Test Report

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

Report No	EQ3408-2
Client	Onset Computer Corporation
Address	470 MacArthur Blvd. Bourne, MA 02532
Phone	(508) 743 3195
Items tested	HOBO MX2300 Series Data Logger (Model: MX2303)
FCC ID	WXF-ONST3
IC	7936A-ONST3
FRN	0009380064
Equipment Type	Low Power Communication Device Transmitter
Equipment Code	DXX
Emission Designator	1M04F1D
Standards	CFR 47 FCC 15.249, RSS 210 Issue 9 Annex B.10
Test Dates	Nov 7-8, 2016
Results	As detailed within this report
Prepared by	Yunus Fazilioglu – Sr. EMC Engineer
Authorized by	Christopher Reynolds – EMC Supervisor
Issue Date	10/9/2017
Conditions of Issue	This Test Report is issued subject to the conditions stated in the '*Conditions of Testing*' section on page 18 of this report.

Contents

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

Product Tested - Configuration Documentation

EUT Configuration			
Work Order:	Q3408		
Company:	Onset Computer Corporation		
Company Address:	470 MacArthur Blvd.		
	Bourne, MA, 02532		
Contact:	Jim Corrigan		
	MN	**PN**	**SN**
EUT:	MX2300	MX2301, MX2302, MX2303, MX2304, MX2305	20031284 (used for conducted testing), 20031285 (used for radiated testing), 20031283 (Normal Mode)
EUT Description:	HOBO MX2300 Series Data Logger		
EUT Max Frequency:	16 MHz		
EUT Min Frequency:	0.032768 MHz		

Port Label	Port Type	# ports	# populated	cable type	shielded	ferrites	length (m)	in/out	under test	comment
Serial	RS-232	1	0	RS-232	No	None	1m	In	No	Test mode configuration only
Temperature Sensors	Sensor	2	2	Metallic	No	None	1m	In	Yes	

Software Operating Mode Description:

EUT was set to transmit at 2402 MHz, 2440 MHz and 2480 MHz channels.

Reason for change	Date Issued
Original Release	October 9, 2017

Summary

This test report supports an application for certification of a transmitter operating pursuant to CFR 47 FCC 15.249, RSS 210 Issue 9 Annex B.10.

The product operates in the 2402MHz to 2480MHz frequency range.

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

Model tested: MX2303

Test results in this report represent the following models. The differences between the models are the types of its sensors. All models share the same RF circuitry and parameters.

List of Models:

MX2301: Internal temperature/relative humidity sensor
MX2302: External temperature/relative humidity sensor
MX2303: 2 external temperature sensors
MX2304: External temperature sensor
MX2305: Internal temperature sensor

MX2303 model was selected for testing to represent the worst case since it has 2 external sensor cables.

Test Methodology

Radiated emissions testing was performed according to the procedures specified in ANSI C63.10-2013 and RSS-Gen Issue 4. Radiated Emissions were maximized around 3 orthogonal planes (X, Y and Z) of the product. EUT antenna is integral and therefore cannot be maximized separately.

AC line conducted emissions testing was not performed since the device is battery powered only.

3 channels were tested as follows:

Low channel = 2402MHz

Middle channel = 2440MHz

High channel = 2480MHz

The EUT operating voltage is 3.6VDC from battery.

The following bandwidths were used during radiated spurious emissions testing.

Frequency	RBW	VBW
30-1000MHz	120kHz	1MHz
1-25GHz	1MHz	3MHz

Compliance Statement

MX2303 has been found to conform to the following parts of 47 CFR and RSS 210

RSS-GEN	RSP-100	RSS 210	Part 15	Comments
6.3			15.15(b)	There are no controls accessible to the user that vary the output power.
	3.1		15.19	The label is shown in the label exhibit.
	3.2		15.21	Information to the user is shown in the instruction manual exhibit.
			15.27	No special accessories are required for compliance.
6.1, 6.5			15.31	The EUT was tested in accordance with the measurement standards in this section.
			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 internal PCB trace with -2dBi 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	Not applicable since the EUT is battery powered.
		B.10(a)	15.249(a)	The fundamental and harmonics meet the limits in 15.249(a)
		B.10(b)	15.249(d)	Spurious emissions meet the limits in 15.209.
6.6				99% emissions bandwidth plot is provided.

Test Results

Fundamental Measurements

LIMITS

The field strength from intentional radiators operated within these frequency bands shall comply with the following:

Fundamental Frequency	Field Strength of Fundamental (millivolts/meter)	Field Strength of Harmonics (microvolts/meter)
902 - 928 MHz	50	500
2400 - 2483.5 MHz	50	500
5725 - 5875 MHz	50	500
24.0 - 24.25 GHz	250	2500

[15.249(a)]

MEASUREMENTS / RESULTS

Radiated Emissions Table

Date: 07-Nov-16 **Company:** Onset **Work Order:** Q3408
Engineer: Zac Johnson **EUT Desc:** MX2303 **EUT Operating Voltage/Frequency:** 3.6V DC
Temp: 22.8C **Humidity:** 27% **Pressure:** 1024mbar
Frequency Range: Fundamental **Measurement Distance:** 3 m
Notes: Y:On its back, X: On its side, Z: Standing up **EUT Max Freq:** 2480MHz
Worst case orientation found to be Y
Duty-Cycle Correction Factor (DCCF) = -20dB

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)
H	2402.0	56.4	36.4	0.0	32.3	3.2	91.9	71.9	114.0	-22.1	Pass	94.0	-22.1	Pass
H	2440.0	57.2	37.2	0.0	32.4	3.2	92.8	72.8	114.0	-21.2	Pass	94.0	-21.2	Pass
H	2480.0	57.1	37.1	0.0	32.4	3.3	92.8	72.8	114.0	-21.2	Pass	94.0	-21.2	Pass

Table Result: Pass by -21.2 dB ***Worst Freq:*** 2480.0 MHz

Test Site: EMI Chamber 2 **Cable 1:** Asset #2052 **Cable 2:** Asset #2053 **Cable 3:** ---
Analyzer: A2093 **Preamp:** none **Antenna:** Blue Horn **Preselector:** ---
CSsoft Radiated Emissions Calculator v 1.017.177
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
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 2	719150	2762A-7	A-0015	1-18GHz		I	4/29/2017	4/29/2015

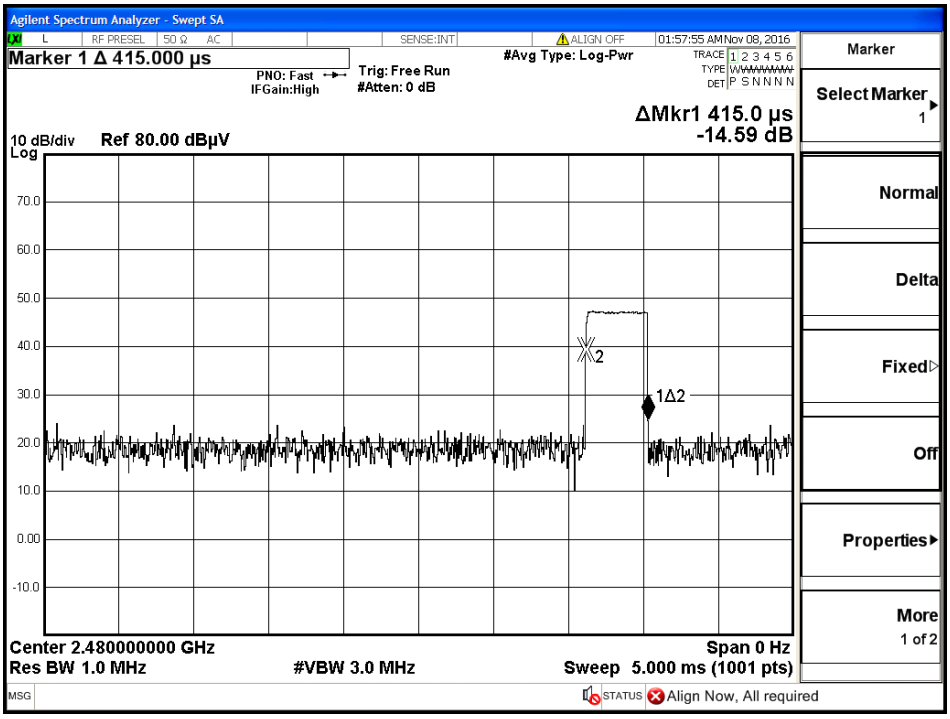
Antennas	Range	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
Blue Horn	1-18Ghz	3117	ETS	157647	1861	I	2/8/2017	2/8/2015

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#2081		HTC-1	HDE		2081	II	4/5/2017	4/5/2016

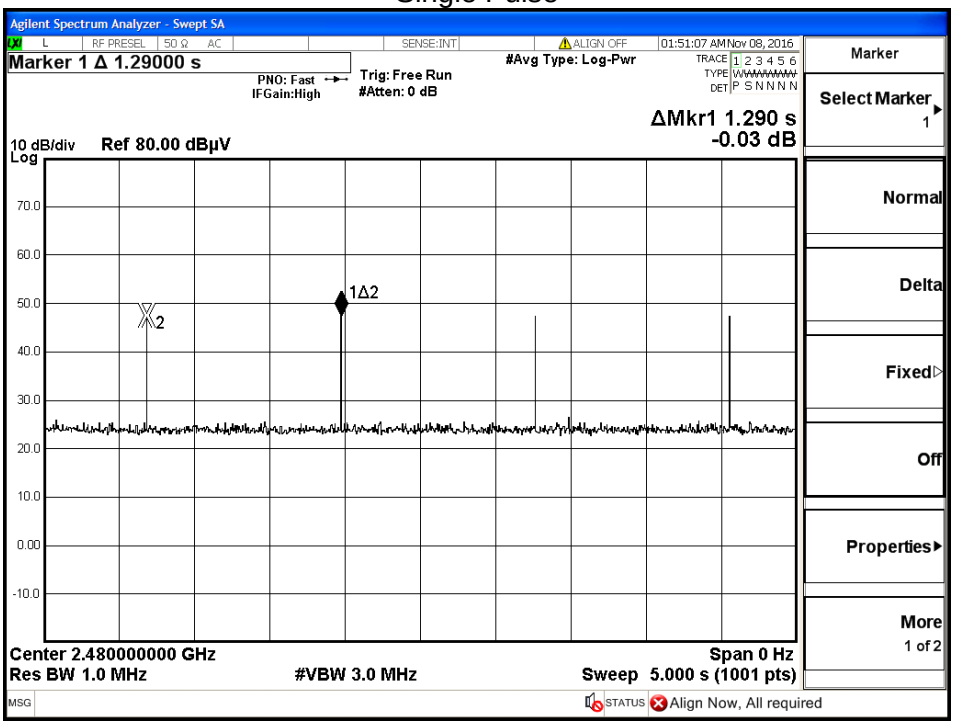
Cables	Range	Mfr	Cat	Calibration Due	Calibrated on
Asset #2052	9kHz - 18GHz	Florida RF	II	3/2/2017	3/2/2016
Asset #2053	9kHz - 18GHz	Florida RF	II	10/1/3017	10/30/2016

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

Duty-Cycle Correction Factor



Single Pulse



Pulse Train

1 pulse in 100ms window
DCCF = 20*log(0.415/100) = -47.6dB
-20dB DCCF has been used throughout this report for average readings where applicable.

Radiated Spurious Emissions

LIMITS

15.249 (d) Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in § 15.209, whichever is the lesser attenuation.

MEASUREMENTS / RESULTS

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Radiated Emissions Table

Date: 07-Nov-16 **Company:** Onset **Work Order:** Q3408
Engineer: Zac Johnson **EUT Desc:** MX2303 **EUT Operating Voltage/Frequency:** 3.6V DC
Temp: 22.8C **Humidity:** 27% **Pressure:** 1024mbar
Frequency Range: Bandedges **Measurement Distance:** 3 m
Notes: Y:On its back, X: On its side, Z: Standing up. Worst case orientation found to be Y **EUT Max Freq:** 2480MHz
NF: Noise Floor

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)
H - NF	2483.5	25.8	12.9	0.0	32.4	3.3	61.5	48.6	74.0	-12.5	Pass	54.0	-5.4	Pass
H - NF	2400	23.7	11.7	0.0	32.3	3.2	59.2	47.2	74.0	-14.8	Pass	54.0	-6.8	Pass
H - NF	2390	23.3	11.9	0.0	32.3	3.2	58.8	47.4	74.0	-15.2	Pass	54.0	-6.6	Pass

Table Result: Pass by -5.4 dB ***Worst Freq:*** 2483.5 MHz

Test Site: EMI Chamber 2 **Cable 1:** Asset #2052 **Cable 2:** Asset #2053 **Cable 3:** ---
Analyzer: A2093 **Preamp:** none **Antenna:** Blue Horn **Preselector:** ---
CSsoft Radiated Emissions Calculator v 1.017.177

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
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 2	719150	2762A-7	A-0015	1-18GHz	I	4/29/2017	4/29/2015

Antennas	Range	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
Blue Horn	1-18Ghz	3117	ETS	157647	1861	I	2/8/2017	2/8/2015

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#2081	HTC-1	HDE		2081	II	4/5/2017	4/5/2016

Cables	Range	Mfr	Cat	Calibration Due	Calibrated on
Asset #2052	9kHz - 18GHz	Florida RF	II	3/2/2017	3/2/2016
Asset #2053	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: 08-Nov-16 **Company:** Onset **Work Order:** Q3408
Engineer: Zac Johnson **EUT Desc:** MX2303 **EUT Operating Voltage/Frequency:** 3.6V DC
Temp: 24.2C **Humidity:** 25% **Pressure:** 1012mbar
Frequency Range: 30-1000MHz **Measurement Distance:** 3m
Notes: Y axis worst case **EUT Max Freq:** 2480MHz
Peak measurements. All readings are noise floor.

Antenna Polarization (H / V)	Frequency (MHz)	Reading (dBµV)	Preamp Factor (dB)	Antenna Factor (dB/m)	Cable Factor (dB)	Adjusted Reading (dBµV/m)	--- Limit (dBµV/m)	--- Margin (dB)	--- Result (Pass/Fail)	FCC Class B Limit (dBµV/m)	FCC Class B Margin (dB)	FCC Class B Result (Pass/Fail)
V - PK	143.0	12.5	0.0	13.0	0.8	26.3	---	---	---	43.5	-17.2	Pass
H - PK	146.0	15.3	0.0	12.8	0.8	28.9	---	---	---	43.5	-14.6	Pass
H - PK	286.0	11.6	0.0	13.3	1.0	25.9	---	---	---	46.0	-20.1	Pass
V - PK	337.0	8.9	0.0	14.1	1.2	24.2	---	---	---	46.0	-21.8	Pass
H - PK	610.0	11.6	0.0	18.8	1.7	32.1	---	---	---	46.0	-13.9	Pass
V - PK	725.0	12.0	0.0	20.5	1.8	34.3	---	---	---	46.0	-11.7	Pass

Table Result: Pass by -11.7 dB ***Worst Freq:*** 725.0 MHz

Analyzer: A2093 **Preamp:** none **Antenna:** Red-Black **Preselector:** ---
v 1.017.177 **Cable 1:** A2051 **Cable 2:** A2054 Copyright Curtis-Straus LLC 2000
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
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
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
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.

Radiated Emissions Table

Date: 07-Nov-16 **Company:** Onset **Work Order:** Q3408
Engineer: Zac Johnson **EUT Desc:** MX2303 **EUT Operating Voltage/Frequency:** 3.6V DC
Temp: 22.8C **Humidity:** 27% **Pressure:** 1024mbar
Frequency Range: 1GHz - 6GHz harmonics **Measurement Distance:** 3 m
Notes: DCCF = -20dB **EUT Max Freq:** 2480MHz
Worst case orientation: Y

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)
H - Y	4880.0	21.1	1.1	0.0	34.4	4.5	60.0	40.0	74.0	-14.0	Pass	54.0	-14.0	Pass
V - Y	4880.0	18.0	-2.0	0.0	34.4	4.5	56.9	36.9	74.0	-17.1	Pass	54.0	-17.1	Pass
H - Y	4804.0	21.0	1.0	0.0	34.4	4.7	60.1	40.1	74.0	-13.9	Pass	54.0	-13.9	Pass
V - Y	4804.0	18.5	-1.5	0.0	34.4	4.7	57.6	37.6	74.0	-16.4	Pass	54.0	-16.4	Pass
H - Y	4960.0	20.7	0.7	0.0	34.4	4.5	59.6	39.6	74.0	-14.4	Pass	54.0	-14.4	Pass
V - Y	4960.0	17.9	-2.1	0.0	34.4	4.5	56.8	36.8	74.0	-17.2	Pass	54.0	-17.2	Pass

Table Result: Pass by -13.9 dB ***Worst Freq:*** 4804.0 MHz

Test Site: EMI Chamber 2 **Cable 1:** Asset #2052 **Cable 2:** Asset #2053 **Cable 3:** ---
Analyzer: A2093 **Preamp:** none **Antenna:** Blue Horn **Preselector:** ---
CSsoft Radiated Emissions Calculator v 1.017.177 Copyright Curtis-Straus LLC 2000
Adjusted Reading = Reading - Preamp Factor + Antenna Factor + Cable Factor

Radiated Emissions Table

Date: 07-Nov-16 **Company:** Onset **Work Order:** Q3408
Engineer: Zac Johnson **EUT Desc:** MX2303 **EUT Operating Voltage/Frequency:** 3.6V DC
Temp: 22.8C **Humidity:** 27% **Pressure:** 1024mbar
Frequency Range: 1-6GHz Spurious **Measurement Distance:** 3 m
Notes: Worst case orientation: Y **EUT Max Freq:** 2480MHz
NF: Noise Floor

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)
H - NF	1236.0	25.7	8.8	0.0	29.0	2.2	56.9	40.0	74.0	-17.1	Pass	54.0	-14.0	Pass
V - NF	1300.0	23.1	8.5	0.0	29.0	2.3	54.4	39.8	74.0	-19.6	Pass	54.0	-14.2	Pass
H - NF	1988.0	21.2	6.7	0.0	31.7	2.9	55.8	41.3	74.0	-18.2	Pass	54.0	-12.7	Pass
V - NF	2193.0	19.3	3.5	0.0	32.1	3.0	54.4	38.6	74.0	-19.6	Pass	54.0	-15.4	Pass
V - NF	3158.0	21.0	5.6	0.0	33.2	3.7	57.9	42.5	74.0	-16.1	Pass	54.0	-11.5	Pass
H - NF	3438.0	21.1	5.8	0.0	33.1	3.7	57.9	42.6	74.0	-16.1	Pass	54.0	-11.4	Pass

Table Result: Pass by -11.4 dB ***Worst Freq:*** 3438.0 MHz

Test Site: EMI Chamber 2 **Cable 1:** Asset #2052 **Cable 2:** Asset #2053 **Cable 3:** ---
Analyzer: A2093 **Preamp:** none **Antenna:** Blue Horn **Preselector:** ---
CSsoft Radiated Emissions Calculator v 1.017.177

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

Radiated Emissions Table

Date: 07-Nov-16 **Company:** Onset **Work Order:** Q3408
Engineer: Zac Johnson **EUT Desc:** MX2303 **EUT Operating Voltage/Frequency:** 3.6V DC
Temp: 22.8C **Humidity:** 27% **Pressure:** 1024mbar
Frequency Range: 6-18GHz Harmonics **Measurement Distance:** 1 m
Notes: DCCF = -20dB **EUT Max Freq:** 2480MHz
Worst case orientation: Y

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)
H - Y	7320.0	19.4	-0.6	0.0	35.9	6.2	61.5	41.5	83.5	-22.0	Pass	63.5	-22.0	Pass
V - Y	7320.0	18.2	-1.8	0.0	35.9	6.2	60.3	40.3	83.5	-23.2	Pass	63.5	-23.2	Pass
H - Y	7206.0	19.0	-1.0	0.0	35.9	6.2	61.1	41.1	83.5	-22.4	Pass	63.5	-22.4	Pass
V - Y	7206.0	19.2	-0.8	0.0	35.9	6.2	61.3	41.3	83.5	-22.2	Pass	63.5	-22.2	Pass
H - Y	7440.0	18.3	-1.7	0.0	36.0	6.2	60.5	40.5	83.5	-23.0	Pass	63.5	-23.0	Pass
V - Y	7440.0	18.5	-1.5	0.0	36.0	6.2	60.7	40.7	83.5	-22.8	Pass	63.5	-22.8	Pass

Table Result: Pass by -22.0 dB ***Worst Freq:*** 7320.0 MHz

Test Site: EMI Chamber 2 **Cable 1:** Asset #2052 **Cable 2:** Asset #2053 **Cable 3:** ---
Analyzer: A2093 **Preamp:** none **Antenna:** Blue Horn **Preselector:** ---
CSsoft Radiated Emissions Calculator v 1.017.177

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

Radiated Emissions Table

Date: 07-Nov-16 **Company:** Onset **Work Order:** Q3408
Engineer: Zac Johnson **EUT Desc:** MX2303 **EUT Operating Voltage/Frequency:** 3.6V DC
Temp: 22.8C **Humidity:** 27% **Pressure:** 1024mbar
Frequency Range: 6-18GHz Spurious **Measurement Distance:** 1 m
Notes: Worst case orientation: Y **EUT Max Freq:** 2480MHz
NF: Noise Floor

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)
H - NF	6618.0	14.7	-0.7	0.0	35.8	5.7	56.2	40.8	83.5	-27.3	Pass	63.5	-22.7	Pass
V - NF	7092.0	14.3	-0.8	0.0	35.9	6.1	56.3	41.2	83.5	-27.2	Pass	63.5	-22.3	Pass
H - NF	8970.0	14.7	-0.9	0.0	36.6	6.4	57.7	42.1	83.5	-25.8	Pass	63.5	-21.4	Pass
V - NF	11200.0	15.2	-0.6	0.0	38.7	7.3	61.2	45.4	83.5	-22.3	Pass	63.5	-18.1	Pass
V - NF	14394.0	16.5	1.3	0.0	39.7	8.2	64.4	49.2	83.5	-19.1	Pass	63.5	-14.3	Pass
H - NF	15390.0	17.2	1.9	0.0	40.4	8.7	66.3	51.0	83.5	-17.2	Pass	63.5	-12.5	Pass

Table Result: Pass by -12.5 dB ***Worst Freq:*** 15390.0 MHz

Test Site: EMI Chamber 2 **Cable 1:** Asset #2052 **Cable 2:** Asset #2053 **Cable 3:** ---
Analyzer: A2093 **Preamp:** none **Antenna:** Blue Horn **Preselector:** ---
CSsoft Radiated Emissions Calculator v 1.017.177

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
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 2	719150	2762A-7	A-0015	1-18GHz		I	4/29/2017	4/29/2015
Antennas	**Range**	**MN**	**Mfr**	**SN**	**Asset**	**Cat**	**Calibration Due**	**Calibrated on**
Blue Horn	1-18Ghz	3117	ETS	157647	1861	I	2/8/2017	2/8/2015
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#2081		HTC-1	HDE		2081	II	4/5/2017	4/5/2016
Cables	**Range**		**Mfr**			**Cat**	**Calibration Due**	**Calibrated on**
Asset #2052	9kHz - 18GHz		Florida RF			II	3/2/2017	3/2/2016
Asset #2053	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: 08-Nov-16 **Company:** Onset **Work Order:** Q3408
Engineer: Zac Johnson **EUT Desc:** MX2303 **EUT Operating Voltage/Frequency:** 3.6V DC
Temp: 24.2C **Humidity:** 25% **Pressure:** 1012mbar
Frequency Range: 18-25GHz Harmonics and Spurious **Measurement Distance:** 0.1 m
Notes: Worst case orientation: Y **EUT Max Freq:** 2480MHz
NF: Noise Floor

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)
H / V - NF	22928.0	40.9	40.9	42.0	40.5	6.4	45.8	45.8	103.5	-57.7	Pass	83.5	-37.7	Pass

Table Result: Pass by -37.7 dB ***Worst Freq:*** 22928.0 MHz

Test Site: EMI Chamber 1 **Cable 1:** EMIR-HIGH-06 **Cable 2:** --- **Cable 3:** ---
Analyzer: Gold **Preamp:** 18-26.5GHz **Antenna:** 18-26.5GHz Horn **Preselector:** ---
CSsoft Radiated Emissions Calculator v 1.017.177

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

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Radiated Emissions Sites	FCC Code	IC Code	VCCI Code	Range		Cat	Calibration Due	Calibrated on
EMI Chamber 1	719150	2762A-6	A-0015	1-18GHz		I	5/23/2017	5/23/2015
Spectrum Analyzers / Receivers /Preselectors	**Range**	**MN**	**Mfr**	**SN**	**Asset**	**Cat**	**Calibration Due**	**Calibrated on**
Gold	00Hz-26.5 GH:	E4407B	Agilent	Y4511381	1284	I	1/13/2017	1/13/2016
Preamps /Couplers Attenuators / Filters	**Range**	**MN**	**Mfr**	**SN**	**Asset**	**Cat**	**Calibration Due**	**Calibrated on**
A#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**
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#2080		HTC-1	HDE		2080	II	4/5/2017	4/5/2016
Cables	**Range**		**Mfr**			**Cat**	**Calibration Due**	**Calibrated on**
REMI-High-06	1 - 26.5GHz	TRU-21B0707-120	TRU			II	8/14/2017	8/14/2016

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

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

N/A. EUT is battery powered only.

Occupied Bandwidth

REQUIREMENT

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

MEASUREMENTS / RESULTS

99% Occupied Bandwidth

Date: 08-Nov-16 **Company:** Onset **Work Order:** Q3408
Engineer: Zac Johnson **EUT Desc:** MX2303 **EUT Operating Voltage/Frequency:** 3.6V DC
Temp: 24.2C **Humidity:** 25% **Pressure:** 1012mbar

Frequency Range: 2402-2480 MHz **Measurement Type:** Conducted measurement at the antenna port
Measurement Method: RSS-Gen Issue 4 Section 6.6

Notes:

Frequency (MHz)	99% OBW (kHz)
2402	1037
2440	1031
2480	1027

Test Site: ENV Chamber 7 **Attenuator** SW2-10-1 (10dB)
Analyzer: A2200

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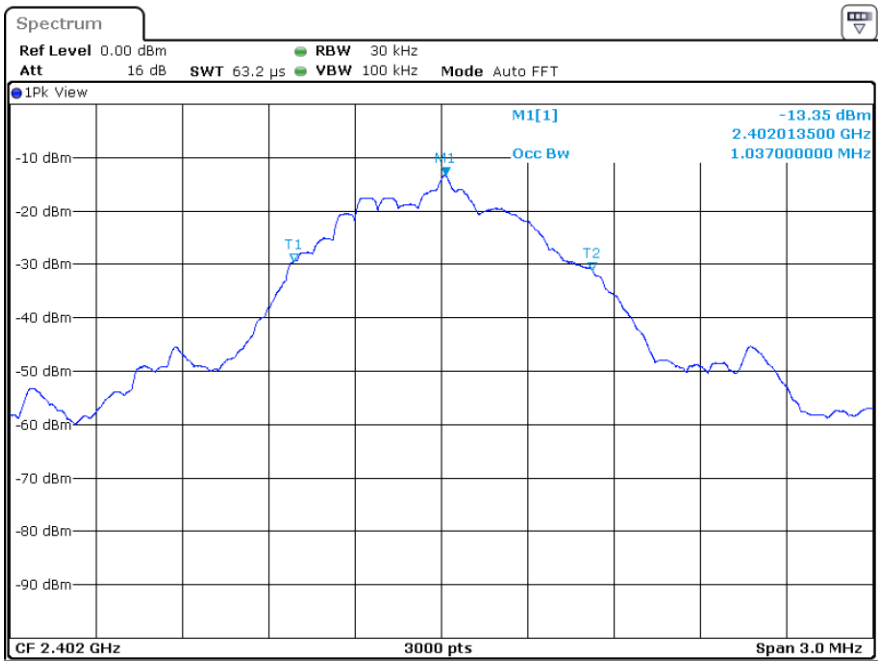
Signal Generators	Range	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
FSV40 Spectrum Analyzer	10Hz-40GHz	FSV40	ROHDE & SCHWARZ	101551	2200	I	6/1/2017	6/1/2016

Cables	Range		Mfr			Cat	Calibration Due	Calibrated on
REMI-High-06	1 - 26.5GHz	I-21B0707	TRU			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#2082		HTC-1	HDE		2082	II	4/5/2017	4/5/2016

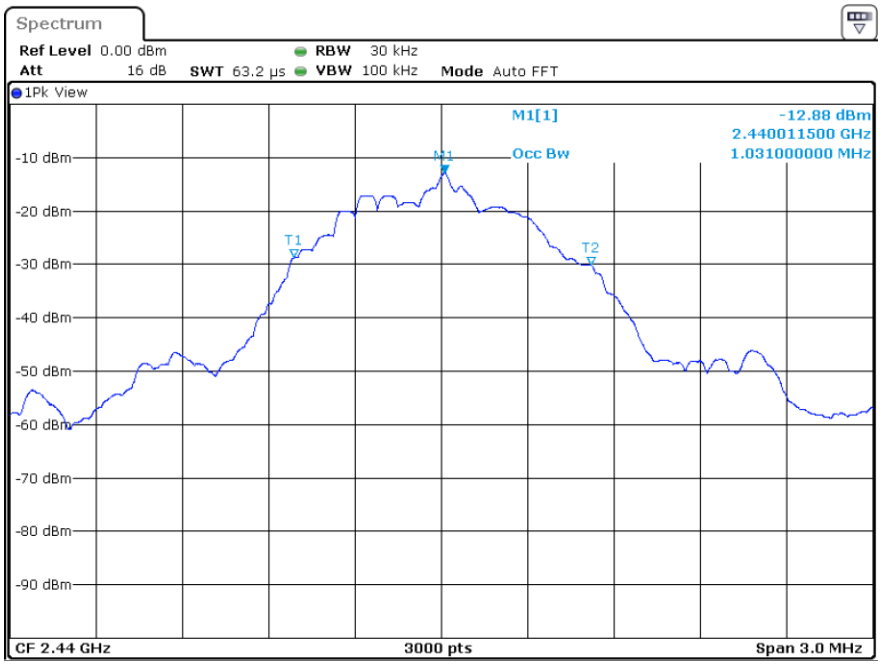
All equipment is calibrated using standards traceable to NIST or other nationally recognized calibration standard.

Plot(s)



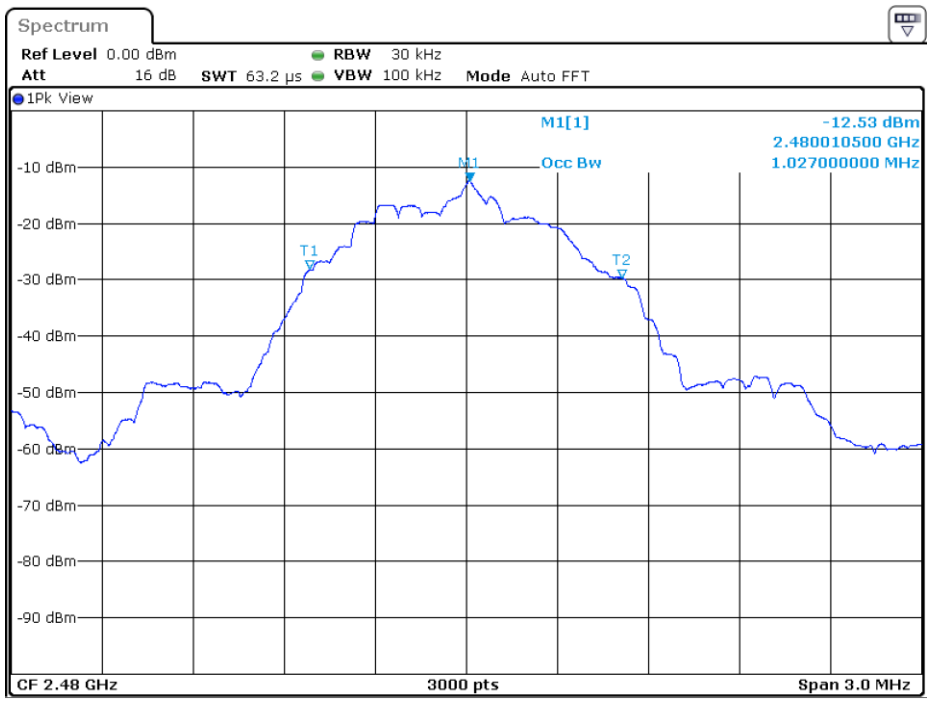
Date: 8.NOV.2016 14:04:34

Occupied Bandwidth – Low Channel (2402 MHz)



Date: 8.NOV.2016 14:08:03

Occupied Bandwidth – Mid channel (2440 MHz)



Occupied Bandwidth – High Channel (2480 MHz)

Measurement Uncertainty

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

Measurement	Expanded Uncertainty k=2	Maximum allowable uncertainty
Radiated Emissions (30-1000MHz) NIST 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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