Test Report

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

Report No	ER1341-1
Client	Triangle BioSystems International
Address	2224 Page Rd., Suite 108 Durham, NC 27703
Phone	(919) 361-2663
Items tested	Model 3050 Transmitter Module
FCC ID	2AJQ2W11
IC	22071-W11
FRN	0025871047
Equipment Type	Part 15 Low Power Communication Device Transmitter
Equipment Code	DXX
Emission Designator	2M54F1D
Standards	CFR Title 47 FCC Parts 15.207 and 15.209, ISED Canada RSS-210 Issue 9
Test Dates	May 9-10 and 22-23, 2017
Results	As detailed within this report
Prepared by	Christopher Bramley – Test Engineer
Authorized by	Yunus Fazilioglu – Sr. Engineer
Issue Date	8/24/2017
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.

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.

Contents

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Summary and Test Methodology

This test report supports a "Limited Modular Approval" certification application for the "Wireless Headstage System" operating under:

CFR Title 47 FCC Parts 15.207 and 15.209, ISED Canada RSS-210 Issue 9

Product is a radio module operating at 3075MHz frequency. All testing was performed in accordance with ANSI C63.10 2013. Emissions were maximized around 3 orthogonal planes (X, Y and Z). Device has surface mounted chip antenna.

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

The following bandwidths were used during emissions testing.

Frequency	RBW	VBW
150kHz-30MHz	9kHz	30kHz
30MHz-1GHz	120kHz	1MHz
1GHz-40GHz	1MHz	3MHz

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

Issue No.	Reason for change	Date Issued
1	Original Release	August 24, 2017

Product Tested - Configuration Documentation

EUT Configuration			
Work Order:	R1341		
Company:	Triangle BioSystems International		
Company Address:	2224 Page Road		
	Durham, NC 27703		
Contact:	James Morizio		
	MN		**SN**
EUT:	Wireless Headstage System		Sample 1
EUT Description:	Animal Biosensor		
EUT Max Frequency:	3075 MHz		

EUT Components	**MN**	**SN**
AC Adapter	3P10-L0504	1204-3575 F

Support Equipment	**MN**	**SN**
On/Off Wand	--	--

Port Label	Port Type	# ports	# populated	cable type	shielded	ferrites	length (m)	in/out	under test	comment
AC Mains of Adapter	Power AC	1	1	Power AC	No	No	1	in	yes	Used only for charging
DC Mains	Power DC	1	1	Power DC	No	No	1	in	yes	Used only for charging

Software Operating Mode Description:

EUT is transmitting at 3.075GHz.

Statement of Conformity

Device 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 surface mounted chip 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 complied with the applicable requirements.
6.6				Occupied Bandwidth measurements were made.

RADIATED EMISSIONS

Radiated Emissions Data Table(s):

Curtis Straus - a Bureau Veritas Company							Work Order - R1341				
Radiated Emissions Electric Field 3m Distance							EUT Power Input - 120V/60Hz				
30-1000MHz Horizontal Tabular Data							Test Site - Chamber 1				
Operator: Chris Bramley							Temp; Humid; Pres - 24.5°C; 22%RH; 1006mBar				
Tx at 3075MHz							Witnessed by - N/A				
Y-Orientation							EUT Maximum Frequency - 3075MHz				
Charger Connected							Req. 1; Req. 2 - FCC 15.209				
Frequency	QP Reading	Preamplifier Gain	Antenna Factor	Cable Loss	QP Amplitude	Limit Req. 1	Margin Req. 1	Results Req. 1	Antenna Height	Turntable Azimuth	Worst Margin Limit 1
MHz	dBµV	dB	dB/m	dB	dBµV/m	dbµV/m	dB	pass/fail	centimeters	degrees	dB
30.465	19.5	25.4	21	0.4	15.4	40	-24.6	PASS	174	25	-24.6
75.054	23.6	25.4	8.5	0.5	7.2	40	-32.8	PASS	202	250	
115.509	20.6	25.4	13.8	0.6	9.6	43.5	-33.9	PASS	267	200	
943.518	20.7	25.3	22.5	2	19.9	46	-26.1	PASS	225	169	

Curtis Straus - a Bureau Veritas Company							Work Order - R1341				
Radiated Emissions Electric Field 3m Distance							EUT Power Input - 120V/60Hz				
30-1000MHz Vertical Tabular Data							Test Site - Chamber 1				
Operator: Chris Bramley							Temp; Humid; Pres - 24.5°C; 22%RH; 1006mBar				
Tx at 3075MHz							Witnessed by - N/A				
Y-Orientation							EUT Maximum Frequency - 3075MHz				
Charger Connected							Req. 1; Req. 2 - FCC 15.209				
Frequency	QP Reading	Preamplifier Gain	Antenna Factor	Cable Loss	QP Amplitude	Limit Req. 1	Margin Req. 1	Results Req. 1	Antenna Height	Turntable Azimuth	Worst Margin Limit 1
MHz	dBµV	dB	dB/m	dB	dBµV/m	dBµV/m	dB	pass/fail	centimeters	degrees	dB
30.817	19.5	25.4	20.7	0.4	15.1	40	-24.9	PASS	175	28	
77.601	34.9	25.4	8.4	0.5	18.4	40	-21.6	PASS	100	262	
78.025	32.4	25.4	8.4	0.5	15.9	40	-24.1	PASS	124	250	
78.532	35.4	25.4	8.3	0.5	18.9	40	-21.1	PASS	104	232	-21.1
79.93	32.7	25.4	8.2	0.5	16	40	-24	PASS	124	325	
896.568	20.7	25.2	22.5	2.1	20.1	46	-25.9	PASS	125	25	

Curtis Straus - a Bureau Veritas Company	Work Order - R1341
Radiated Emissions Electric Field 3m Distance	EUT Power Input - Battery
30-1000MHz Horizontal Tabular Data	Test Site - Chamber 1
Operator: Chris Bramley	Temp; Humid; Pres - 24.5°C; 22%RH; 1006mBar
Tx at 3075MHz	Witnessed by - N/A
Y-Orientation	EUT Maximum Frequency - 3075MHz
No Charger	Req. 1; Req. 2 - FCC 15.209

Frequency	QP Reading	Preamplifier Gain	Antenna Factor	Cable Loss	QP Amplitude	Limit Req. 1	Margin Req. 1	Results Req. 1	Antenna Height	Turntable Azimuth	Worst Margin Limit 1
MHz	dBµV	dB	dB/m	dB	dBµV/m	dbµV/m	dB	pass/fail	centimeters	degrees	dB
30.815	19.4	25.4	20.7	0.4	15	40	-25	PASS	112	30	-25
126.944	19.4	25.4	14.3	0.7	8.9	43.5	-34.6	PASS	191	65	
904.195	20.8	25.2	22.6	2.1	20.3	46	-25.7	PASS	115	143	

Curtis Straus - a Bureau Veritas Company	Work Order - R1341
Radiated Emissions Electric Field 3m Distance	EUT Power Input - Battery
30-1000MHz Vertical Tabular Data	Test Site - Chamber 1
Operator: Chris Bramley	Temp; Humid; Pres - 24.5°C; 22%RH; 1006mBar
Tx at 3075MHz	Witnessed by - N/A
Y-Orientation	EUT Maximum Frequency - 3075MHz
No Charger	Req. 1; Req. 2 - FCC 15.209

Frequency	QP Reading	Preamplifier Gain	Antenna Factor	Cable Loss	QP Amplitude	Limit Req. 1	Margin Req. 1	Results Req. 1	Antenna Height	Turntable Azimuth	Worst Margin Limit 1
MHz	dBµV	dB	dB/m	dB	dBµV/m	dBµV/m	dB	pass/fail	centimeters	degrees	dB
30.145	19.5	25.4	21.2	0.4	15.7	40	-24.3	PASS	218	160	-24.3
117.495	19.2	25.4	13.9	0.6	8.4	43.5	-35.1	PASS	109	150	
192.543	21.3	25.4	11.9	1	8.7	43.5	-34.8	PASS	124	70	
283.994	21.5	25.5	13.3	1.1	10.4	46	-35.6	PASS	124	155	
487.911	20.4	25.6	17.8	1.5	14.2	46	-31.8	PASS	175	64	
904.058	20.8	25.2	22.6	2.1	20.4	46	-25.7	PASS	198	70	

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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**	**Asset**	**Cat**	**Calibration Due**	**Calibrated on**
EMI Chamber 1	719150	2762A-6	A-0015	30-1000MHz	1685	II	12/21/2018	12/21/2016
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
Antennas	**Range**	**MN**	**Mfr**	**SN**	**Asset**	**Cat**	**Calibration Due**	**Calibrated on**
Red-White Bilog	30-2000MHz	JB1	Sunol	A091604-1	1105	I	8/12/2017	8/12/2015
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#2078		HTC-1	HDE		2078	II	3/23/2018	3/23/2017
Cables	**Range**		**Mfr**			**Cat**	**Calibration Due**	**Calibrated on**
Asset #2051	9kHz - 18GHz		Florida RF			II	3/5/2018	3/5/2017
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.

Radiated Emissions Table

Date: 23-May-17 **Company:** Triangle BioSystems International **Work Order:** R1341
Engineer: Chris Bramley **EUT Desc:** Wireless Headstage System **EUT Operating Voltage/Frequency:** 120V/60Hz
Temp: 25.5°C **Humidity:** 30% **Pressure:** 1001mBar Battery
Frequency Range: 1-6GHz **Measurement Distance:** 3 m
Notes: No emissions found other than Fundamental **EUT Max Freq:** 3075MHz

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			FCC Class B High Frequency - Average		
									Limit (dBµV/m)	Margin (dB)	Result (Pass/Fail)	Limit (dBµV/m)	Margin (dB)	Result (Pass/Fail)
Charging Mode														
h	3075.0	47.39	33.2	38.1	33.1	4.6	47.0	32.8	74.0	-27.0	Pass	54.0	-21.2	Pass
v	3075.0	47.98	33.3	38.1	33.1	4.6	47.6	32.9	74.0	-26.4	Pass	54.0	-21.1	Pass
Battery Mode														
h	3075.0	47.2	33.1	38.1	33.1	4.6	46.8	32.7	74.0	-27.2	Pass	54.0	-21.3	Pass
v	3075.0	46.86	33.2	38.1	33.1	4.6	46.5	32.8	74.0	-27.5	Pass	54.0	-21.2	Pass

Table Result: Pass by -21.1 dB ***Worst Freq:*** 3075.0 MHz

Test Site: EMI Chamber 1 **Cable 1:** Asset #2051 **Cable 2:** Asset #2054 **Cable 3:** Asset #1522
Analyzer: Rental SA#1 **Preamp:** Asset #2111 **Antenna:** Blue Horn
CSsoft Radiated Emissions Calculator v 1.017.188

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

Radiated Emissions Table

Date: 23-May-17 **Company:** Triangle BioSystems International **Work Order:** R1341
Engineer: Chris Bramley **EUT Desc:** Wireless Headstage System **EUT Operating Voltage/Frequency:** 120V/60Hz
Temp: 25.5°C **Humidity:** 30% **Pressure:** 1001mBar Battery
Frequency Range: 6-18GHz **Measurement Distance:** 1 m
Notes: Scanned in Charging Mode and Battery Mode **EUT Max Freq:** 3075MHz

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			FCC Class B High Frequency - Average		
									Limit (dBµV/m)	Margin (dB)	Result (Pass/Fail)	Limit (dBµV/m)	Margin (dB)	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 **Cable 3:** Asset #1522
Analyzer: Rental SA#1 **Preamp:** Asset #2111 **Antenna:** Blue Horn
CSsoft Radiated Emissions Calculator v 1.017.188

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
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	Asset	Cat	Calibration Due	Calibrated on
EMI Chamber 1	719150	2762A-6	A-0015	1-18GHz	1685	I	12/21/2018	12/21/2016

Preamps /Couplers Attenuators / Filters	Range	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
2111 HF Preamp	0.5-18GHz	PAM-118A	COM-POWER	551063	2111	II	11/5/2017	11/5/2016

Antennas	Range	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
Blue Horn	1-18Ghz	3117	ETS	157647	1861	I	2/14/2019	2/14/2017

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#2084		HTC-1	HDE		2084	II	3/23/2018	3/23/2017

Cables	Range	Mfr	Cat	Calibration Due	Calibrated on
Asset #1522	9kHz - 18GHz	Florida RF	II	2/11/2018	2/11/2017
Asset #2051	9kHz - 18GHz	Florida RF	II	3/5/2018	3/5/2017
Asset #2054	9kHz - 18GHz	Florida RF	II	10/30/3017	10/30/2016

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

Radiated Emissions Table

Date: 10-May-17 **Company:** Triangle BioSystems International **Work Order:** R1341
Engineer: Chris Hamel, John Sherwin **EUT Desc:** Wireless Headstage System **EUT Operating Voltage/Frequency:** 120V/60Hz
Temp: 23.2°C **Humidity:** 25% **Pressure:** 1007mBar Battery
Frequency Range: 18-26.5GHz **Measurement Distance:** 0.1 m
Notes: Tested in Charging and Battery Modes **EUT Max Freq:** 3075MHz

Antenna Polarization (H / V)	Frequency (MHz)	Reading (dBµV)	Preamp Factor (dB)	Antenna Factor (dB/m)	Cable Factor (dB)	Adjusted Reading (dBµV/m)				FCC Class B Limit (dBµV/m)	Margin (dB)	Result (Pass/Fail)
No Emissions found												

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

Test Site: EMI Chamber 1 **Cable 1:** Asset #2329
Analyzer: Gold **Preamp:** 18-26.5GHz **Antenna:** 18-26.5GHz Horn
CSsoft Radiated Emissions Calculator v 1.017.186

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

Radiated Emissions Table

Date: 10-May-17 **Company:** Triangle BioSystems International **Work Order:** R1341
Engineer: Chris Hamel, John Sherwin **EUT Desc:** Wireless Headstage System **EUT Operating Voltage/Frequency:** 120V/60Hz
Temp: 23.2°C **Humidity:** 25% **Pressure:** 1007mBar Battery
Frequency Range: 26.5-40GHz **Measurement Distance:** 0.1 m
Notes: Tested in Charging and Battery Modes **EUT Max Freq:** 3075MHz

Antenna Polarization (H / V)	Frequency (MHz)	Reading (dBµV)	Preamp Factor (dB)	Antenna Factor (dB/m)	Cable Factor (dB)	Adjusted Reading (dBµV/m)				FCC Class B Limit (dBµV/m)	Margin (dB)	Result (Pass/Fail)
No Emissions found												

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

Test Site: EMI Chamber 1 **Cable 1:** Asset #2329 **Cable 2:** Asset #2328
Analyzer: Gold **Preamp:** 40GHz Mixer **Antenna:** 40GHz Mixer
CSsoft Radiated Emissions Calculator v 1.017.186

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
Gold	100Hz-26.5 GHz	E4407B	Agilent	MY45113816	1284	I	2/28/208	2/28/2017

Radiated Emissions Sites	FCC Code	IC Code	VCCI Code	Range	Asset	Cat	Calibration Due	Calibrated on
EMI Chamber 1	719150	2762A-6	A-0015	1-18GHz	1685	I	12/21/2018	12/21/2016

Mixers/Diplexers	Range	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
Mixer / Horn	26.5-40 GHz	11970A	Agilent	3003A10230	2154	I	3/12/2019	3/12/2016

Preamps /Couplers Attenuators / Filters	Range	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
HF (Yellow)	18-26.5GHz	AFS4-18002650-60-8P-4	CS	467559	1266	II	9/16/2017	9/16/2016

Antennas	Range	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
HF (White) Horn	18-26.5GHz	801-WLM	Waveline	758	758	III	Verify before Use	date of test

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#2084		HTC-1	HDE		2084	II	3/23/2018	3/23/2017

Cables	Range		Mfr			Cat	Calibration Due	Calibrated on
Asset #2328	1 - 26.5GHz	PE350-72	Pasternack	1539		II	2/6/2018	2/6/2017
Asset #2329	1 - 26.5GHz	PE350-120	Pasternack	1545		II	2/6/2018	2/6/2017

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

CONDUCTED EMISSIONS

Conducted Emissions Data Table(s):

Curtis Straus - a Bureau Veritas Company						Work Order # - R1341	
Conducted E CISPR Average Detector						EUT Power Input - 120VAC/ 60Hz	
Final Average Detector Tabular Data - Voltage Measurement						Test Site - CEMI-6	
Operator: Chris Bramley						Temp; Humid; Pres - 22.0°C; 31%RH; 1007mBar	
Testing Line						EUT Maximum Freq - 3075MHz	
EUT Tx at 3075MHz						Requirement - FCC 15.207	
Charging Mode							

Frequency	Raw Average Reading	Correction Factor	Adjusted Average Amplitude	Average Limit	Average Margin	Average Results	Worst Average Margin
MHz	dBµV	dB	dBµV	dBµV	dB	Pass/Fail	dB
0.161	13.7	20.1	33.9	55.4	-21.6	PASS	
0.239	21	20.1	41.1	52.1	-11	PASS	
0.48	21.9	20.1	42	46.3	-4.3	PASS	-4.3
0.718	20.4	20.1	40.5	46	-5.5	PASS	
0.957	18	20.1	38.1	46	-7.9	PASS	
1.196	15.7	20.1	35.8	46	-10.2	PASS	

Curtis Straus - a Bureau Veritas Company						Work Order # - R1341	
Conducted Emissions per CISPR 16-2-1						EUT Power Input - 120VAC/ 60Hz	
Quasi-peak Detector Tabular Data - Voltage Measurement						Test Site - CEMI-6	
Operator: Chris Bramley						Temp; Humid; Pres - 22.0°C; 31%RH; 1007mBar	
Testing Line						EUT Maximum Freq - 3075MHz	
EUT Tx at 3075MHz						Requirement - FCC 15.207	
Charging Mode							

Frequency	Raw Quasi-peak Reading	Correction Factor	Adjusted QP Amplitude	Quasi-peak Limit	Margin to Quasi-peak Limit	Quasi-peak Limit Results	Worst Margin (QP Limit)
MHz	dBµV	dB	dBµV	dBµV	dB	Pass/Fail	dB
0.152	25.243	20.2	45.4	65.9	-20.5	PASS	
0.221	22.301	20.1	42.4	62.8	-20.3	PASS	
0.479	32.435	20.1	52.5	56.4	-3.8	PASS	-3.8
0.719	31.207	20.1	51.3	56	-4.7	PASS	
0.957	28.188	20.1	48.3	56	-7.7	PASS	
1.198	25.557	20.1	45.7	56	-10.3	PASS	

Curtis Straus - a Bureau Veritas Company						Work Order # - R1341	
Conducted I CISPR Average Detector						EUT Power Input - 120VAC/ 60Hz	
Final Average Detector Tabular Data - Voltage Measurement						Test Site - CEMI-6	
Operator: Chris Bramley						Temp; Humid; Pres - 22.0°C; 31%RH; 1007mBar	
Testing Neutral						EUT Maximum Freq - 3075MHz	
EUT Tx at 3075MHz						Requirement - FCC 15.207	
Charging Mode							

Frequency	Raw Average Reading	Correction Factor	Adjusted Average Amplitude	Average Limit	Average Margin	Average Results	Worst Average Margin
MHz	dBµV	dB	dBµV	dBµV	dB	Pass/Fail	dB
0.24	16.3	20.1	36.5	52.1	-15.6	PASS	
0.298	12.7	20.1	32.9	50.3	-17.5	PASS	
0.479	17.7	20.1	37.8	46.4	-8.5	PASS	-8.5
0.718	15.7	20.1	35.8	46	-10.2	PASS	
0.961	13.1	20.1	33.2	46	-12.8	PASS	
1.199	11.8	20.1	31.9	46	-14.1	PASS	

Curtis Straus - a Bureau Veritas Company						Work Order # - R1341	
Conducted Emissions per CISPR 16-2-1						EUT Power Input - 120VAC/ 60Hz	
Quasi-peak Detector Tabular Data - Voltage Measurement						Test Site - CEMI-6	
Operator: Chris Bramley						Temp; Humid; Pres - 22.0°C; 31%RH; 1007mBar	
Testing Neutral						EUT Maximum Freq - 3075MHz	
EUT Tx at 3075MHz						Requirement - FCC 15.207	
Charging Mode							

Frequency	Raw Quasi-peak Reading	Correction Factor	Adjusted QP Amplitude	Quasi-peak Limit	Margin to Quasi-peak Limit	Quasi-peak Limit Results	Worst Margin (QP Limit)
MHz	dBµV	dB	dBµV	dBµV	dB	Pass/Fail	dB
0.254	20.3	20.1	40.4	61.6	-21.2	PASS	
0.309	18.4	20.1	38.5	60	-21.5	PASS	
0.479	27.285	20.1	47.4	56.3	-9	PASS	-9
0.718	25.588	20.1	45.7	56	-10.3	PASS	
0.958	23.404	20.1	43.5	56	-12.5	PASS	
1.201	20.229	20.1	40.3	56	-15.7	PASS	

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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
LISNs/Measurement Probes	**Range**	**MN**	**Mfr**	**SN**	**Asset**	**Cat**	**Calibration Due**	**Calibrated on**
LISN Asset 1732	150kHz-30MHz	LI-150A	Com-Power	201094	1732	I	3/8/2018	3/8/2017
LISN Asset 1733	150kHz-30MHz	LI-150A	Com-Power	201095	1733	I	3/8/2018	3/8/2017
Conducted Test Sites (Mains / Telco)	**FCC Code**		**VCCI Code**			**Cat**	**Calibration Due**	**Calibrated on**
CEMI 6	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	3/23/2018	3/23/2017
Cables	**Range**		**Mfr**			**Cat**	**Calibration Due**	**Calibrated on**
CEMI-11	9kHz - 2GHz		C-S			II	10/2/2017	1/2/2016
Attenuators	**Range**	**MN**	**Mfr**	**SN**	**Asset**	**Cat**	**Calibration Due**	**Calibrated on**
20dB Attenuator-01	9kHz-2GHz			N/A		II	10/2/2017	10/2/2016

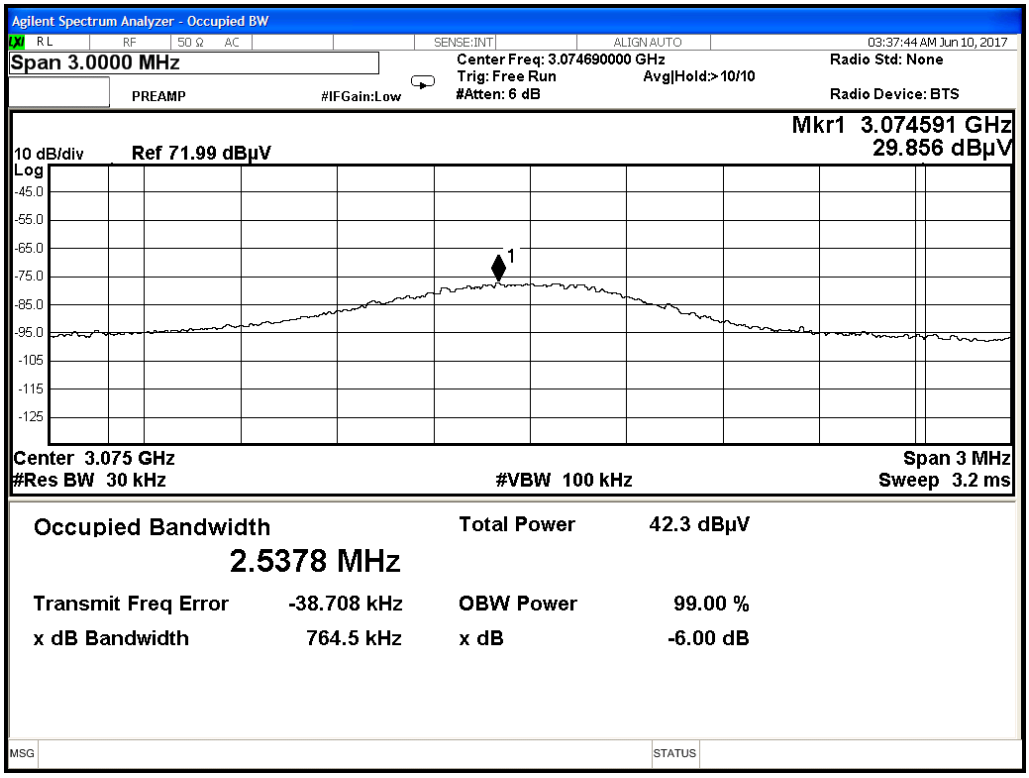
All equipment is calibrated using standards traceable to NIST or other nationally recognized calibration standard.

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]

Plot:



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.

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