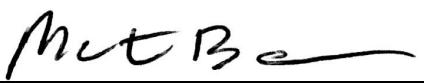
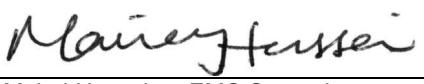




BUREAU  
VERITAS

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# Test Report

Report No	EL2238-2
Client	Airvana
Address	19 Alpha Road Chelmsford, MA 01824
Phone	978-250-2622
Item tested	Femto Cell 750701
FCC ID	QHYHUBBUBC4000-RT
FRN	0021466594
Equipment Type	PCS Licensed Transmitter
Equipment Code	PCB
Emission Designator	1M27D7D
FCC Rule Parts	47 CFR 90 Subpart S
Test Dates	January 9-12 <sup>th</sup> , 2012
Results	As detailed within this report
Prepared by	 Matthew Burman – Test Engineer
Authorized by	 Mairaj Hussain – EMC Supervisor
Issue Date	<u>February 3, 2012</u>

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.



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



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## ***Summary***

This test report supports an application for certification of a transmitter operating pursuant to 47 CFR 90. The product is the Femto Cell 750701. It is a transmitter that operates in the range 862-869MHz.

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

The EUT utilizes 64-QAM modulation.

## ***Test Methodology***

Radiated emission testing was performed according to the procedures specified in ANSI C63.4 (2003) and TIA-603-C. Radiated Emissions were maximized by rotating the device around its upright axes as well as varying the test antenna's height and polarity.

Conducted measurements at the antenna port were performed.

The EUT operating voltage is 120Vac 60Hz.

During AC line conducted emissions and radiated spurious measurements, the product was removed from the plastic enclosure which should have no effects on EMI results.

For antenna port conducted spurious emissions 30MHz to 20GHz was checked.

Radiated spurious emissions in the frequency range of 30MHz to 20GHz were inspected, along with the digital circuitry.

The digital circuitry is compliant to FCC part 15 class B limits for unintentional radiators as issued in work order EM0015.

Low Channel = 862.9MHz

Middle Channel = 866.65MHz

High Channel = 868.15MHz



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**Product Tested - Configuration Documentation**

EUT Configuration									
Work Order: L2238 Company: Airvana Company Address: 19 Alpha Road Chelmsford, MA 01824 Contact: Stuart MacEachern Person Present: Stuart MacEachern									
MN		PN		SN					
EUT:	750701	---		Sample 1					
<b>EUT Description:</b> Femto Cell <b>EUT Max Frequency:</b> 1000MHz									
Support Equipment:		MN		SN					
IQNAV GPS Generator		IQN00962		---					
Dell Latitude Laptop		D610		---					
<b>EUT Ports:</b>									
Port Label	Port Type	No. of ports	Populated	Cable Type	Shielded	Ferrites	Length	Max Length	In/Out NEBS Type
AC Power	Power AC	1	1	2 Wire AC	No	None	1.5m	NA	indoor
Ethernet	Ethernet	3	3	Cat.5	No	None	1.5m	100m	indoor
GPS	other	1	1	Coaxial	Yes	None	10m	10m	indoor
<b>Software / Operating Mode Description:</b>									
All three radios are simultaneously active. (Beacon(1941), 1X(1953.8), and 10X (1965MHz))									



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Testing Cert. No. 1627-01

## ***Statement of Conformity***

The Femto Cell 750701 has been found to conform to the following parts of 47 CFR 90 as detailed below:

Part 2	Part 90	Comments
2.1033(c)(4)		CDMA is the type of RF modulation.
2.1033(c)(6)		RF output power is not adjustable to end users.
2.1049(l)		Occupied bandwidth measured
2.1051	90.691(a)	Spurious emissions within limit of -13dBm
2.1053	90.691(a)	Spurious emissions within limit of -13dBm
2.1055(a)(d)	90.213(a)	Frequency stability within 1.5ppm
	90.691	Fundamental enclosed in spectral mask
2.1033(c)(7)	90.635	Power limit: 100W ERP.
2.1033(c)(9)		The Femto Cell 705701 does not require a tune-up procedure.



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Testing Cert. No. 1627-01

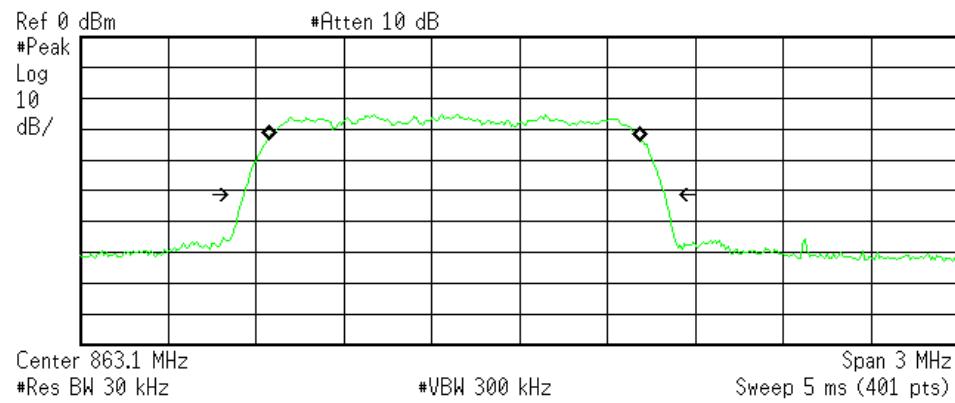
## Occupied Bandwidth

### MEASUREMENTS / RESULTS

#### Low Channel

Agilent 04:13:13 Jan 11, 2012

R L



Transmit Freq Error -220.985 kHz  
x dB Bandwidth 1.440 MHz



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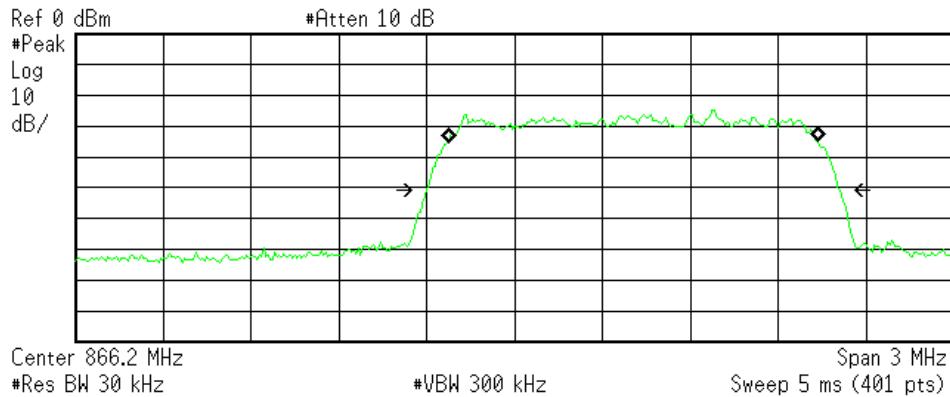


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## Mid Channel

\* Agilent 05:33:35 Jan 11, 2012

R L

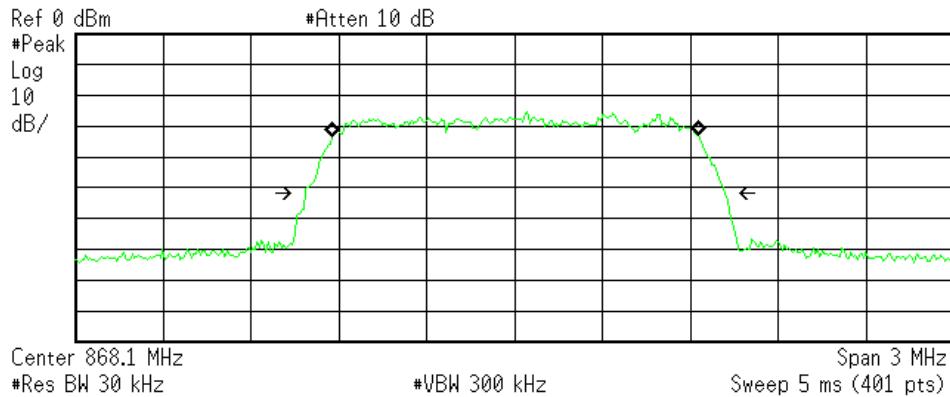


Transmit Freq Error      403.775 kHz  
x dB Bandwidth      1.412 MHz

## High Channel

\* Agilent 05:50:59 Jan 11, 2012

R L



Transmit Freq Error      4.026 kHz  
x dB Bandwidth      1.433 MHz



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## ERP

ERP							Work Order: L2238									
Date: 12-Jan-12		Company: Airvana				EUT Operating Voltage/Frequency: 120Vac 60Hz										
Engineer: Matthew Burman		EUT Desc: Femto Cell 750701				Pressure: 997mBar										
Temp: 21.0°C																
Humidity: 21%																
Frequency Range: 862-869MHz							Measurement Distance: 3 m									
Notes: Substitution Method							20dBW = 100W = 50dBm									
Antenna Polarization (H / V)	Frequency (MHz)	Field Strength (dB $\mu$ V/m)	Signal Generator Power (dBm)	Cable Loss (dB)	Antenna Gain (dBi)	ERP Adjusted Power (dBm)			FCC 90.635 (b)							
									Limit (dBm)	Margin (dB)	Result (Pass/Fail)					
Low Channel	V	862.9	101.49	2.3	0.9	0.0	1.4	---	50.0	-48.6	Pass					
Mid Channel	H	862.9	97.9	-1.4	0.9	0.0	-2.3	---	50.0	-52.3	Pass					
High Channel	V	866.65	103.43	4.3	0.9	0.0	3.4	---	50.0	-46.6	Pass					
	H	866.65	100.53	1.1	0.9	0.0	0.2	---	50.0	-49.8	Pass					
	V	868.15	104.3	5.6	0.9	0.0	4.7	---	50.0	-45.3	Pass					
	H	868.15	98.64	0.1	0.9	0.0	-0.8	---	50.0	-50.8	Pass					
<b>Table Result:</b>							Pass									
Test Site: 1DCC-OATS-3M-I				Signal Generator: Red				Receive Cable: EMIR-18								
Analyzer: Rental SA#5				Receive Antenna: Red-Brown				Transmit Cable: EMIR-High-21								
				Transmit Antenna: Dipole												

When performing ERP measurements, the fundamental emission from the EUT is measured in terms of field strength. The EUT is then replaced with a calibrated antenna, cable and signal generator, the field strength is matched from a known power source. The power is then calculated by subtracting the cable loss and adding any antenna gain. A dipole antenna was used in the measurements which contains no gain.



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## ***Emission Mask***

### **LIMITS**

*"For any frequency removed from the EA licensee's frequency block by up to and including 37.5 kHz, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least  $116 \log_{10}(f/6.1)$  decibels or  $50 + 10 \log_{10}(P)$  decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed from the center of the outer channel in the block in kilohertz and where f is greater than 12.5 kHz."*

*"For any frequency removed from the EA licensee's frequency block greater than 37.5 kHz, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least  $43 + 10 \log_{10}(P)$  decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed from the center of the outer channel in the block in kilohertz and where f is greater than 37.5 kHz." [90.691(a)]*

### **MEASUREMENTS / RESULTS**

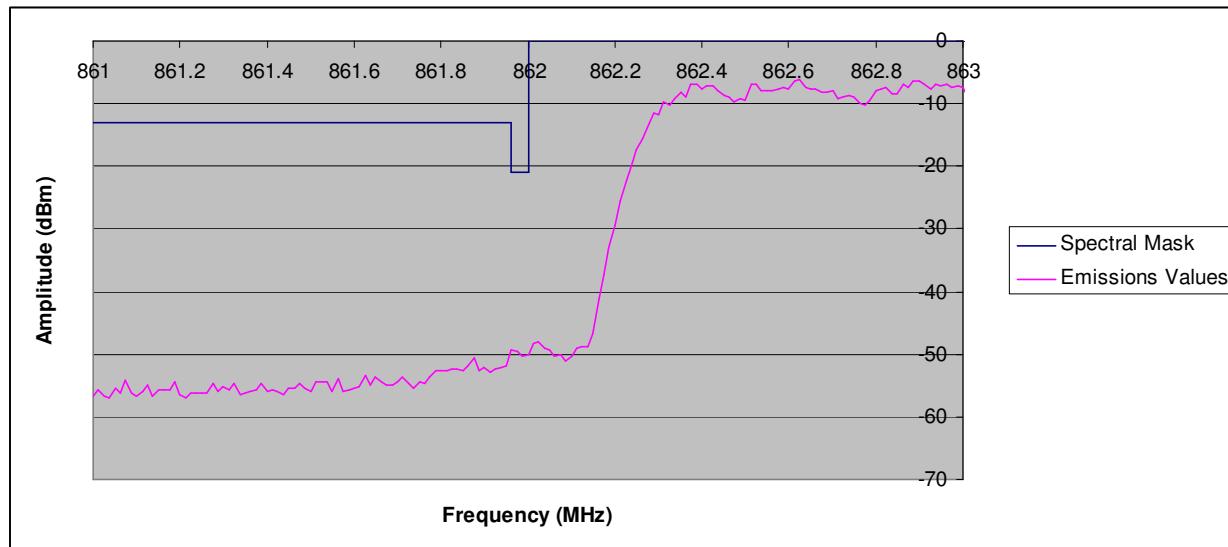
Resolution Bandwidth = 30kHz

Peak Detector

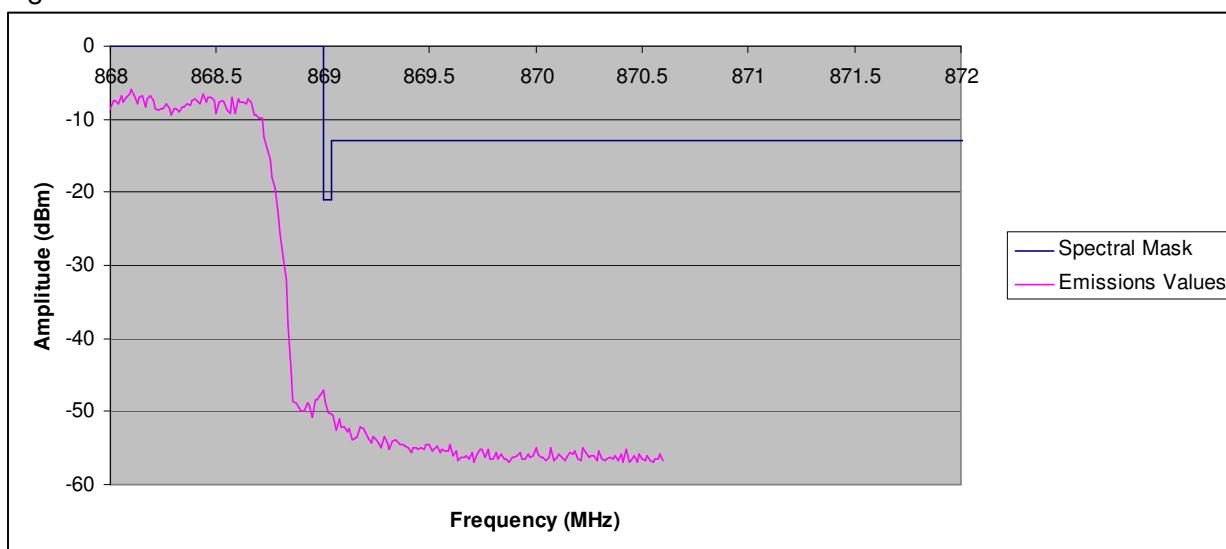
20dB attenuation

Limits =  $50 + 10 \times \log(P)$  and  $43 + 10 \times \log(P)$

Low Band



## High Band



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## Radiated Spurious Emissions Measurements

### LIMITS

"For any frequency removed from the EA licensee's frequency block greater than 37.5 kHz, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least  $43 + 10\log_{10}(P)$  decibels." [90.691(a)]

### MEASUREMENTS / RESULTS

#### Radiated Emissions Table

Date: 09-Jan-12	Company: Airvana	Work Order: L2238										
Engineer: Ahmed Ahmed	EUT Desc: 750701 Fempto Cell	EUT Operating Voltage/Frequency: 120VAC, 60Hz										
Temp: 23.1°C	Humidity: 16%	Pressure: 998mBar										
Frequency Range: 30-1000MHz		Measurement Distance: 3 m										
Notes:												
-13dBm = 82.157dB <sub>u</sub> V/m at 3m												
Antenna Polarization (H / V)	Frequency (MHz)	Reading (dB <sub>u</sub> V)	Preamp Factor (dB)	Antenna Factor (dB/m)	Cable Factor (dB)	Adjusted Reading (dB <sub>u</sub> V/m)	---			FCC Part 90.691 (a)		
							Limit (dB <sub>u</sub> V/m)	Margin (dB)	Result (Pass/Fail)	Limit (dB <sub>u</sub> V/m)	Margin (dB)	Result (Pass/Fail)
V	33.11	31.3	22.8	18.8	0.6	27.9	---	---	---	82.2	-54.3	Pass
V	48.45	36.0	22.9	8.5	0.6	22.2	---	---	---	82.2	-60.0	Pass
V	61.68	42.8	22.8	8.0	0.6	28.6	---	---	---	82.2	-53.6	Pass
V	100.0	46.9	22.7	10.2	0.7	35.1	---	---	---	82.2	-47.1	Pass
V	135.4	36.3	22.8	13.6	0.8	27.9	---	---	---	82.2	-54.3	Pass
V	185.2	35.0	22.8	10.7	1.0	23.9	---	---	---	82.2	-58.3	Pass
H	199.8	39.6	22.9	12.1	1.0	29.8	---	---	---	82.2	-52.4	Pass
V	200.0	45.7	22.9	12.1	1.0	35.9	---	---	---	82.2	-46.3	Pass
H	265.9	46.2	22.8	12.8	1.2	37.4	---	---	---	82.2	-44.8	Pass
H	400.0	34.0	22.6	15.4	1.4	28.2	---	---	---	82.2	-54.0	Pass
V	625.0	33.5	22.7	19.2	1.9	31.9	---	---	---	82.2	-50.3	Pass
H	834.2	28.7	21.9	21.6	2.2	30.6	---	---	---	82.2	-51.6	Pass
<b>Table Result:</b> Pass by -44.8 dB			<b>Worst Freq:</b> 265.9 MHz									
Test Site: EMI Chamber 2	Cable 1: Asset #1506	Cable 2: Asset #1507										
Analyzer: Asset #1328	Preamp: Blue	Antenna: Red-Black										

#### Radiated Emissions Table

Date: 09-Jan-12	Company: Airvana	Work Order: L2239										
Engineer: Ahmed Ahmed	EUT Desc: 750701 Fempto Cell	EUT Operating Voltage/Frequency: 120VAC, 60Hz										
Temp: 23.1°C	Humidity: 16%	Pressure: 998mBar										
Frequency Range: 1-6GHz		Measurement Distance: 3 m										
Notes: Substitution method												
Antenna Polarization (H / V)	Frequency (MHz)	Field Strength (dB <sub>u</sub> V/m)	Signal Generator Power (dBm)	Cable Loss (dB)	Antenna Gain (dB)	Adjusted Power (dBm)	---			FCC Part 90.691 (a)		
							Limit (dB <sub>u</sub> V/m)	Margin (dB)	Result (Pass/Fail)	Limit (dB <sub>u</sub> V/m)	Margin (dB)	Result (Pass/Fail)
H	1088.0	56.55	-47.5	1.1	4.9	-43.7	---	---	---	-13.0	-30.7	Pass
V	1088.0	63.41	-40.6	1.1	4.9	-36.8	---	---	---	-13.0	-23.8	Pass
V	1166.0	53.7	-50.7	1.1	5.2	-46.6	---	---	---	-13.0	-33.6	Pass
V	1731.0	60.48	-46.5	1.3	8.0	-39.8	---	---	---	-13.0	-26.8	Pass
H	3930.0	67.08	-39.7	2.1	8.6	-33.2	---	---	---	-13.0	-20.2	Pass
V	3930.0	69.2	-37.6	2.1	8.6	-31.1	---	---	---	-13.0	-18.1	Pass
<b>Table Result:</b> Pass by -18.1			<b>Worst Freq:</b> 3930.0 MHz									
Receive Setup												
Test Site: EMI Chamber 2	Cable 1: Asset #1506	Cable 2: Asset #1507										
Analyzer: Rental SA#1	Preamplifier: Brown	Antenna: Yellow Horn										
Transmit Setup												
Test Site: EMI Chamber 2	Cable 1: EMIR-High -21	Cable 2: Asset #1507										
Antenna: Red Horn	Signal Generator: Rental SA#1	Antenna: Yellow Horn										



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**Radiated Emissions Table**

Date: 09-Jan-12 Engineer: Ahmed Ahmed Temp: 23.1°C			Company: Airvana EUT Desc: 750701 Fempto Cell Humidity: 16%			Work Order: L2239 EUT Operating Voltage/Frequency: 120VAC, 60Hz Pressure: 998mBar																											
Frequency Range: 6-18GHz						Measurement Distance: 1 m																											
Notes:																																	
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th rowspan="2">Antenna Polarization (H / V)</th> <th rowspan="2">Frequency (MHz)</th> <th rowspan="2">Field Strength (dB<math>\mu</math>V/m)</th> <th rowspan="2">Signal Generator Power (dBm)</th> <th rowspan="2">Antenna Gain (dBi)</th> <th rowspan="2">Cable Loss (dB)</th> <th rowspan="2">Adjusted Power (dBm)</th> <th colspan="3">FCC Part 90.691 (a)</th> </tr> <tr> <th>Limit (dBm)</th> <th>Margin (dB)</th> <th>Result (Pass/Fail)</th> </tr> </thead> <tbody> <tr> <td>H</td> <td>11210.0</td> <td>77.7</td> <td>-45.1</td> <td>18.6</td> <td>3.9</td> <td>-30.4</td> <td>---</td> <td>---</td> <td>-13.0</td> <td>-17.4</td> <td>Pass</td> </tr> </tbody> </table>									Antenna Polarization (H / V)	Frequency (MHz)	Field Strength (dB $\mu$ V/m)	Signal Generator Power (dBm)	Antenna Gain (dBi)	Cable Loss (dB)	Adjusted Power (dBm)	FCC Part 90.691 (a)			Limit (dBm)	Margin (dB)	Result (Pass/Fail)	H	11210.0	77.7	-45.1	18.6	3.9	-30.4	---	---	-13.0	-17.4	Pass
Antenna Polarization (H / V)	Frequency (MHz)	Field Strength (dB $\mu$ V/m)	Signal Generator Power (dBm)	Antenna Gain (dBi)	Cable Loss (dB)	Adjusted Power (dBm)	FCC Part 90.691 (a)																										
							Limit (dBm)	Margin (dB)	Result (Pass/Fail)																								
H	11210.0	77.7	-45.1	18.6	3.9	-30.4	---	---	-13.0	-17.4	Pass																						
<b>Table Result:</b> Pass				by 17.4dB			<b>Worst Freq:</b> 11210.0 MHz																										
Test Site: EMI Chamber 2 Analyzer: Rental SA#1 Tx Cable 2: Asset #1507			Tx Cable 1: Asset #1506 Preamp: Brown Receive Antenna: Yellow Horn			Signal Generator: Rental Sweeper Transmit Antenna: Red Horn Transmit Cable: EMIR-High-21																											

**Radiated Emissions Table**

Date: 10-Jan-12 Engineer: Ahmed Ahmed Temp: 23.1°C			Company: Airvana EUT Desc: 750701 Fempto Cell Humidity: 16%			Work Order: L2238 EUT Operating Voltage/Frequency: 120VAC, 60Hz Pressure: 998mBar																											
Frequency Range: 18-20GHz						Measurement Distance: 0.1 m																											
Notes:																																	
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th rowspan="2">Antenna Polarization (H / V)</th> <th rowspan="2">Frequency (MHz)</th> <th rowspan="2">Peak Reading (dB<math>\mu</math>V)</th> <th rowspan="2">Preamp Factor (dB)</th> <th rowspan="2">Antenna Factor (dB/m)</th> <th rowspan="2">Cable Factor (dB)</th> <th rowspan="2">Adjusted Peak Reading (dB<math>\mu</math>V/m)</th> <th colspan="3">FCC Part 90.691 (a)</th> </tr> <tr> <th>Limit (dB<math>\mu</math>V/m)</th> <th>Margin (dB)</th> <th>Result (Pass/Fail)</th> </tr> </thead> <tbody> <tr> <td>No emission found</td> <td></td> <td></td> <td>---</td> <td>---</td> <td>---</td> <td>---</td> <td>---</td> <td>---</td> <td>---</td> <td>---</td> <td>---</td> </tr> </tbody> </table>									Antenna Polarization (H / V)	Frequency (MHz)	Peak Reading (dB $\mu$ V)	Preamp Factor (dB)	Antenna Factor (dB/m)	Cable Factor (dB)	Adjusted Peak Reading (dB $\mu$ V/m)	FCC Part 90.691 (a)			Limit (dB $\mu$ V/m)	Margin (dB)	Result (Pass/Fail)	No emission found			---	---	---	---	---	---	---	---	---
Antenna Polarization (H / V)	Frequency (MHz)	Peak Reading (dB $\mu$ V)	Preamp Factor (dB)	Antenna Factor (dB/m)	Cable Factor (dB)	Adjusted Peak Reading (dB $\mu$ V/m)	FCC Part 90.691 (a)																										
							Limit (dB $\mu$ V/m)	Margin (dB)	Result (Pass/Fail)																								
No emission found			---	---	---	---	---	---	---	---	---																						
<b>Table Result:</b> ---				by --- dB			<b>Worst Freq:</b> --- MHz																										
Test Site: EMI Chamber 2 Analyzer: Rental SA#1			Cable 1: EMIR-HIGH-13 Preamp: 18-26.5GHz			Antenna: 18-26.5GHz Horn																											



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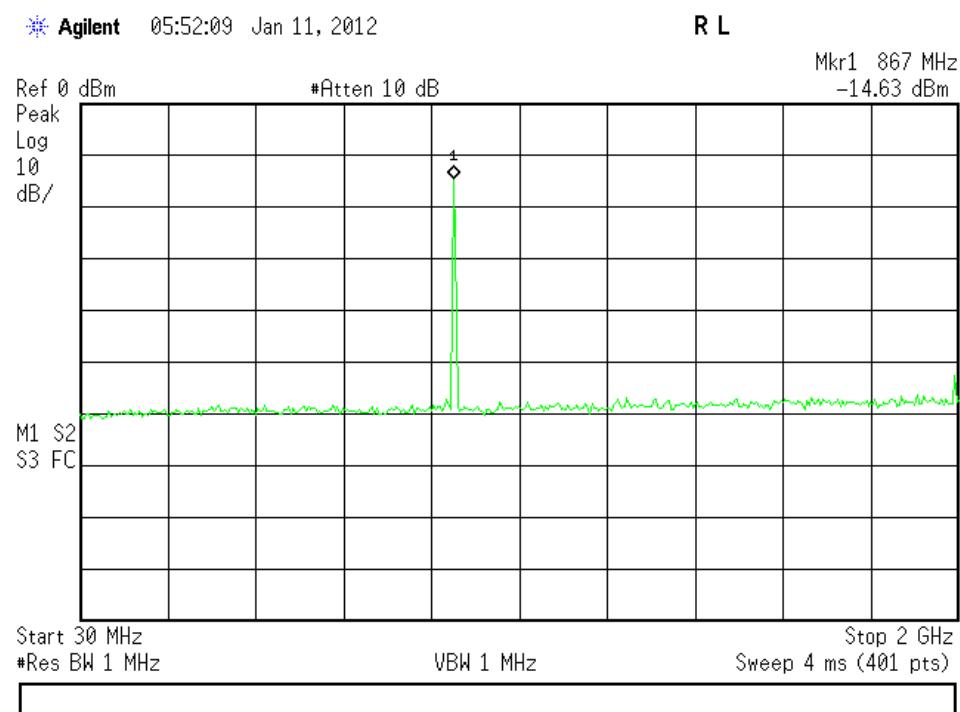
## Conducted Spurious Emissions Measurements

### LIMITS

"For any frequency removed from the EA licensee's frequency block greater than 37.5 kHz, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least  $43 + 10\log_{10}(P)$  decibels." [90.691(a)]

Limit =  $10^{\log(P[mW])} - (43 + 10^{\log(P[W])}) = -13\text{dBm}$

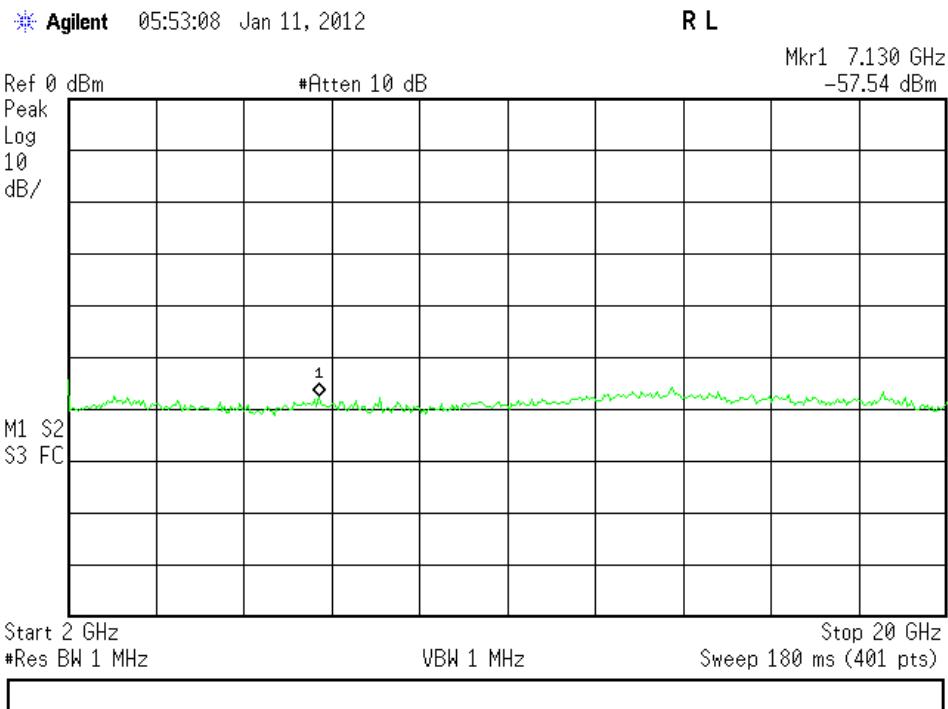
### PLOTS



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## Frequency Stability

### REQUIREMENT

*"The frequency stability shall be within 1.5parts per million for fixed and base stations within the frequency range of 854-869MHz." [90.213(a)]*

### MEASUREMENTS / RESULTS

Frequency Stability		Curtis-Straus LLC	
Engineer:	Matthew Burman	Company:	Airvana
Date:	1/11/2012	EUT:	750701 Fempto Cell
Analyzer:	Asset #1491	Work Order:	L2238
Cable:	EMIR-High-22		
Note:	Reference: 20°C 110VAC		
Temperature	Supply Voltage	Center Frequency	Frequency Delta
(°C)	(VAC)	(Hz)	(ppm)
-30	110	1932499910	0.00
-20	110	1932499910	0.00
-10	110	1932499910	0.00
0	110	1932499910	0.00
10	110	1932499920	-0.01
20	93.5	1932499910	0.00
20	110	1932499910	0.00
20	126.5	1932499895	0.01
30	110	1932499890	0.01
40	110	1932499910	0.00
50	110	1932499925	-0.01

\*The EUT has an intentional transmitter that operates at both 1900 and 800MHz, the hardware utilized for both bands are the same, the software controls the different bands. Testing was performed at the 1900MHz band to satisfy the 800MHz requirements as well.



## Test Equipment Used

Spectrum Analyzers / Receivers /Preselectors		Range	MN	Mfr	SN	Asset	Cat	Calibration Due
Rental SA #5		9kHz-26.5 GHz	E4407B	Agilent	MY44220066	1491	I	17-Mar-2012
<b>Radiated Emissions Sites</b> 1DCC-OATS-3M-I		<b>FCC Code</b> 719150	<b>IC Code</b> 2762A-8	<b>VCCI Code</b> R-3109, G-494			<b>Cat</b>	<b>Calibration Due</b>
<b>Antennas</b> Orange Horn		Range 1-18GHz	MN 3115	Mfr EMCO	SN 0004-6123	Asset 390	Cat I	27-Jul-2013
Red Horn		1-10GHz	3115	EMCO	1687	II	See RFI Systems	
<b>Meteorological Meters</b> Temp./Humidity/Atm. Pressure Gauge 1DCC-OATS-3M-I Thermohygrometer			<b>MN</b> 7400 Perception II 35519-044	<b>Mfr</b> Davis Control Company	<b>SN</b> N/A	<b>Asset</b> 965	<b>Cat</b> I	4-Apr-2013
<b>Cables</b> REMI-High-21		Range 9kHz - 26.5GHz		<b>Mfr</b> C-S			<b>Cat</b>	<b>Calibration Due</b>
REMI-High-22		9kHz - 15GHz		C-S			II	18-Jan-2012
<b>Signal Generators</b> Red		<b>Range</b> 0.09-2000MHz	<b>MN</b> HP8648B	<b>Mfr</b> Agilent	<b>SN</b> 3847U02192	<b>Asset</b> 366	<b>Cat</b> I	<b>Calibration Due</b>
Rev: 30-Dec-2011								
Spectrum Analyzers / Receivers /Preselectors		Range	MN	Mfr	SN	Asset	Cat	Calibration Due
SA EMI Chamber (1328)		9kHz-13.2 GHz	E4405B	Agilent	MY44210241	1328	I	4-Mar-2012
Rental SA #1 (Brown)		9kHz-26.5GHz	E4407B	Agilent	SG44210511	1510	I	12-Apr-2012
<b>Radiated Emissions Sites</b> EMI Chamber 2		<b>FCC Code</b> 719150	<b>IC Code</b> 2762A-7	<b>VCCI Code</b> R-3033, G-107			<b>Cat</b>	<b>Calibration Due</b>
							I	12-Mar-2013
<b>Preamps /Couplers Attenuators / Filters</b>		<b>Range</b>	<b>MN</b>	<b>Mfr</b>	<b>SN</b>	<b>Asset</b>	<b>Cat</b>	<b>Calibration Due</b>
Blue		0.009-2000MHz	ZFL-1000-LN	CS	N/A	759	II	1-Jun-2012
Brown		1-18GHz	CS	CS	N/A	1523	II	10-Dec-2012
HF 20dB 50W Attenuator		0.009-18 GHz	PE 7019-20	Pasterнак	1	791	II	1-Jun-2013
<b>Antennas</b> Red-Black BiLog		Range 30-2000MHz	MN JB1	Mfr Sunol	SN A091604-2	Asset 1106	Cat I	3-Dec-2012
Yellow Horn		1-18GHz	3115	EMCO	9608-4898	37	I	17-Jun-2013
<b>Signal Generators</b> Rental Sweeper		<b>Range</b> 0.01-20.0GHz	<b>MN</b> HP83752B	<b>Mfr</b> Agilent	<b>SN</b> 3610A01297	<b>Asset</b> Rental	<b>Cat</b> I	<b>Calibration Due</b>
<b>Meteorological Meters</b> Temp./Humidity/Atm. Pressure Gauge CHAMBER2 Thermohygrometer			<b>MN</b> 7400 Perception II 35519-044	<b>Mfr</b> Davis Control Company	<b>SN</b> N/A	<b>Asset</b> 965	<b>Cat</b> I	4-Apr-2013
						1347	II	19-Aug-2013
<b>Cables</b> Asset #1506		Range 9kHz - 18GHz		<b>Mfr</b> Florida RF			<b>Cat</b>	<b>Calibration Due</b>
Asset #1507		9kHz - 26.5GHz		Florida RF			II	19-Aug-2012
							II	18-Jan-2012

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



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Testing Cert. No. 1627-01

## 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-STRAUSS (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.



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13. CLIENT SHALL, EXCEPT TO THE EXTENT OF COMPANY'S LIABILITY TO CLIENT HEREUNDER (WHICH IN NO EVENT SHALL EXCEED THE LIMITATION OF LIABILITY HEREIN), HOLD HARMLESS AND INDEMNIFY THE COMPANY, ITS AFFILIATES AND THEIR RESPECTIVE DIRECTORS, OFFICERS, EMPLOYEES, AGENTS AND SUBCONTRACTORS AGAINST ALL ACTUAL OR ALLEGED THIRD PARTY CLAIMS FOR LOSS, DAMAGE OR EXPENSE OF WHATSOEVER NATURE AND HOWSOEVER ARISING FROM OR RELATING TO (i) THE PERFORMANCE, PURPORTED PERFORMANCE OR NON-PERFORMANCE OF ANY SERVICES BY THE COMPANY OR (ii) THE SALE, RESALE, MANUFACTURE, DISTRIBUTION OR USE OF ANY TESTED GOODS.

14. EXCEPT AS MAY OTHERWISE BE EXPRESSLY AGREED TO IN WRITING BY THE COMPANY AND NOTWITHSTANDING ANY PROVISION TO THE CONTRARY CONTAINED HEREIN OR IN ANY TEST REPORT, NO WARRANTY OR GUARANTEE, EXPRESS OR IMPLIED, INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR USE, IS MADE.

15. (A) IN NO EVENT WHATSOEVER SHALL THE COMPANY BE LIABLE FOR ANY CONSEQUENTIAL, SPECIAL, INCIDENTAL, EXEMPLARY OR PUNITIVE DAMAGES IN CONNECTION WITH, RELATING TO OR ARISING OUT OF THE TEST REPORT OR THE SERVICES PROVIDED BY THE COMPANY HEREUNDER, INCLUDING WITHOUT LIMITATION LOSS OF OR DAMAGE TO PROPERTY; LOSS OF INCOME, PROFIT OR USE; OR ANY CLAIMS OR DEMANDS MADE AGAINST CLIENT OR ANY OTHER PERSON BY ANY THIRD PARTY IN CONNECTION WITH, RELATING TO OR ARISING OUT OF THE SERVICES PROVIDED BY THE COMPANY HEREUNDER.

(B) NOTWITHSTANDING ANY PROVISION TO THE CONTRARY CONTAINED HEREIN, AND IN RECOGNITION OF THE RELATIVE RISKS AND BENEFITS TO CLIENT AND THE COMPANY ASSOCIATED WITH THE TESTING SERVICES CONTEMPLATED HEREBY, THE RISKS HAVE BEEN ALLOCATED SUCH THAT UNDER NO CIRCUMSTANCES WHATSOEVER SHALL THE LIABILITY OF THE COMPANY TO CLIENT OR ANY THIRD PARTY IN RESPECT OF ANY CLAIM FOR LOSS, DAMAGE OR EXPENSE, OF WHATSOEVER NATURE OR MAGNITUDE, AND HOWSOEVER ARISING, EXCEED AN AMOUNT EQUAL TO FIVE (5) TIMES THE AMOUNT OF THE FEES PAID TO THE COMPANY FOR THE SPECIFIC SERVICES WHICH GAVE RISE TO SUCH CLAIM OR U.S.\$10,000, WHICHEVER IS THE LESSER AMOUNT.

16. The Company shall not be liable for any loss or damage resulting from any delay or failure in performance of its obligations hereunder resulting directly or indirectly from any event of force majeure or any event outside the control of the Company. If any such event occurs, the Company may immediately cancel or suspend its performance hereunder without incurring any liability whatsoever to Client.

17. Company's services, including these Conditions, shall be governed by, and construed in accordance with, the local laws of the country where the Company performs the tests or, in the case of tests performed in the United States of America, the laws of Massachusetts without regard to conflicts of laws principles. If any aspect(s) of these Conditions is found to be illegal or unenforceable, the validity, legality and enforceability of all remaining aspects of these Conditions shall not in any way be affected or impaired thereby. Any proceeding related to the subject matter hereof shall be brought, if at all, in the courts of the country where the Company performs the tests or, in the case of tests performed in the United States of America, in the courts of Massachusetts. Client waives the right to interpose any counterclaim or setoffs of any nature in any litigation arising hereunder.

Rev.160009121(2) #684340 v13CS



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