Test Report

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

Report No	ER0190-1
Client	Ideal Industries, Inc.
Address	Becker Place Sycamore, IL 60178
Phone	(815) 895-1295
Items tested	LCE20A-1000
FCC ID	2AAMXLCE20A1000
IC	11250A-LCE20A1000
FRN	0002862225
Equipment Type	Digital Transmission System
Equipment Code	DTS
Emission Designator	756KG1D
FCC/IC Rule Parts	CFR Title 47 FCC Part 15.247, ISED Canada RSS-247 Issue 1
Test Dates	January 24-26, February 3, 6 and March 31, 2017
Results	As detailed within this report
Prepared by	Christopher Bramley – Test Engineer
Authorized by	Yunus Fazilogiu – Sr. EMC Engineer
Issue Date	4/13/2017
Conditions of Issue	This Test Report is issued subject to the conditions stated in the '*Conditions of Testing*' section on page 322 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.

ACCREDITED Cert No. 1627-01

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Form Final Report REV 7-20-07 (DW)

Summary

This test report supports an application for certification of a transmitter operating pursuant to: CFR Title 47 FCC Part 15.247, ISED Canada RSS-247 Issue 1

The product is the LCE20A-1000. It is a digitally modulated transmitter that operates in the 902-928MHz frequency range. The product was tested with a permanently installed PCB antenna with 1.43dBi gain.

We found that the product met the above requirements without modification. The test samples were received in good condition.

Test Methodology

All testing was performed according to the following rules/procedures/documents;
CFR Title 47 FCC Part 15.247, ISED Canada RSS-247 Issue 1, ISED Canada RSS-Gen Issue 4, FCC KDB 558074 D01 DTS Measurement Guidance v03r05 and ANSI C63.10-2013.

Radiated emissions were maximized by rotating the device around three orthogonal axes as well as varying the test antenna's height and polarity. AC line conducted emissions testing was performed with a 50Ω/50μH LISN. The EUT operating voltage was 120/277VAC at 60Hz.

RF measurements were performed at the antenna port on 3 channels as follows:
Low channel = 902.7MHz
Mid channel = 915MHz
High channel = 927.3MHz

The following bandwidths were used during radiated spurious and AC line conducted emissions tests:

Frequency	RBW	VBW
0.15-30MHz	9kHz	30kHz
30-1000MHz	120kHz	1MHz
1-10GHz	1MHz	3MHz

Product Tested - Configuration Documentation

EUT Configuration			
Work Order:	R0190		
Company:	Ideal Industries		
Company Address:	Becker Place		
	Sycamore, IL 60178		
Contact:	Tim Tunnell		
	MN		**SN**
EUT:	LCE20A-1000		S70041
EUT Description:	Smart Connector		
EUT Tx Frequency:	902.7-927.3 MHz		

Port Label	Port Type	# ports	# populated	cable type	shielded	ferrites	length (m)	in/out	under test	comment
AC Mains	Power AC	1	1	Power AC	No	No	1.5	in	yes	
Low Voltage	other	1	1	other	No	No	1	in	yes	

Software Operating Mode Description:

The EUT provides AC power and a 0-10V dimming control to an electronic ballast. The EUT was set to transmit at Low (902.7MHz), Middle (915MHz), and High (927.3MHz) channels.

Statement of Conformity

RSS-GEN	RSP-100	RSS 247	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	The antenna for this device is a permanently installed PCB antenna with 1.43dBi gain.
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 meets the AC Line conducted emissions requirements of this section.
			15.247	The unit complies with the requirements of 15.247
		RSS 247		The unit complies with the requirements of RSS-247
6.6				Occupied Bandwidth measurements were made.

Test Results

Bandwidth

LIMIT

The minimum 6 dB bandwidth shall be at least 500 kHz. [15.247(a) (2)]

MEASUREMENTS / RESULTS

DTS Bandwidth Table

Date: 25-Jan-17 **Company:** Ideal Industries, Inc. **Work Order:** R0190
Engineer: Jason Haley **EUT Desc:** Smart Connector - LCE20A-1000 **EUT Operating Voltage/Frequency:** 120V/60Hz
Temp: 23.2°C **Humidity:** 24% **Pressure:** 990mBar

Frequency Range: Fundamental

Notes: Tested IAW FCC OET 558074 D01 DTS Meas Guidance v03r05 Section 8.2.

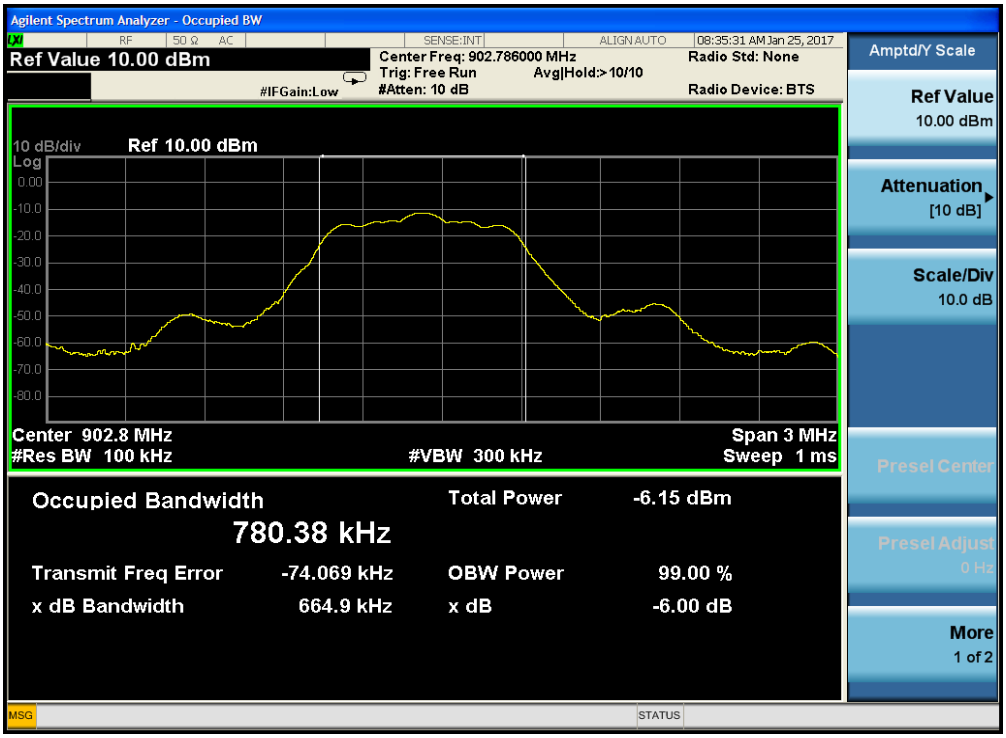
Channel	Frequency (MHz)	DTS Bandwidth (kHz)	DTS Bandwidth Limit (kHz)	Test Results (Pass/Fail)
Low	902.7	664.9	≥500	**Pass**
Middle	915	664.4	≥500	**Pass**
High	927.3	665.6	≥500	**Pass**

Rev. 2/4/2017

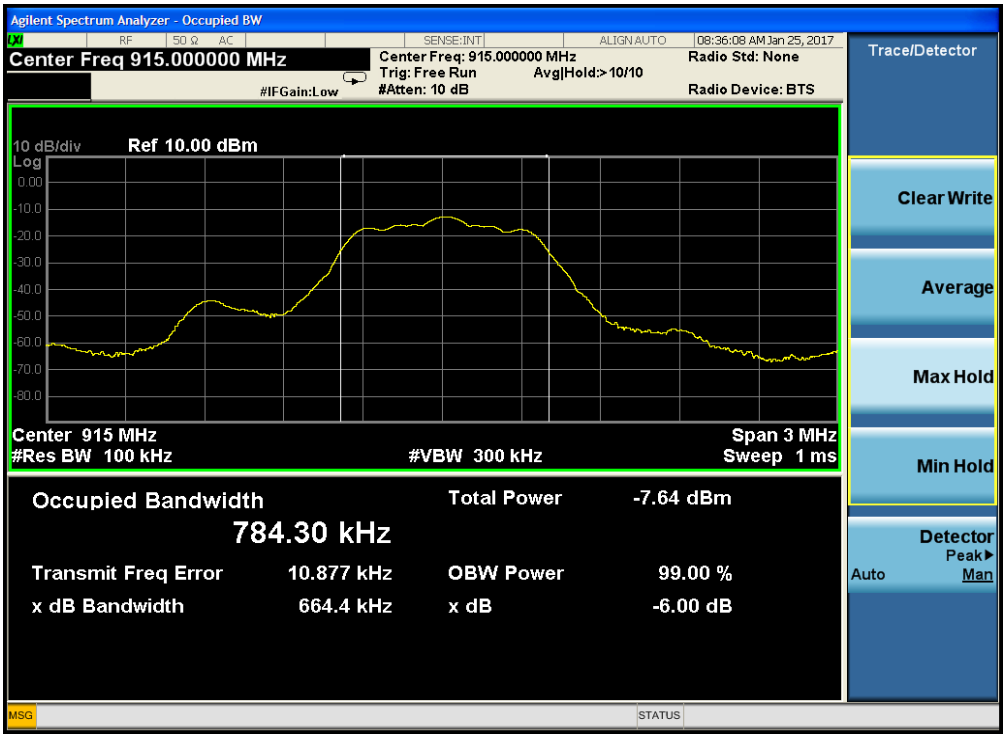
Spectrum Analyzers / Receivers /Preselectors	Range	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
Rental MXE EMI Receiver(1170725)	20Hz-26.5GHz	N9038A	Agilent	MY51210151	1170725	I	12/22/2017	12/22/2016
Conducted Test Sites (Mains / Telco)	**FCC Code**		**VCCI Code**			**Cat**	**Calibration Due**	**Calibrated on**
CEMI 1	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	4/28/2018	4/28/2016
TH A#2086		HTC-1	HDE		2086	II	4/5/2017	4/5/2016
Preamps /Couplers Attenuators / Filters	**Range**	**MN**	**Mfr**	**SN**	**Asset**	**Cat**	**Calibration Due**	**Calibrated on**
HF 30dB 50W Attenuator	0.009-18 GHz	PE 7322-30	Pasternack	1	1840	II	9/3/2017	9/3/2016

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

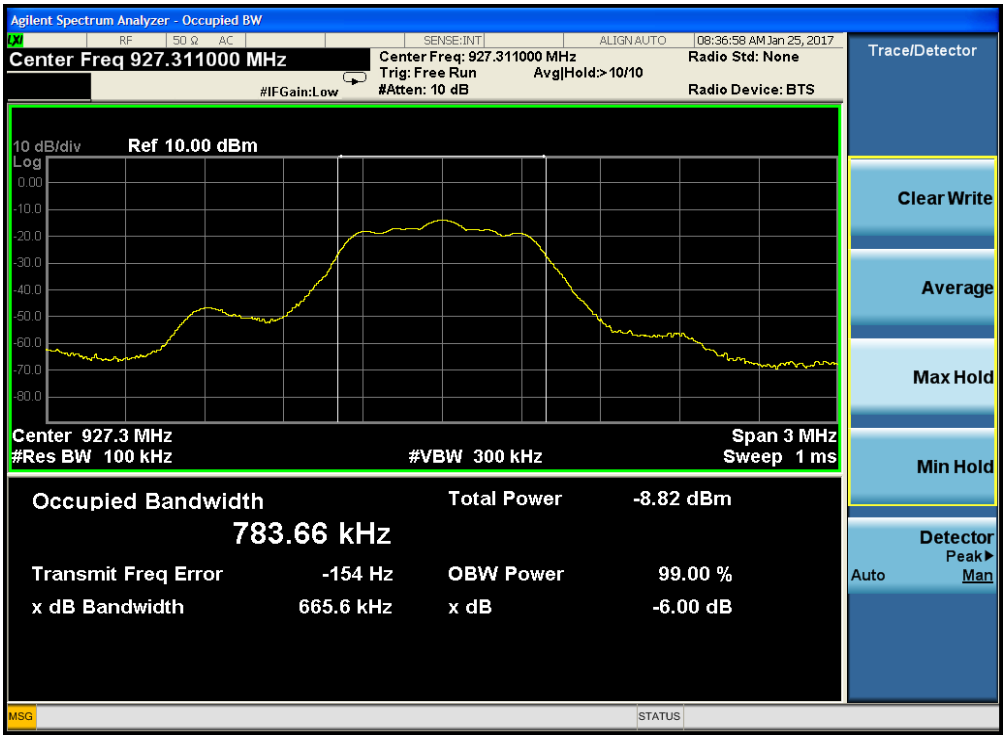
PLOT(s)



6dB Bandwidth – Low Channel



6dB Bandwidth – Mid Channel



6dB Bandwidth – High Channel

Fundamental Emission Output Power

LIMIT

Conducted Output Power
1 Watt
[15.247(b) (3)]

Per 558074 D01 DTS Measurement Guidance v03r05 Section 9.2.2.2 (AVGSA-1 Average Conducted Output Power)

MEASUREMENTS / RESULTS

Fundamental Emission Output Power Table

Date: 31-Mar-17 **Company:** Ideal Industries, Inc. **Work Order:** R0190
Engineer: Chris Bramley **EUT Desc:** Smart Connector - LCE20A-1000 **EUT Operating Voltage/Frequency:** 120V/60Hz
Temp: 23.2°C **Humidity:** 24% **Pressure:** 990mBar

Frequency Range: Fundamental

Notes: Tested IAW FCC OET 558074 D01 DTS Meas Guidance v03r05 Section 9.2.2.2, Method AVGSA-1

Channel	Frequency (MHz)	Output Power (dBm)	Reference Level Offset (dB)	Output Power Limit (dBm)	Margin (dB)	Test Results (Pass/Fail)
Low	902.7	19.42	19.42	30	-10.58	Pass
Middle	915	17.88	19.42	30	-12.12	Pass
High	927.3	16.79	19.42	30	-13.21	Pass

Rev. 3/27/2017

Spectrum Analyzers / Receivers /Preselectors	Range	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
Rental MXE EMI Receiver(1170725)	20Hz-26.5GHz	N9038A	Agilent	MY51210151	1170725	I	12/22/2017	12/22/2016

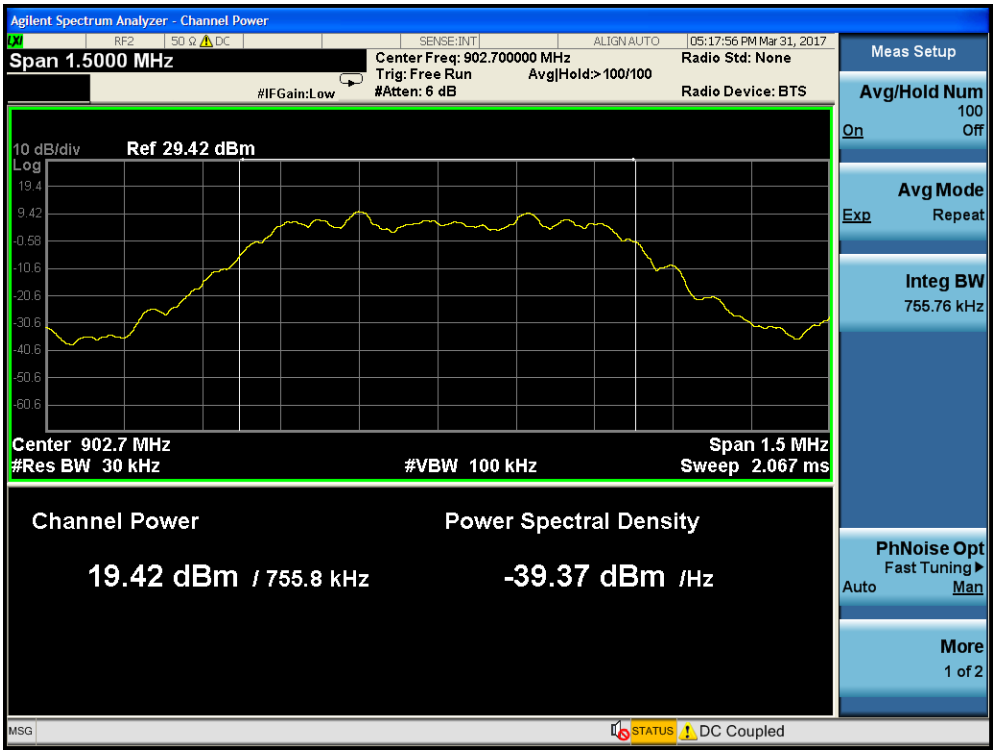
Radiated Emissions Sites	FCC Code	IC Code	VCCI Code	Range	Asset	Cat	Calibration Due	Calibrated on
EMI Chamber 2	719150	2762A-7	A-0015	30-1000MHz	1686	II	12/21/2018	12/21/2016

Preamps /Couplers Attenuators / Filters	Range	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
HF 20dB 50W Attenuator	0.009-18 GHz	PE 7019-20	Pasternack	1	791	II	8/14/2017	8/14/2016

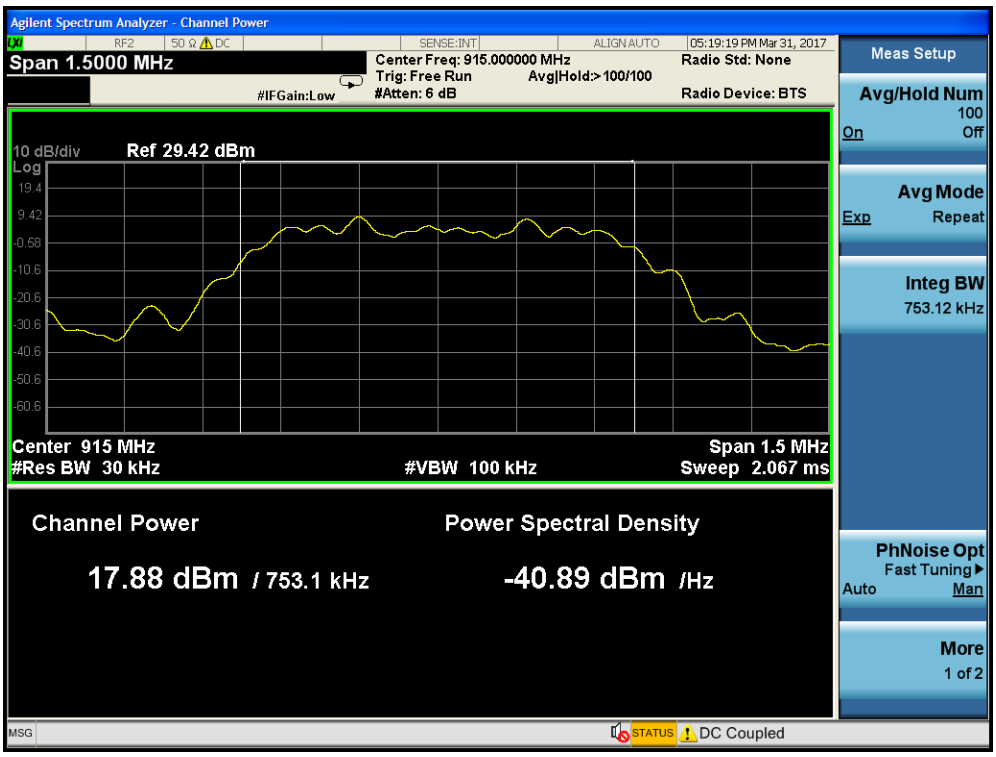
Meteorological Meters	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
Weather Clock (Pressure Only)	BA928	Oregon Scientific	C3166-1	831	I	4/28/2018	4/28/2016
TH A#2086	HTC-1	HDE		2086	II	3/23/2018	3/23/2017

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

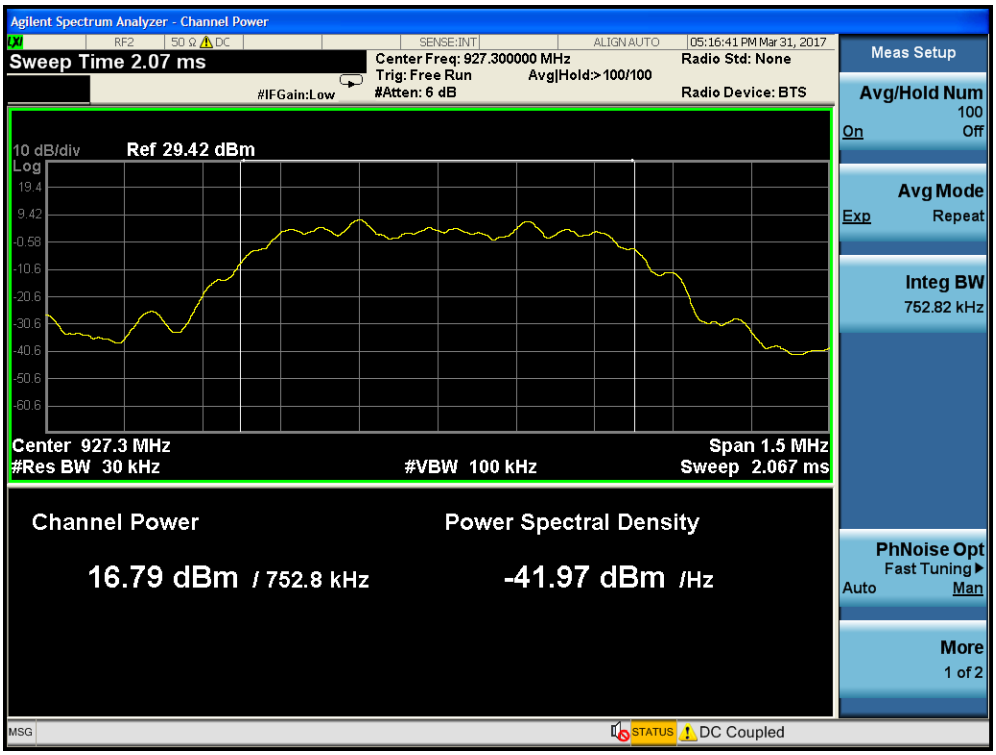
PLOTS



Channel Power – Low Channel



Channel Power – Mid Channel



Channel Power – High Channel

Radiated Spurious Emissions

LIMITS

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).
[15.247(d)]

MEASUREMENTS / RESULTS

Curtis Straus - a Bureau Veritas Company
Radiated Emissions Electric Field 3m Distance
30-1000MHz Horizontal Tabular Data
Operator: Chris Bramley
Client Present: None
Company: Ideal Industries, Inc.
EUT in X-Orientation
Tx on Low Channel(902.7MHz)

EUT Description - Smart Connector - LCE20A-1000
EUT Power Input - 120V/60Hz
Test Site - Chamber 1
Temperature; Humidity - 23.2°C; 24%RH
Barometric Pressure - 985mBar
EUT Maximum Frequency - 902-928MHz
Work Order # - R0190

Frequency MHz	QP Reading dBµV	Preamplifier Gain dB	Antenna Factor dB/m	Cable Loss dB	QP Amplitude dBµV/m	Limit Req. 1 dbµV/m	Margin Req. 1 dB	Results Req. 1 pass/fail	Antenna Height centimeters	Turntable Azimuth degrees	Worst Margin Limit 1 dB
68.645	33.1	25.4	8.6	0.5	16.9	40	-23.1	PASS	143	191	
132.565	27.3	25.4	14	0.8	16.9	43.5	-26.6	PASS	254	127	
210.548	46.2	25.5	10.5	0.9	32.3	43.5	-11.2	PASS	192	86	
219.597	45.1	25.5	10.8	1	31.5	46	-14.5	PASS	176	274	
279.306	45.9	25.5	13.4	1	35	46	-11.1	PASS	110	143	-11.1
441.162	40.4	25.6	16.7	1.4	33.2	46	-12.8	PASS	143	126	

Curtis Straus - a Bureau Veritas Company
Radiated Emissions Electric Field 3m Distance
30-1000MHz Vertical Tabular Data
Operator: Chris Bramley
Client Present: None
Company: Ideal Industries, Inc.
EUT in X-Orientation
Tx on Low Channel(902.7MHz)

EUT Description - Smart Connector - LCE20A-1000
EUT Power Input - 120V/60Hz
Test Site - Chamber 1
Temperature; Humidity - 23.2°C; 24%RH
Barometric Pressure - 985mBar
EUT Maximum Frequency - 902-928MHz
Work Order # - R0190

Frequency MHz	QP Reading dBµV	Preamplifier Gain dB	Antenna Factor dB/m	Cable Loss dB	QP Amplitude dBµV/m	Limit Req. 1 dBµV/m	Margin Req. 1 dB	Results Req. 1 pass/fail	Antenna Height centimeters	Turntable Azimuth degrees	Worst Margin Limit 1 dB
30.527	32.4	25.4	21.3	0.4	28.7	40	-11.3	PASS	130	79	
33.381	33	25.4	19.1	0.3	27	40	-13	PASS	104	193	
62.109	35.5	25.4	7.8	0.5	18.4	40	-21.6	PASS	232	89	
68.655	40.2	25.4	8.6	0.5	24	40	-16	PASS	228	239	
134.238	38.2	25.4	13.9	0.8	27.7	43.5	-15.9	PASS	332	335	
152.611	51	25.5	12.5	0.9	38.9	43.5	-4.6	PASS	100	24	-4.6
175.996	34.1	25.5	11.3	0.9	20.9	43.5	-22.6	PASS	400	45	
209.76	40.5	25.5	10.5	0.9	26.6	43.5	-17	PASS	199	7	

Curtis Straus - a Bureau Veritas Company
Radiated Emissions Electric Field 3m Distance
1-6GHz Horizontal Tabular Data
Operator: Chris Bramley
Client Present: None
Company: Ideal Industries, Inc.
EUT in X-Orientation
Tx on Low Channel(902.7MHz)

EUT Description - Smart Connector - LCE20A-1000
EUT Power Input - 120V/60Hz
Test Site - Chamber 1
Temperature; Humidity - 23.2°C; 24%RH
Barometric Pressure - 985mBar
EUT Maximum Frequency - 902-928MHz
Work Order # - R0190

Frequency MHz	Raw Peak Reading dBµV	Raw Average Reading dBµV	Preamp Factor dB	Antenna Factor dB/m	Cable Factor dB	Adjusted Peak Amplitude dBµV/m	Adjusted Average Amplitude dBµV/m	Peak Limit dBµV/m	Peak Margin dB	Peak Results Pass/Fail	Average Limit dBµV/m	Average Margin dB	Average Results Pass/Fail	Worst Peak Margin dB	Worst Average Margin dB
1805.3	42.2	38.2	17.8	26.7	2.8	54.2	50.2	74	-19.8	PASS	54	-3.7	PASS	-19.8	-3.7
2708.1	29.6	19	19.2	28.5	3.4	42.9	32.3	74	-31.1	PASS	54	-21.7	PASS		
3611.8	25.9	17.3	19.1	31.6	3.9	42.8	34.1	74	-31.2	PASS	54	-19.9	PASS		
4516	26.3	16.8	17.8	32.5	4.5	45.9	36.4	74	-28	PASS	54	-17.6	PASS		
5416.6	25.2	15.7	17.3	34.3	5.4	48	38.5	74	-26	PASS	54	-15.5	PASS		

Curtis Straus - a Bureau Veritas Company
Radiated Emissions Electric Field 3m Distance
1-6GHz Vertical Tabular Data
Operator: Chris Bramley
Client Present: None
Company: Ideal Industries, Inc.
EUT in X-Orientation
Tx on Low Channel(902.7MHz)

EUT Description - Smart Connector - LCE20A-1000
EUT Power Input - 120V/60Hz
Test Site - Chamber 1
Temperature; Humidity - 23.2°C; 24%RH
Barometric Pressure - 985mBar
EUT Maximum Frequency - 902-928MHz
Work Order # - R0190

Frequency MHz	Raw Peak Reading dBµV	Raw Average Reading dBµV	Preamp Factor dB	Antenna Factor dB/m	Cable Factor dB	Adjusted Peak Amplitude dBµV/m	Adjusted Average Amplitude dBµV/m	Peak Limit dBµV/m	Peak Margin dB	Peak Results Pass/Fail	Average Limit dBµV/m	Average Margin dB	Average Results Pass/Fail	Worst Peak Margin dB	Worst Average Margin dB
1805.5	41.6	37.3	17.8	26.7	2.8	53.6	49.3	74	-20.4	PASS	54	-4.7	PASS	-20.4	-4.7
2707.6	29.5	21.3	19.2	28.5	3.4	42.8	34.6	74	-31.2	PASS	54	-19.4	PASS		
3608.8	25.4	17.8	19.1	31.6	3.9	42.2	34.6	74	-31.7	PASS	54	-19.4	PASS		
4513.2	28.2	16.8	17.8	32.5	4.5	47.9	36.4	74	-26.1	PASS	54	-17.5	PASS		
5415.9	24.2	15.7	17.3	34.3	5.4	46.9	38.5	74	-27	PASS	54	-15.5	PASS		

Curtis Straus - a Bureau Veritas Company
Radiated Emissions Electric Field 3m Distance
1-6GHz Horizontal Tabular Data
Operator: Chris Bramley
Client Present: None
Company: Ideal Industries, Inc.
EUT in X-Orientation
Tx on Mid Channel(915MHz)

EUT Description - Smart Connector - LCE20A-1000
EUT Power Input - 120V/60Hz
Test Site - Chamber 1
Temperature; Humidity - 23.2°C; 24%RH
Barometric Pressure - 985mBar
EUT Maximum Frequency - 902-928MHz
Work Order # - R0190

Frequency MHz	Raw Peak Reading dBµV	Raw Average Reading dBµV	Preamp Factor dB	Antenna Factor dB/m	Cable Factor dB	Adjusted Peak Amplitude dBµV/m	Adjusted Average Amplitude dBµV/m	Peak Limit dBµV/m	Peak Margin dB	Peak Results Pass/Fail	Average Limit dBµV/m	Average Margin dB	Average Results Pass/Fail	Worst Peak Margin dB	Worst Average Margin dB
1830	43	38.7	17.8	26.9	2.8	55.3	50.9	74	-18.7	PASS	54	-3.1	PASS	-18.7	-3.1

Curtis Straus - a Bureau Veritas Company
Radiated Emissions Electric Field 3m Distance
1-6GHz Vertical Tabular Data
Operator: Chris Bramley
Client Present: None
Company: Ideal Industries, Inc.
EUT in X-Orientation
Tx on Mid Channel(915MHz)

EUT Description - Smart Connector - LCE20A-1000
EUT Power Input - 120V/60Hz
Test Site - Chamber 1
Temperature; Humidity - 23.2°C; 24%RH
Barometric Pressure - 985mBar
EUT Maximum Frequency - 902-928MHz
Work Order # - R0190

Frequency MHz	Raw Peak Reading dBµV	Raw Average Reading dBµV	Preamp Factor dB	Antenna Factor dB/m	Cable Factor dB	Adjusted Peak Amplitude dBµV/m	Adjusted Average Amplitude dBµV/m	Peak Limit dBµV/m	Peak Margin dB	Peak Results Pass/Fail	Average Limit dBµV/m	Average Margin dB	Average Results Pass/Fail	Worst Peak Margin dB	Worst Average Margin dB
1830	43.4	39.2	17.8	26.9	2.8	55.6	51.5	74	-18.4	PASS	54	-2.5	PASS	-18.4	-2.5

Curtis Straus - a Bureau Veritas Company
Radiated Emissions Electric Field 3m Distance
1-6GHz Horizontal Tabular Data
Operator: Chris Bramley
Client Present: None
Company: Ideal Industries, Inc.
EUT in X-Orientation
Tx on High Channel(927.3MHz)

EUT Description - Smart Connector - LCE20A-1000
EUT Power Input - 120V/60Hz
Test Site - Chamber 1
Temperature; Humidity - 23.2°C; 24%RH
Barometric Pressure - 985mBar
EUT Maximum Frequency - 902-928MHz
Work Order # - R0190

Frequency MHz	Raw Peak Reading dBµV	Raw Average Reading dBµV	Preamp Factor dB	Antenna Factor dB/m	Cable Factor dB	Adjusted Peak Amplitude dBµV/m	Adjusted Average Amplitude dBµV/m	Peak Limit dBµV/m	Peak Margin dB	Peak Results Pass/Fail	Average Limit dBµV/m	Average Margin dB	Average Results Pass/Fail	Worst Peak Margin dB	Worst Average Margin dB
1854.7	39.6	34.4	17.8	27.1	2.8	52.1	46.9	74	-21.9	PASS	54	-7	PASS	-21.9	-7

Curtis Straus - a Bureau Veritas Company
Radiated Emissions Electric Field 3m Distance
1-6GHz Vertical Tabular Data
Operator: Chris Bramley
Client Present: None
Company: Ideal Industries, Inc.
EUT in X-Orientation
Tx on High Channel(927.3MHz)

EUT Description - Smart Connector - LCE20A-1000
EUT Power Input - 120V/60Hz
Test Site - Chamber 1
Temperature; Humidity - 23.2°C; 24%RH
Barometric Pressure - 985mBar
EUT Maximum Frequency - 902-928MHz
Work Order # - R0190

Frequency MHz	Raw Peak Reading dBµV	Raw Average Reading dBµV	Preamp Factor dB	Antenna Factor dB/m	Cable Factor dB	Adjusted Peak Amplitude dBµV/m	Adjusted Average Amplitude dBµV/m	Peak Limit dBµV/m	Peak Margin dB	Peak Results Pass/Fail	Average Limit dBµV/m	Average Margin dB	Average Results Pass/Fail	Worst Peak Margin dB	Worst Average Margin dB
1854.6	41.3	35.7	17.8	27.1	2.8	53.8	48.2	74	-20.1	PASS	54	-5.8	PASS	-20.1	-5.8

Radiated Emissions Table

Date: 24-Jan-17 **Company:** Ideal Industries, Inc. **Work Order:** R0190
Engineer: Chris Bramley **EUT Desc:** Smart Connector - LCE20A-1000 **EUT Operating Voltage/Frequency:** 120V/60Hz
Temp: 23.2°C **Humidity:** 24% **Pressure:** 985mBar
Frequency Range: 6-10GHz **Measurement Distance:** 1 m
Notes: Checked Low, Mid, and High Channels **EUT Tx Freq:** 902.7-927.3MHz

Antenna Polarization (H / V)	Frequency (MHz)	Peak Reading (dBµV)	Average Reading (dBµV)	Preamp Factor (dB)	Antenna Factor (dB/m)	Cable Factor (dB)	Adjusted Peak Reading (dBµV/m)	Adjusted Avg Reading (dBµV/m)	FCC Class B High Frequency - Peak Limit (dBµV/m)	FCC Class B High Frequency - Peak Margin (dB)	FCC Class B High Frequency - Peak Result (Pass/Fail)	FCC Class B High Frequency - Average Limit (dBµV/m)	FCC Class B High Frequency - Average Margin (dB)	FCC Class B High Frequency - Average Result (Pass/Fail)
No emissions found														

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

Test Site: EMI Chamber 1 **Cable 1:** Asset #2051 **Cable 2:** Asset #2054
Analyzer: SA#2093 **Preamp:** Brown **Antenna:** Yellow Horn
CSsoft Radiated Emissions Calculator v 1.017.180
Adjusted Reading = Reading - Preamp Factor + Antenna Factor + Cable Factor

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Rev. 1/21/2017

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	8/9/2017	8/9/2016

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
EMI Chamber 1	719150	2762A-6	A-0015	1-18GHz		I	5/23/2017	5/23/2015

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	10/30/2017	10/30/2016
Brown	1-10GHz	CS	CS	N/A	1523	II	9/25/2017	9/25/2016
2130 BRF	0.009-18000MHz	BRM18770	Micro-Tronics	1	2130	II	1/7/2018	1/7/2017

Antennas	Range	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
Red-Black Bilog	30-2000MHz	JB1	Sunol	A091604-2	1106	I	2/9/2017	2/9/2015
Yellow Horn	1-18GHz	3115	EMCO	9608-4898	37	I	8/9/2018	8/6/2016

Meteorological Meters		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#2080		HTC-1	HDE		2080	II	4/5/2017	4/5/2016

Cables	Range	Mfr	Cat	Calibration Due	Calibrated on
Asset #2051	9kHz - 18GHz	Florida RF	II	3/2/2017	3/2/2016
Asset #2054	9kHz - 18GHz	Florida RF	II	10/1/3017	10/30/2016

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

Conducted Spurious Emissions

LIMITS

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100kHz bandwidth that contains the highest level of desired power based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB …
[15.247(d)]

MEASUREMENTS / RESULTS

Conducted Spurious Emissions Table

Date: 25-Jan-17 **Company:** Ideal Industries, Inc. **Work Order:** R0190
Engineer: Jason Haley **EUT Desc:** Smart Connector - LCE20A-1000 **EUT Operating Voltage/Frequency:** 120V/60Hz
Temp: 23.2°C **Humidity:** 24% **Pressure:** 990mBar

Frequency Range: Fundamental

Notes: Tested IAW FCC OET 558074 D01 DTS Meas Guidance v03r05 Section 11

Channel	Frequency (MHz)	Frequency Range Measured	Limit (dBm)	Test Results (Pass/Fail)
Low	902.7	9kHz to 10GHz	See Graphs	Pass
Middle	915	9kHz to 10GHz	See Graphs	Pass
High	927.3	9kHz to 10GHz	See Graphs	Pass

Rev. 2/4/2017

Spectrum Analyzers / Receivers /Preselectors	Range	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
Rental MXE EMI Receiver(1170725)	20Hz-26.5GHz	N9038A	Agilent	MY51210151	1170725	I	12/22/2017	12/22/2016
Conducted Test Sites (Mains / Telco)	**FCC Code**		**VCCI Code**			**Cat**	**Calibration Due**	**Calibrated on**
CEMI 1	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	4/28/2018	4/28/2016
TH A#2086		HTC-1	HDE		2086	II	4/5/2017	4/5/2016
Preamps /Couplers Attenuators / Filters	**Range**	**MN**	**Mfr**	**SN**	**Asset**	**Cat**	**Calibration Due**	**Calibrated on**
HF 30dB 50W Attenuator	0.009-18 GHz	PE 7322-30	Pasternack	1	1840	II	9/3/2017	9/3/2016

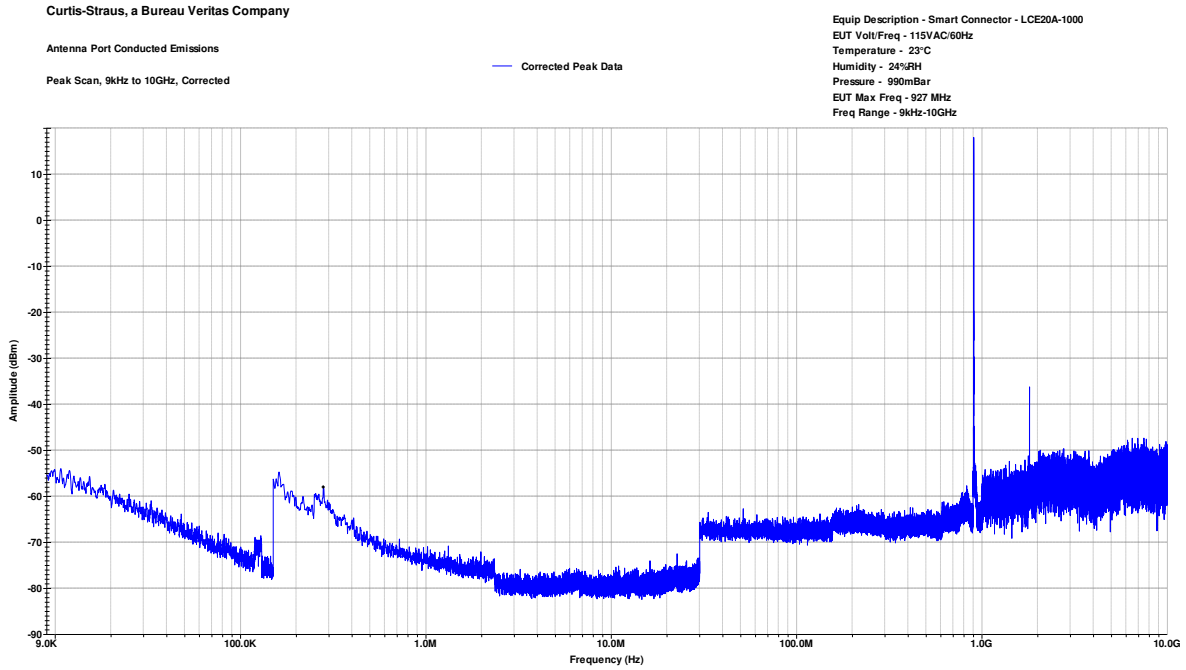
All equipment is calibrated using standards traceable to NIST or other nationally recognized calibration standard.

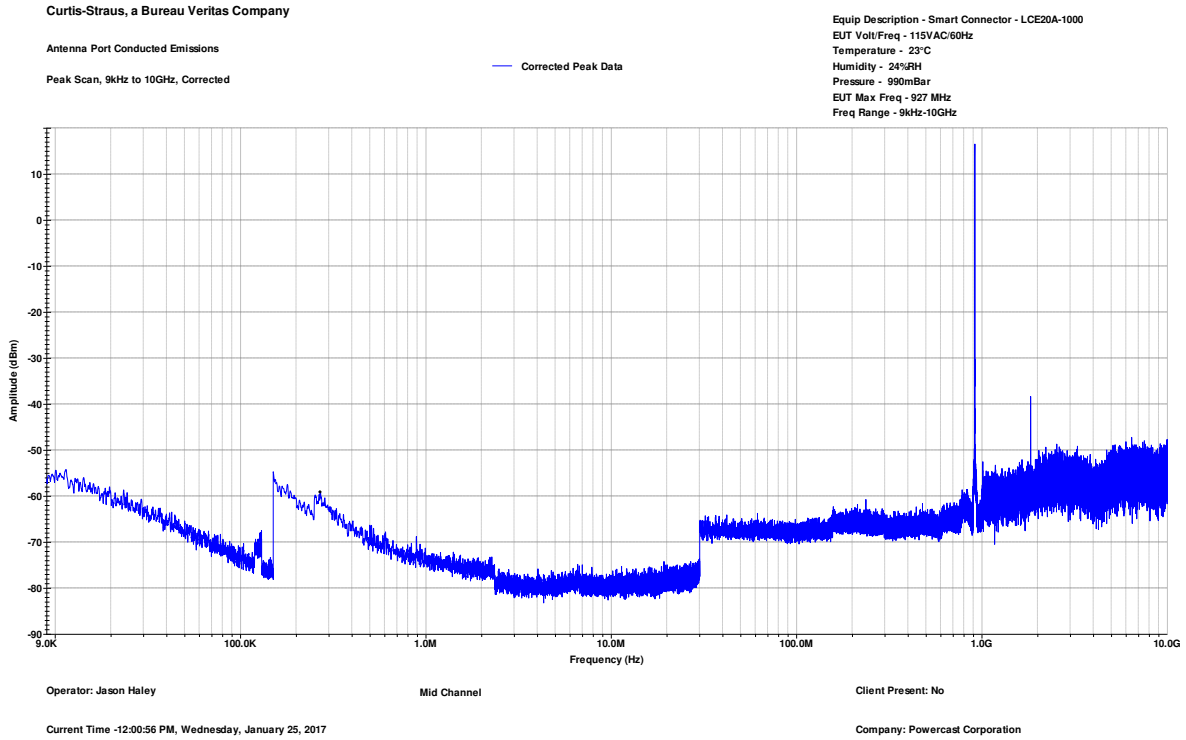
Conducted spurious emissions at the antenna port were measured in accordance with FCC KDB 558074 D01 DTS Measurement Guidance v03r05 Section 11.0.

Frequency range up to 10GHz was investigated for all 3 channels (low, middle and high) at the EUT antenna port. Plots below show that all emissions are more than 30dB below the fundamental.

Plots

Conducted Spurious Emissions





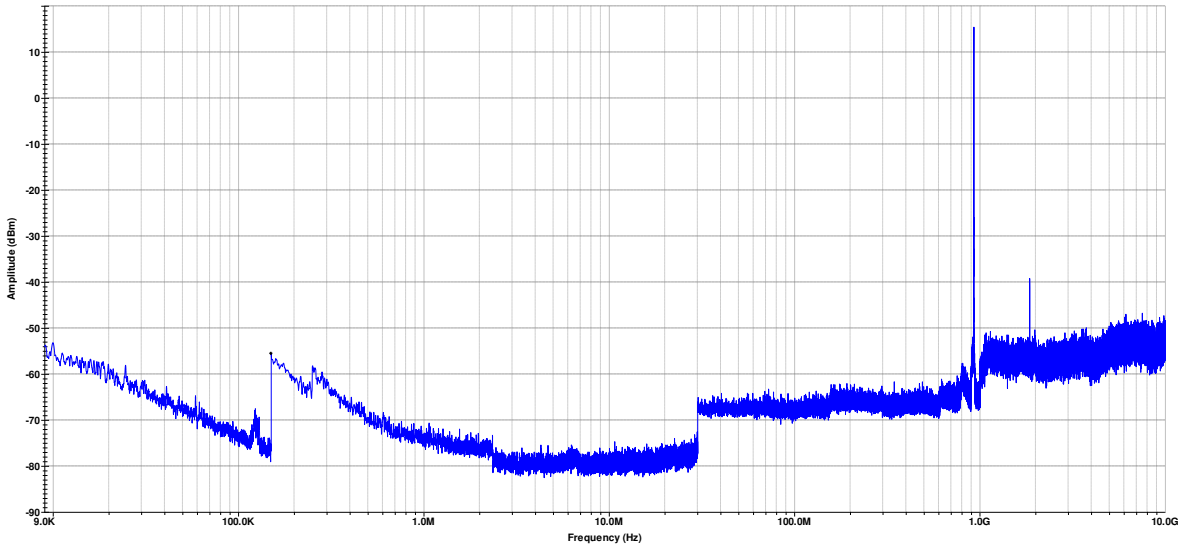
Curtis-Straus, a Bureau Veritas Company

Antenna Port Conducted Emissions

Peak Scan, 9kHz to 10GHz, Corrected

Corrected Peak Data

Equip Description - Smart Connector - LCE20A-1000
EUT Volt/Freq - 115VAC/60Hz
Temperature - 23°C
Humidity - 24%RH
Pressure - 990mBar
EUT Max Freq - 927 MHz
Freq Range - 9kHz-10GHz



Operator: Jason Haley

High Channel

Client Present: No

Current Time -11:44:41 AM, Wednesday, January 25, 2017

Company: Powercast Corporation

Power Spectral Density

LIMIT

…the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8dBm in any 3 kHz band during any time interval of continuous transmission. [15.247(e)]

Per 558074 D01 DTS Measurement Guidance v03r05 DTS Method 10.3 AVGPSD-1 (trace averaging with EUT transmitting at full power throughout each sweep)

MEASUREMENTS / RESULTS

Maximum Power Spectral Density Level in the Fundamental Emission Table

Date: 06-Feb-17 **Company:** Ideal Industries, Inc. **Work Order:** R0190
Engineer: Chris Bramley **EUT Desc:** Smart Connector - LCE20A-1000 **EUT Operating Voltage/Frequency:** 120V/60Hz
Temp: 21.0°C **Humidity:** 33% **Pressure:** 1010mBar

Frequency Range: Fundamental

Notes: Tested IAW FCC OET 558074 D01 DTS Meas Guidance v03r05 Section 10.3, Method AVGPSD-1

Channel	Frequency (MHz)	PSD Measured (dBm)	PSD Limit (dBm)	Margin (dB)	Test Results (Pass/Fail)
Low	902.7	5.535	8	-2.5	PASS
Middle	915	4.015	8	-4.0	PASS
High	927.3	2.892	8	-5.1	PASS

Rev. 4/10/2017

Spectrum Analyzers / Receivers /Preselectors	Range	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
Rental EXA Signal Analyzer(1118470)	9KHz-26.5GHz	N9010A-526;M	AT	MY51170093	1118470	I	1/3/2018	1/3/2017
Conducted Test Sites (Mains / Telco)	**FCC Code**		**VCCI Code**			**Cat**	**Calibration Due**	**Calibrated on**
CEMI 2	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	4/28/2018	4/28/2016
TH A#2086		HTC-1	HDE		2086	II	3/23/2018	3/23/2017
Preamps /Couplers Attenuators / Filters	**Range**	**MN**	**Mfr**	**SN**	**Asset**	**Cat**	**Calibration Due**	**Calibrated on**
HF 30dB 50W Attenuator	0.009-18 GHz	PE 7322-30	Pasternack	1	1840	II	9/3/2017	9/3/2016

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

PLOTS

PSD – Low Channel

PSD – Mid Channel

PSD – High Channel

AC Line Conducted Emissions

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 / RESULTS

Curtis Straus - a Bureau Veritas Company
Conducted Emissions - Voltage
Quasi-peak and Average Voltage Tabular Data
Operator: Jason Haley
CEMI 115-60 phase.til - Ideal Industries, Inc.
3:38:26 PM Wednesd January 25 2017 Client Present: No
Line tested: 115VAC/60Hz Phase
EUT transmitting on 902MHz

Equip Description - Smart Connector - LCE20A-1000
Test Site - CEMI-1
Temperature - 23°C
Humidity - 24%RH
Pressure - 990mBar
EUT Max Freq - 927MHz
Work Order - R0190

Frequency MHz	Raw Average Reading dBµV	Raw Quasi-peak Reading dBµV	Attenuator Factor dB	Cable Factor dB	Transducer Factor dB	Adjusted Average Amplitude dBµV	Adjusted Quasi-peak Amplitude dBµV	Average Limit dBµV	Quasi-peak limit dBµV	Average Margin dB	Quasi-peak Margin dB	Average Results Pass/Fail	Quasi-peak Results Pass/Fail	Worst Margin dB
0.15	15.1	25.5	19.4	0.4	-0.1	35.1	45.4	56	66	-20.9	-20.6	PASS	PASS	
0.275	14.5	31.2	19.4	0.2	-0.1	34.2	51	51	61	-16.8	-10	PASS	PASS	
0.458	12.9	35.3	19.4	0.3	-0.1	32.7	55	46.7	56.7	-14.1	-1.7	PASS	PASS	-1.7
0.552	8.1	23.3	19.4	0.3	-0.1	27.9	43.1	46	56	-18.1	-12.9	PASS	PASS	
0.744	6.1	17.1	19.4	0.3	-0.1	25.8	36.9	46	56	-20.2	-19.1	PASS	PASS	
0.827	6	20.8	19.4	0.3	-0.1	25.8	40.6	46	56	-20.2	-15.4	PASS	PASS	
1.019	5	15.8	19.4	0.3	-0.1	24.8	35.6	46	56	-21.2	-20.4	PASS	PASS	
1.111	4.7	16.5	19.4	0.3	-0.1	24.5	36.2	46	56	-21.5	-19.8	PASS	PASS	
1.298	4.3	14.6	19.4	0.3	-0.1	24.1	34.4	46	56	-21.9	-21.6	PASS	PASS	
1.384	4	16.5	19.4	0.3	-0.1	23.8	36.3	46	56	-22.2	-19.7	PASS	PASS	
1.666	3.6	16.3	19.4	0.3	-0.1	23.4	36.1	46	56	-22.6	-19.9	PASS	PASS	
1.977	5.4	26.9	19.4	0.3	-0.1	25.2	46.7	46	56	-20.8	-9.3	PASS	PASS	
2.155	5.5	26.4	19.4	0.3	-0.1	25.3	46.1	46	56	-20.7	-9.9	PASS	PASS	
2.512	3.2	25.6	19.4	0.3	-0.1	23	45.3	46	56	-23	-10.7	PASS	PASS	
4.053	1.2	20.5	19.4	0.3	-0.1	21	40.3	46	56	-25	-15.7	PASS	PASS	

Curtis Straus - a Bureau Veritas Company
Conducted Emissions - Voltage
Quasi-peak and Average Voltage Tabular Data
Operator: Jason Haley
CEMI 115-60 neutral.til - Ideal Industries, Inc.
Wednesday January 2 2017 Client Present: No
Line tested: 115VAC/60Hz Neutral
EUT transmitting on 902MHz

Equip Description - Smart Connector - LCE20A-1000
Test Site - CEMI-1
Temperature - 23°C
Humidity - 24%RH
Pressure - 990mBar
EUT Max Freq - 927MHz
Work Order - R0190

Frequency MHz	Raw Average Reading dBµV	Raw Quasi-peak Reading dBµV	Attenuator Factor dB	Cable Factor dB	Transducer Factor dB	Adjusted Average Amplitude dBµV	Adjusted Quasi-peak Amplitude dBµV	Average Limit dBµV	Quasi-peak limit dBµV	Average Margin dB	Quasi-peak Margin dB	Average Results Pass/Fail	Quasi-peak Results Pass/Fail	Worst Margin dB
0.28	14.1	30.7	19.4	0.2	-0.1	33.9	50.4	50.8	60.8	-16.9	-10.4	PASS	PASS	
0.487	8.1	16.2	19.4	0.3	-0.1	27.9	36	46.2	56.2	-18.3	-20.2	PASS	PASS	
0.556	8	22.7	19.4	0.3	-0.1	27.8	42.5	46	56	-18.2	-13.5	PASS	PASS	
0.845	5.4	15.2	19.4	0.3	-0.1	25.3	35	46	56	-20.7	-21	PASS	PASS	
1.313	4.2	15	19.4	0.3	-0.1	24.1	34.8	46	56	-21.9	-21.2	PASS	PASS	
1.678	3.4	15.9	19.4	0.3	-0.1	23.2	35.7	46	56	-22.8	-20.3	PASS	PASS	
1.872	2.9	11.1	19.4	0.3	-0.1	22.8	31	46	56	-23.2	-25	PASS	PASS	
2.536	5	28.6	19.4	0.3	-0.1	24.8	48.4	46	56	-21.2	-7.6	PASS	PASS	-7.6
3.4	-0.3	11.3	19.4	0.3	-0.1	19.6	31.2	46	56	-26.4	-24.8	PASS	PASS	
4.972	1	18.2	19.4	0.3	-0.1	20.9	38	46	56	-25.1	-18	PASS	PASS	

Curtis Straus - a Bureau Veritas Company
Conducted Emissions - Voltage
Quasi-peak and Average Voltage Tabular Data
Operator: Nirak So
R0190 CEMI 1-26-2017.til Compl deal Industries, Inc.
6:29:27 PM Thursday January 2 2017 Client Present: No
277V/60Hz

Equip Description - Smart Connector - LCE20A-1000
Test Site - CEMI-6
Temperature - 21.9
Humidity - 34
Pressure - 981
EUT Max Freq - 927.3
Work Order - R0190

Frequency	Raw Average Reading	Raw Quasi-peak Reading	Attenuator Factor	Cable Factor	Limiter Factor	Preselector Factor	Transducer Factor	Adjusted Average Amplitude	Adjusted Quasi-peak Amplitude	Average Limit	Quasi-peak limit	Average Margin	Quasi-peak Margin	Average Results	Quasi-peak Results
MHz	dBµV	dBµV	dB	dB	dB	dB	dB	dBµV	dBµV	dBµV	dBµV	dB	dB	Pass/Fail	Pass/Fail
0.445	15.8	42.2	0	0	10	0	0	25.9	52.3	47	57	-21.1	-4.7	PASS	PASS
0.801	12.6	40.6	0	0.1	10.1	0	-0.1	22.7	50.7	46	56	-23.3	-5.3	PASS	PASS
1.064	14.5	42.1	0	0.1	10.1	0	-0.1	24.7	52.3	46	56	-21.3	-3.7	PASS	PASS
1.507	12.8	41.9	0	0.1	10	0	-0.1	23	52.1	46	56	-23	-3.9	PASS	PASS
1.683	13.4	41.6	0	0.1	10.1	0	-0.1	23.5	51.8	46	56	-22.5	-4.2	PASS	PASS
2.299	11.9	40.2	0	0.1	10.1	0	-0.1	22.1	50.4	46	56	-23.9	-5.6	PASS	PASS

Line tested: L0
Mode: Full Power

Curtis Straus - a Bureau Veritas Company
Conducted Emissions - Voltage
Quasi-peak and Average Voltage Tabular Data
Operator: Nirak So
R0190 CEMI 1-26-2017.tilCompany: Powercast Corporation
7:03:29 PM Thursday January 2 2017Client Present: No
277V/60Hz

Equip Description - Smart Connector - LCE20A-1000
Test Site - CEMI-6
Temperature - 22.1
Humidity - 35
Pressure - 981
EUT Max Freq - 927.3
Work Order - R0190

Frequency	Raw Average Reading	Raw Quasi-peak Reading	Attenuator Factor	Cable Factor	Limiter Factor	Preselector Factor	Transducer Factor	Adjusted Average Amplitude	Adjusted Quasi-peak Amplitude	Average Limit	Quasi-peak limit	Average Margin	Quasi-peak Margin	Average Results	Quasi-peak Results
MHz	dBµV	dBµV	dB	dB	dB	dB	dB	dBµV	dBµV	dBµV	dBµV	dB	dB	Pass/Fail	Pass/Fail
0.788	12.9	38.9	0	-0.1	10.1	0	0	22.9	48.9	46	56	-23.1	-7.1	PASS	PASS
0.876	14.2	41.4	0	-0.1	10.1	0	0	24.2	51.4	46	56	-21.8	-4.6	PASS	PASS
1.137	13.2	40.1	0	-0.1	10	0	-0.1	23.2	50.1	46	56	-22.8	-5.9	PASS	PASS
1.488	13.2	40.4	0	0	10	0	-0.1	23.3	50.5	46	56	-22.7	-5.5	PASS	PASS
1.663	13.6	41.5	0	-0.1	10.1	0	-0.1	23.6	51.5	46	56	-22.4	-4.5	PASS	PASS
3.061	9.1	37.2	0	0	10.1	0	-0.1	19.2	47.3	46	56	-26.8	-8.7	PASS	PASS

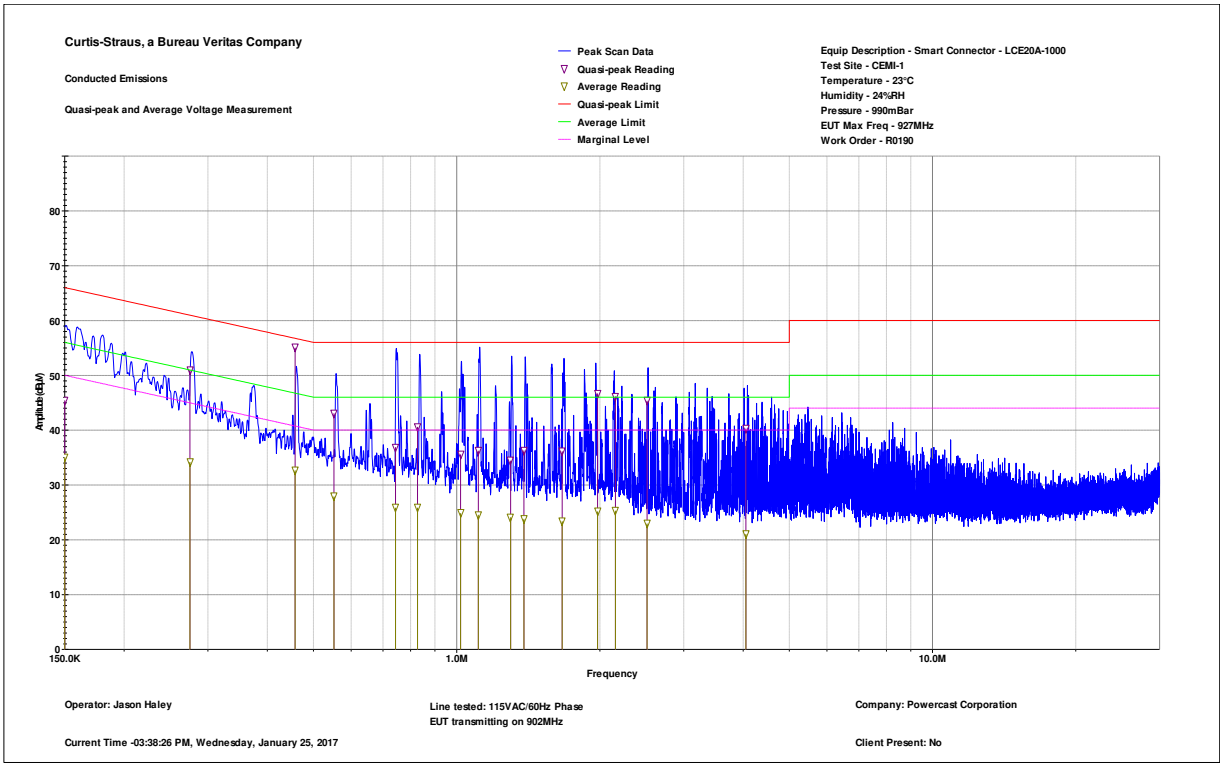
Line tested: L1
Mode: Full Power

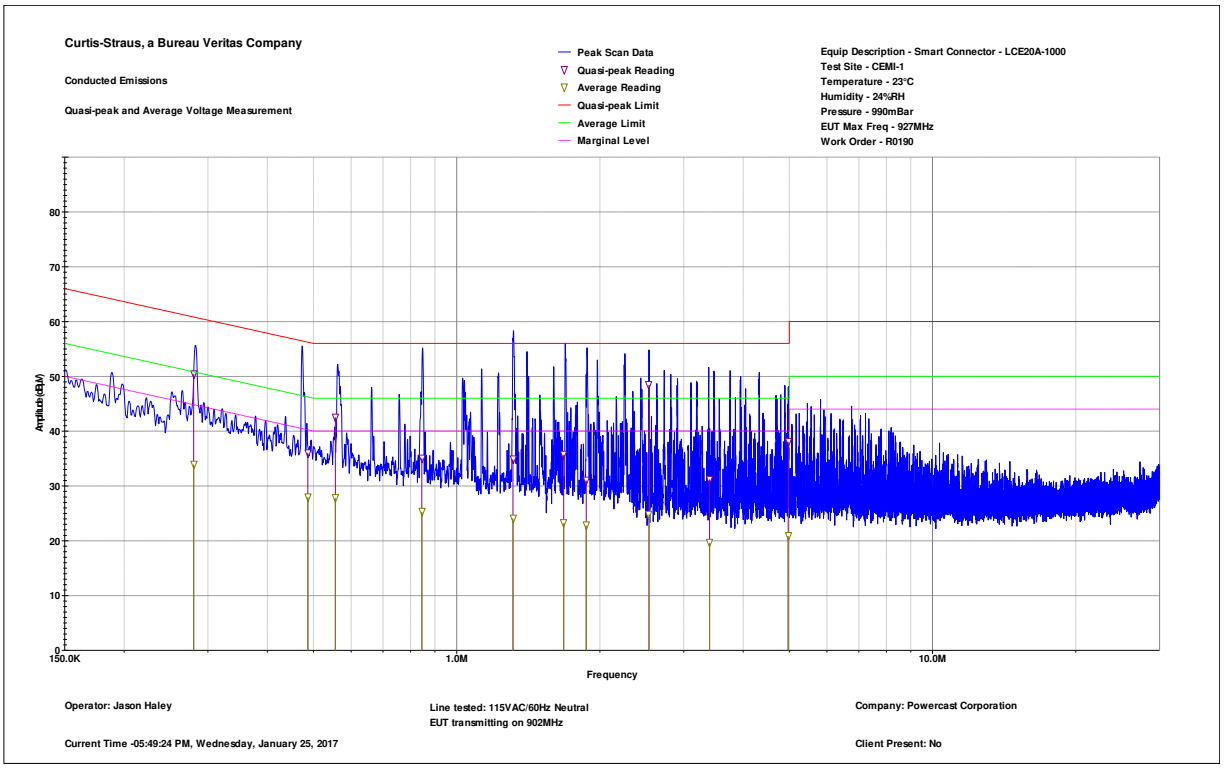
Rev. 1/21/2017

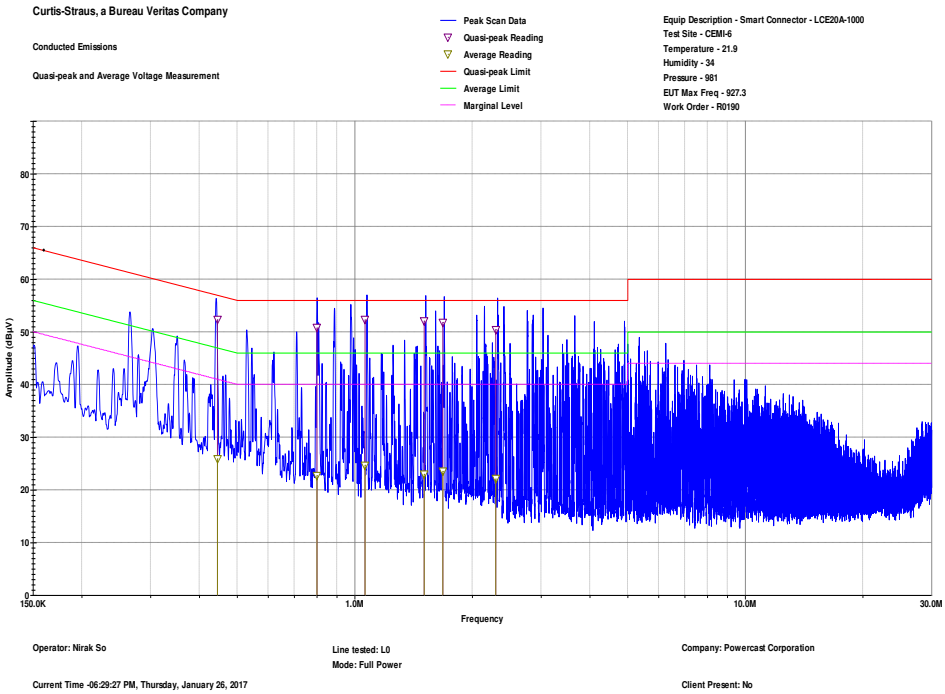
Spectrum Analyzers / Receivers /Preselectors	**Range**	**MN**	**Mfr**	**SN**	**Asset**	**Cat**	**Calibration Due**	**Calibrated on**
Rental MXE EMI Receiver(1170725)	20Hz-26.5GHz	N9038A	Agilent	MY51210151	1170725	I	12/22/2017	12/22/2016
LISNs/Measurement Probes	**Range**	**MN**	**Mfr**	**SN**	**Asset**	**Cat**	**Calibration Due**	**Calibrated on**
LISN Asset 1730	150kHz-30MHz	LI-150A	Com-Power	201090	1730	I	3/10/2017	3/10/2016
LISN Asset 1731	150kHz-30MHz	LI-150A	Com-Power	201091	1731	I	3/10/2017	3/10/2016
Conducted Test Sites (Mains / Telco)	**FCC Code**		**VCCI Code**			**Cat**	**Calibration Due**	**Calibrated on**
CEMI 1	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	4/28/2018	4/28/2016
TH A#2082		HTC-1	HDE		2082	II	4/5/2017	4/5/2016
Cables	**Range**		**Mfr**			**Cat**	**Calibration Due**	**Calibrated on**
CEMI-10	9kHz - 2GHz		C-S			II	5/10/2017	5/10/2016
Attenuators	**Range**	**MN**	**Mfr**	**SN**	**Asset**	**Cat**	**Calibration Due**	**Calibrated on**
20dB Attenuator-60	9kHz-2GHz			N/A		II	4/12/2017	4/12/2016

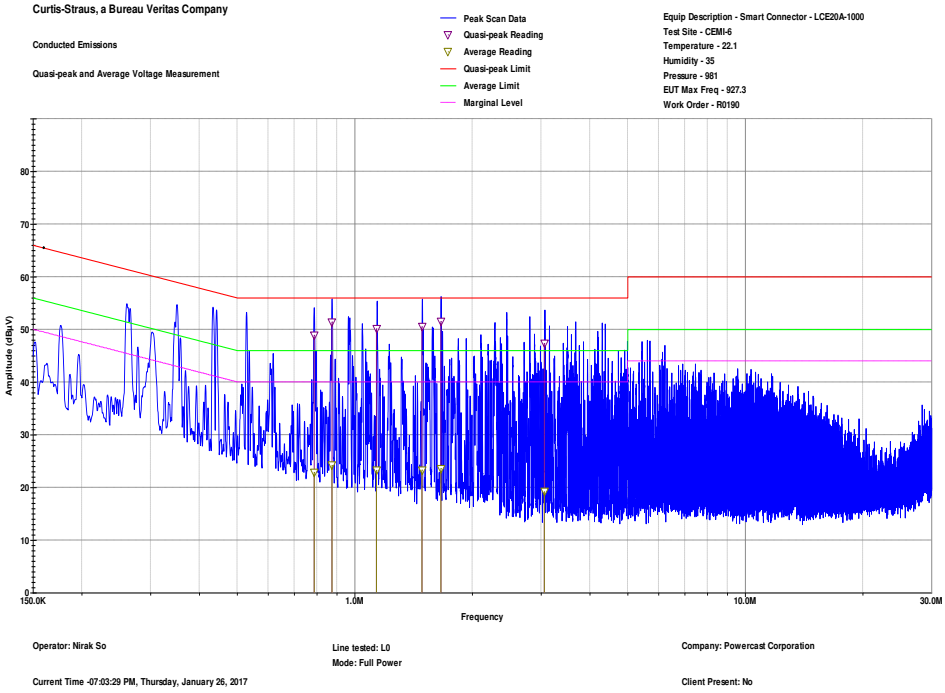
All equipment is calibrated using standards traceable to NIST or other nationally recognized calibration standard.

Plots
AC Line Conducted Emissions






Curtis-Straus, a Bureau Veritas Company
Conducted Emissions
Quasi-peak and Average Voltage Measurement
Peak Scan Data
Quasi-peak Reading
Average Reading
Quasi-peak Limit
Average Limit
Marginal Level
Equip Description - Smart Connector - LCE20A-1000
Test Site - CEMI-6
Temperature - 21.9
Humidity - 34
Pressure - 981
EUT Max Freq - 927.3
Work Order - R0190
Amplitude (dBµV)
Frequency
150.0K
1.0M
10.0M
30.0M
Operator: Nirak So
Line tested: L0
Mode: Full Power
Company: Powercast Corporation
Current Time -06:29:27 PM, Thursday, January 26, 2017
Client Present: No


Curtis-Straus, a Bureau Veritas Company
Conducted Emissions
Quasi-peak and Average Voltage Measurement
Peak Scan Data
Quasi-peak Reading
Average Reading
Quasi-peak Limit
Average Limit
Marginal Level
Equip Description - Smart Connector - LCE20A-1000
Test Site - CEMI-6
Temperature - 22.1
Humidity - 35
Pressure - 981
EUT Max Freq - 927.3
Work Order - R0190
Amplitude (dBµV)
Frequency
150.0K
1.0M
10.0M
30.0M
Operator: Nirak So
Line tested: L0
Mode: Full Power
Company: Powercast Corporation
Current Time -07:03:29 PM, Thursday, January 26, 2017
Client Present: No

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]

MEASUREMENTS / RESULTS

Occupied Bandwidth Table

Date: 25-Jan-17 **Company:** Ideal Industries, Inc. **Work Order:** R0190
Engineer: Jason Haley **EUT Desc:** Smart Connector - LCE20A-1000 **EUT Operating Voltage/Frequency:** 120V/60Hz
Temp: 23.2°C **Humidity:** 24% **Pressure:** 990mBar

Frequency Range: Fundamental

Notes:

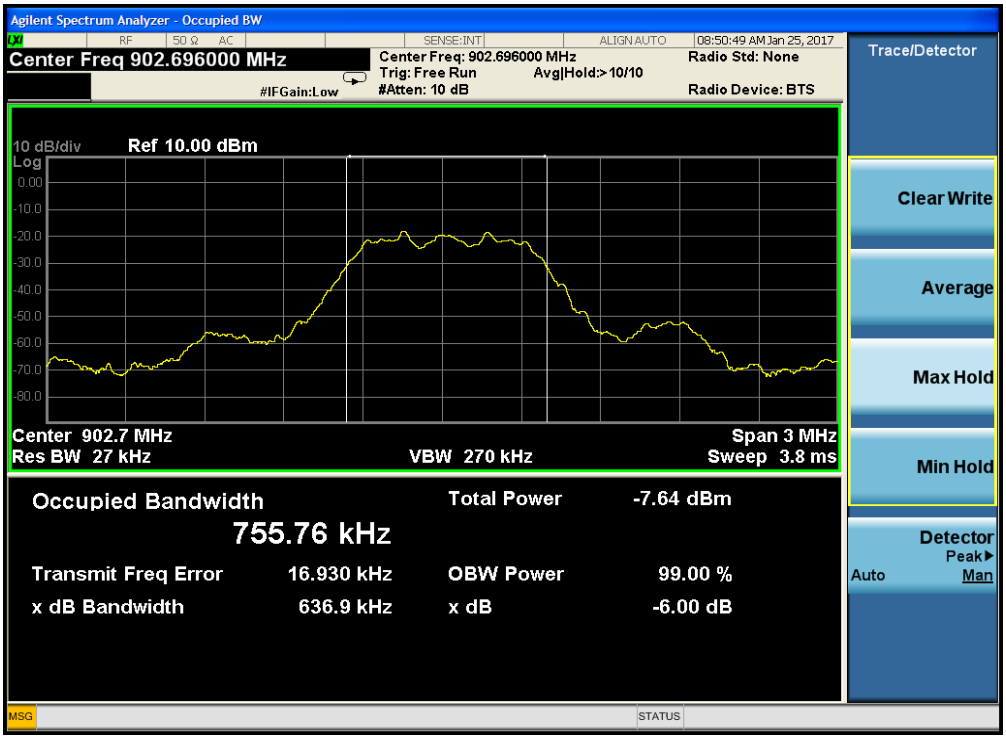
Channel	Frequency (MHz)	Occupied Bandwidth (kHz)
Low	902.7	755.76
Middle	915	753.12
High	927.3	752.82

Rev. 2/4/2017

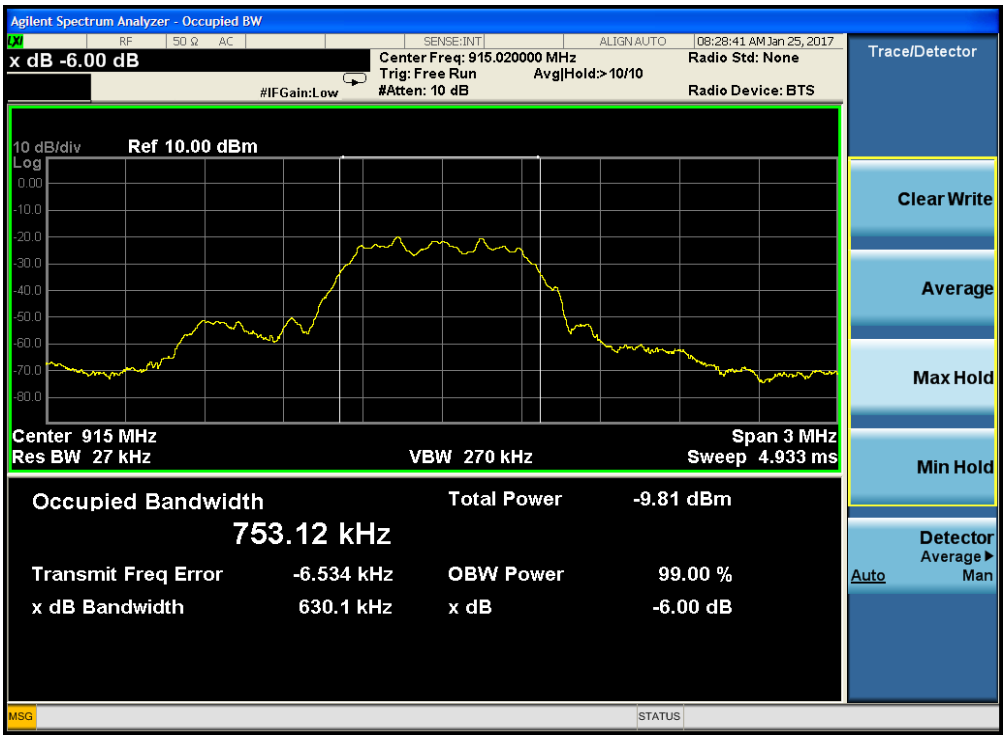
Spectrum Analyzers / Receivers /Preselectors	Range	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
Rental MXE EMI Receiver(1170725)	20Hz-26.5GHz	N9038A	Agilent	MY51210151	1170725	I	12/22/2017	12/22/2016
Conducted Test Sites (Mains / Telco)	**FCC Code**		**VCCI Code**			**Cat**	**Calibration Due**	**Calibrated on**
CEMI 1	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	4/28/2018	4/28/2016
TH A#2086		HTC-1	HDE		2086	II	4/5/2017	4/5/2016
Preamps /Couplers Attenuators / Filters	**Range**	**MN**	**Mfr**	**SN**	**Asset**	**Cat**	**Calibration Due**	**Calibrated on**
HF 30dB 50W Attenuator	0.009-18 GHz	PE 7322-30	Pasternack	1	1840	II	9/3/2017	9/3/2016

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

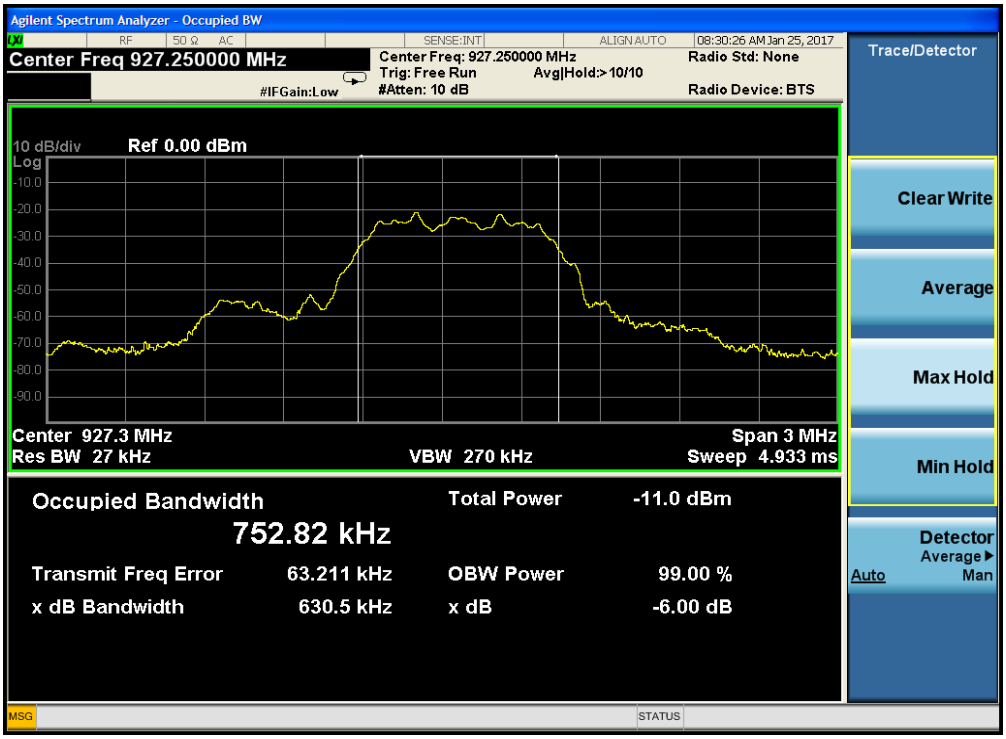
Plot(s)



Occupied Bandwidth – Low Channel



Occupied Bandwidth – Middle Channel



Occupied Bandwidth – High Channel

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.

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.

The complete list of the Approved Subcontractors Curtis-Straus may use to delegate the performance of work can be provided upon request.