



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

Report No EQ1581-2

Client ROAR for Good, LLC

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Items tested Athena

FCC ID 2AJ85-RR1000 IC ID 22154-RR1000 FRN 0026003616

Equipment Type Digital Transmission System

Equipment Code DTS
Emission Designator 1M02F1D

Test Dates February 14 to 21, 2017

Results As detailed within this report

Prepared by Zachary Johnson – Lest Engineer

Authorized by

Yukus Fazilogu — Sr. FMC Engineer

Issue Date 3/30/2017

Conditions of Issue This Test Report is issued subject to the conditions stated in the 'Conditions of Testing' section on page 39 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

Contents	
ContentsSummary	3
Test Methodology	4
Product Tested - Configuration Documentation	5
Statement of Conformity	
Modifications Required for Compliance	
Test Results	7
Bandwidth	
Peak Output Power	
Band Edge Measurements	13
Radiated Spurious Emissions	14
Duty Cycle Correction Factor	24
Conducted Spurious Emissions	26
Power Spectral Density	31
AC Line Conducted Emissions	
Occupied Bandwidth	35
Measurement Uncertainty	38
Conditions of Testing	39

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 1

"Athena" is a Bluetooth Low Energy transmitter operating in the 2402MHz-2480MHz frequency range.

Antenna Type: Internal surface mount chip

Gain: +0.5 dBi

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 1, 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:

2402MHz: Low Channel2440MHz: Mid Channel2480MHz: High Channel

EUT operating voltage is 5VDC from battery or USB.

The following bandwidths were used during radiated spurious emissions testing.

Frequency	RBW	VBW
0.15-30MHz	9kHz	30kHz
30-1000MHz	120kHz	1MHz
1-25GHz	1MHz	3MHz



ACCREDITED

Product Tested - Configuration Documentation

					EUT C	onfiguration					
Work	Order:	Q1581									
Con	mpany:	ROAR for 0	Good, L	LC							
Company A	ddress:	3401 Marke	et St. Su	ite 200							
		Philadelphia	a, PA 19	104 USA							
C	ontact:	Joseph Crab	btree								
		1									
	MN						PN			SN	
	EUT:			R1000						Sample	
				R1000				le 2 (Antenna	2 (Antenna Port tests)		
EUT Description: ROAR Athena											
EUT Tx Frequency: 2402 to 2480MHz											
Support Equipment	<u> </u>			M	N				SN		
Anker PowerPort2 U				A21			FY6461FF				
Wall Charger											
Port Label	Don	t Type #	ports	# populated	cable type	shielded	ferrites	length (m)	in/out	under	comment
r of t Laber	101	t Type #	ports	# populateu	cable type	sineided	Territes	length (m)	III/OUT	test	comment
Micro USB	USB	1		1	USB	Yes	No	0.2	in	yes	
		•	•						•		
Software Operating	Mode D	escription:									
The EUT provides B	luetooth o	communicatio	on with a	single pushbutte	on. EUT is set to	transmit on sin	ngle channel; Le	ow (2402 MHz),	Mid (2440	MHz) and H	igh (2480 MHz)
respectively.											



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 permanently
				installed PCB antenna with a +0.5dBi gain.
8.10			15.205	The fundamental is not in a Restricted band and the
			15.209	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 operating voltage is 5VDC from battery or USB.
				AC side of support DC Power Supply meets the AC
				Line conducted emissions requirements of this
				section.
			15.247	The unit complies with the requirements of 15.247
		RSS 247		The unit complies with the requirements of RSS-247
6.6				Occupied Bandwidth measurements were made.

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: 21-Feb-17	Company: ROAR for Go	od, LLC	Work Order: Q1581										
Engineer: Zac Johnson	EUT: ROAR Athen	a	EUT Operati	ng Voltage	/Frequency:	5.0V DC USB							
Temp: 20.5°C	Humidity: 34%	Pressure: 1015mBar											
Frequency Range: 2	2402-2480 MHz Meas	surement Type: Conducted Ante	enna Port	•									
	Measur	ement Method: FCC KDB 5580	74 D01 DTS M	leas Guidan	ce v03r05 Sed	ction 8.2							
Notes:													
					6dB Bandwid	dth							
Frequency		Reading		Limit	Margin	Result							
(MHz)		(kHz)		(kHz)	(kHz)	(Pass/Fail)							
2402		685.4		≥500	185	Pass							
2440		685.4		≥500	185	Pass							
2480		693.3		≥500	193	Pass							
Test Site: CEMI-05	Cable: 2288	Attenuator:	2107 40dB	3									
Analyzer: EXA 1118470					Copyright Cur	tis-Straus LLC 2000							

Rev. 2/20/2017 Spectrum Analyzers / Receivers / Preselectors Rental EXA Signal Analyzer(1118470)	Range 9KHz-26.5GHz	MN N9010A-526;M	M fr AT	SN MY51170093	Asset 1118470	Cat 	Calibration Due 1/3/2018	Calibrated on 1/3/2017
Conducted Test Sites (Mains / Telco) CEMI 5	FCC Code 719150		VCCI Code A-0015			Cat	Calibration Due NA	Calibrated on N/A
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#2085		MN BA928 HTC-1	Mfr Oregon Scientific HDE	SN C3166-1	Asset 831 2085	Cat 	Calibration Due 4/28/2018 4/5/2017	Calibrated on 4/28/2016 4/5/2016
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

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





PLOTS



Low Channel DTS Bandwidth



Middle Channel DTS Bandwidth



ACCREDITED
Testing Carl No. 1877-01



High Channel DTS Bandwidth



Peak Output Power

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

MEASUREMENTS / RESULTS

Asset #2288

			Peak Outpu	t Power						
Date: 20-Feb-17		Company: ROAR for	Good, LLC			Work Order: Q1581				
Engineer: Zac Johnson		EUT: ROAR At	hena	na EUT Operating Voltage/Frequency: 5						
Temp: 20.5°C		Humidity: 34%		Pressure: 1015mBar						
Frequency Range: 2402-24	80 MHz		Measurement Type: Conducted Antenna Port							
			Measureme	nt Method: FCC KDB 5	58074 D01 DTS Meas	Guidance v03r05 S	Section 9.1.1			
Notes:										
Frequency Pea	k Reading	Cable Loss Attenuator Loss	Peak Output Power	Limit	Margin	Result				
(MHz)	(dBm)	(dB)	(dB)	(dBm)	(dBm)	(dB)	(Pass/Fail)			
2402.0	-39.59	0.32	39.42	0.15	30.0	-29.85	Pass			
2440.0	-39.35	0.32	39.42	0.39	30.0	-29.61	Pass			
2480.0	-40.13	0.32	39.42	-0.39	30.0	-30.39	Pass			
Test Site: CEMI-05		Cable: 2288	•	Attenuator	: 2107 40dB					

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

Spectrum Analyzers / Receivers / Preselectors Range MN Mfr Asset **Calibration Due** Calibrated on 9KHz-26.5GHz N9010A-526:M MY51170093 1118470 Rental EXA Signal Analyzer(1118470) ΑT 1/3/2018 1/3/2017 Conducted Test Sites (Mains / Telco) FCC Code **VCCI Code** Cat **Calibration Due** Calibrated on 719150 A-0015 NA N/A Preamps/Couplers Attenuators / Filters MN Mfr SN **Calibration Due** Calibrated on 0.009-18GHz API - 40dB 100W Attenuator 48-40-34 API Weinschel CG7990 2107 10/2/2017 10/2/2016 Meteorological Meters MN Asset Calibration Due Calibrated on Weather Clock (Pressure Only) TH A#2085 BA928 Oregon Scientific C3166-1 831 4/28/2018 4/28/2016 HTC-1 HDE 2085 Ш 4/5/2017 4/5/2016 Cables Mfr **Calibration Due** Calibrated on

Mini-Circuits

16021029

9KHz-26.5GHz FLC-1.5FT-SMSM+

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

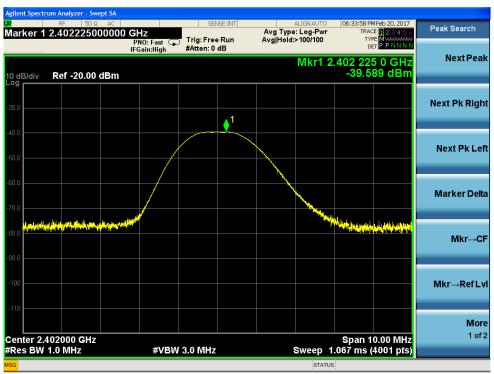




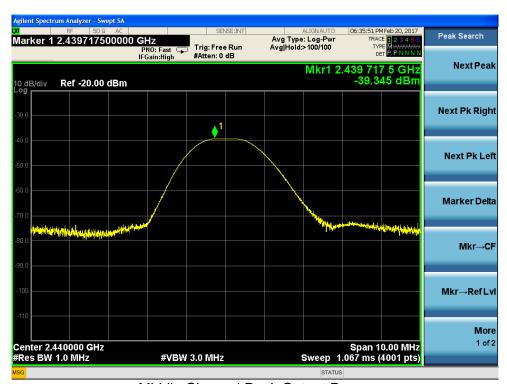
1/27/2018

1/27/2017

PLOTS



Low Channel Peak Output Power



Middle Channel Peak Output Power



ACCREDITED
Testing Carl No. 1877-01

Peak Search Avg Type: Log-Pwr Avg|Hold:>100/100 Marker 1 2.479722500000 GHz Trig: Free Run #Atten: 0 dB PNO: Fast G Next Peak Mkr1 2.479 722 5 GHz -40.132 dBm Ref -20.00 dBm Next Pk Right Next Pk Left Marker Delta Mkr→CF Mkr→RefLv More Center 2.480000 GHz #Res BW 1.0 MHz Span 10.00 MHz Sweep 1.067 ms (4001 pts) 1 of 2 **#VBW** 3.0 MHz

High Channel Peak Output Power



Band Edge Measurements

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:	15-Feb-17			Company:	ROAR for	Good, LL	С					V	Work Order: Q1581		
Engineer:	Zac Johnson			EUT Desc:	ROAR Ath	ena					EUT Operat	ing Voltage/	Frequency:	5V DC US	
Temp:	23.8°C			Humidity:	22%			Pressure:	993mBar						
		Freque	ncy Range:	Bandedge	2400-2483	3.5MHz					Measureme	nt Distance:	3 m		
Notes: CW High Power Mode EUT Max Freq: 2480MHz															
										FCC 15.209 FCC 15.209					
Antenna plarization	-	Peak	Average	Preamp	Antenna	Cable Factor	Adjusted	Adjusted	Limit	Margin	D It	Limit		Result	
(H/V)	Frequency (MHz)	Reading (dBuV)	Reading (dBµV)	Factor (dB)	Factor (dB/m)	(dB)	Peak Reading (dBuV/m)	Avg Reading (dBuV/m)	(dBuV/m)	(dB)	Result (Pass/Fail)	(dBµV/m)	Margin (dB)	(Pass/Fai	
Н	2400.0	23.0	3.0	0.0	28.2	3.4	54.6	34.6	74.0	-19.4	Pass	54.0	-19.4	Pass	
V	2400.0	23.5	3.5	0.0	28.2	3.4	55.1	35.1	74.0	-18.9	Pass	54.0	-18.9	Pass	
Н	2483.5	23.1	3.1	0.0	28.2	3.3	54.6	34.6	74.0	-19.4	Pass	54.0	-19.4	Pass	
V	2483.5	22.6	2.6	0.0	28.2	3.3	54.1	34.1	74.0	-19.9	Pass	54.0	-19.9	Pass	
Table	e Result:		Pass	by	-18.9	dB		Worst Freq: 2				2400.0	MHz		
Test Site:	est Site: EMI Chamber 1 Cable 1: Asset #2051							Cable 2:	Asset #2054		Cable 3:				
Analyzer:	Black			Preamp:	none	Antenna: Yellow Horn Preselector:									

Rev. 2/13/2017 Spectrum Analyzers / Receivers / Preselectors Rental MXE EMI Receiver (1170725)	Range 20Hz-26.5GHz	MN N9038A	Mfr Agilent	SN MY51210151	Asset 1170725	Cat	Calibration Due 12/22/2017	Calibrated on 12/22/2016
Radiated Emissions Sites EMI Chamber 1	FCC Code 719150	IC Code 2762A-6	VCCI Code A-0015	Range 1-18GHz		Cat 	Calibration Due 5/23/2017	Calibrated on 5/23/2015
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#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
REMI-High-07	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.





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

Curtis Straus - a Bureau Veritas Company Radiated Emissions Electric Field 3m Distance Top Peaks Horizontal 30-1000MHz

Operator: Chris Bramley⊡ ⊞lient Present: None ■ompany: ROAR for Good

Frequency	Delta to Marginal Level	Peak Reading	Preamplifier Factor	Antenna Factor	Cable Factor	Adjusted Peak Level	Requirement 1 Limit	Requirement 1 Margin	Requirement 1 Results	EUT Azimuth	Antenna Height	Margin Limit 1
MHz	dB	dΒμV	dB	dB/m	dB	dBμV/m	dBμV/m	dB	Pass/Fail	degrees	centimeters	dB
30.291	-11.9	26	25.4	21.2	0.4	22.1	40	-17.9	PASS	315	200	
87.957	-12.9	38.5	25.4	7.5	0.5	21.1	40	-18.9	PASS	90	200	
92.541	-12.9	41.2	25.4	8.3	0.5	24.6	43.5	-18.9	PASS	90	200	
97.076	-8.2	44.8	25.4	9.4	0.5	29.3	43.5	-14.2	PASS	270	200	-14.2
99.646	-11.1	41.2	25.4	10.1	0.6	26.4	43.5	-17.1	PASS	90	200	
865.558	-13	28.6	25.5	21.9	2	27	46	-19	PASS	270	150	

All 3 channels were investigated; only the worst case recorded.

2402MHz - High Power CW

EUT Description - ROAR Athena EUT Power Input - 5Vdc via USB Test Site - Chamber 1

Temperature; Humidity - 23.9°C; 22%RH Barometric Pressure - 999mBar EUT Maximum Frequency - 2480MHz Work Order # - Q1581

30 to 1000 MHz Radiated Spurious Horizontal

Curtis Straus - a Bureau Veritas Company Radiated Emissions Electric Field 3m Distance

Top Peaks Vertical 30-1000MHz Operator: Chris Bramley⊞ Blient Present: None Bompany: ROAR for Good

Frequency	Delta to Marginal Level	Peak Reading	Preamp Factor	Antenna Factor	Cable Factor	Adjusted Peak Reading	Requirement 1 Limit	Requirement 1 Margin	Requirement 1 Results	Turntable Azimuth	Antenna Height	Worst Margin Limit 1
MHz	dB	dΒμV	dB	dB/m	dB	dBμV/m	dBμV/m	dB	Pass/Fail	degrees	centimeters	dB
30.049	-8.8	28.9	25.4	21.4	0.4	25.2	40	-14.8	PASS	180	100	
43.58	-9	38.8	25.4	11.3	0.4	25	40	-15	PASS	0	100	
45.181	-7	41.7	25.4	10.3	0.4	27	40	-13	PASS	45	100	-13
48.406	-11.5	38.8	25.4	8.7	0.4	22.5	40	-17.5	PASS	315	100	
97.027	-13.1	39.9	25.4	9.4	0.5	24.4	43.5	-19.1	PASS	180	200	
98.167	-13.3	39.4	25.4	9.7	0.5	24.3	43.5	-19.3	PASS	180	200	

All 3 channels were investigated; only the worst case recorded

2402MHz - High Power CW

EUT Description - ROAR Athena EUT Power Input - 5Vdc via USB Test Site - Chamber 1

Temperature; Humidity - 23.9°C; 22%RH Barometric Pressure - 999mBar EUT Maximum Frequency - 2480MHz Work Order # - Q1581

30 to 1000 MHz Radiated Spurious Vertical





3/5/2018

10/1/3017

8/14/2017

3/5/2017

10/30/2016

8/14/2016

Rev. 3/12/2017 Spectrum Analyzers / Receivers / Preselectors Calibration Due Calibrated on Range MN Cat Rental MXE EMI Receiver(1170725) 20Hz-26.5GHz N9038A MY51210151 12/22/2016 Agilent 12/22/2017 Radiated Emissions Sites FCC Code IC Code VCCI Code Cat Calibration Due Calibrated on Range EMI Chamber 1 12/21/2018 12/21/2016 Preamps / Couplers Attenuators / Filters Range 0.009-2000MHz ZFL-1000-LN N/A 1258 10/30/2017 10/30/2016 A#2111 HF Preamp COM-POWER 0.5-18GHz PAM-118A 11/5/2017 11/5/2016 551063 2111 Antennas Range Mfr SN Cat Calibration Due Calibrated on 30-2000MHz Red-Brown Bilog JB1 A0032406 Sunol 1/13/2019 Meteorological Meters MN Mfr SN Asset Cat Calibration Due Calibrated on Weather Clock (Pressure Only) BA928 Oregon Scientific C3166-1 4/28/2016 TH A#2080 HTC-1 HDE 2080 4/5/2017 4/5/2016 Cables Cat Calibration Due Range

Florida RF

Florida RF

TRU

TRU-21B0707-120

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

9kHz - 18GHz

9kHz - 18GHz

1 - 26.5GHz

Curtis Straus - a Bureau Veritas Company Radiated Emissions Electric Field 3m Distance

Asset #2051

Asset #2054

REMI-High-07

1-6GHz Horizontal Tabular Data Operator: Chris Bramley

☑lient Present: None **B**ompany: ROAR for Good

Frequency	Raw Peak Reading	Raw Average Reading	Preamp Factor	Antenna Factor	Cable Factor	Adjusted Peak Amplitude	Adjusted Average Amplitude	Peak Limit	Peak Margin	Peak Results	Average Limit	Average Margin	Average Results	Worst Peak Margin	Worst Average Margin
MHz	dΒμV	dΒμV	dB	dB/m	dB	dBμV/m	dBμV/m	dBμV/m	dB	Pass/Fail	dBμV/m	dB	Pass/Fail	dB	dB
2041.4	28.8	19.1	18.4	28	3.1	41.5	31.7	74	-32.5	PASS	54	-22.2	PASS		
4804.1	29.1	23	17.7	33.1	4.9	49.4	43.3	74	-24.6	PASS	54	-10.7	PASS		-10.7
5975	26.1	15.5	17.1	34.6	5.8	49.5	38.9	74	-24.5	PASS	54	-15.1	PASS	-24.5	

EUT Tx on Low Channel 2402MHz - High Power CW

EUT Description - ROAR Athena EUT Power Input - 5Vdc via USB

Test Site - Chamber 1

Temperature; Humidity - 23.9°C; 22%RH Barometric Pressure - 999mBar EUT Maximum Frequency - 2480MHz

Work Order # - Q1581

1-6GHz Radiated Spurious Horizontal (2402 MHz)





Curtis Straus - a Bureau Veritas Company

Radiated Emissions Electric Field 3m Distance 1-6GHz Vertical Tabular Data Operator: Chris Bramley®

☑lient Present: None ☑ompany: ROAR for Good

Frequency	Raw Peak Reading	- 0	Preamp Factor	Antenna Factor	Cable Factor	Adjusted Peak Amplitude	Adjusted Average Amplitude	Peak Limit	Peak Margin	Peak Results	Average Limit	Average Margin	Average Results	Worst Peak Margin	Worst Average Margin
MHz	dΒμV	dΒμV	dB	dB/m	dB	dBμV/m	dBμV/m	dBμV/m	dB	Pass/Fail	dBμV/m	dB	Pass/Fail	dB	dB
4803.9	32.6	28.5	17.7	33.1	4.9	52.9	48.9	74	-21.1	PASS	54	-5.1	PASS	-21.1	-5.1
5923.3	27	15.7	17.1	34.5	5.7	50.1	38.8	74	-23.9	PASS	54	-15.2	PASS		

EUT Tx on Low Channel 2402MHz - High Power CW

EUT Description - ROAR Athena EUT Power Input - 5Vdc via USB Test Site - Chamber 1

Temperature; Humidity - 23.9°C; 22%RH Barometric Pressure - 999mBar EUT Maximum Frequency - 2480MHz

Work Order # - Q1581

1-6GHz Radiated Spurious Vertical (2402 MHz)

Curtis Straus - a Bureau Veritas Company Radiated Emissions Electric Field 3m Distance

Radiated Emissions Electric Field 3m Distanc 1-6GHz Horizontal Tabular Data

Operator: Chris Bramley

Illient Present: None

Ompany: ROAR for Good

Frequency	Raw Peak Reading	0 -	Preamp Factor	Antenna Factor	Cable Factor	Adjusted Peak Amplitude	Adjusted Average Amplitude	Peak Limit	Peak Margin	Peak Results	Average Limit	Average Margin	Average Results	Worst Peak Margin	Worst Average Margin
MHz	dΒμV	dΒμV	dB	dB/m	dB	dBμV/m	dBμV/m	dBμV/m	dB	Pass/Fail	dBμV/m	dB	Pass/Fail	dB	dB
4879.8	34.4	31.4	17.4	33.2	4.9	55.1	52	74	-18.9	PASS	54	-1.9	PASS	-18.9	-1.9
5862.5	24.9	15.7	17.2	34.3	5.7	47.8	38.6	74	-26.2	PASS	54	-15.4	PASS		

EUT Tx on Mid Channel 2440MHz - High Power CW

EUT Description - ROAR Athena EUT Power Input - 5Vdc via USB Test Site - Chamber 1

Temperature; Humidity - 23.9°C; 22%RH Barometric Pressure - 999mBar EUT Maximum Frequency - 2480MHz

Work Order # - Q1581

1-6GHz Radiated Spurious Horizontal (2440 MHz)





Curtis Straus - a Bureau Veritas Company

Radiated Emissions Electric Field 3m Distance

1-6GHz Vertical Tabular Data Operator: Chris Bramley 2

■lient Present: None mompany: ROAR for Good

Frequency	Raw Peak Reading	Raw Average Reading		Antenna Factor	Cable Factor	Adjusted Peak Amplitude	Adjusted Average Amplitude	Peak Limit	Peak Margin	Peak Results	Average Limit	Average Margin	Average Results	Worst Peak Margin	Worst Average Margin	Filter Factor
MHz	dΒμV	dΒμV	dB	dB/m	dB	dΒμV/m	dBμV/m	dBμV/m	dB	Pass/Fail	dBμV/m	dB	Pass/Fail	dB	dB	0.3
*4880	39.1	19.1	17.4	33.2	4.9	60.1	40.1	74	-13.9	PASS	54	-13.9	PASS	-13.9	3.9	

EUT Tx on Mid Channel 2440MHz - High Power CW

*Duty Cycle Correction Factor (DCCF) is applied to harmonic measurement where it is applicable; worst case applied -20dB.

EUT Description - ROAR Athena EUT Power Input - 5Vdc via USB Test Site - Chamber 1

Temperature; Humidity - 23.9°C; 22%RH Barometric Pressure - 999mBar EUT Maximum Frequency - 2480MHz

Work Order # - Q1581

1-6GHz Radiated Spurious Vertical (2440 MHz)

Curtis Straus - a Bureau Veritas Company

Radiated Emissions Electric Field 3m Distance

1-6GHz Horizontal Tabular Data

Operator: Chris Bramley

Dlient Present: None

mompany: ROAR for Good

Frequency	Raw Peak Reading	Raw Average Reading	Preamp Factor	Antenna Factor	Cable Factor	Peak	Adjusted Average Amplitude	Peak Limit	Peak Margin	Peak Results	Average Limit	Average Margin	Average Results	Worst Peak Margin	Worst Average Margin
MHz	dΒμV	dΒμV	dB	dB/m	dB	dBμV/m	dBμV/m	dBμV/m	dB	Pass/Fail	dBμV/m	dB	Pass/Fail	dB	dB
4959.9	34.4	32.3	17.3	33.3	4.9	55.3	53.1	74	-18.7	PASS	54	-0.8	PASS	-18.7	-0.8
5977.3	23.4	14.9	17.1	34.6	5.8	46.7	38.3	74	-27.2	PASS	54	-15.7	PASS		

EUT Tx on High Channel 2480MHz - High Power CW

EUT Description - ROAR Athena EUT Power Input - 5Vdc via USB

Test Site - Chamber 1

Temperature; Humidity - 23.9°C; 22%RH Barometric Pressure - 999mBar EUT Maximum Frequency - 2480MHz

Work Order # - Q1581

1-6GHz Radiated Spurious Horizontal (2480 MHz)





Curtis Straus - a Bureau Veritas Company

Radiated Emissions Electric Field 3m Distance

1-6GHz Vertical Tabular Data Operator: Chris Bramley Dilient Present: None Company: ROAR for Good

Frequency	Raw Peak Reading	Raw Average Reading	Preamp Factor	Antenna Factor	Cable Factor	Adjusted Peak Amplitude	Adjusted Average Amplitude	Peak Limit	Peak Margin	Peak Results	Average Limit	Average Margin	Average Results	Worst Peak Margin	Worst Average Margin
MHz	dΒμV	dΒμV	dB	dB/m	dB	dBμV/m	dBμV/m	dBμV/m	dB	Pass/Fail	dBμV/m	dB	Pass/Fail	dB	dB
*4960.1	40.6	20.6	17.3	33.3	4.9	61.5	41.5	74	-12.5	PASS	54	-12.5	PASS	-12.5	6.2
5909	24.1	15.2	17.1	34.4	5.7	47.1	38.3	74	-26.8	PASS	54	-15.7	PASS		

EUT Tx on High Channel 2480MHz - High Power CW

*Duty Cycle Correction Factor (DCCF) is applied to harmonic measurement where it is applicable; worst case applied -20dB.

EUT Description - ROAR Athena EUT Power Input - 5Vdc via USB Test Site - Chamber 1

Temperature; Humidity - 23.9°C; 22%RH Barometric Pressure - 999mBar EUT Maximum Frequency - 2480MHz

Work Order # - Q1581

1-6GHz Radiated Spurious Vertical (2480 MHz)

Curtis Straus - a Bureau Veritas Company Radiated Emissions Electric Field 1m Distance

6-18GHz Horizontal Tabular Data Operator: Chris Bramley 2 Elient Present: None Company: ROAR for Good

Frequency			Preamplifier Factor	Antenna Factor	Cable Factor	Adjusted Peak Amplitude	Adjusted Average Amplitude	Peak Limit	Peak Margin	Peak Results	Average Limit	Average Margin	Average Results	EUT Azimuth	Antenna Height
MHz	dΒμV	dΒμV	dB	dB	dB	dBμV/m	dBμV/m	dBμV/m	dB	Pass/Fail	dBμV/m	dB	Pass/Fail	degrees	cm
*7206	63.7	43.7	37.1	37.1	9.6	73.4	53.3	83.5	-10.1	PASS	63.5	-10.2	PASS	116	150
*9607.9	61.2	41.2	36.3	38.8	10.4	74.1	54.1	83.5	-9.4	PASS	63.5	-9.4	PASS	108	150
12010	49.7	48.7	37	39	12.3	64	63	83.5	-19.5	PASS	63.5	-0.5	PASS	114	155
14410.9	38.1	28.1	37	40.9	13.2	55.2	45.2	83.5	-28.3	PASS	63.5	-18.3	PASS	164	140
16814.2	44.3	41.7	37.2	41	14.4	62.4	59.9	83.5	-21.1	PASS	63.5	-3.6	PASS	121	150
17910.8	33.6	24.8	35.4	44.7	15.2	58.1	49.3	83.5	-25.4	PASS	63.5	-14.2	PASS	228	196

EUT Tx on Low Channel 2402MHz - High Power CW

*Duty Cycle Correction Factor (DCCF) is applied to harmonic measurement where it is applicable; worst case applied -20dB.

EUT Description - ROAR Athena EUT Power Input - 5Vdc via USB

Test Site - Chamber 1

Temperature; Humidity - 23.9°C; 22%RH Barometric Pressure - 999mBar EUT Maximum Frequency - 2480MHz

Work Order # - Q1581

6-18GHz Radiated Spurious Horizontal (2402 MHz)





Curtis Straus - a Bureau Veritas Company Radiated Emissions Electric Field 1m Distance

6-18GHz Vertical Tabular Data Operator: Chris Bramley[®] Elient Present: None Elompany: ROAR for Good

Frequency		Raw Average Reading	Preamplifier Factor	Antenna Factor	Cable Factor	Adjusted Peak Amplitude	Adjusted Average Amplitude	Req. 1 Peak Limit	Peak Margin	Peak Results	Average Limit	Average Margin	Average Results	EUT Azimuth	Antenna Height
MHz	dΒμV	dΒμV	dB	dB	dB	dBμV/m	dBμV/m	dBμV/m	dB	Pass/Fail	dBμV/m	dB	Pass/Fail	degrees	cm
*7206	70	50	37.1	37.1	9.6	79.6	59.6	83.5	-3.9	PASS	63.5	-3.9	PASS	141	152
*9608	65.9	45.9	36.3	38.8	10.4	78.8	58.8	83.5	-4.7	PASS	63.5	-4.7	PASS	139	139
12010.1	51.5	47.7	37	39	12.3	65.7	61.9	83.5	-17.8	PASS	63.5	-1.6	PASS	130	139
14409.5	37.2	27.2	37	40.9	13.2	54.3	44.3	83.5	-29.2	PASS	63.5	-19.2	PASS	106	100
16811.4	37.3	27.4	37.2	41	14.4	55.5	45.6	83.5	-28	PASS	63.5	-17.9	PASS	96	139
17944.6	35.7	25	35.5	44.9	15.3	60.4	49.6	83.5	-23.1	PASS	63.5	-13.9	PASS	275	200

EUT Tx on Low Channel 2402MHz - High Power CW

*Duty Cycle Correction Factor (DCCF) is applied to harmonic measurement where it is applicable; worst case applied -20dB.

EUT Description - ROAR Athena EUT Power Input - 5Vdc via USB Test Site - Chamber 1 Temperature; Humidity - 23.9°C; 22%RH

Temperature; Humidity - 23.9°C; 22%RI Barometric Pressure - 999mBar EUT Maximum Frequency - 2480MHz

Work Order # - Q1581

6-18GHz Radiated Spurious Vertical (2402 MHz)

Curtis Straus - a Bureau Veritas Company

Radiated Emissions Electric Field 1m Distance 6-18GHz Horizontal Tabular Data

Operator: Chris Bramley

Client Present: None

Company: ROAR for Good

Frequency	Raw Peak Reading		Preamplifier Factor	Antenna Factor	Cable Factor	Adjusted Peak Amplitude	Adjusted Average Amplitude	Peak Limit	Peak Margin	Peak Results	Average Limit	Average Margin	Average Results	EUT Azimuth	Antenna Height
MHz	dΒμV	dΒμV	dB	dB	dB	dBμV/m	dBμV/m	dBμV/m	dB	Pass/Fail	dBμV/m	dB	Pass/Fail	degrees	cm
*7320	61.4	41.4	37	37.6	9.6	71.5	51.5	83.5	-12	PASS	63.5	-12	PASS	105	145
*9759.9	53.9	33.9	36.2	38.7	10.5	67	47	83.5	-16.5	PASS	63.5	-16.5	PASS	100	158
14171.9	37.9	28.3	36.7	41.6	13.3	56.2	46.6	83.5	-27.3	PASS	63.5	-16.9	PASS	54	100
15376.8	35.8	26.8	37.2	38.5	13.9	50.9	41.9	83.5	-32.6	PASS	63.5	-21.6	PASS	101	175
15957	36.1	27.4	37.4	37.9	14	50.7	41.9	83.5	-32.8	PASS	63.5	-21.6	PASS	302	196
17974.3	33.2	24.9	35.6	45	15.3	58	49.7	83.5	-25.5	PASS	63.5	-13.8	PASS	261	124

EUT Tx on Mid Channel

2440MHz - High Power CW

Filter Factor not displayed in the data

*Duty Cycle Correction Factor (DCCF) is applied to harmonic measurement where it is applicable; worst case applied -20dB.

EUT Description - Athena EUT Power Input - 5Vdc via USB

Test Site - Chamber 1 Temperature; Humidity - 23.9°C; 22%RH Barometric Pressure - 999mBar EUT Maximum Frequency - 2480MHz

Work Order # - Q1581

6-18GHz Radiated Spurious Horizontal (2440 MHz)





Curtis Straus - a Bureau Veritas Company Radiated Emissions Electric Field 1m Distance 6-18GHz Vertical Tabular Data

Operator: Chris Bramley 2 Dilient Present: None Dompany: ROAR for Good EUT Description - Athena EUT Power Input - 5Vdc via USB

Test Site - Chamber 1

Temperature; Humidity - 23.9°C; 22%RH Barometric Pressure - 999mBar EUT Maximum Frequency - 2480MHz

Work Order # - Q1581

		Raw				Adjusted	Adjusted	Req. 1							
	Raw Peak	Average	Preamplifier	Antenna	Cable	Peak	Average	Peak	Peak	Peak	Average	Average	Average	EUT	Antenna
Frequency	Reading	Reading	Factor	Factor	Factor	Amplitude	Amplitude	Limit	Margin	Results	Limit	Margin	Results	Azimuth	Height
MHz	dΒμV	dΒμV	dB	dB	dB	dBμV/m	dBμV/m	dBμV/m	dB	Pass/Fail	dBμV/m	dB	Pass/Fail	degrees	cm
7320	69.6	49.6	37	37.6	9.6	79.8	59.8	83.5	-3.7	PASS	63.5	-3.7	PASS	137	146
9760	63.9	43.9	36.2	38.7	10.5	77	57	83.5	-6.5	PASS	63.5	-6.5	PASS	139	146
12200	48.8	47.8	37.1	38.7	12.5	62.9	61.9	83.5	-20.6	PASS	63.5	-1.6	PASS	152	136
14639.9	48	46	37.3	40.4	13.3	64.4	62.4	83.5	-19.1	PASS	63.5	-1.1	PASS	147	146
17079.9	40.3	36.3	36.2	41.4	14.6	60.1	56.1	83.5	-23.4	PASS	63.5	-7.4	PASS	148	140
17984.2	33.8	25	35.6	45.1	15.4	58.6	49.8	83.5	-24.9	PASS	63.5	-13.7	PASS	0	100

EUT Tx on Mid Channel 2440MHz - High Power CW

Filter Factor not displayed in the data

*Duty Cycle Correction Factor (DCCF) is applied to harmonic measurement where it is applicable; worst case applied -20dB.

EUT Description - Athena EUT Power Input - 5Vdc via USB

Test Site - Chamber 1

Temperature; Humidity - 23.9°C; 22%RH Barometric Pressure - 999mBar EUT Maximum Frequency - 2480MHz

Work Order # - Q1581

6-18GHz Radiated Spurious Vertical (2440 MHz)

Curtis Straus - a Bureau Veritas Company

Radiated Emissions Electric Field 1m Distance

6-18GHz Horizontal Tabular Data Operator: Chris Bramley2

Elient Present: None

Mompany: ROAR for Good

Frequency			Preamplifier Factor	Antenna Factor	Cable Factor	Adjusted Peak Amplitude	Adjusted Average Amplitude	Peak Limit	Peak Margin	Peak Results	Average Limit	Average Margin	Average Results	EUT Azimuth	Antenna Height
MHz	dΒμV	dΒμV	dB	dB	dB	dBμV/m	dBμV/m	dBμV/m	dB	Pass/Fail	dBμV/m	dB	Pass/Fail	degrees	cm
*7440	57.8	37.8	36.9	37.6	9.6	68.1	48.1	83.5	-15.4	PASS	63.5	-15.4	PASS	0	170
9920	48.6	47	36.1	38.9	10.6	62.1	60.4	83.5	-21.4	PASS	63.5	-3.1	PASS	295	133
14210.5	37.4	28.1	36.7	41.6	13.4	55.6	46.4	83.5	-27.9	PASS	63.5	-17.1	PASS	116	175
15342.2	38.4	27.1	37.3	38.6	13.8	53.5	42.2	83.5	-30	PASS	63.5	-21.3	PASS	302	124
16383.8	37.2	28.2	37.1	39.6	14.3	53.9	45	83.5	-29.6	PASS	63.5	-18.5	PASS	290	185
17906.7	34.9	25.2	35.4	44.7	15.2	59.4	49.7	83.5	-24.1	PASS	63.5	-13.8	PASS	302	100

EUT Tx on High Channel

2480MHz - High Power CW

Filter Factor not displayed in the data

*Duty Cycle Correction Factor (DCCF) is applied to harmonic measurement where it is applicable; worst case applied -20dB.

EUT Description - ROAR Athena EUT Power Input - 5Vdc via USB

Test Site - Chamber 1

Temperature; Humidity - 23.9°C; 22%RH Barometric Pressure - 999mBar EUT Maximum Frequency - 2480MHz

Work Order # - Q1581

6-18GHz Radiated Spurious Horizontal (2480 MHz)





Curtis Straus - a Bureau Veritas Company Radiated Emissions Electric Field 1m Distance

6-18GHz Vertical Tabular Data Operator: Chris Bramley Blient Present: None Sompany: ROAR for Good

	Raw Peak	Raw Average	Preamplifier	Antenna	Cable	Adjusted Peak	Adjusted Average	Req. 1 Peak	Peak	Peak	Average	Average	Average	EUT	Antenna
Frequency		•	Factor	Factor	Factor		Amplitude	Limit	Margin	Results	Limit	Margin	Results	Azimuth	Height
MHz	dΒμV	dΒμV	dB	dB	dB	dBμV/m	dBμV/m	dBμV/m	dB	Pass/Fail	dBμV/m	dB	Pass/Fail	degrees	cm
7440	53.5	51.9	36.9	37.6	9.6	63.8	62.1	83.5	-19.7	PASS	63.5	-1.4	PASS	5	100
9920.1	50	47.8	36.1	38.9	10.6	63.5	61.2	83.5	-20	PASS	63.5	-2.3	PASS	13	100
12400.1	37.9	35.5	36.6	39	12.8	53	50.6	83.5	-30.5	PASS	63.5	-12.9	PASS	139	139
14005.8	36.1	27.3	36.7	41.6	12.8	53.9	45.1	83.5	-29.6	PASS	63.5	-18.4	PASS	44	100
15726.3	36.7	27.5	37.3	37.7	14	51.2	42	83.5	-32.3	PASS	63.5	-21.5	PASS	290	200
17869.8	34.7	25.1	35.4	44.5	15.2	59	49.4	83.5	-24.5	PASS	63.5	-14.1	PASS	18	100

EUT Tx on High Channel 2480MHz - High Power CW

Filter Factor not displayed in the data

*Duty Cycle Correction Factor (DCCF) is applied to harmonic measurement where it is applicable; worst case applied -20dB.

EUT Description - ROAR Athena EUT Power Input - 5Vdc via USB

Test Site - Chamber 1

Temperature; Humidity - 23.9°C; 22%RH Barometric Pressure - 999mBar EUT Maximum Frequency - 2480MHz

Work Order # - Q1581

6-18GHz Radiated Spurious Vertical (2480 MHz)

Rev. 3/12/2017								
Spectrum Analyzers / Receivers / Preselectors	Range	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
Rental MXE EMI Receiver(1170725)	20Hz-26.5GHz	N9038A	Agilent	MY51210151	1170725	1	12/22/2017	12/22/2016
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		1	12/21/2018	12/21/2016
Preamps /Couplers Attenuators / Filters	Range	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
Brown	1-10GHz	CS	CS	N/A	1523	II	9/25/2017	9/25/2016
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
Yellow Horn	1-18GHz	3115	EMCO	9608-4898	37	1	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#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	3/5/2018	3/5/2017
Asset #2054	9kHz - 18GHz		Florida RF			II	10/1/3017	10/30/2016
REMI-High-07	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.





Radiated Emissions Table

Pressure: 993mBar

Company: ROAR for Good, LLC Work Order: Q1581 Date: 15-Feb-17 Engineer: Zac Johnson EUT Desc: ROAR Athena EUT Operating Voltage/Frequency: 5V DC USB Temp: 23.8°C

Frequency Range: 18-25GHz Measurement Distance: 0.1 m

Notes: CW High Power Mode EUT Max Freq: 2480MHz

Humidity: 22%

FCC 15.209 High Frequency CC 15.209 High Frequency - Peal Adiusted Adjusted Polarization Frequency Reading Reading Factor Factor Factor Peak Reading Avg Reading Limit Margin Result Limit Margin Result (H/V) (dBµV) (dB) (dB) (dBµV/m (dBµV/m) (dB/m dΒμV/ı (dB) H/V 18857.0 44.7 44.7 41.7 40.2 5.9 49.1 49.1 103.5 -54.4 Pass 83.5 -34.4 Pass 20870.0 45.2 42.7 48.8 -54.7 -34.7 45.2 83.5 Pass H/V 40.1 48.8 103.5 Pass 6.2 H/V 22690.0 44.5 44.5 42.1 40.5 49.9 49.9 103.5 -53.6 83.5 -33.6 Pass Pass H/V 24020.0 51.6 51.6 40.9 40.4 58.1 58.1 103.5 -45.4 83.5 Pass

Table Result: Pass -25.4 dB Worst Freq: 24020.0 MHz by

Cable 1: EMIR-HIGH-07 Cable 3: Test Site: EMI Chamber Cable 2: Analyzer: Brown SA SSsoft Radiated Emissions Calculator Preamp: 18-26.5GHz Antenna: 18-26.5GHz Horn Preselector: ---Copyright Curtis-Straus LLC 20

v 1.017.182

djusted Reading = Reading - Preamp Factor + An

Radiated Emissions Table Company: ROAR for Good, LLC Engineer: Zac Johnson EUT Desc: ROAR Athena EUT Operating Voltage/Frequency: 5V DC USB Temp: 23.8°C Humidity: 22% Pressure: 993mBar

Frequency Range: 18-25GHz Measurement Distance: 0.1 m

Notes: CW High Power Mode EUT Max Freq: 2480MHz

CC 15.209 High Frequency - Peal FCC 15.209 High Frequency Adjusted Adjusted Average Preamp Average Reading Factor Peak Reading Polarizatio Factor Avg Reading Limit Margin Result Limit Margin Pacult (H/V) (MHz) (dBµV) (dBµV) (dB) (dB/m) (dB) (dBµV/m) (dBµV/m) dBμV/n (dB) (Pass/Fail dBµV/m (dB) (Pass/Fa Mid H/V 19522 0 54.65 54.7 42 N 40.3 6.0 59.0 59.0 103.5 -44 5 Pass 83.5 -24 5 Pass H/V 21972.0 51.4 51.4 42.8 40.5 6.7 55.8 55.8 103.5 -47.7 Pass 83.5 -27.7 Pass 24140.0 46.4 46.4 41.2 52.4 83.5 -31.1 40.3 6.9 103.5 -51.1 Pass Pass 40.2 H/V 24405.0 50.7 41 0 57 1 57 1 103.5 -46 4 Pass

Table Result: Pass by -24.5 dB Worst Freq: 19522.0 MHz

Test Site: EMI Chamber Cable 1: EMIR-HIGH-07 Cable 2: Cable 3: -

Antenna: 18-26.5GHz Horn Analyzer: Brown SA Preamp: 18-26.5GHz Preselector: ---CSsoft Radiated Emissions Calculator v 1.017.182 Copyright Curtis-Straus LLC 20 djusted Reading = Reading - Preamp Fa na Factor + Cable Facto

Radiated Emissions Table Date: 15-Feb-17 Company: ROAR for Good, LLC Work Order: Q158 EUT Operating Voltage/Frequency: 5V DC USB Engineer: Zac Johnson EUT Desc: ROAR Athena Humidity: 22%

Pressure: 993mBar

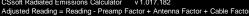
Frequency Range: 18-25GHz Measurement Distance: 0.1 m

Notes: CW High Power Mode EUT Max Freg: 2480MHz

FCC 15.209 High Frequency CC 15.209 High Frequency - Peal Average Cable Adiusted Adjusted Average Polarization Frequency Reading Reading Factor Factor Factor Peak Reading Ava Reading Limit Margin Result Limit Margin Result (dBµV) (dBµV) (dB) (dBµV/m (H/V) (MHz) (dB/m (dB) (dBµV/m) Pass/Fai dBµV/n (dB) High H/V 18770.0 45.0 45.0 41.7 40.2 5.8 49.3 49.3 103.5 -54.2 Pass 83.5 -34.2 Pass 19855.0 56.7 42.4 60.6 103.5 -42.9 83.5 -22.9 H/V 56.7 40.3 6.0 60.6 Pass Pass H/V 22323.0 52.7 52.7 42.7 40.5 6.6 57.1 57.1 103.5 -46.4 83.5 -26.4 Pass H/V 24810.0 50.6 50.6 41.3 40.2 56.5 56.5 103.5 -47.0Pass 83.5 -27.0 Pass

Worst Freq: Table Result: Pass -22.9 dB 19855.0 MHz by

Cable 1: EMIR-HIGH-07 Analyzer: Brown SA Preamp: 18-26.5GHz Antenna: 18-26.5GHz Horn Preselector: --soft Radiated Emissions Calculator v 1.017.182 Copyright Curtis-Straus LLC 2





Temp: 23.8°C



Rev. 2/13/2017 Spectrum Analyzers / Receivers / Preselectors Brown	Range 9kHz-26.5GHz	MN E4407B	Mfr Agilent	SN SG44210511	Asset 1510	Cat	Calibration Due 2/21/2017	Calibrated on 1/21/2016
Radiated Emissions Sites EMI Chamber 1	FCC Code 719150	IC Code 2762A-6	VCCI Code A-0015	Range 1-18GHz		Cat I	Calibration Due 5/23/2017	Calibrated on 5/23/2015
Preamps/Couplers Attenuators / Filters HF (Yellow)	Range 18-26.5GHz	MN AFS4-18002650-60-8P-4	Mfr CS	SN 467559	Asset 1266	Cat II	Calibration Due 9/16/2017	Calibrated on 9/16/2016
Antennas HF (White) Horn	Range 18-26.5GHz	MN 801-WLM	M fr Waveline	SN 758	Asset 758	Cat III	Calibration Due Verify before Use	Calibrated on date of test
Meteorological Meters Weather Clock (Pressure Only) TH A#2080		MN BA928 HTC-1	Mfr Oregon Scientific HDE	SN C3166-1	Asset 831 2080	Cat I II	Calibration Due 4/28/2018 4/5/2017	Calibrated on 4/28/2016 4/5/2016
Cables REMI-High-07	Range 1 - 26.5GHz	TRU-21B0707-120	M fr TRU			Cat	Calibration Due 8/14/2017	Calibrated on 8/14/2016

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





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-Feb-17	Company:	ROAR for Good,	LLC		'	Work Order: Q1581			
Engineer: Zac Johns	on EUT :	ROAR Athena		EUT Ope	erating Voltage	/Frequency: 5.0V DC USB			
Temp: 20.5°C	Humidity:	34%	Pressure: 1015mBar						
Frequency Range:	2402 MHz	Measurement 1	Type: Conducted	Antenna Por	t				
Notes:									
Frequency	On Time	Period		Duty Cycle	Correction Factor	(DCCF)			
(MHz)	(millisecond)	(millisecond)		DCCF = 20*log	g (ON TIME/ 100mi	llisecond)			
2402.0	0.4429	100.00			-47.1				
Test Site: CEMI-05	Cable:	2288	А	ttenuator:	2107 40dB				
Analyzer: EXA 11184	470					Copyright Curtis-Straus LLC 2000			

Note: Worst case DCCF (-20dB) shall be used to apply to Harmonics of the fundamental where it is applicable.

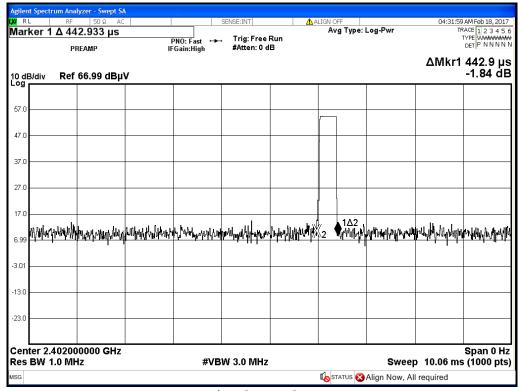
Rev. 2/20/2017 Spectrum Analyzers / Receivers / Preselectors Rental EXA Signal Analyzer(1118470)	Range 9KHz-26.5GHz	MN N9010A-526;M	M fr AT	SN MY51170093	Asset 1118470	Cat 	Calibration Due 1/3/2018	Calibrated on 1/3/2017
Conducted Test Sites (Mains / Telco) CEMI 5	FCC Code 719150		VCCI Code A-0015			Cat	Calibration Due NA	Calibrated on N/A
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#2085		MN BA928 HTC-1	M fr Oregon Scientific HDE	SN C3166-1	Asset 831 2085	Cat 	Calibration Due 4/28/2018 4/5/2017	Calibrated on 4/28/2016 4/5/2016
Cables Asset #2288	Range 9KHz-26.5GHz	FLC-1.5FT-SMSM+	Mfr Mini-Circuits	16021029		Cat II	Calibration Due 1/27/2018	Calibrated on 1/27/2017

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

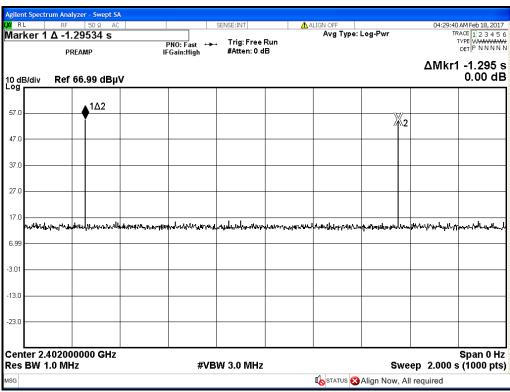




PLOTS



Single pulse



Period (2-second window)



ACCREDITED

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)]

MEASUREMENTS / RESULTS

Date: 20-Feb-17	Company: ROAR for 0	Good, LLC			Vork Order:	Q1581
Engineer: Zac Johnson	EUT: ROAR Ath	ena	EUT Oper	ating Voltage/	Frequency:	5.0V DC USE
Temp: 20.5°C	Humidity: 34%	Pressure: 1015mBar				
Frequency Range: 2402	-2480 MHz Mea s	surement Type: Conducted				
Notes:						
		Bandedge		Delta	Limit	
		(dBm)		(dB)	(dB)	(Pass/Fail)
Low Bandedge		-87.66		48.17	≥ 20	Pass
High Bandedge		-90.00		49.93	≥ 20	Pass
Test Site: CEMI-05	Cable: 2288	Attenuator: 210	7 40dB			
TOSE OILO. OLIVII OO						

	•							
Conducted Spurious Emis	ssion							
Date: 20-Feb-17 Co	ompany: ROAR for Go	ood, LLC					Work Order	: Q1581
Engineer: Zac Johnson	EUT: ROAR Ather	na		EUT	Operati	ng Vo	Itage/Frequency	: 5.0V DC USB
Temp: 20.5°C H	umidity: 34%	Pressure: 10	15mBar					
Frequency Range: 9KHz to 25 GH	dz Meas u	rement Type: Co	nducted					
Notes:								
Frequency range from 9 KHz up to 25 GHz were spurious emissions were at the instrument no								
spurious emissions were at the instrument no fundamental limit. (see Plots for more detail)	oise noor. Highest noise	e floor level was les	is than -bodb for t	me entire ireq	luency ra	nge, w	mich is more than	roug below the
· ·								
Test Site: CEMI-05	Cable: 2288	At	tenuator: 210	7 40dB				
Test Site: CEMI-05 Analyzer: EXA 1118470	Cable: 2288	At	tenuator: 210	7 40dB			Copyright C	urtis-Straus LLC 2000
Analyzer: EXA 1118470 Rev. 2/20/2017								
Analyzer: EXA 1118470		MN N9010A-526;M	Mfr AT	7 40dB SN MY51170093	Asset 1118470	Cat 	Copyright C Calibration Due 1/3/2018	urtis-Straus LLC 2000 Calibrated on 1/3/2017
Analyzer: EXA 1118470 Rev. 2/20/2017 Spectrum Analyzers / Receivers / Preselect	ors Range	MN	Mfr	SN	, ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		Calibration Due	Calibrated on
Analyzer: EXA 1118470 Rev. 2/20/2017 Spectrum Analyzers / Receivers / Preselect Rental EXA Signal Analyzer(1118470) Conducted Test Sites (Mains / Telco)	ors Range 9KHz-26.5GHz FCC Code 719150	MN	Mfr AT VCCI Code	SN	, ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	Cat	Calibration Due 1/3/2018 Calibration Due	Calibrated on 1/3/2017 Calibrated on
Analyzer: EXA 1118470 Rev. 2/20/2017 Spectrum Analyzers / Receivers / Preselectric Rental EXA Signal Analyzer(1118470) Conducted Test Sites (Mains / Telco) CEMI 5 Preamps / Couplers Attenuators / Filters API - 40dB 100W Attenuator	ors Range 9KHz-26.5GHz FCC Code 719150 Range	MN N9010A-526;M MN 48-40-34	Mfr AT VCCI Code A-0015 Mfr API Weinschel	SN MY51170093 SN CG7990	1118470 Asset 2107	Cat	Calibration Due 1/3/2018 Calibration Due NA Calibration Due 10/2/2017	Calibrated on 1/3/2017 Calibrated on N/A Calibrated on 10/2/2016
Analyzer: EXA 1118470 Rev. 2/20/2017 Spectrum Analyzers / Receivers / Preselection Rental EXA Signal Analyzer (1118470) Conducted Test Sites (Mains / Telco) CEMI 5 Preamps / Couplers Attenuators / Filters API - 40dB 100W Attenuator Meteorological Meters	ors Range 9KHz-26.5GHz FCC Code 719150 Range	MN N9010A-526;M MN 48-40-34 MN	Mfr AT VCCI Code A-0015 Mfr API Weinschel	\$N MY51170093 \$N CG7990 \$N	1118470 Asset 2107 Asset	Cat	Calibration Due 1/3/2018 Calibration Due NA Calibration Due 10/2/2017 Calibration Due	Calibrated on 1/3/2017 Calibrated on N/A Calibrated on 10/2/2016 Calibrated on
Analyzer: EXA 1118470 Rev. 2/20/2017 Spectrum Analyzers / Receivers / Preselectric Rental EXA Signal Analyzer(1118470) Conducted Test Sites (Mains / Telco) CEMI 5 Preamps / Couplers Attenuators / Filters API - 40dB 100W Attenuator	ors Range 9KHz-26.5GHz FCC Code 719150 Range	MN N9010A-526;M MN 48-40-34	Mfr AT VCCI Code A-0015 Mfr API Weinschel	SN MY51170093 SN CG7990	1118470 Asset 2107	Cat	Calibration Due 1/3/2018 Calibration Due NA Calibration Due 10/2/2017	Calibrated on 1/3/2017 Calibrated on N/A Calibrated on 10/2/2016
Analyzer: EXA 1118470 Rev. 2/20/2017 Spectrum Analyzers / Receivers / Preselect Rental EXA Signal Analyzer(1118470) Conducted Test Sites (Mains / Telco) CEMI 5 Preamps / Couplers Attenuators / Filters API - 40dB 100W Attenuator Meteorological Meters Weather Clock (Pressure Only)	ors Range 9KHz-26.5GHz FCC Code 719150 Range	MN N9010A-526;M MN 48-40-34 MN BA928	Mfr AT VCCI Code A-0015 Mfr API Weinschel Mfr Oregon Scientific	\$N MY51170093 \$N CG7990 \$N	1118470 Asset 2107 Asset 831	Cat Cat Cat	Calibration Due 1/3/2018 Calibration Due NA Calibration Due 10/2/2017 Calibration Due 4/28/2018	Calibrated on 1/3/2017 Calibrated on N/A Calibrated on 10/2/2016 Calibrated on 4/28/2016

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

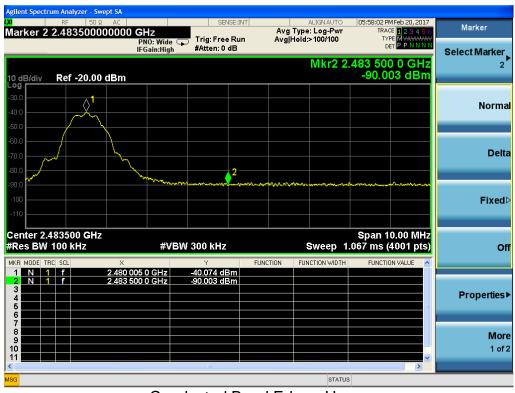




PLOTS



Conducted Band Edge - Lower



Conducted Band Edge - Upper



ACCREDITED

Peak Search Avg Type: Log-Pwr Avg|Hold:>100/100 Marker 1 2.402001500000 GHz Trig: Free Run PNO: Wide 🖵 IFGain:High **Next Peak** Mkr1 2.402 001 50 GHz -39.742 dBm Ref -20.00 dBm **Next Pk Right Next Pk Left** Marker Delta Mkr→CF Mkr→Ref Lv More 1 of 2 Span 3.000 MHz Sweep 1.067 ms (4001 pts) Center 2.402000 GHz #Res BW 100 kHz **#VBW** 300 kHz

Low Channel 9 KHz - 25GHz Conducted Spurious Reference



Low Channel 9 KHz -25GHz Conducted Spurious





Peak Search Avg Type: Log-Pwr Avg|Hold:>100/100 Marker 1 2.440002250000 GHz Trig: Free Run #Atten: 0 dB PNO: Wide 🖵 IFGain:High **Next Peak** Mkr1 2.440 002 25 GHz -39.497 dBm Ref -20.00 dBm **Next Pk Right Next Pk Left** Marker Delta Mkr→CF Mkr→Ref Lv More 1 of 2 Span 3.000 MHz Sweep 1.067 ms (4001 pts) Center 2.440000 GHz #Res BW 100 kHz **#VBW** 300 kHz

Middle Channel 9 KHz-25GHz Conducted Spurious Reference



Middle Channel 9 KHz -25GHz Conducted Spurious





Peak Search Avg Type: Log-Pwr Avg|Hold:>100/100 Marker 1 2.480017250000 GHz Trig: Free Run #Atten: 0 dB PNO: Wide 🖵 IFGain:High **Next Peak** Mkr1 2.480 017 25 GHz -40.313 dBm Ref -20.00 dBm **Next Pk Right Next Pk Left** Marker Delta Mkr→CF Mkr→Ref Lvl More 1 of 2 Center 2.480000 GHz #Res BW 100 kHz Span 3.000 MHz Sweep 1.067 ms (4001 pts) **#VBW** 300 kHz

High Channel 9 KHz -25GHz Conducted Spurious Reference



High Channel 9 KHz -25GHz Conducted Spurious





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

Asset #2288

MEASUREMEN	19 / KESULI	5								
		Peak Po	ower S	pectral	Dei	nsity				
Date: 21-Feb-17	Company	: ROAR for Go	od, LLC						Work Order:	Q1581
Engineer: Zac Johns	on EUT	: ROAR Athen	а			EUT Opera	ating V	oltag	e/Frequency:	5.0V DC USB
Temp: 20.5°C	Humidity	: 34%	Pressu	re: 1015mBa	r					
Frequency Range:	2402-2480 MHz	Measureme Measureme	· ·	Conducte : FCC KDE			S Meas	Guida	ance v03r05 Se	ction 10.2
Notes:										
Frequency	Peak Reading	Cable Los	ss Atte	nuator Loss	Pe	Peak PSD		nit	Margin	Result
(MHz)	(dBm)	(dB)		(dB)	((dBm)	(dB	m)	(dB)	- nooun
2402.0	-39.48	0.32		39.42		0.26	8.	0	-7.74	Pass
2440.0	-39.40	0.32		39.42		0.34	8.	0	-7.66	Pass
2480.0	-40.10	0.32		39.42		-0.36	8.	0	-8.36	Pass
Test Site: CEMI-05	Cable	: 2288			Atten	uator:	2107 40)dB		
Analyzer: EXA 1118	470								Copyright Curt	is-Straus LLC 2000
PSD(dBm) = Reading (dBi	m) + Cable Loss (dB)	+ Attenuator Lo	oss (dBm)							
Rev. 2/20/2017 Spectrum Analyzers / Rev	caivers /Preselectors	Range	MN	Mf	,	SN	Asset	Cat	Calibration Due	Calibrated on
Rental EXA Signal Ar		9KHz-26.5GHz	N9010A-526			MY51170093		ı	1/3/2018	1/3/2017
Conducted Test Site: CEMI	` '	FCC Code 719150		VCCI (Cat III	Calibration Due NA	Calibrated on N/A
Preamps/Couplers At API - 40dB 100W		Range 0.009-18GHz	MN 48-40-34	Mf API Wei	-	SN CG7990	Asset 2107	Cat II	Calibration Due 10/2/2017	Calibrated on 10/2/2016
Meteorologic Weather Clock (P			MN BA928	M f Oregon S		SN C3166-1	Asset 831	Cat	Calibration Due	Calibrated on 4/28/2016
TH A#20	• • •		HTC-1	Oregon S HD		C3100-1	2085	i	4/5/2017	4/5/2016
Cable	s	Range		Mf	r			Cat	Calibration Due	Calibrated on

Mini-Circuits

16021029

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

9KHz-26.5GHz FLC-1.5FT-SMSM+





1/27/2018

1/27/2017

PLOTS



Low Channel Power Spectral Density



Middle Channel Power Spectral Density



ACCREDITED
Testing Cert. No. 1527.01



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

Side of a DC		nducted	Emiss	ions				1110					04504
	ate: 21-Feb-17 eer: Zac Johnson					Company: ROAF EUT Desc: ROAF					V	Nork Order	: Q1581
	mp: 21.6 °C					Humidity: 33%	Allielle	1				Pressure	: 1015 mBar
	tes: AC side of Sup	port DC Power	r Supply tes	ted while the EU1	was transmitting	,							
					Frequ	ency Range: 0.15-3	80MHz				/Frequency: :		
	Quasi Read			erage adings	LISN Factors		ΠN		FCC 15.20	7		FCC 15.207	,
Frequency (MHz)	QP1 (dBµV)	QP2 (dBµV)	AVG1 (dBµV)	AVG2 (dBµV)	L1 L2 (dB)		ctor dB)	QP Limit (dBµV)	Margin (dB)	Result (Pass/Fail)	AVG Limit (dBµV)	Margin (dB)	Result (Pass/Fail)
0.15	34.6	31.8	11.8	18.0	-0.2 -0.1		0.0	66.0	-11.2	Pass	56.0	-17.9	Pass
0.57	17.2	17.8	8.0	9.3	-0.1 0.0		0.0	56.0	-18.1	Pass	46.0	-16.6	Pass
0.90	15.7	16.6	7.6	8.1	0.0 0.0		0.0	56.0	-19.3	Pass	46.0	-17.8	Pass
1.23	18.2	13.4	6.7	7.0	0.0 0.0		0.0	56.0	-17.7	Pass	46.0	-18.9	Pass
1.70 21.22	18.6 17.1	13.3 12.4	7.0 6.7	7.1 6.8	0.0 0.0 -0.1 -0.1		0.0	56.0 60.0	-17.3 -22.6	Pass Pass	46.0 50.0	-18.8 -22.9	Pass Pass
	It: Pass	12.4	6.7	0.0	-0.1 -0.1	Worst Mar		-11.2			uency:	0.150	
						`		-11.2	. ub		,		
surement Devic	ce: LISN ASSE	T 1728(Line	1) LISN A	SSET 1729(Li		Cable: CEM Attenuator: 20dE				Spectrum	Analyzer:		.#5
						Attenuator: 2006	s Aπen	uaτor-uz			Site:	CEMI 2	
M Calculator Varsia	n 2 0 14										Equipment Eq	actor Shoot	rov: 1/15/2017
MI Calculator Version Reading = Raw Re		tion Loss + Ca	ble Loss + /	Attenuation		2002					Equipment Fa	actor Sheet i	rev: 1/15/2017
EMI Calculator Version Ind Reading = Raw Resided Indicate Raw Re		tion Loss + Ca	ble Loss + /	Attenuation							Equipment Fa	actor Sheet i	rev: 1/15/2017
d Reading = Raw Re /20/2017	eading + LISN Inser				MN	Mfr		SN	Asset	Cat Cal	Equipment Fa		rev: 1/15/2017 brated on
ed Reading = Raw Re /20/2017 Spectrum Analyz	eading + LISN Inser	s/Preselecto	ors	Range		Mfr						e Cali	
d Reading = Raw Re /20/2017 Spectrum Analyz Rental EXA	eading + LISN Inser	s /Preselecto (1199509)	ors	Range	MN	Mfr		SN		I	ibration Du	e Calil	brated on
d Reading = Raw Re /20/2017 Spectrum Analyz Rental EXA LISNs/N	eading + LISN Inser zers / Receivers Signal Analyzer(s /Preselecto (1199509)	ors	Range 9KHz-26.5GHz	MN N9010A-526;R MN	Mfr AT	SG5	SN 3470118	1199509	Cat Cal	ibration Due 1/27/2018	e Calii 1/ e Calii	brated on 27/2017
d Reading = Raw Re /20/2017 Spectrum Analya Rental EXA LISNs/N	zers / Receivers Signal Analyzer(Measurement Pr	s /Preselecto (1199509)	ors	Range 9KHz-26.5GHz Range	MN N9010A-526;R MN LI-150A	Mfr AT Mfr	SG5	SN 3470118 SN	1199509 Asset	Cat Cal	ibration Due 1/27/2018 ibration Due	e Calii 1/ e Calii 4/	brated on 27/2017 brated on
d Reading = Raw Re /20/2017 Spectrum Analyz Rental EXA LISNs/N	zers / Receivers Signal Analyzer(Measurement Pr ISN Asset 1728	s/Preselecto (1199509) robes	ors	Range 9KHz-26.5GHz Range 150kHz-30MHz	MN N9010A-526;R MN LI-150A	Mfr AT Mfr Com-Power	SG5	SN 33470118 SN 01084	1199509 Asset 1728	Cat Cal	ibration Duc 1/27/2018 ibration Duc 4/20/2017	e Calii 1/ e Calii 4/	brated on 27/2017 brated on 20/2016
d Reading = Raw Re /20/2017 Spectrum Analyz Rental EXA LISNs/N	zers / Receivers Signal Analyzer(Measurement Pr ISN Asset 1728	s/Preselecto (1199509) robes	ors	Range 9KHz-26.5GHz Range 150kHz-30MHz 150kHz-30MHz	MN N9010A-526;R MN LI-150A	Mfr AT Mfr Com-Power Com-Power	SG5	SN 33470118 SN 01084	1199509 Asset 1728	Cat Cal	ibration Due 1/27/2018 ibration Due 4/20/2017 4/20/2017	e Calii 1/ e Calii 4/	brated on 27/2017 brated on 20/2016 20/2016
d Reading = Raw Re /20/2017 Spectrum Analyz Rental EXA LISNs/M LI Conducted 1	adding + LISN Inser zers / Receivers Signal Analyzer(leasurement Pr ISN Asset 1728 ISN Asset 1729 Test Sites (Main CEMI 2 orological Mete	s/Preselecto (1199509) robes as/Telco)	ors	Range 9KHz-26.5GHz Range 150kHz-30MHz 150kHz-30MHz FCC Code	MN N9010A-526;R MN LI-150A	Mfr AT Mfr Com-Power Com-Power VCCI Code A-0015	SG5	SN 33470118 SN 01084	1199509 Asset 1728	Cat Cal	ibration Duc 1/27/2018 ibration Duc 4/20/2017 4/20/2017 ibration Duc	e Calii	brated on 27/2017 brated on 20/2016 20/2016 brated on
d Reading = Raw Re /20/2017 Spectrum Analyz Rental EXA LISNs/M LI Conducted 1	zers / Receivers Signal Analyzer(Measurement Pri ISN Asset 1728 ISN Asset 1729	s/Preselecto (1199509) robes as/Telco)	ors	Range 9KHz-26.5GHz Range 150kHz-30MHz 150kHz-30MHz FCC Code	MN N9010A-526;R MN LI-150A LI-150A	Mfr AT Mfr Com-Power Com-Power VCCI Code A-0015	SG5	SN 63470118 SN 01084 01085	1199509 Asset 1728 1729	Cat Cal	ibration Duc 1/27/2018 ibration Duc 4/20/2017 4/20/2017 ibration Duc NA	e Calii 1/ e Calii 4/ 4/ e Calii	brated on 27/2017 brated on 20/2016 20/2016 brated on N/A
d Reading = Raw Re /20/2017 Spectrum Analyz Rental EXA LISNs/M LI Conducted 1	adding + LISN Inser zers / Receivers Signal Analyzer(leasurement Pr ISN Asset 1728 ISN Asset 1729 Test Sites (Main CEMI 2 orological Mete	s/Preselecto (1199509) robes as/Telco)	ors	Range 9KHz-26.5GHz Range 150kHz-30MHz 150kHz-30MHz FCC Code	MN N9010A-526;R MN LI-150A LI-150A	Mfr AT Mfr Com-Power Com-Power VCCI Code A-0015	SG5	SN 3470118 SN 01084 01085	1199509 Asset 1728 1729 Asset	Cat Cal	ibration Dua 1/27/2018 ibration Dua 4/20/2017 4/20/2017 ibration Dua NA ibration Dua	e Calii 1/ e Calii 4/ 4/ e Calii e Calii 4/	brated on 27/2017 brated on 20/2016 20/2016 brated on N/A brated on
d Reading = Raw Re /20/2017 Spectrum Analyz Rental EXA LISNs/M LI Conducted 1	zers / Receivers Signal Analyzer(leasurement Pr leasurement Pr Sisn Asset 1728 SISN Asset 1729 Test Sites (Main CEMI 2 orological Mete Clock (Pressure TH A#2086 Cables	s/Preselecto (1199509) robes as/Telco)	ors	Range 9KHz-26.5GHz Range 150KHz-30MHz 150KHz-30MHz FCC Code 719150	MN N9010A-526;R MN LI-150A LI-150A MN BA928	Mfr AT Mfr Com-Power Com-Power VCCI Code A-0015 Mfr Oregon Scientific HDE	SG5	SN 3470118 SN 01084 01085	1199509 Asset 1728 1729 Asset 831	Cat Cal Cat Cal Cat Cal Cat Cal Cat Cal	ibration Duc 1/27/2018 ibration Duc 4/20/2017 4/20/2017 ibration Duc NA ibration Duc 4/28/2018 4/5/2017 ibration Duc	e Calil 4/ 4/ 4/ e Calil e Calil e Calil e Calil	brated on 27/2017 brated on 20/2016 20/2016 brated on N/A brated on 28/2016 /5/2016 brated on
d Reading = Raw Re /20/2017 Spectrum Analyz Rental EXA LISNs/M LI Conducted 1	zers / Receivers Signal Analyzer(leasurement Pr ISN Asset 1728 ISN Asset 1729 Test Sites (Main CEMI 2 orological Mete Clock (Pressure TH A#2086	s/Preselecto (1199509) robes as/Telco)	ors	Range 9KHz-26.5GHz Range 150KHz-30MHz 150KHz-30MHz FCC Code 719150	MN N9010A-526;R MN LI-150A LI-150A MN BA928	Mfr AT Mfr Com-Power Com-Power VCCI Code A-0015 Mfr Oregon Scientific HDE	SG5	SN 3470118 SN 01084 01085	1199509 Asset 1728 1729 Asset 831	Cat Cal Cat Cal Cat Cal Cat Cal Cat Cal	ibration Dud 1/27/2018 ibration Dud 4/20/2017 4/20/2017 ibration Dud NA ibration Dud 4/28/2018 4/5/2017	e Calil 4/ 4/ 4/ e Calil e Calil e Calil e Calil	brated on 27/2017 brated on 20/2016 20/2016 brated on N/A brated on 28/2016 /5/2016
d Reading = Raw Re (20/2017 Spectrum Analyz Rental EXA LISNs/N LI Conducted 1 Mete Weather	zers / Receivers Signal Analyzer(fleasurement Pr Signal Analyzer(fleasurement Pr Signal Analyzer(fleasurement Pr Fleasurement Pr Cest Sites (Main CEMI 2 orological Mete Clock (Pressure TH A#2086 Cables CEMI-13 Attenuators	s/Preselecto (1199509) robes us/Telco) ers Only)	ors	Range 9KHz-26.5GHz Range 150kHz-30MHz 150kHz-30MHz FCC Code 719150 Range 9kHz - 2GHz Range	MN N9010A-526;R MN LI-150A LI-150A MN BA928	Mfr AT Mfr Com-Power Com-Power VCCI Code A-0015 Mfr Oregon Scientific HDE	SG5	SN 33470118 SN 01084 01085 SN 3166-1	1199509 Asset 1728 1729 Asset 831	Cat Cal III Cat Cal III Cat Cal III Cat Cal III Cat Cal Cal III Cat Cal Cal III	ibration Duc 4/20/2017 4/20/2017 ibration Duc NA ibration Duc NA ibration Duc 4/28/2018 4/5/2017 ibration Duc ibration Duc ibration Duc ibration Duc ibration Duc	e Caliil 1/ e Caliil 4/ 4/ e Caliil e Caliil 1, 1, e Caliil	brated on 27/2017 brated on 20/2016 20/2016 brated on N/A brated on 28/2016 /5/2016 brated on /2/2016 brated on
d Reading = Raw Re (20/2017 Spectrum Analyz Rental EXA LISNs/N LI Conducted 1 Mete Weather	zers / Receivers Signal Analyzer(Ileasurement Pr ISN Asset 1728 ISN Asset 1729 Test Sites (Main CEMI 2 Clock (Pressure TH A#2086 Cables CEMI-13	s/Preselecto (1199509) robes us/Telco) ers Only)	ors	Range 9KHz-26.5GHz Range 150kHz-30MHz 150kHz-30MHz FCC Code 719150 Range 9kHz - 2GHz	MN N9010A-526;R MN LI-150A LI-150A MN BA928 HTC-1	Mfr AT Mfr Com-Power Com-Power VCCI Code A-0015 Mfr Oregon Scientifi HDE Mfr C-S	SG5	SN 33470118 SN 01084 01085 SN 3166-1	1199509 Asset 1728 1729 Asset 831 2086	Cat Cal III Cat Cal III Cat Cal III Cat Cal III Cat Cal Cal III Cat Cal Cal III	ibration Duc 4/20/2017 4/20/2017 4/20/2017 ibration Duc NA iibration Duc 4/28/2018 4/5/2017 ibration Duc 10/2/2017	e Caliil 1/ e Caliil 4/ 4/ e Caliil e Caliil 1, 1, e Caliil	brated on 27/2017 brated on 20/2016 20/2016 brated on N/A brated on 28/2016 5/2016 brated on (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 4.6.1]

MEASUREMENTS / RESULTS

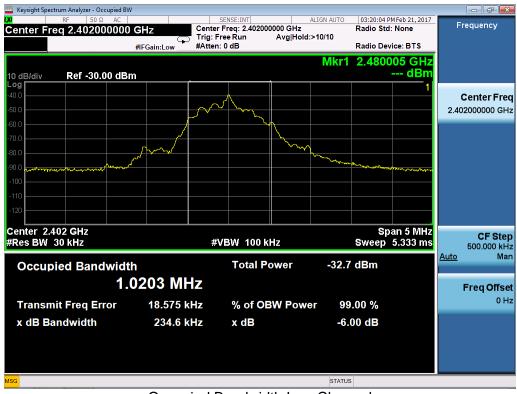
IEASUKEWIEN I	3/KESULI	<u> </u>							
		99%	Occupied	Bandwidtl	า				
Date: 21-Feb-17	Company	: ROAR for Good	, LLC					Work Orde	r: Q1581
Engineer: Zac Johnson	EU1	EU	EUT Operating Voltage/Frequency: 5.0V DC USE						
Temp: 20.5°C	Humidity	/ : 34%	Pressure	: 1015mBar					
Frequency Range: 2	2402-2480 MHz	N	leasurement Type	: Conducted					
		Mea	surement Method	: RSS-Gen Issue	4 Section 6.	6			
Notes:									
Frequency				99% OBW					
(MHz)				(kHz)					
2402				1020.3					
2440				1016.7					
2480				1019.7					
Test Site: CEMI-05	Cable	: 2288		Attenuator:	21	07 40dB			
Analyzer: EXA 1118470								Copyright (Curtis-Straus LLC 200
. 2/20/2017									
Spectrum Analyzers / Rece		Range	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
Rental EXA Signal Ana	llyzer(1118470)	9KHz-26.5GHz	N9010A-526;M	AT	MY51170093	1118470	1	1/3/2018	1/3/2017
Conducted Test Sites CEMI 5	(Mains / Telco)	FCC Code 719150		VCCI Code A-0015			Cat III	Calibration Due NA	Calibrated on N/A
Preamps/Couplers Atte		Range 0.009-18GHz	MN 48-40-34	Mfr API Weinschel	SN CG7990	Asset 2107	Cat	Calibration Due	Calibrated on
Meteorological			MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
Weather Clock (Pre TH A#208			BA928 HTC-1	Oregon Scientific HDE	C3166-1	831 2085	I II	4/28/2018 4/5/2017	4/28/2016 4/5/2016
Cables		Range		Mfr			Cat	Calibration Due	Calibrated or
Asset #22	88		FLC-1.5FT-SMSM+	Mini-Circuits	16021029		II	1/27/2018	1/27/2017

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





PLOTS



Occupied Bandwidth Low Channel



Occupied Bandwidth Middle Channel



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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
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 x 10 ⁻⁸	1 x 10 ⁻⁷
RF power, conducted	0.40dB	0.75dB
Maximum frequency deviation:	0.40ub	0.73ub
 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		_



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Testing Cord, No. 4827 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'IABÎLITY TO CLIENT HERÈUNDER (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.



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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 HERE! INDEED

(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



