



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

Report No EQ3620-1

Client Onset Computer Corporation

Address 470 MacArthur Blvd. Bourne, MA 02532

Phone (508) 743 - 3195

Equipment Type
Equipment Code
Emission Designator

Equipment Type
Digital Transmission System
DTS
1M44F1D

Test Dates March 2 to 20, 2017

Prepared by

Tuven Truena – Test Engineer

Authorized by

Yurks Fazilogki Sr. EMC Engineer

Issue Date 10/26/2018

Conditions of Issue This Test Report is issued subject to the conditions stated in the 'Conditions of Testing' section on page 30 of this report.



ACCREDITED
Cort No. 1637-01

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Form Final Report REV 12-07-15



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 2

"SRW Mote" is a transmitter operating in the 906MHz-924MHz frequency range.

Antenna Type: PCB thru-hole stamped metal antenna

Gain: 2dBi

We found that the product met the above requirements without modification.

Test samples were received in good condition.





Test Methodology

All testing was performed according to the following rules/procedures/documents; CFR 47 FCC Part 15.247, RSS-247 Issue 2, 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 3 orthogonal planes (X, Y and Z) as well as varying the test antenna's height and polarity. The device antenna could not be maximized separately.

RF measurements were performed at the antenna port. 3 channels were tested as follows:

906MHz: Low Channel914MHz: Mid Channel924MHz: High Channel

EUT operating voltage is 3VDC from battery.

The following bandwidths were used during radiated spurious emissions testing.

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



Product Tested - Configuration Documentation

					EU	T Configuration	n					
Work (Order:	Q3620										
Com	npany:	Onset C	Computer Co	rporation								
Company Ad	dress:	470 Ma	cArthur Blv	d.								
		Bourne	, MA, 02532									
Co	ntact:	John A	raujo									
				MN				N			SN	
	EUT:			nort range wirele				LIA-900			Sample	
				hort range wirele	ess)	J	RXW-I	LIA-900		Sample 2 (c	onducted an	tenna port testing)
EUT Descri	•		s Transmitte	er								
EUT TX Frequ	•		924 MHz									
EUT Min Frequ	uency:	906 MI	-lz									
Port Label	Port	Туре	# ports	# populated	cable ty	pe shielde	d	ferrites	length (m)	in/out	under test	comment
Sensor	0	ther	1	1	Other	No		No	1m	in	yes	
Software Operating	Mode De	escription	n:									
Firmware Version 0.3		•										
EUT is set to transmit	on 906,	916 and 9	924 MHz res	pectively.								
Performance Criteria	a:											
Radio must not becom	ne discon	nected from	om gateway	(immunity testin	g only)		-					·



Statement of Conformity

The EUT has been found to conform to the following parts of FCC 15.247 and RSS 247 as detailed below:

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.
	3.2		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, 6.5			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 PCB thru-hole stamped metal antenna 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 operating voltage is 3VDC from battery.
			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.

Modifications Required for Compliance

No modifications required for compliance





Test Results

Bandwidth

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

MEASUREMENTS / RESULTS

		6dB Bandwidth			
Date: 20-Mar-17	Company: Onset Comput	er Corporation		Work Order:	Q3620
Engineer: ZJ	EUT: SRW Mote		EUT Operating Voltage	/Frequency:	3VDC battery
Temp: 23.3°C	Humidity: 24%	Pressure: 1013mbar			
Frequency Range: 90	6-924 MHz	Measurement Type: Conducted			
	Me	asurement Method: FCC KDB 558074	D01 DTS Meas Guidance v03r05	Section 8.2	
Notes:					
				6dB Bandwi	dth
Frequency		Reading	Limit	Margin	Result
(MHz)		(kHz)	(kHz)	(kHz)	(Pass/Fail)
906		827.6	≥500	328	Pass
916		838.4	≥500	338	Pass
924		839.0	≥500	339	Pass
Test Site: EMC3	Cable: 2288	Attenuator 2107			
Analyzer: 2093				Copyright Cu	rtis-Straus LLC 2000

Rev. 3/27/2017 Spectrum Analyzers / Receivers / Preselectors 2093 MXE EMI Receiver	Range 20Hz-26.5GHz	MN N9038A	M fr Agilent	SN MY51210181	Asset 2093	Cat I	Calibration Due 8/9/2017	Calibrated on 8/9/2016
Preamps/Couplers Attenuators / Filters API - 40dB 100W Attenuator	Range 0.009-18GHz	MN 48-40-34	Mfr API Weinschel	SN CG7990	Asset 2107	Cat II	Calibration Due 10/2/2017	Calibrated on 10/2/2016
Meteorological Meters Weather Clock (Pressure Only) TH A#2079		MN BA928 HTC-1	Mfr Oregon Scientific HDE	SN C3166-1	Asset 831 2079	Cat I II	Calibration Due 4/28/2018 3/23/2018	Calibrated on 4/28/2016 3/23/2017
Cables Asset #2288	Range 9KHz-26.5GHz	FLC-1.5FT-SMSM+	M fr Mini-Circuits	16021029		Cat II	Calibration Due 1/27/2018	Calibrated on 1/27/2017







Low Channel DTS Bandwidth



Middle Channel DTS Bandwidth



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Tabling Carl, No. 1627.01



High Channel DTS Bandwidth



Peak Output Power

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

MEASUREMENTS / RESULTS

			Peak Outpu	ut Power							
Date: 20-Mar-17		Company: Onset Co	mputer Corporation			Work Orde	r: Q3620				
Engineer: ZJ		EUT: SRW Mo	te		EUT Operating	EUT Operating Voltage/Frequency: 3VDC					
Temp: 23.3°C		Humidity: 24%									
Frequency Range:	906-924 N	lHz	Measurer	ment Type: Conducted							
			Measureme	nt Method: FCC KDB	558074 D01 DTS Mea	as Guidance v03r05 S	Section 9.1.2				
Notes:											
Frequency	Peak Reading	Cable Loss	Attenuator Loss	Peak Output Power	Limit	Margin	Result				
(MHz)	(dBm)	(dB)	(dB)	(dBm)	(dBm)	(dB)	(Pass/Fail)				
906	-31.00	0.3	40.03	9.35	30.0	-20.65	Pass				
916	-31.12	0.3	40.03	9.23	30.0	-20.77	Pass				
924	-31.31	0.3	40.03	9.04	30.0	-20.96	Pass				
Test Site: EMC3		Cable: 2288		Attenuato	2107						
Analyzer: 2093						Copyright	Curtis-Straus LLC 20				

Peak Output Power (dBm)= Peak Reading (dBm) + Cable Loss (dB) + Attenuator Loss (dB)

Rev. 3/27/2017								
Spectrum Analyzers / Receivers / Preselectors 2093 MXE EMI Receiver	Range 20Hz-26.5GHz	MN N9038A	Mfr Agilent	SN MY51210181	Asset 2093	Cat I	Calibration Due 8/9/2017	Calibrated on 8/9/2016
Preamps /Couplers Attenuators / Filters	Range	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
API - 40dB 100W Attenuator	0.009-18GHz	48-40-34	API Weinschel	CG7990	2107	II	10/2/2017	10/2/2016
Meteorological Meters		MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
Weather Clock (Pressure Only)		BA928	Oregon Scientific	C3166-1	831	1	4/28/2018	4/28/2016
TH A#2079		HTC-1	HDE		2079	II	3/23/2018	3/23/2017
Cables	Range		Mfr			Cat	Calibration Due	Calibrated on
Asset #2288	9KHz-26.5GHz	FLC-1.5FT-SMSM+	Mini-Circuits	16021029		II.	1/27/2018	1/27/2017







Low Channel Peak Output Power



Middle Channel Peak Output Power



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Testing Cert. No. 1827.01



High Channel Peak Output Power



Radiated Spurious Emissions

Limits: Radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a). [15.247(d)]

MEASUREMENTS / RESULTS

Date	: 02-Mar-17		Company:	Onset Con	nputer Co	poration				-	V	Nork Order:	Q3620
Engineer	: Zac Johnson		EUT Desc:	SRW Mote	•					EUT Operat	ing Voltage/	Frequency:	3V DC
Temp	: 22.7°C		Humidity:	35%			Pressure	985mBar					Battery
	Freque	ncy Range:	30-1000MH	-lz						Measureme	nt Distance:	3 m	
Notes	Low channel, v 900-930MHz H			ed						EU ⁻	Г Max Freq:	924MHz	
Antenna			Preamp	Antenna	Cable	Notch	Adjusted		-			FCC 15.209	1
Polarization	Frequency	Reading	Factor	Factor	Factor	Factor	Reading	Limit	Margin	Result	Limit	Margin	Result
(H/V)	(MHz)	(dBµV)	(dB)	(dB/m)	(dB)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	(Pass/Fail)	(dBµV/m)	(dB)	(Pass/Fa
V	49.4	37.4	25.2	8.1	0.4	0.9	21.6				40.0	-18.4	Pass
Н	57.2	32.2	25.2	7.4	0.5	0.9	15.8				40.0	-24.2	Pass
V	85.3	35.7	25.2	7.7	0.5	0.9	19.6				40.0	-20.4	Pass
Н	88.2	31.4	25.2	7.7	0.5	0.9	15.3				43.5	-28.2	Pass
V	139.6	35.7	25.3	13.4	0.8	0.9	25.5				43.5	-18.0	Pass
Н	261.8	30.4	25.1	12.3	1.0	0.9	19.5				46.0	-26.5	Pass
V	293.8	34.6	25.0	13.3	1.0	0.9	24.8				46.0	-21.2	Pass
Н	633.3	29.3	24.8	19.5	1.7	0.9	26.6				46.0	-19.4	Pass
Tab	le Result:	Pass	by	-18.0	dB					W	orst Freq:	139.6	MHz
	: EMI Chamber : Rental SA#2	2	Cable 1: Preamp:	Asset #20	52					Asset #2053		Cable 3: Preselector:	

Da	te: 02-Mar-17		Company:	Onset Con	nputer Co	rporation					1	Nork Order:	Q3620	
Engine	er: Zac Johnson		EUT Desc:	SRW Mote	9					EUT Operat	ing Voltage	/Frequency:	3V DC	
Ten	np: 22.7℃		Humidity:	35%			Pressure:	985mBar					Battery	
	Freque	ency Range:	30-1000MH	Нz						Measureme	3 m			
Not	es: Center chann	el. worst case	e Z orientati	on						EU ⁻	T Max Freg:	924MHz		
					mp Test	Equipment Nois	e floor readings	over 800MHz						
												FCC 15.209)	
Antenna			Preamp	Antenna	Cable	Notch	Adjusted							
Polarization	Frequency	Reading	Factor	Factor	Factor	Factor	Reading	Lim it	Margin	Result	Limit	Margin	Result	
(H/V)	(MHz)	(dBµV)	(dB)	(dB/m)	(dB)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	(Pass/Fail)	(dBµV/m)	(dB)	(Pass/Fail)	
V	51.3	38.7	25.2	7.6	0.4	0.9	22.4				40.0	-17.6	Pass	
Н	57.2	33.6	25.2	7.4	0.5	0.9	17.2				40.0	-22.8	Pass	
V	139.6	34.3	25.3	13.4	0.8	0.9	24.1				43.5	-19.4	Pass	
V	213.4	34.2	25.2	10.6	0.9	0.9	21.4				43.5	-22.1	Pass	
Н	221.1	33.8	25.1	10.8	1.0	0.9	21.4				46.0	-24.6	Pass	
Н	558.0	33.3	25.4	18.3	1.3	0.9	28.4				46.0	-17.6	Pass	
V	703.2	36.0	24.2	20.2	1.8	0.9	34.7				46.0	-11.3	Pass	
Н	703.2	36.7	24.2	20.2	1.8	0.9	35.4				46.0	-10.6	Pass	
Та	ble Result:	Pass	by	-10.6	dB					W	orst Freq:	703.2	MHz	
	te: EMI Chamber	2	Cable 1	Asset #20	52				Cable 2	2: Asset #2053				
Test Si	te: Eivii Chambei	2	ouble i.	/ 133Ct #20	92							ouble o.		





Radiated Emissions Table Date: 02-Mar-17 Company: Onset Computer Corporation Work Order: Q3620 Engineer: Zac Johnson EUT Desc: SRW Mote EUT Operating Voltage/Frequency: 3V DC Pressure: 985mBar **Temp:** 22.7°C Humidity: 35% Battery Frequency Range: 30-1000MHz Measurement Distance: 3 m Notes: High channel, worst case Z orientation EUT Max Freq: 924MHz 900-930MHz Notch filter used FCC 15.209 Cable Notch Adjusted Preamp Antenna Antenna Polarization Frequency Factor Factor Factor Factor Reading Margin Margin (H/V) (MHz) (dBµV) (dB) (dB) (dBuV/m (dBµV/m dBuV/n 53.3 38.1 0.4 0.9 -18.5 Pass 25.2 7.3 21.5 40.0 62.0 35.5 25.2 7.8 0.5 0.9 19.5 40.0 -20.5 V 82.4 39.5 36.3 25.2 8.0 11.5 0.5 0.9 23.7 ------40.0 -16.3 Pass ---176.5 25.3 0.8 24.2 Н 0.9 43.5 -19.3 Pass 39.5 37.2 25.2 25.4 46.0 46.0 257.0 11.8 0.9 0.9 27.9 -18.1 Pass Pass Н 559.6 18.3 1.3 0.9 32.3 -13.7 772.0 24.3 35.2 -10.8 788.5 24.7 0.9 Pass Table Result: Pass by -8.5 dB Worst Freq: 788.5 MHz Test Site: EMI Chamber 2 Cable 1: Asset #2052 Cable 2: Asset #2053 Cable 3: --Analyzer: Rental SA#2 Preamp: Red
CSsoft Radiated Emissions Calculator v1.017.183
Adjusted Reading = Reading - Preamp Factor + Antenna Factor + Cable Factor Antenna: Red-White Preselector: --Copyright Curtis-Straus LLC 200

Spectrum Analyzers / Receivers / Preselectors Range MN Mfr SN Asset Cat Calibration Due Calibrated and 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 and 2015 Agilent MY51210181 2093 I 8/9/2017 8/9/2016	
•	2016
Radiated Emissions Sites FCC Code IC Code VCCI Code Range Cat Calibration Due Calibrated	
	ated on
EMI Chamber 2 719150 2762A-7 A-0015 30-1000MHz II 3/22/2017 3/22/2015	/2015
Preamps /Couplers Attenuators / Filters Range MN Mfr SN Asset Cat Calibration Due Calibrated	ated on
Red 0.009-2000MHz ZFL-1000-LN CS N/A 798 II 1/28/2018 1/28/2017	
Antennas Range MN Mfr SN Asset Cat Calibration Due Calibrated	
Red-White Bilog 30-2000MHz JB1 Sunol A091604-1 1105 I 8/12/2017 8/12/2015	/2015
Meteorological Meters MN Mfr SN Asset Cat Calibration Due Calibrated	ated on
Weather Clock (Pressure Only) BA928 Oregon Scientific C3166-1 831 I 4/28/2018 4/28/2016	/2016
TH A#2081 HTC-1 HDE 2081 II 4/5/2017 4/5/2016	2016
Cables Range Mfr Cat Calibration Due Calibrated	ated 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	

Radiated Emis	sions Tab	le													
Date	e: 02-Mar-17			Company:	Onset Con	nputer Co	orporation						٧	Vork Order:	Q3620
Enginee	r: Zac Johnson			EUT Desc:	SRW Mote	•						EUT Operat	ing Voltage/	Frequency:	3V DC
Temp	o: 22.7°C			Humidity:	35%				Pressure:	985mBar					Battery
		Freque	ncy Range:	1-6GHz								Measureme	nt Distance:	3 m	
Note	s: 3 channels, w 900-930MHz I											EUT	Max Freq:	924MHz	
Antenna		Peak	Average	Preamp	Antenna	Cable	Notch	Adjusted	Adjusted	FCC 15.209	High Frequ	ency - Peak	FCC 15.2	209 High Fre Average	quency -
Polarization (H/V)	Frequency (MHz)	Reading (dBµV)	Reading (dBµV)	Factor (dB)	Factor (dB/m)	Factor (dB)	Factor (dB)	Peak Reading (dBµV/m)	Avg Reading (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result (Pass/Fail)	Limit (dBµV/m)	Margin (dB)	Result (Pass/Fail)
Low Channel															
V H	3625.0 3625.0	24.6 25.4	8.8 9.6	0.0 0.0	31.7 31.7	3.7 3.7	1.1 1.1	61.1 61.9	45.3 46.1	74.0 74.0	-12.9 -12.1	Pass Pass	54.0 54.0	-8.7 -7.9	Pass Pass
Tab	le Result:		Pass	by	-7.9	dB						W	orst Freq:	3625.0	MHz
	r: MXE Receiver			Cable 1: Preamp:	Asset #209 none	52						Asset #2053 Yellow Hom		Cable 3: Preselector:	
djusted Reading = Read.				Cable Facto	or									Copyright Curt	is-Straus LLC 200





	e: 02-Mar-17			Company:			orporation							Vork Order:	
	r: Zac Johnson			EUT Desc: SRW Mote					EUT Operating Voltage/Frequency: 3V						
Tem	o: 22.7°C			Humidity: 35% Pressure: 985mBar									Battery		
		Freque	ency Range:	1-6GHz								Measureme	nt Distance:	3 m	
Note	s: 3 channels, w	orst case Z	orientation									EUT	Max Freq:	924MHz	
	900-930MHz I	Notch filter u	sed												
Antenna		Peak	Average	Preamp	Antenna	Cable	Notch	Adjusted	Adjusted	FCC 15.209	High Frequ	ency - Peak	FCC 15.	209 High Fre Average	quency -
Polarization	Frequency	Reading	Reading	Factor	Factor	Factor	Factor	Peak Reading	Avg Reading	Limit	Margin	Result	Limit	Margin	Result
(H/V)	(MHz)	(dBµV)	(dBµV)	(dB)	(dB/m)	(dB)	(dB)	(dBµV/m)	(dBµV/m)	(dBµV/m)	(dB)	(Pass/Fail)	(dBµV/m)	(dB)	(Pass/Fail
Center Channel			L					L	L						
V	3665.0	27.8	12.0	0.0	32.0	3.7	1.1	64.6	48.8	74.0	-9.4	Pass	54.0	-5.2	Pass
Н	3665.0	28.8	13.0	0.0	32.0	3.7	1.1	65.6	49.8	74.0	-8.4	Pass	54.0	-4.2	Pass
Tab	le Result:		Pass	by	-4.2	dB						W	orst Freq:	3665.0	MHz
Test Site	e: EMI Chamber	2		Cable 1:	Asset #20	52					Cable 2	: Asset #2053		Cable 3:	
	r: MXE Receiver			Preamp:	none						Antonno	Yellow Horn		reselector:	

	e: 02-Mar-17			Company:			orporation							Nork Order:	
	r: Zac Johnson			EUT Desc:		9						EUT Operati	ng Voltage	Frequency:	3V DC
Tem	p: 22.7°C			Humidity:	35%				Pressure: 985mBar Ba					Battery	
		Freque	ency Range:	1-6GHz								Measuremer	nt Distance:	3 m	
Note	s: 3 channels, w	orst case Z	orientation									EUT	Max Freq:	924MHz	
	900-930MHz I	Notch filter u	ised												
Antenna		Peak	Average	Preamp	Antenna	Cable	Notch	Adjusted	Adjusted	FCC 15.209	High Frequ	ency - Peak	FCC 15.	209 High Fre Average	equency -
Polarization	Frequency	Reading	Reading	Factor	Factor	Factor	Factor	Peak Reading	Avg Reading	Lim it	Margin	Result	Limit	Margin	Result
(H/V)	(MHz)	(dBµV)	(dBµV)	(dB)	(dB/m)	(dB)	(dB)	(dBµV/m)	(dBµV/m)	(dBµV/m)	(dB)	(Pass/Fail)	(dBµV/m)	(dB)	(Pass/Fa
High Channel															
V	3695.0	25.3	9.5	0.0	32.1	3.7	1.1	62.2	46.4	74.0	-11.8	Pass	54.0	-7.6	Pass
H	3695.0	27.5	11.7	0.0	32.1	3.7	1.1	64.4	48.6	74.0	-9.6	Pass	54.0	-5.4	Pass
Tab	ole Result:		Pass	by	-5.4	dB						Wo	rst Freq:	3695.0	MHz
Test Site	e: EMI Chamber	2		Cable 1:	Asset #20	52					Cable 2	Asset #2053		Cable 3:	
	r: MXE Receiver			Preamp:	none						Antenna	Yellow Horn		Preselector:	
oft Radiated Emission	ns Calculator	v 1.017.183												Copyright Curti	Strone LLC

	EMI Chamber	2	. 400	-	Asset #20					Cable 2:	Asset #2053		Cable 3:		
Table	e Result:		Pass	by	-16.9	dB					We	orst Frea:	9408.0	MHz	
			All 3 channe	ls (Low, Mi	d and High)	were inve	estigated; no emi	issions seen in t	this range tha	t are within 1	0dB of the lim	its.			
(H/V)	(MHz)	(dBµV)	(dBµV)	(dB)	(dB/m)	(dB)	(dBµV/m)	(dBµV/m)	(dBµV/m)	(dB)	(Pass/Fail)	(dBµV/m)	(dB)	(Pass/Fa	
olarization	Frequency	Reading	Reading	Factor	Factor	Factor	Peak Reading	Avg Reading	Limit	Margin	Result	Limit	Margin	Result	
Antenna		Peak	Average	Preamp	Antenna	Cable	Adjusted	Adjusted	FCC 15.209	High Frequ	ency - Peak	FCC 15.2	209 High Fre Average	equency -	
	Noise Floor Re	eadings				1	1	1	500 IF 000			500 45			
Notes:	All 3 channels	were tested	i;								EU	Γ Max Freq:	924MHz		
		Freque	ncy Range:	6-18GHz							Measureme	nt Distance:	1 m		
Temp:	22.7°C			Humidity:	umidity: 35% Pressure: 985mBar					ar Bati					
Engineer:	Zac Johnson			EUT Desc:	SRW Mote	9				EUT Operating Voltage/Frequency: 3V					
	02-Mar-17			Company:	Onset Con	nputer Co	rporation					v	Vork Order:	Q3620	

Rev. 2/26/2017			
Spectrum Analyzers / Receivers / Preselectors	Range	MN	N
2093 MXE EMI Receiver	20Hz-26.5GHz	N9038A	Agi

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 2	719150	2762A-7	A-0015	1-18GHz		1	4/29/2017	4/29/2015
Antennas	Range	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
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	1	4/28/2018	4/28/2016
TH A#2081		HTC-1	HDE		2081	II.	4/5/2017	4/5/2016

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





Asset Cat Calibration Due

Calibrated on

Duty Cycle Correction Factor

Limits:

Unless otherwise specified, e.g., §§15.255(b), and 15.256(l)(5), when the radiated emission limits are expressed in terms of the average value of the emission, and pulsed operation is employed, the measurement field strength shall be determined by averaging over one complete pulse train, including blanking intervals, as long as the pulse train does not exceed 0.1 seconds. As an alternative (provided the transmitter operates for longer than 0.1 seconds) or in cases where the pulse train exceeds 0.1 seconds, the measured field strength shall be determined from the average absolute voltage during a 0.1 second interval during which the field strength is at its maximum value. The exact method of calculating the average field strength shall be submitted with any application for certification or shall be retained in the measurement data file for equipment subject to notification or verification.

[15.35(c)]

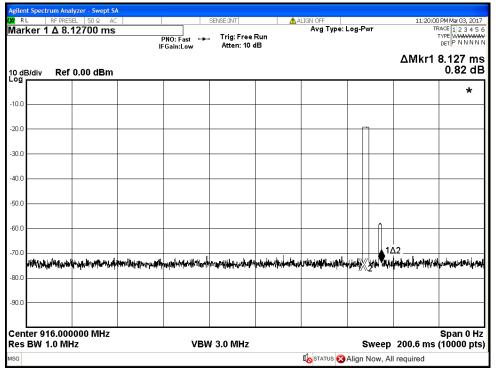
MEASUREMENTS / RESULTS

		Duty Cycle	Correction	Factor
Date: 20-Mar-17	Company:	Onset Computer C	Corporation	Work Order: Q3620
Engineer: ZJ	EUT:	SRW Mote		EUT Operating Voltage/Frequency: 3VDC battery
Temp: 23.3°C	Humidity:	24% Pr	essure: 1013mbar	
Frequency Range:	916 MHz	Measurement Typ	pe: Conducted A	Antenna Port
Notes:				
Frequency	On Time	Period		Duty Cycle Correction Factor (DCCF)
(MHz)	(millisecond)	(millisecond)		
916.0	16.2500	100.00		-15.783
Test Site: EMC3	Cable:	2288	Attenuat 21	07
rode onto: Enroo				

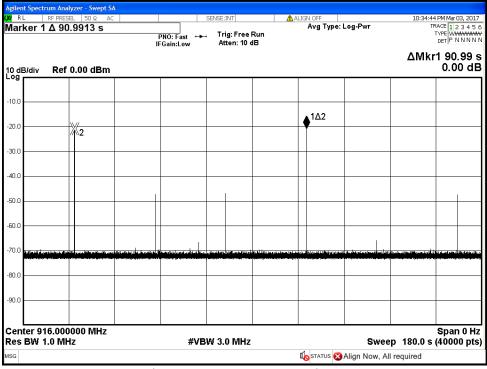
Rev. 3/27/2017 Spectrum Analyzers / Receivers / Preselectors 2093 MXE EMI Receiver	Range 20Hz-26.5GHz	MN N9038A	M fr Agilent	SN MY51210181	Asset 2093	Cat 	Calibration Due 8/9/2017	Calibrated on 8/9/2016
Preamps /Couplers Attenuators / Filters API - 40dB 100W Attenuator	Range 0.009-18GHz	MN 48-40-34	M fr API Weinschel	SN CG7990	Asset 2107	Cat	Calibration Due 10/2/2017	Calibrated on 10/2/2016
Meteorological Meters Weather Clock (Pressure Only) TH A#2079		MN BA928 HTC-1	Mfr Oregon Scientific HDE	SN C3166-1	Asset 831 2079	Cat 	Calibration Due 4/28/2018 3/23/2018	Calibrated on 4/28/2016 3/23/2017
Cables Asset #2288	Range 9KHz-26.5GHz	FLC-1.5FT-SMSM+	Mfr Mini-Circuits	16021029		Cat	Calibration Due 1/27/2018	Calibrated on 1/27/2017







Single pulse



Period (180-second window)





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.

[15.247(d)]









ACCREDITED
Testing Cert. No. 1627-01



Middle Channel - Conducted Spurious Reference



Middle Channel 9 KHz -25GHz Conducted Spurious







High Channel - Conducted Spurious Reference



High Channel 9 KHz -25GHz Conducted Spurious





No emissions within 20dB of their corresponding fundamentals were found on all three channels.

Rev. 3/27/2017								
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	1	8/9/2017	8/9/2016
Preamps /Couplers Attenuators / Filters	Range	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
API - 40dB 100W Attenuator	0.009-18GHz	48-40-34	API Weinschel	CG7990	2107	II	10/2/2017	10/2/2016
Meteorological Meters		MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
Weather Clock (Pressure Only)		BA928	Oregon Scientific	C3166-1	831	- 1	4/28/2018	4/28/2016
TH A#2079		HTC-1	HDE		2079	II	3/23/2018	3/23/2017
Cables	Range		Mfr			Cat	Calibration Due	Calibrated on
Asset #2288	9KHz-26.5GHz	FLC-1.5FT-SMSM+	Mini-Circuits	16021029		II	1/27/2018	1/27/2017





Power Spectral Density

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

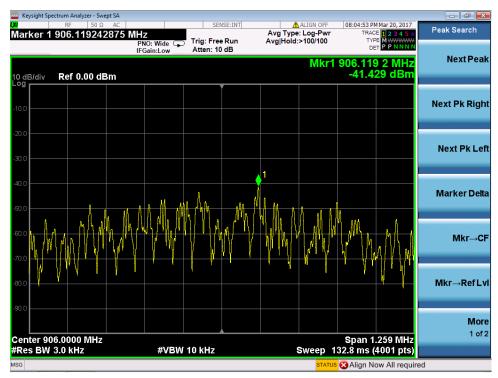
MEASUREMENTS / RESULTS

	P	eak Pow	er Sp	ectral D	ensity						
Date: 20-Mar-17	Company	Onset Comput	ter Corpo	oration			Work Ord	er: Q3620			
Engineer: ZJ	EUT	SRW Mote			EUT Oper	EUT Operating Voltage/Frequency: 3VDC batter					
Temp: 23.3°C	Humidity	Humidity: 24% Pressure: 1013mbar									
Frequency Range:	906-924 MHz	Measuremen Measuremen	• •	Conducte d: FCC KDE		TS Meas	Guidance v03r0	05 Section 10.2			
Notes:											
Frequency	Peak Reading	Cable Loss	s Att	tenuator Loss	Peak PSD	Limit	Margin	Result			
(MHz)	(dBm)	(dB)		(dB)	(dBm)	(dBm) (dB)	1.00 u.s			
906	-41.429	0.3		40.03	-1.08	8.0	-9.08	Pass			
916	-41.601	0.3		40.03	-1.25	8.0	-9.25	Pass			
924	-41.831	0.3		40.03	-1.48	8.0	-9.48	Pass			
Test Site: EMC3 Analyzer: 2093 PSD(dBm) = Reading (dBm	Cable) + Cable Loss (dB) + Atte		Sm)	Attenuat	2107		Copyrigh	t Curtis-Straus LLC 2000			
Rev. 3/27/2017 Spectrum Analyzers / Rec 2093 MXE EMI		Range Hz-26.5GHz I	MN N9038A	M fr Agilent	SN MY51210181	Asset Ca 2093 I	Calibration D 8/9/2017	ue Calibrated on 8/9/2016			

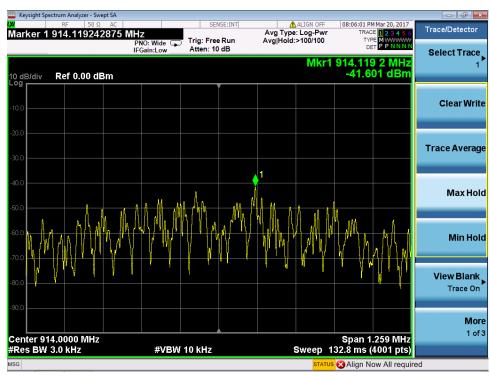
ev. 3/27/2017								
Spectrum Analyzers / Receivers / Preselectors	Range	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
2093 MXE EMI Receiver	20Hz-26.5GHz	N9038A	Agilent	MY51210181	2093	I	8/9/2017	8/9/2016
Preamps /Couplers Attenuators / Filters	Range	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
API - 40dB 100W Attenuator	0.009-18GHz	48-40-34	API Weinschel	CG7990	2107	II	10/2/2017	10/2/2016
Meteorological Meters		MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
Weather Clock (Pressure Only)		BA928	Oregon Scientific	C3166-1	831	- 1	4/28/2018	4/28/2016
TH A#2079		HTC-1	HDE		2079	II	3/23/2018	3/23/2017
Cables	Range		Mfr			Cat	Calibration Due	Calibrated on
Asset #2288	9KHz-26.5GHz	FLC-1.5FT-SMSM+	Mini-Circuits	16021029		II	1/27/2018	1/27/2017







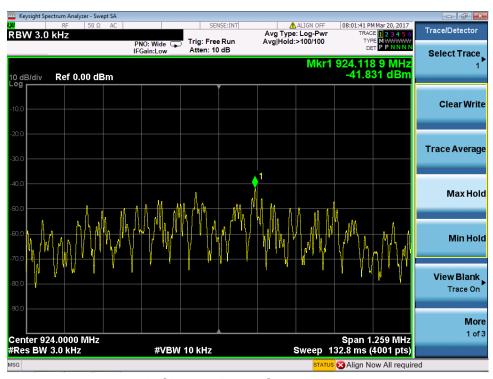
Low Channel Power Spectral Density



Middle Channel Power Spectral Density







High Channel Power Spectral Density



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

Not applicable since EUT is battery powered (3VDC)





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 4.6.1]

MEASUREMENTS / RESULTS

ILAGGILLILLI	/ IXEGGETO		
	99%	% Occupied Bandwidth	
Date: 20-Mar-17	Company: Onset Comput	er Corporation	Work Order: Q3620
Engineer: ZJ	EUT: SRW Mote		EUT Operating Voltage/Frequency: 3VDC batte
Temp: 23.3°C	Humidity: 24%	Pressure: 1013mbar	
Frequency Range: 906	-924 MHz	Measurement Type: Conducted	
	Me	asurement Method: RSS-Gen Issue 4 S	Section 6.6
Notes:			
Frequency		99% OBW	
(MHz)		(kHz)	
906		1442.7	
916		1373.1	
924		1375.8	
Test Site: EMC3	Cable: 2288	Attenuator 2107	
Analyzer: 2093			Copyright Curtis-Straus LLC 2

Rev. 3/27/2017								
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
Preamps /Couplers Attenuators / Filters	Range	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
API - 40dB 100W Attenuator	0.009-18GHz	48-40-34	API Weinschel	CG7990	2107	II	10/2/2017	10/2/2016
Meteorological Meters		MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
Weather Clock (Pressure Only)		BA928	Oregon Scientific	C3166-1	831	- 1	4/28/2018	4/28/2016
TH A#2079		HTC-1	HDE		2079	II	3/23/2018	3/23/2017
Cables	Range		Mfr			Cat	Calibration Due	Calibrated on
Asset #2288	9KHz-26.5GHz	FLC-1.5FT-SMSM+	Mini-Circuits	16021029		II	1/27/2018	1/27/2017







Occupied Bandwidth Low Channel



Occupied Bandwidth Middle Channel



ACCREDITED
Testing Carl No. 1827-01



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	3.9dB	N/A
CISPR Telco Conducted Emissions (Current)	3.6dB 2.9dB	3.6dB (Ucispr) N/A
	4.4dB	N/A
Telco Conducted Emissions (Voltage)		
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 x 10 ⁻⁸	1 x 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		



ACCREDITED

Lating Cert No. 1827 01

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. CLIÉNT SHALL, EXCEPT TO THE EXTENT OF COMPANY'S L'IABILITY 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.



ACCREDITED

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. Rev.160009121(2)_#684340 v14CS



