Avg Limit Results	Worst Margin (Avg Limit)
(MHz)	(dBµV)	(dB)	(dBµV)	(dBµV)	(dB)	(Pass/Fail)	(dB)	(dBµV)	(dB)	(Pass/Fail)	(dB)
0.15	20	20	40	66	-26	PASS		56	-16	PASS	
0.19	19.8	20	39.7	64	-24.3	PASS		54	-14.3	PASS	
0.339	25.5	20	45.5	59.2	-13.7	PASS	-13.7	49.2	-3.7	PASS	-3.7
2.543	9.5	20.3	29.8	56	-26.2	PASS		46	-16.2	PASS	
3.557	9.8	20.3	30.1	56	-25.9	PASS		46	-15.9	PASS	
13.559	18	20.4	38.4	60	-21.6	PASS		50	-11.6	PASS	

Antenna replaced with resistive load

Rev. 4/9/2018

Spectrum Analyzers / Receivers /Preselectors	Range	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
Rental EXA Signal Analyzer(1118473)	9KHz-26.5GHz	N9010A-526;N	AT	MY51170076	1118473	I	5/19/2018	5/19/2017
LISNs/Measurement Probes	**Range**	**MN**	**Mfr**	**SN**	**Asset**	**Cat**	**Calibration Due**	**Calibrated on**
LISN Asset 2092	9KHz-30MHz	NNLK 8121	Schwarzbeck	NNLK 8121-662	2092	I	7/25/2018	7/25/2017
Conducted Test Sites (Mains / Telco)	**FCC Code**		**VCCI Code**			**Cat**	**Calibration Due**	**Calibrated on**
CEMI 5	719150		A-0015			III	NA	N/A
Meteorological Meters/Chambers		**MN**	**Mfr**	**SN**	**Asset**	**Cat**	**Calibration Due**	**Calibrated on**
Weather Clock (Pressure Only)		BA928	Oregon Scientific	C3166-1	831	I	4/28/2018	4/28/2016
TH A#2077		HTC-1	HDE		2077	II	3/22/2019	3/22/2018
Cables	**Range**		**Mfr**			**Cat**	**Calibration Due**	**Calibrated on**
CEMI-15	9kHz - 2GHz		C-S			II	10/2/2018	10/2/2017
Attenuators	**Range**	**MN**	**Mfr**	**SN**	**Asset**	**Cat**	**Calibration Due**	**Calibrated on**
20dB Attenuator-05	9kHz-2GHz	2	Aeroflex/Weinschel	BS9092		II	8/8/2018	8/8/2017

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

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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