

Test Report

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

Report No	EN1043-2
Client	Airvana
Address	19 Alpha Road Chelmsford, MA 01824
Phone	978-250-2622
Item tested FCC ID	Femto Cell 750721 QHYHUBBUBC4501-RT
FRN	0021466594
Equipment Type Equipment Code Emission Designator	PCS Licensed Transmitter PCB 1M27D7D
FCC Rule Parts	47 CFR 22 Subpart H 47 CFR 24 Subpart E 47 CFR 90 Subpart S
Test Dates	April 26, 2013; May 22, 23, and 24, 2013
Results	As detailed within this report
Prepared by	Arik Zwirner
Authorized by	M. Hussain – EMC Supervisor
Issue Date	<u>June 20, 2013</u>
	American Association for Laboratory Accreditation for the specific scope of accreditation under ort may contain data which is not covered by the A2LA accreditation.



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



Summary

This test report supports an application for certification of a transmitter operating pursuant to 47 CFR 22 Subpart H, 47 CFR 24 Subpart E, and 47 CFR 90 Subpart S.

The product is the Femto Cell 750721, FCC ID QHYHUBBUBC4501-RT. It is a transceiver that operates in the ranges 862-869MHz, 869-894MHz, and 1930-1990MHz.

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

Release Control Record Issue No. Reason for change

1 Original Release

Date Issued August 14, 2007



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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.

The Femto Cell 750721 has five transmitters, identified as One-X, EVDO, Beacon BC0, Beacon BC1, and Beacon BC10. Three of these transmitters, One-X, EVDO, & Beacon BC1, operate in the 1930-1990MHz band and were tested for Part 24. The Beacon BC0 operates in the 869-894MHz band and was tested for Part 22. The Beacon BC10 operates in the 862-869MHz band and was tested for Part 90.

Per Airvana, the device under test prevents the operation of 3 transmit channels operating on the same frequency at the same time. Thus it is not allowed for the One-X, EVDO, & Beacon BC1 to simultaneously operate at the same frequency.

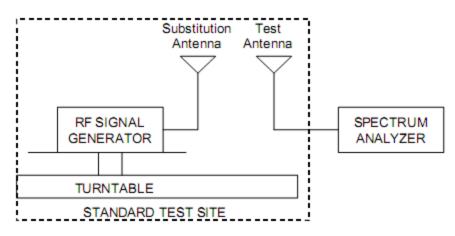
Modulation is QAM -16 for each of the different types of channels.

For Part 22, the lowest and highest operating frequencies are 870.03MHz and 889.2MHz, respectively. For Part 24, the lowest and highest operating frequencies are 1931.25MHz and 1988.75MHz, respectively. For Part 90, the lowest and highest operating frequencies are 862.9MHz and 867.9MHz, respectively

The substitution method is used for ERP and EIRP measurements. The method is performed as follows. When performing ERP or EIRP measurements, the fundamental emission of the EUT is measured in terms of field strength. The EUT is then substituted with a calibrated antenna, cable, and signal generator. The initially measured field strength is reproduced and matched by the substituting equipment. The power of the substitution source (the signal generator) is noted and this value is then corrected for the cable loss and the antenna gain (dBi) to determine the ERP or EIRP of the EUT.







Sample calculation for substitution method.

 $P_d(dBm) = P_g(dBm) - cable loss (dB) + antenna gain (dB)$

where:

 P_d is the dipole equivalent power and

 P_{g} is the generator output power into the substitution antenna.





Product Tested - Configuration Documentation

				EUT Con	nyurau	511				
Work Orde										
Company										
Company Address										
Conton	Chelmsford, t: Kevin Craig	MA 01824								
Person Presen										
	a rioni oraig									
		MN						SN		
EUT	:	750721						Sample 1		
EUT Description		o Cell Rev3								
EUT Max Frequency	r: 125MHz									
Support Equipment:		MN						SN		
Dell Laptop		PP1LL								
IQ Nav GPS Test System		Litepoint								
EUT Ports:										
		No. of	No.					Max	In/Out	
Port Label	Port Type	ports	Populated	Cable Type	Shielded	Ferrites	Length	Length	NEBS Type	Unpopulated Reaso
Power	Power AC	1	1	2 Wire AC	No	None	1.5m	N/A	indoor	
LAN ethernet	RJ-45	2	2	cat5	No	None	1.5m	100m	indoor	
WAN ethernet	RJ-45	1	1	cat5	No	None	1.5m	100m	indoor	
GPS	MCX	1	1	Coaxial	Yes	None	10m	10m	indoor	
	cription:									
oftware / Operating Mode Des									6	
oftware / Operating Mode Des PS is active and the ethernet is	pinging interna	ally with loop	backs on eacl	n cable. EUT is	running ope	erational soft	ware as onn		o soπware.	
oftware / Operating Mode Despective and the ethernet is or formance Criteria:	pinging interna	ally with loop	backs on eacl	n cable. EUT is	running ope	erational soft	ware as opp	osed to Dia	g soπware.	





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Statement of Conformity

The Femto Cell 750721 has been found to conform to the following parts of 47 CFR 22, 47 CFR 24, & 47 CFR 90 as detailed below:

	Part 22	
	22.913(a)	Meets ERP limit: 7W
	22.359	Band edge
	22.917(a)	Spurious emissions within limit of -13dBm
	Part 24	
2.1033(c)(7)	24.232(c)	Meets power limit: 2W EIRP.
	24.235	Fundamental is within authorized frequency block
	Part 90	
2.1051	90.691(a)	Spurious emissions within limit of -13dBm
2.1053	90.691(a)	Spurious emissions within limit of -13dBm
	90.635	Meets power limit: 100W ERP





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Tests Specific to Part 22

Bandwidth

Bandwidtl	h Measurements								
Date:	24-May-13	Cor	mpany: Air	vana	V	Vork O	rder:	N1043	
Engineer:	Edward Breen	EU	T Desc: 75	0721 Femto	Cell I	EUT Po	wer:	120V/60Hz	
Temp:	23.1°C	Hu	midity: 36	%		Pres	sure:	998mbar	
	Frequency Range: 8	369-894MHz, FC0	C Part 22						
Notes:									
OUTPUT	CHANNEL POSITION	CHANNEL NUN	IBER	FREQUENCY 26dB BANDWID				IDWIDTH	
			(MHz)			(MHz)			
Beacon BC0									
	Low	1		870.03			1.383		
	Mid	320		879.6			1.4	02	
	High	640		889.2			1.4	24	
Test Site:	1DCC-OATS-3M-II				Spectrur	n Anal	yzer:	Rental #1	
Rev. 5/15/2013		_				•	. .		
•	Alyzers / Receivers /Preselectors Rental SA #1 (Brown)	Range 9kHz-26.5GHz	MN E4407B	Mfr Agilent	SN SG44210511	Asset 1510	Cat I	Calibration Due 4/15/2014	
Rac	liated Emissions Sites 1DCC-OATS-3M-II	FCC Code 719150	IC Code 2762A-10	VCCI Code A-0015	Range 30-1000MHz		Cat ∥	Calibration Due 5/11/2015	
	Couplers Attenuators / Filters	Range 0.009-18 GHz	MN	Mfr Pasternack	SN 1	Asset 791	Cat II	Calibration Due 6/1/2013	

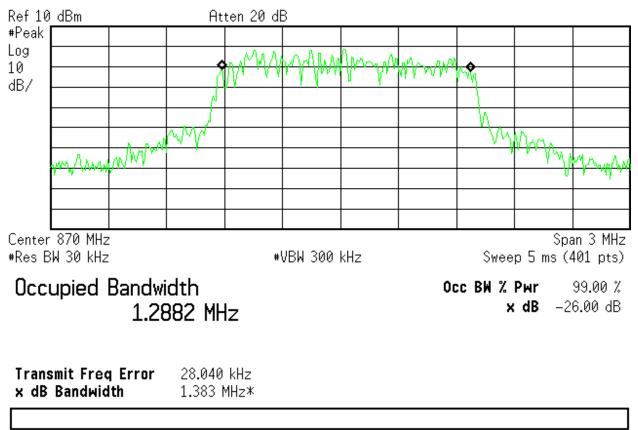
All equipment is calibrated using standards traceable to NIST or other nationally recognized calibration standard.











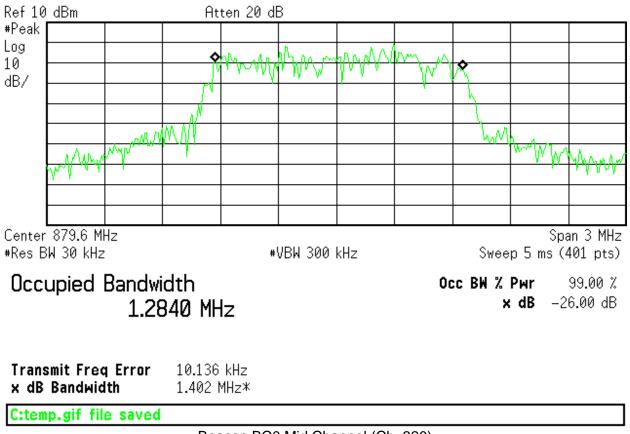
Beacon BC0 Low Channel (Ch. 1)











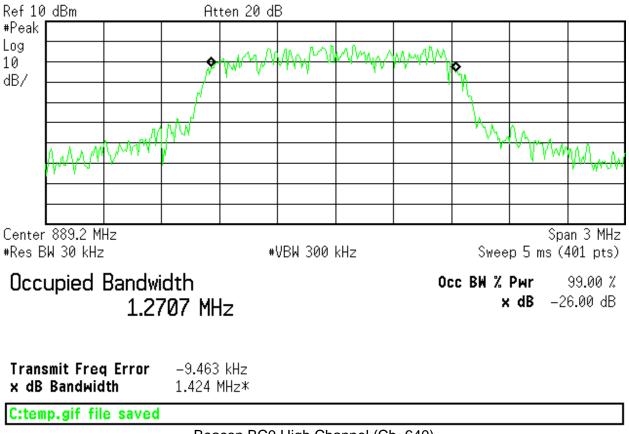
Beacon BC0 Mid Channel (Ch. 320)











Beacon BC0 High Channel (Ch. 640)





ERP

Engineer:	23-May-13		Company	Airvana			Work Order: N1043					
	Edward Breen	n	EUT Desc:	750721 Femto Cell				EUT Operating	g Voltage/	Frequenc	cy: 120V/60Hz	
Temp:	23.2°C		Humidity	33%	Pressure: 10	02mBar						
	F	Frequency Range:	Part 22 ERP mea	surements				Measurement	Distance:	3m		
Notes:	Band Class 0 7W = 38.45dB											
• ·				-						-	-	
Antenna Polarization (H / V)	Frequency (MHz)	Signal Generator Output (dBm)	Tx Antenna Gain (dB/m)	Tx A Cable (dB)	Adjusted ERP (dBm)	Limit (dBm)	Margin (dB)	Result (Pass/Fail)	Limit (dBµV/m)	Margin (dB)	Result (Pass/Fail)	
(11/ V)	(11112)	(ubili)					(ub) 		(ubµv/iii) 	(ub)		
Channel 1												
н	870.03	6.1	0.0	0.5	5.6	38.5	-32.9	Pass				
V	870.03	10.1	0.0	0.5	9.6	38.5	-28.9	Pass				
Channel 200												
Channel 320 H	879.6	4.4	0.0	0.5	 3.9	 38.5	 -34.6	 Pass				
H V	879.6	4.4 8.9	0.0	0.5	3.9 8.4	38.5 38.5	-34.6	Pass Pass				
v	010.0	0.0					-50.1					
Channel 640												
н	889.2	7.0	0.0	0.6	6.4	38.5	-32.1	Pass				
V	889.2	8.5	0.0	0.6	7.9	38.5	-30.6	Pass				
	e Result: 1DCC-OATS-	Pass	by Receive Antenna:	-28.9 Red-Brown		Transn	nit Antenna:		st Freq:)3 MHz	
								DIDOIE #756			or: Rental Sweepe	
Analyzer:	Rental SA#1		Receive Cable:				nsmit Cable		Signal	Generati	or: Rental Sweepe	
ev. 5/15/201	13		Receive Cable	#1506	MAL	Trar	nsmit Cable:	: #1787				
ev. 5/15/201	13 'um Analyze	r s / Receivers /P I SA #1 (Brown)	Receive Cable		MN E4407B	Trar			Asset 1510	Cat	Calibration Du 4/15/2014	
ev. 5/15/201	13 'um Analyze Renta	rs/Receivers/P	Receive Cable: reselectors	#1506 Range		Trar Ag	nsmit Cable: Mfr	#1787 SN SG44210511 Range	Asset	Cat	Calibration Du 4/15/2014	
ev. 5/15/20 ⁻	13 rum Analyze Renta Radiate	r s / Receivers /P I SA #1 (Brown)	Receive Cable: reselectors	#1506 Range 9kHz-26.5GHz	E4407B	Tran Ay VCC	nsmit Cable: Mfr gilent	#1787 SN SG44210511	Asset	Cat I	Calibration Du	
ev. 5/15/20 ⁻	13 um Analyze Renta Radiate 1DC	rs / Receivers /P I SA #1 (Brown) d Emissions Site	Receive Cable: reselectors	#1506 Range 9kHz-26.5GHz FCC Code	E4407B	Tran Ay VCC A	Mfr gilent CI Code -0015 Mfr	#1787 SN SG44210511 Range	Asset	Cat I Cat	Calibration Du 4/15/2014 Calibration Du 5/11/2015	
ev. 5/15/20 ⁻	13 rum Analyze Renta Radiate 1DC	rs / Receivers /P I SA #1 (Brown) d Emissions Site CC-OATS-3M-II	Receive Cable: reselectors	#1506 Range 9kHz-26.5GHz FCC Code 719150	E4407B IC Code 2762A-10	Tran Ay VCC A	nsmit Cable: Mfr gilent Cl Code -0015	#1787 SN SG44210511 Range 30-1000MHz	Asset 1510	Cat I Cat	Calibration Du 4/15/2014 Calibration Du 5/11/2015	
ev. 5/15/20 ⁻	13 um Analyze Renta Radiate 1DC Red	rs / Receivers /P I SA #1 (Brown) d Emissions Site CC-OATS-3M-II Antennas	Receive Cable: reselectors	#1506 Range 9kHz-26.5GHz FCC Code 719150 Range	E4407B IC Code 2762A-10 MN	Tran Ay VCC A	Mfr gilent CI Code -0015 Mfr	#1787 SN SG44210511 Range 30-1000MHz SN	Asset 1510 Asset	Cat I Cat II Cat	Calibration Du 4/15/2014 Calibration Du 5/11/2015 Calibration Du	
ev. 5/15/20 ⁻	13 um Analyze Renta Radiate 1DC Rec Adju	rs / Receivers /P I SA #1 (Brown) d Emissions Site CC-OATS-3M-II Antennas d-Brown Bilog ustable Dipole rological Meters	Receive Cable: Treselectors	#1506 Range 9kHz-26.5GHz FCC Code 719150 Range 30-2000MHz	E4407B IC Code 2762A-10 MN JB1 3121C MN	Tran A VCC A S E	nsmit Cables Mfr gilent CI Code -0015 Mfr MCO Mfr	#1787 SG44210511 Range 30-1000MHz SN A0032406 1371 SN	Asset 1510 Asset 1218 756 Asset	Cat Cat Cat Cat	Calibration Du 4/15/2014 Calibration Du 5/11/2015 Calibration Du 1/8/2015 12/28/2014 Calibration Du	
ev. 5/15/20 ⁻	13 um Analyze Renta Radiate 1DC Rec Adju	rs / Receivers /P I SA #1 (Brown) d Emissions Site C-OATS-3M-II Antennas d-Brown Bilog ustable Dipole	Receive Cable: Treselectors	#1506 Range 9kHz-26.5GHz FCC Code 719150 Range 30-2000MHz	E 4407B IC Code 2762A-10 MN JB1 3121C	Tran A VCC A S E	nsmit Cable Mfr gilent CI Code -0015 Mfr Sunol MCO	#1787 SG44210511 Range 30-1000MHz SN A0032406 1371	Asset 1510 Asset 1218 756	Cat Cat Cat 	Calibration Du 4/15/2014 Calibration Du 5/11/2015 Calibration Du 1/8/2015 12/28/2014	
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ev. 5/15/20 Spectr	13 Renta Radiate 1DC 1DC Neteor Weather C DCC-OATS-3	rs / Receivers /P I SA #1 (Brown) d Emissions Site CC-OATS-3M-II Antennas d-Brown Bilog ustable Dipole rological Meters lock (Pressure Or 3M-I Thermohygro Cables	Receive Cable: reselectors s	#1506 Range 9kHz-26.5GHz FCC Code 719150 Range 30-2000MHz 30-1000MHz	E4407B IC Code 2762A-10 MN JB1 3121C MN BA928 35519-044	Art VCC Art S E Oregor Control	Mfr gilent CI Code -0015 Mfr MCO Mfr o Scientific Company Mfr	#1787 SG44210511 Range 30-1000MHz SN A0032406 1371 SN C3166-1	Asset 1510 Asset 1218 756 Asset 831	Cat I Cat I Cat I Cat I I Cat	Calibration Du 4/15/2014 Calibration Du 5/11/2015 Calibration Du 1/8/2015 12/28/2014 Calibration Du 3/20/2014 8/19/2013	
ev. 5/15/20 Spectr	13 Renta Radiate 1DC 1DC Neteor Weather C DCC-OATS-3	rs / Receivers /P I SA #1 (Brown) d Emissions Site C-OATS-3M-II Antennas d-Brown Bilog ustable Dipole rological Meters lock (Pressure Or 3M-I Thermohygro	Receive Cable: reselectors s	#1506 Range 9kHz-26.5GHz FCC Code 719150 Range 30-2000MHz 30-1000MHz	E4407B IC Code 2762A-10 MN JB1 3121C MN BA928 35519-044	Art VCC Art S E Oregor Control	Mfr gilent CI Code -0015 Mfr MCO Mfr o Scientific Company	#1787 SG44210511 Range 30-1000MHz SN A0032406 1371 SN C3166-1	Asset 1510 Asset 1218 756 Asset 831	Cat I Cat I Cat I I Cat I I Cat I I	Calibration Du 4/15/2014 Calibration Du 5/11/2015 Calibration Du 1/8/2015 12/28/2014 Calibration Du 3/20/2014 8/19/2013	
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All equipment is calibrated using standards traceable to NIST or other nationally recognized calibration standard.





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Band Edge Measurements

§ 22.359 Emission limitations.

(a) *Out of band emissions.* The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log (P) dB.

MEASUREMENTS / RESULTS

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

Note: Mask lines are set to -13dBm at 869MHz and 894MHz.

TEST EQUIPMENT USED

Rev. 5/15/2013							
Spectrum Analyzers / Receivers / Preselectors	Range	MN	Mfr	SN	Asset	Cat	Calibration Due
Rental SA #1 (Brown)	9kHz-26.5GHz	E4407B	Agilent	SG44210511	1510	I	4/15/2014
Radiated Emissions Sites	FCC Code	IC Code	VCCI Code	Range		Cat	Calibration Due
1DCC-OATS-3M-II	719150	2762A-10	A-0015	30-1000MHz		Ш	5/11/2015
Preamps /Couplers Attenuators / Filters	Range	MN	Mfr	SN	Asset	Cat	Calibration Due
HF 20dB 50W Attenuator	0.009-18 GHz	PE 7019-20	Pasternack	1	791	11	6/1/2013
Meteorological Meters		MN	Mfr	SN	Asset	Cat	Calibration Due
Meteorological Meters Temp./Humidity/Atm. Pressure Gauge		MN 7400 Perception II	Mfr Davis	SN N/A	Asset 965	Cat	Calibration Due 4/4/2013

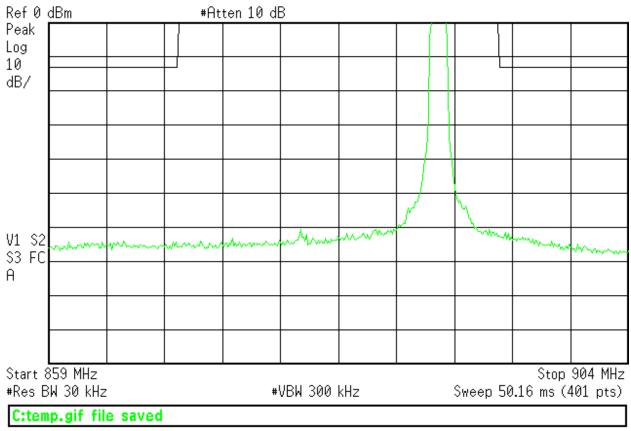
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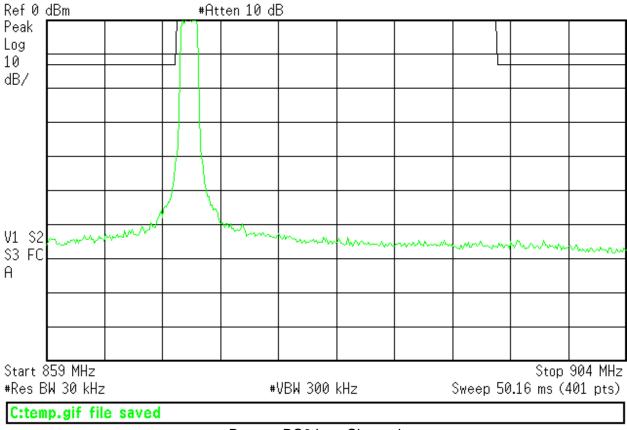
Beacon BC0 High Channel

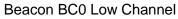
















Conducted Spurious Emissions at Antenna Port

§ 22.359 Emission limitations.

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(a) *Out of band emissions.* The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log (P) dB.

MEASUREMENTS / RESULTS

Limit = 10*log(P[mW]) - (43 + 10*log(P[W])) = -13dBm

Note: Limit lines are set to -13dBm at 30-869MHz and 894-20000MHz.

TEST EQUIPMENT USED

Rev. 5/15/2013							
Spectrum Analyzers / Receivers / Preselectors	Range	MN	Mfr	SN	Asset	Cat	Calibration Due
Rental SA #1 (Brown)	9kHz-26.5GHz	E4407B	Agilent	SG44210511	1510	I	4/15/2014
Radiated Emissions Sites	FCC Code	IC Code	VCCI Code	Range		Cat	Calibration Due
1DCC-OATS-3M-II	719150	2762A-10	A-0015	30-1000MHz		Ш	5/11/2015
Preamps /Couplers Attenuators / Filters	Range	MN	Mfr	SN	Asset	Cat	Calibration Due
HF 20dB 50W Attenuator	0.009-18 GHz	PE 7019-20	Pasternack	1	791	Ш	6/1/2013
Meteorological Meters		MN	Mfr	SN	Asset	Cat	Calibration Due
Temp./Humidity/Atm. Pressure Gauge		7400 Perception II	Davis	N/A	965	1	4/4/2013
1DCC-OATS-3M-I Thermohygrometer		35519-044	Control Company	72457635	1334	II	8/19/2013

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



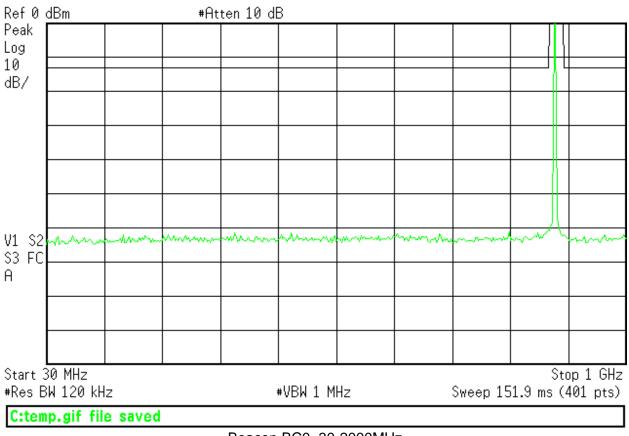


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PLOTS

🔆 Agilent

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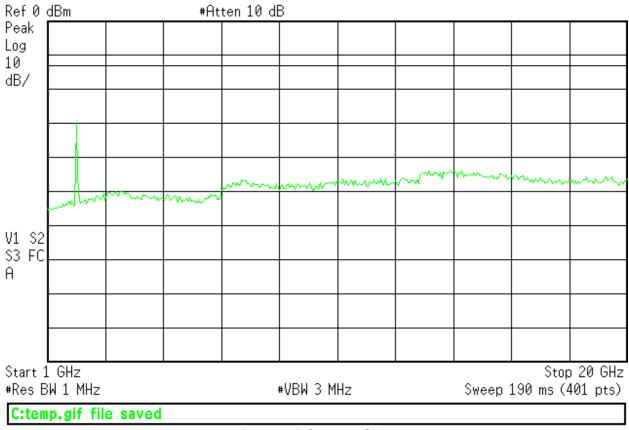
Beacon BC0, 30-2000MHz











Beacon BC0, 2-20GHz





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Tests Specific to Part 24

Bandwidth

<u>LIMIT</u>

"The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power." [24.238(b)]

MEASUREMENTS / RESULTS

Date:	24-May-13	Co	mpany: A	irvana	v	Vork O	rder:	N1043			
Engineer:	Edward Breen	EU	T Desc: 7	50721 Femt	o Cell E	UT Po	wer:	120V/60Hz			
Temp:	23.1°C	Hu		Pressure: 998mbar							
	Frequency Range:	1930-1990MHz, F	CC Part 2	4 E							
Notes:											
OUTPUT	CHANNEL POSITION	CHANNEL NU	MBER	FREQUEN	CY	26dE	B BAN	DWIDTH			
				(MHz)			(M⊢	lz)			
EVDO											
	Low	25		1931.25	5		1.4	15			
	Mid	525		1956.25	5	1.411			1.411		11
	High	1175		1988.75	5	1.418					
One-X											
	Low	25		1931.25	5		1.40	00			
	Mid	525		1956.25	;		1.40	05			
	High	1175		1988.75	5		1.40	01			
Beacon BC1											
	Low	25		1931.25	5		1.40	05			
	Mid	525		1956.25	5		1.40	03			
	High	1175		1988.75	5		1.40	06			
Test Site:	1DCC-OATS-3M-II				Spectrun	n Analy	zer:	Rental #1			
v. 5/15/2013		_					_				
	lyzers / Receivers /Preselectors ental SA #1 (Brown)	Range 9kHz-26.5GHz	MN E4407B	Mfr Agilent	SN SG44210511	Asset 1510	Cat I	Calibration D 4/15/2014			
Rad	iated Emissions Sites 1DCC-OATS-3M-II	FCC Code 719150	IC Code 2762A-10	VCCI Code A-0015	Range 30-1000MHz		Cat II	Calibration D 5/11/2015			
Preamps /0	Couplers Attenuators / Filters	Range	MN	Mfr	SN	Asset	Cat	Calibration D			

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



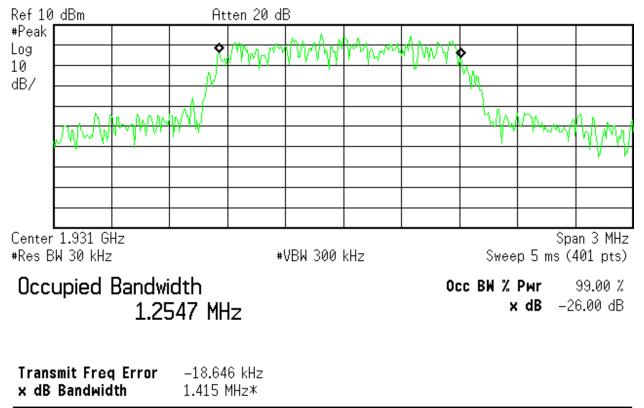
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EVDO

🔆 Agilent



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C:temp.gif file saved

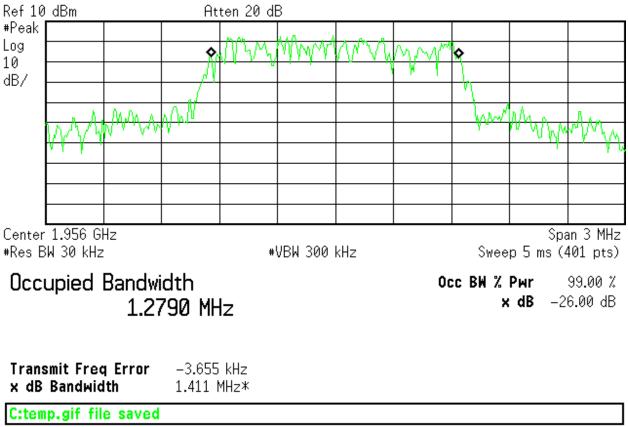
EVDO Low Channel











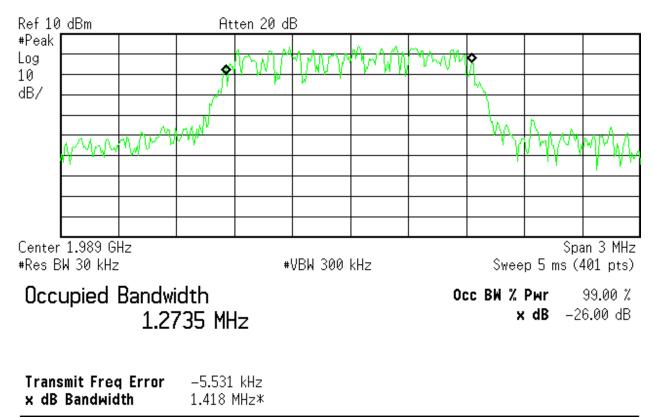
EVDO Mid Channel











C:temp.gif file saved

EVDO High Channel

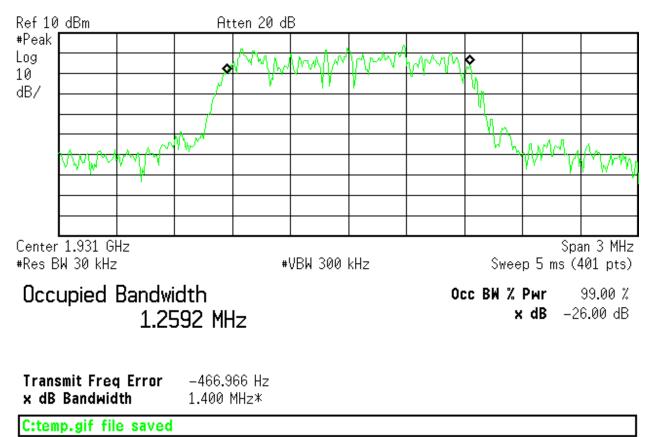






🔆 Agilent





One-X Low Channel

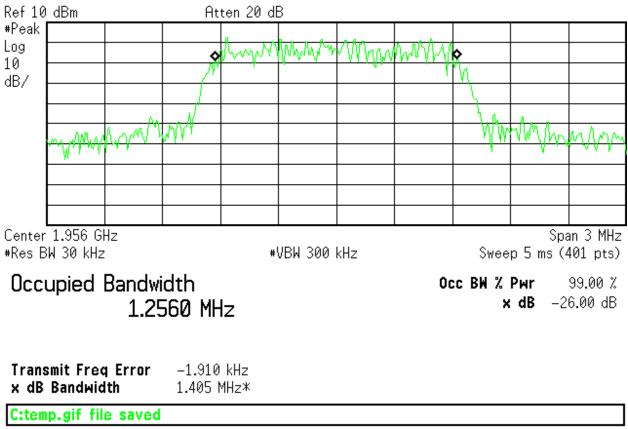




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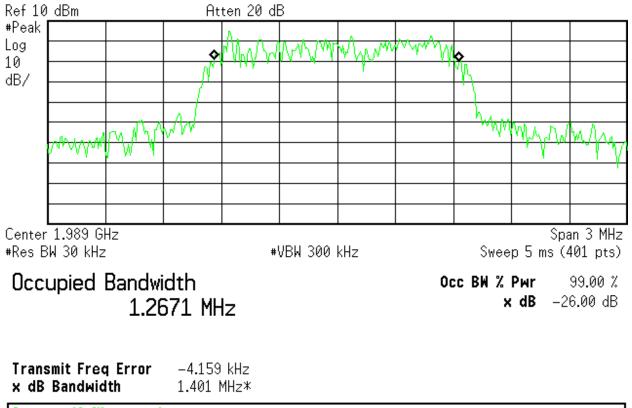
One-X Mid Channel









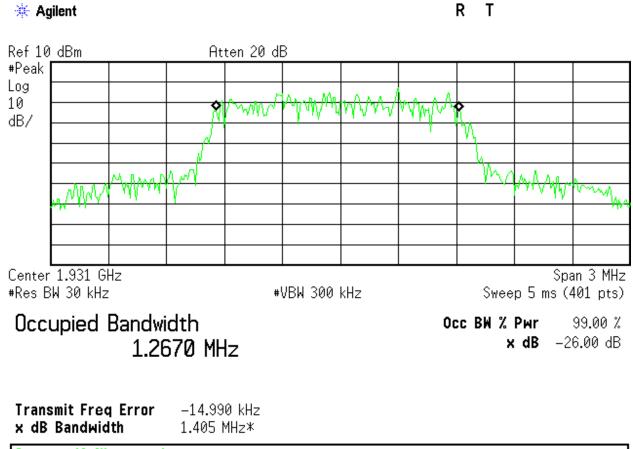


C:temp.gif file saved

One-X High Channel







C:temp.gif file saved

Beacon BC1

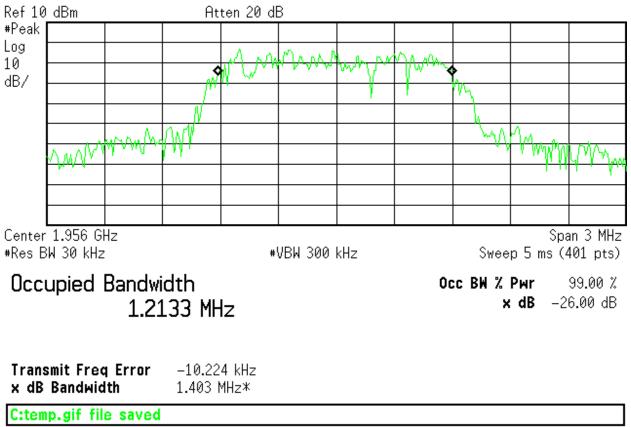
Beacon BC1 Low Channel









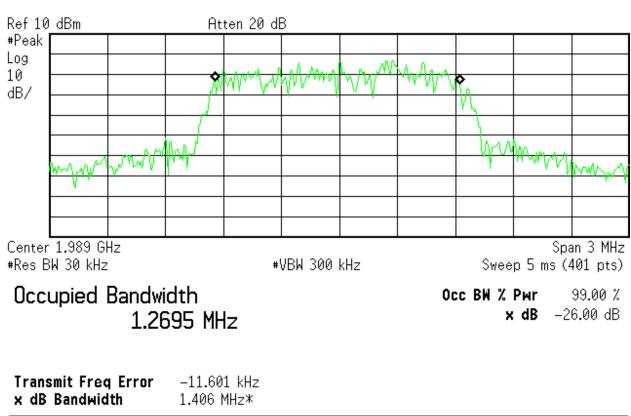


Beacon BC1 Mid Channel





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R T

C:temp.gif file saved

🔆 Agilent

Beacon BC1 High Channel





EIRP

"Mobile and portable stations are limited to 2 watts EIRP and the equipment must employ a means for limiting power to the minimum necessary for successful communications." [24.232 (c)]

Date:	23-May-13		Company	Airvana					V	Vork Order:	N1043
Engineer:	Edward Breen		EUT Desc:	750721 Fer	nto Cell			EUT Operat	ing Voltage/	Frequency:	120V/60Hz
Temp:	23.2°C		Humidity:	33%	Pressure:	1002mBar					
	F	requency Range	: Part 24 E,	EIRP meas	urements			Measureme	nt Distance:	3m	
Notes:											
Antenna		Signal Generator	Тх	Tx Ant	Adjusted			FCC 24	.232 section	с	
Polarization (H/V)	Frequency (MHz)	Output (dBm)	Cable (dB)	Gain (dBi)	ERP (dBm)	Limit (dBm)	Margin (dB)	Result (Pass/Fail)			
Beacon BC1 Ch. 25											
Н	1931.25	6.1	0.7	8.0	13.4	33.0	-19.6	Pass			
V	1931.25	8.2	0.7	8.0	15.5	33.0	-17.5	Pass			
Beacon BC1 Ch. 525											
H	1956.25	6.4	0.7	8.0	13.7	33.0	-19.3	Pass			
V	1956.25	7.1	0.7	8.0	14.4	33.0	-18.6	Pass			
Beacon BC1 Ch. 1175											
н	1988.75	8.6	0.8	8.0	15.8	33.0	-17.2	Pass			
V	1988.75	9.0	0.8	8.0	16.2	33.0	-16.8	Pass			
One-X Ch. 25											
н	1931.25	6.0	0.7	8.0	13.3	33.0	-19.7	Pass			
V	1931.25	6.5	0.7	8.0	13.8	33.0	-19.2	Pass			
One-X Ch. 525											
Н	1956.25	6.7	0.7	8.0	14.0	33.0	-19.0	Pass			
V	1956.25	9.4	0.7	8.0	16.7	33.0	-16.3	Pass			
One-X Ch. 1175											
н	1988.75	9.5	0.8	8.0	16.7	33.0	-16.3	Pass			
V	1988.75	10.7	0.8	8.0	17.9	33.0	-15.1	Pass			
EVDO Ch. 25											
н	1931.25	14.9	0.7	8.0	22.2	33.0	-10.8	Pass			
V	1931.25	17.9	0.7	8.0	25.2	33.0	-7.8	Pass			
EVDO Ch. 525											
н	1956.25	15.3	0.7	8.0	22.6	33.0	-10.4	Pass			
V	1956.25	16.1	0.7	8.0	23.4	33.0	-9.6	Pass			
EVDO Ch. 1175											
Н	1988.75	15.3	0.8	8.0	22.5	33.0	-10.5	Pass			
V	1988.75	15.6	0.8	8.0	22.8	33.0	-10.2	Pass			
Table	e Result:	Pass	by	-7.8				Wa	orst Freq:	1931.25	MHz
Test Site:	1DCC-OATS-3		e Antenna:	Yellow Horr		Trance	nit Antonna	: Black Horn			Rental Sweep





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Rev. 5/15/2013

54. 5/15/2015							
Spectrum Analyzers / Receivers /Preselectors Rental SA #1 (Brown)	Range 9kHz-26.5GHz	MN E4407B	Mfr Agilent	SN SG44210511	Asset 1510	Cat I	Calibration Due 4/15/2014
Radiated Emissions Sites	FCC Code	IC Code	VCCI Code	Range		Cat	Calibration Due
1DCC-OATS-3M-II	719150	2762A-10	A-0015	30-1000MHz		Ш	5/11/2015
Antennas	Range	MN	Mfr	SN	Asset	Cat	Calibration Due
Yellow Horn	1-18GHz	3115	EMCO	9608-4898	37	I	6/17/2013
Black Hom	1-18GHz	3115	EMCO	9703-5148	56	I	6/29/2013
Meteorological Meters		MN	Mfr	SN	Asset	Cat	Calibration Due
Weather Clock (Pressure Only)		BA928	Oregon Scientific	C3166-1	831	I	3/20/2014
1DCC-OATS-3M-I Thermohygrometer		35519-044	Control Company	72457635	1334	Ш	8/19/2013
Cables	Range		Mfr			Cat	Calibration Due
Asset #1506	9kHz - 18GHz		Florida RF			Ш	2/2/2014
Asset #1787	9kHz - 18GHz		Florida RF			Ш	3/14/2014
Signal Generators	Range	MN	Mfr	SN	Asset	Cat	Calibration Due
Rental Sweeper	0.01-20.0GHz	HP83752B	Agilent	3610A01297	Rental	I	8/28/2013

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





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Band Edge Measurements

LIMITS

"The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P) dB$." [24.238(a)]

"A narrower resolution bandwidth is permitted in all cases to improve measurement accuracy provided the measured power is integrated over the full required measurement bandwidth (i.e. 1MHz or 1 percent of emission bandwidth, as specified)." [24.238(b)]

MEASUREMENTS / RESULTS

Note: Mask lines are set to -13dBm at 1930MHz and 1990MHz.

Spectrum analyzer screen plots for EVDO, One-X, and Beacon BC1 are shown on the following pages.

TEST EQUIPMENT USED

Rev. 5/15/2013

. 3/13/2013							
Spectrum Analyzers / Receivers /Preselectors Rental SA #1 (Brown)	Range 9kHz-26.5GHz	MN E4407B	Mfr Agilent	SN SG44210511	Asset 1510	Cat I	Calibration Due 4/15/2014
Radiated Emissions Sites	FCC Code	IC Code	VCCI Code	Range		Cat	Calibration Due
1DCC-OATS-3M-II	719150	2762A-10	A-0015	30-1000MHz		Ш	5/11/2015
Preamps /Couplers Attenuators / Filters	Range	MN	Mfr	SN	Asset	Cat	Calibration Due
HF 20dB 50W Attenuator	0.009-18 GHz	PE 7019-20	Pasternack	1	791	Ш	6/1/2013
Meteorological Meters		MN	Mfr	SN	Asset	Cat	Calibration Due
Temp./Humidity/Atm. Pressure Gauge		7400 Perception II	Davis	N/A	965	I.	4/4/2013
1DCC-OATS-3M-I Thermohygrometer		35519-044	Control Company	72457635	1334	Ш	8/19/2013
	Spectrum Analyzers / Receivers /Preselectors Rental SA #1 (Brown) Radiated Emissions Sites 1DCC-OATS-3M-II Preamps /Couplers Attenuators / Filters HF 20dB 50W Attenuator Meteorological Meters Temp./Humidity/Atm. Pressure Gauge	Spectrum Analyzers / Receivers /Preselectors Rental SA #1 (Brown) Range 9kHz-26.5GHz Radiated Emissions Sites 1DCC-OATS-3M-II FCC Code 719150 Preamps /Couplers Attenuators / Filters HF 20dB 50W Attenuator Range 0.009-18 GHz Meteorological Meters Temp./Humidity/Atm. Pressure Gauge Pressure Gauge	Spectrum Analyzers / Receivers /Preselectors Rental SA #1 (Brown) Range 9kHz-26.5GHz MN E4407B Radiated Emissions Sites 1DCC-OATS-3M-II FCC Code 719150 IC Code 2762A-10 Preamps /Couplers Attenuators / Filters HF 20dB 50W Attenuator Range 0.009-18 GHz MN PE 7019-20 Meteorological Meters Temp./Humidity/Atm. Pressure Gauge MN 7400 Perception II	Spectrum Analyzers / Receivers / Preselectors Rental SA #1 (Brown)Range 9kHz-26.5GHzMN E4407BMfr AgilentRadiated Emissions Sites 1DCC-OATS-3M-IIFCC Code 719150IC Code 2762A-10VCCI Code A-0015Preamps /Couplers Attenuators / Filters HF 20dB 50W AttenuatorRange 0.009-18 GHzMN PE 7019-20Mfr PasternackMeteorological Meters Temp./Humidity/Atm. Pressure GaugeMN 7400 Perception IIMfr Davis	Spectrum Analyzers / Receivers / Preselectors Rental SA #1 (Brown) Range 9kHz-26.5GHz MN E4407B Mfr Agilent SN SG44210511 Radiated Emissions Sites 1DCC-OATS-3M-II FCC Code 719150 IC Code 2762A-10 VCCI Code A-0015 Range 30-1000MHz Preamps /Couplers Attenuators / Filters HF 20dB 50W Attenuator Range 0.009-18 GHz MN PE 7019-20 Mfr Pastemack SN 1 Meteorological Meters Temp./Humidity/Atm. Pressure Gauge MN 7400 Perception II Mfr Davis SN N/A	Spectrum Analyzers / Receivers /Preselectors Rental SA #1 (Brown) Range 9kHz-26.5GHz MN E4407B Mfr Agilent SN SG44210511 Asset 1510 Radiated Emissions Sites 1DCC-OATS-3M-II FCC Code 719150 IC Code 2762A-10 VCCI Code A-0015 Range 30-1000MHz Preamps /Couplers Attenuators / Filters HF 20dB 50W Attenuator Range 0.009-18 GHz MN PE 7019-20 Mfr Pasternack SN 1 Asset 791 Meteorological Meters Temp./Humidity/Atm. Pressure Gauge MN 7400 Perception II Mfr Davis SN N/A Asset 965	Spectrum Analyzers / Receivers /Preselectors Rental SA #1 (Brown) Range 9kHz-26.5GHz MN E4407B Mfr Agilent SN SG44210511 Asset 1510 Cat I Radiated Emissions Sites 1DCC-OATS-3M-II FCC Code 719150 IC Code 2762A-10 VCCI Code A-0015 Range 30-1000MHz Cat II Preamps /Couplers Attenuators / Filters HF 20dB 50W Attenuator Range 0.009-18 GHz MN PE 7019-20 Mfr Pastemack SN 1 Asset II Cat II Meteorological Meters Temp./Humidity/Atm. Pressure Gauge MN 7400 Perception II Mfr Davis SN N/A Asset 965 Cat II

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

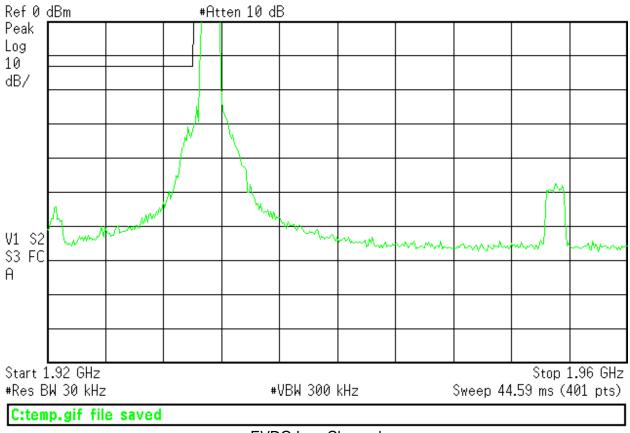




EVDO

🔆 Agilent





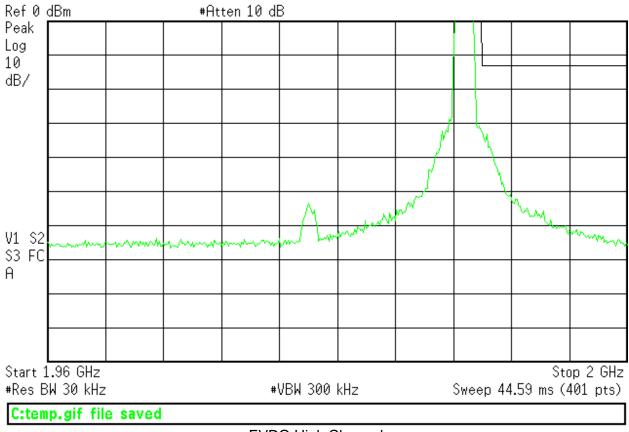
EVDO Low Channel











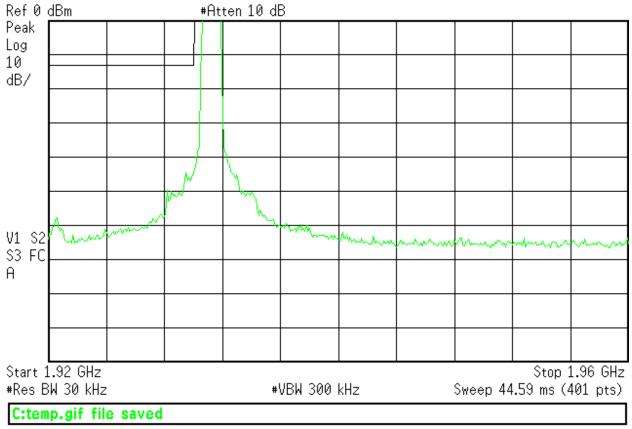
EVDO High Channel











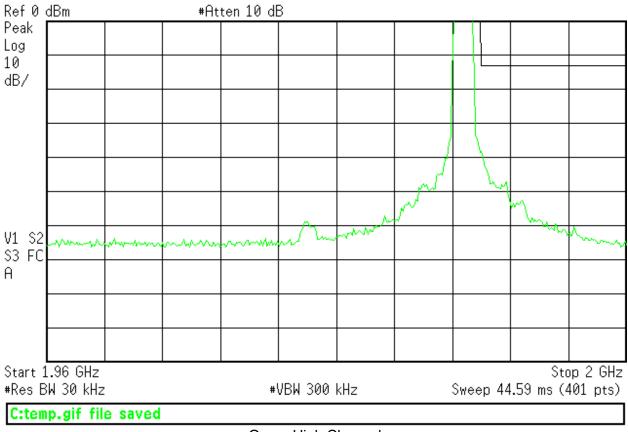
One-X Low Channel











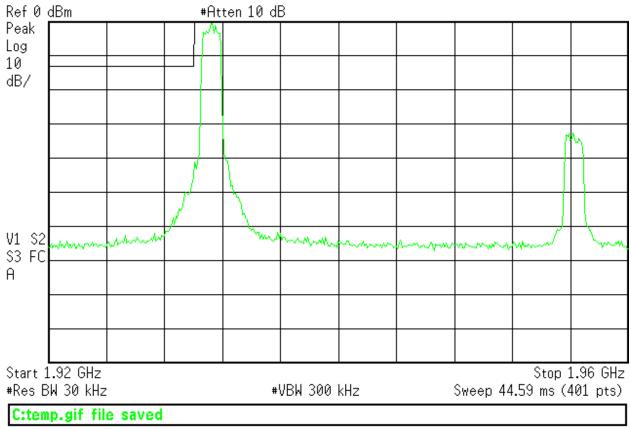
One-x High Channel





Beacon BC1





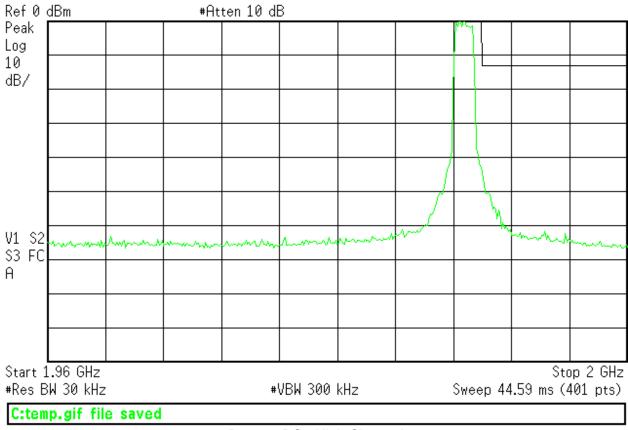












Beacon BC1 High Channel





Conducted Spurious Emissions at Antenna Port

"The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P) dB$." [24.238(a)]

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

Spectrum analyzer screen plots for EVDO, One-X, and Beacon BC1 are shown on the following pages.

TEST EQUIPMENT USED

Rev. 5/15/2013							
Spectrum Analyzers / Receivers / Preselectors	Range	MN	Mfr	SN	Asset	Cat	Calibration Due
Rental SA #1 (Brown)	9kHz-26.5GHz	E4407B	Agilent	SG44210511	1510	T	4/15/2014
Radiated Emissions Sites	FCC Code	IC Code	VCCI Code	Range		Cat	Calibration Due
1DCC-OATS-3M-II	719150	2762A-10	A-0015	30-1000MHz		Ш	5/11/2015
Preamps /Couplers Attenuators / Filters	Range	MN	Mfr	SN	Asset	Cat	Calibration Due
HF 20dB 50W Attenuator	0.009-18 GHz	PE 7019-20	Pasternack	1	791	Ш	6/1/2013
Meteorological Meters		MN	Mfr	SN	Asset	Cat	Calibration Due
Temp./Humidity/Atm. Pressure Gauge		7400 Perception II	Davis	N/A	965	1	4/4/2013
1DCC-OATS-3M-I Thermohygrometer		35519-044	Control Company	72457635	1334	Ш	8/19/2013

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





PLOTS

EVDO

🔆 Agilent



Ref 0	dBm		#At	ten 10 di	3					
Peak										
Log										
10										
dB/										
V1 S2	month	man	hunter	m	man	mound	mon		month	-
S3 FC										
Ĥ										
Start 3								~	Sto	p 1 GHz
	W 120 kH			:	⊎VBW 1 M	Hz		Sweep 15	i1.9 ms (4	101 pts)
C:tem	p.gif fil	e saved								

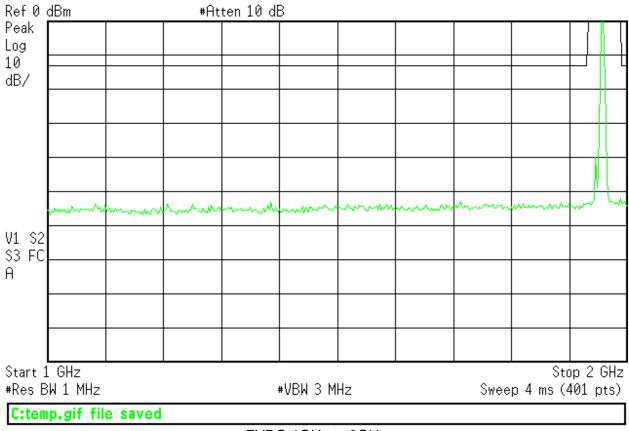
EVDO 30MHz to 1GHz











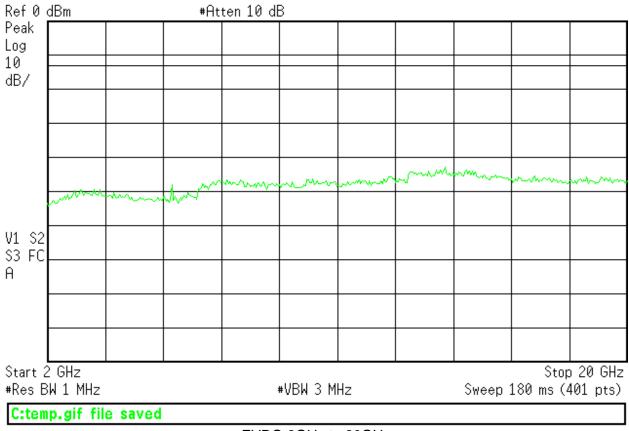
EVDO 1GHz to 2GHz











EVDO 2GHz to 20GHz

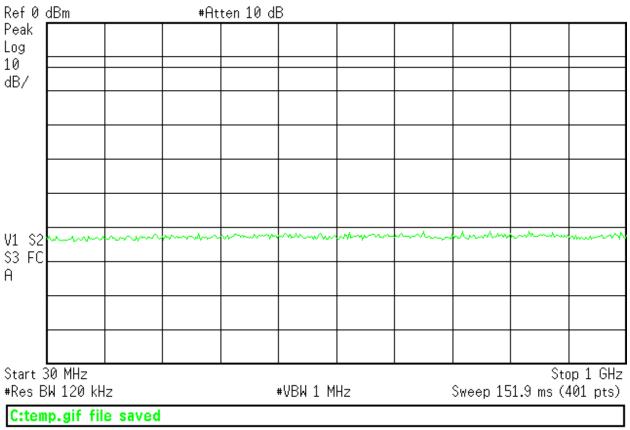




One-X

🔆 Agilent

R T



One-X 30MHz to 1GHz

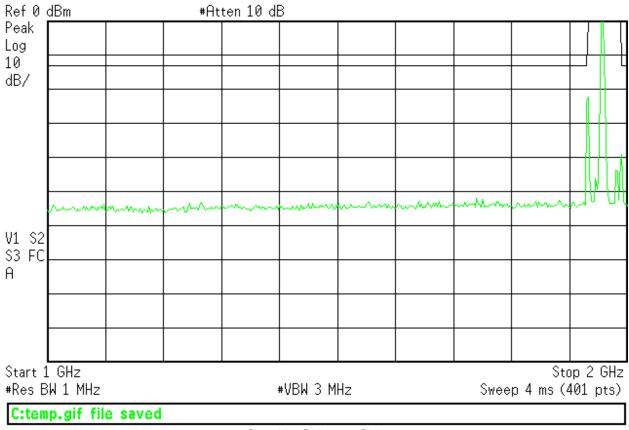




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One-X 1GHz to 2GHz

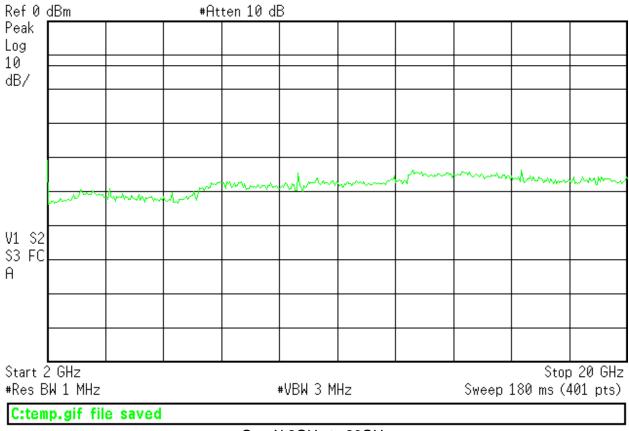




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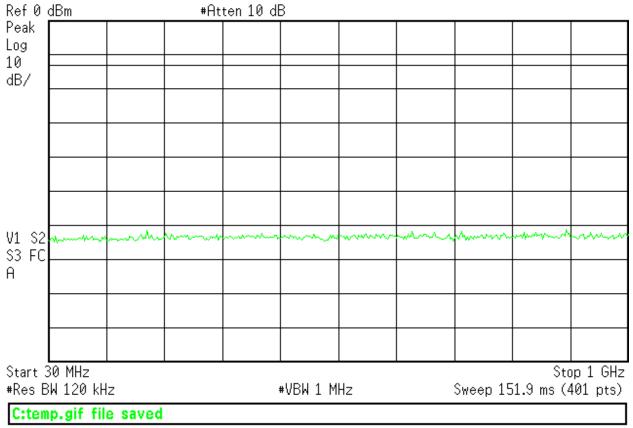
One-X 2GHz to 20GHz





Beacon BC1





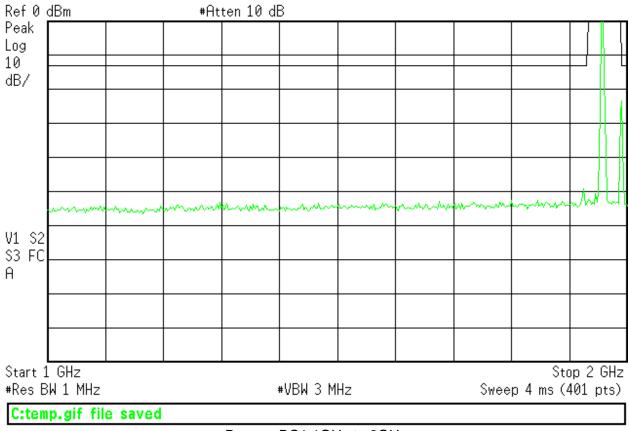














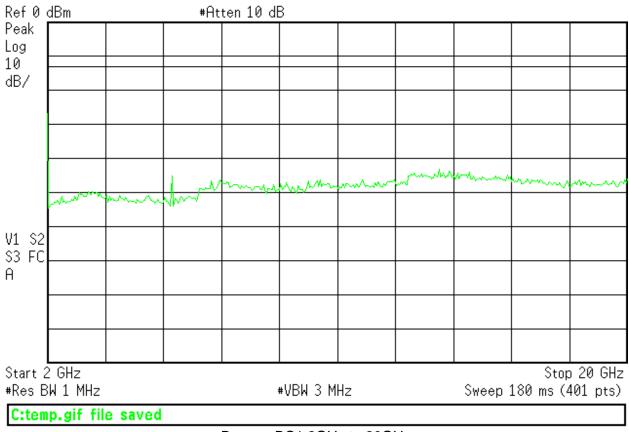




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Occupied Bandwidth

n Measurements							
24-May-13	Co	mpany: A	lirvana	V	Vork O	rder:	N1043
Edward Breen	EU	JT Desc: 7	50721 Femt	o Cell E	EUT Po	wer:	120V/60Hz
23.1°C	H	umidity: 3	6%		Pres	sure:	998mbar
Frequency Range:	862-869MHz, FC	C Part 90					
CHANNEL POSITION	CHANNEL NU	MBER	FREQUEN	ICY	26dE	B BAN	DWIDTH
			(MHz)			(M⊦	łz)
Low	476		862.90			1.4	11
Mid	576		865.4			1.4	17
High	676		867.9			1.4	17
1DCC-OATS-3M-II				Spectrun	n Analy	/zer:	Rental #1
Iyzers / Receivers /Preselectors ental SA #1 (Brown)	Range 9kHz-26.5GHz	MN E4407B	Mfr Agilent	SN SG44210511	Asset 1510	Cat I	Calibration Due 4/15/2014
iated Emissions Sites 1DCC-OATS-3M-II	FCC Code 719150	IC Code 2762A-10	VCCI Code A-0015	Range 30-1000MHz		Cat II	Calibration Due 5/11/2015
Couplers Attenuators / Filters	Range	MN	Mfr	SN	Asset	Cat	Calibration Due
i	24-May-13 Edward Breen 23.1°C Frequency Range: CHANNEL POSITION Low Mid High 1DCC-OATS-3M-II Vyzers / Receivers /Preselectors ental SA #1 (Brown) iated Emissions Sites 1DCC-OATS-3M-II	24-May-13 Co Edward Breen EL 23.1°C Hi Frequency Range: 862-869MHz, FC CHANNEL POSITION CHANNEL POSITION CHANNEL NU Low 476 Mid 576 High 676 1DCC-OATS-3M-II PkHz-26.5GHz stated Emissions Sites FCC Code 1DCC-OATS-3M-II 719150	24-May-13 Company: A Edward Breen EUT Desc: 7 23.1°C Humidity: 3 Frequency Range: 862-869MHz, FCC Part 90 CHANNEL POSITION CHANNEL POSITION CHANNEL NUMBER Low 476 Mid 576 High 676 1DCC-OATS-3M-II PKHz-26.5GHz MN Mated Emissions Sites FCC Code IC Code 1DCC-OATS-3M-II FCC Code IC Code 1DCC-OATS-3M-II 719150 2762A-10	24-May-13 Company: Airvana Edward Breen EUT Desc: 750721 Femt 23.1°C Humidity: 36% Frequency Range: 862-869MHz, FCC Part 90 CHANNEL POSITION CHANNEL POSITION Low 476 862.90 Mid 576 865.4 High 676 865.4 1DCC-OATS-3M-II 9kHz-26.5GHz Min Mfr Agilent 576 8407B Agilent iated Emissions Sites FCC Code IC Code VCCI Code 1DCC-OATS-3M-II 719150 2762A-10 A-0015	24-May-13 Company: Airvana W Edward Breen EUT Desc: 750721 Femto Cell B 23.1°C Humidity: 36% Frequency Range: 862-869MHz, FCC Part 90 Frequency Range: 862-869MHz, FCC Part 90 CHANNEL POSITION CHANNEL NUMBER FREQUENCY (MHz) (MHz) Low 476 862.90 Mid 576 865.4 High 676 867.9 1DCC-OATS-3M-II Spectrum Vyzers / Receivers /Preselectors tental SA #1 (Brown) Range 9kHz-26.5GHz MN E4407B Mfr Agilent SN SG44210511 iated Emissions Sites 1DCC-OATS-3M-II FCC Code 719150 IC Code 2762A-10 VCCI Code A-0015 Range 30-1000MHz	24-May-13 Company: Airvana Work Or Edward Breen EUT Desc: 750721 Femto Cell EUT Po 23.1°C Humidity: 36% Press Frequency Range: 862-869MHz, FCC Part 90 Frequency Range: 862-869MHz, FCC Part 90 Frequency Range: 862-869MHz, FCC Part 90 CHANNEL POSITION CHANNEL NUMBER FREQUENCY 26de Low 476 862.90 (MHz) Low 476 862.90 865.4 High 676 865.4 150 DCC-OATS-3M-II Spectrum Analy Sg44210511 1510 Mid S776 865.4 1510 1510 IDCC-OATS-3M-II Sg44210511 1510 Sg44210511 719150 2762A-10 A-0015 30-1000MHz	24-May-13 Company: Airvana Work Order: Edward Breen EUT Desc: 750721 Femto Cell EUT Power: 23.1°C Humidity: 36% Pressure: Frequency Range: 862-869MHz, FCC Part 90 Pressure: Pressure: CHANNEL POSITION CHANNEL NUMBER FREQUENCY 26dB BAN Low 476 862.90 1.4 Mid 576 865.4 1.4 High 676 865.4 1.4 IDCC-OATS-3M-II Range MN Mfr SN Asset Cat IDCC-OATS-3M-II FCC Code IC Code VCCI Code Range Code VCCI Code Range Cat IDCC-OATS-3M-II FCC Code IC Code VCCI Code Range Cat

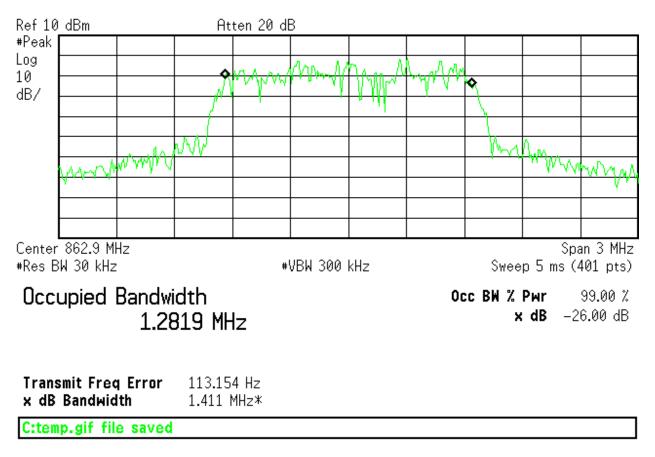
All equipment is calibrated using standards traceable to NIST or other nationally recognized calibration standard.











Beacon BC10 Low Channel (Ch. 476)

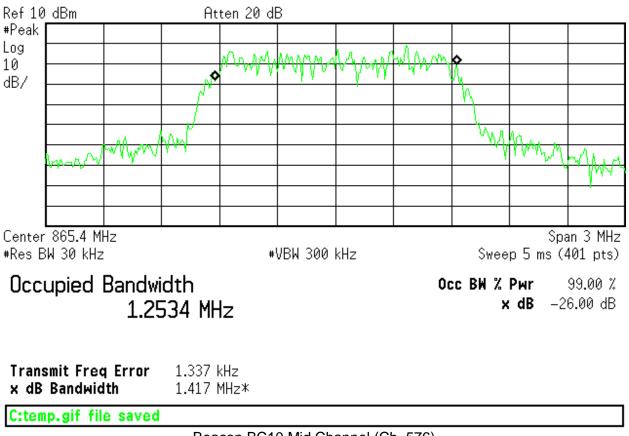




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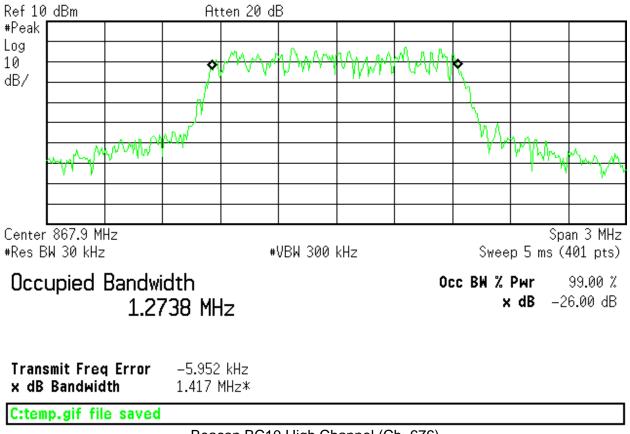
Beacon BC10 Mid Channel (Ch. 576)











Beacon BC10 High Channel (Ch. 676)





ERP

Date:	23-May-13		Company:	Airvana				١	Nork Orde	er: N1043
Engineer:	Edward Breen	ı	EUT Desc:	750721 Femto Cell			EUT Operatin	g Voltage/	/Frequenc	y: 120V/60Hz
Temp:	23.2°C		Humidity:	33%	Pressure: 10	02mBar				
	F	Frequency Range:	Part 90 ERP mea	surements			Measurement	Distance:	3m	
Notes:	Band Class 1	0								
Antenna		Signal Generator	Tx Antenna	Тх	Adjusted	FCC 90.635	(b)			-
Polarization (H / V)	Frequency (MHz)	Output (dBm)	Gain (dBi)	Cable (dB)	ERP (dBm)	Limit Margin (dBm) (dB)	Result (Pass/Fail)	Limit (dBµV/m)	Margin (dB)	Result (Pass/Fail)
							1			(
Channel 476										
H V	862.9 862.9	5.3 11.1	0.0 0.0	0.5 0.5	4.8 10.6	50.0 -45.2 50.0 -39.4	Pass Pass			
v	002.9	11.1	0.0	0.5			Pass			
Channel 576										
н	865.4	4.2	0.0	0.5	3.7	50.0 -46.3	Pass			
V	865.4	10.1	0.0	0.5	9.6	50.0 -40.4	Pass			
Channel 676 H	867.9	6.4	0.0	0.5	 5.9	 50.0 -44.1	 Pass			
п V	867.9	10.7	0.0	0.5	10.2	50.0 -39.8	Pass			
v	007.0	10.7								
								_		
Table	e Result:	Pass	by	-39.4			Wor	st Freq:	862	.9 MHz
	e Result: 1DCC-OATS-3		by Receive Antenna:			Transmit Antenna				
Test Site:				Red-Brown		Transmit Antenna Transmit Cable	: Dipole #756			.9 MHz or: Rental Sweepe
Test Site: Analyzer: lev. 5/15/201	1DCC-OATS- Rental SA#1 3	3M-II R	Receive Antenna: Receive Cable:	Red-Brown #1506		Transmit Cable	: Dipole #756 e: #1787	Signal	Generato	or: Rental Sweepe
Test Site: Analyzer: ev. 5/15/201	1DCC-OATS- Rental SA#1 3 um Analyze		Receive Antenna: Receive Cable:	Red-Brown	MN E4407B		: Dipole #756	Signal Asset	Generato	-
Test Site: Analyzer: ev. 5/15/201	1DCC-OATS- Rental SA#1 3 um Analyze Renta	3M-II R ers / Receivers /P I SA #1 (Brown)	Receive Antenna: Receive Cable: Preselectors	Red-Brown #1506 Range 9kHz-26.5GHz	E4407B	Transmit Cable Mfr Agilent	:: Dipole #756 :: #1787 SN SG44210511	Signal Asset	Generato Cat	Calibration Du 4/15/2014
Test Site: Analyzer: ev. 5/15/201	1DCC-OATS- Rental SA#1 3 um Analyze Renta Radiates	3M-II R	Receive Antenna: Receive Cable: Preselectors	Red-Brown #1506 Range		Transmit Cable Mfr	: Dipole #756 e: #1787 SN	Signal Asset 1510	Generato	Calibration Du 4/15/2014
Test Site: Analyzer: ev. 5/15/201	1DCC-OATS- Rental SA#1 3 um Analyze Renta Radiated 1DC	I SA #1 (Brown) d Emissions Site C-OATS-3M-II Antennas	Receive Antenna: Receive Cable: Preselectors	Red-Brown #1506 9kHz-26.5GHz FCC Code 719150 Range	E4407B IC Code 2762A-10 MN	Mfr Agilent VCCI Code A-0015 Mfr	:: Dipole #756 :: #1787 SN SG44210511 Range 30-1000MHz SN	Signal Asset 1510 Asset	Generato Cat I Cat II Cat	Calibration Du 4/15/2014 Calibration Du 5/11/2015 Calibration Du
Test Site: Analyzer: ev. 5/15/201	1DCC-OATS- Rental SA#1 3 um Analyze Renta Radiate 1DC	ameri Receivers / Pers / Receivers / Pers / Receivers / Person and the second state of	Receive Antenna: Receive Cable: Preselectors	Red-Brown #1506 9kHz-26.5GHz FCC Code 719150 Range 30-2000MHz	E4407B IC Code 2762A-10 MN JB1	Mfr Agilent VCCI Code A-0015 Mfr Sunol	:: Dipole #756 :: #1787 SN SG44210511 Range 30-1000MHz SN A0032406	Signal Asset 1510 Asset 1218	Generato Cat I Cat II Cat I	Calibration Du 4/15/2014 Calibration Du 5/11/2015 Calibration Du 1/8/2015
Test Site: Analyzer: ev. 5/15/201	1DCC-OATS- Rental SA#1 3 um Analyze Renta Radiate 1DC	I SA #1 (Brown) d Emissions Site C-OATS-3M-II Antennas	Receive Antenna: Receive Cable: Preselectors	Red-Brown #1506 9kHz-26.5GHz FCC Code 719150 Range	E4407B IC Code 2762A-10 MN	Mfr Agilent VCCI Code A-0015 Mfr	:: Dipole #756 :: #1787 SN SG44210511 Range 30-1000MHz SN	Signal Asset 1510 Asset	Generato Cat I Cat II Cat	Calibration Du 4/15/2014 Calibration Du 5/11/2015 Calibration Du
Test Site: Analyzer: ev. 5/15/201	1DCC-OATS- Rental SA#1 3 um Analyze Renta 1DC 1DC	3M-II R rs / Receivers /P I SA #1 (Brown) d Emissions Site CC-OATS-3M-II Antennas d-Brown Bilog Jastable Dipole rological Meters	Receive Antenna: Receive Cable: Preselectors	Red-Brown #1506 9kHz-26.5GHz FCC Code 719150 Range 30-2000MHz	E4407B IC Code 2762A-10 MN JB1 3121C MN	Mfr Agilent VCCI Code A-0015 Mfr Sunol EMCO Mfr	: Dipole #756 : #1787 SG44210511 Range 30-1000MHz SN A0032406 1371 SN	Signal Asset 1510 Asset 1218 756 Asset	Generato Cat I Cat II Cat I	Calibration Du 4/15/2014 Calibration Du 5/11/2015 Calibration Du 1/8/2015 12/28/2014 Calibration Du
Test Site: Analyzer: ev. 5/15/201 Spectro	1DCC-OATS- Rental SA#1 3 um Analyze Renta 1DC 1DC Rec Adju Meteor Weather C	3M-II R rs / Receivers /P I SA #1 (Brown) d Emissions Site C-OATS-3M-II Antennas d-Brown Bilog ustable Dipole rological Meters lock (Pressure Or	Receive Antenna: Receive Cable: Preselectors S	Red-Brown #1506 9kHz-26.5GHz FCC Code 719150 Range 30-2000MHz	E4407B IC Code 2762A-10 MN JB1 3121C MN BA928	Mfr Agilent VCCI Code A-0015 Mfr Sunol EMCO Mfr Oregon Scientific	:: Dipole #756 :: #1787 SN SG44210511 Range 30-1000MHz SN A0032406 1371 SN C3166-1	Signal Asset 1510 Asset 1218 756 Asset 831	Generato Cat I Cat I Cat I Cat I Cat	Calibration Du 4/15/2014 Calibration Du 5/11/2015 Calibration Du 1/8/2015 12/28/2014 Calibration Du 3/20/2014
Test Site: Analyzer: ev. 5/15/201 Spectro	1DCC-OATS- Rental SA#1 3 um Analyze Renta 1DC 1DC Rec Adju Meteor Weather C	3M-II R rs / Receivers /P I SA #1 (Brown) d Emissions Site CC-OATS-3M-II Antennas d-Brown Bilog Jastable Dipole rological Meters	Receive Antenna: Receive Cable: Preselectors S	Red-Brown #1506 9kHz-26.5GHz FCC Code 719150 Range 30-2000MHz	E4407B IC Code 2762A-10 MN JB1 3121C MN	Mfr Agilent VCCI Code A-0015 Mfr Sunol EMCO Mfr	: Dipole #756 : #1787 SG44210511 Range 30-1000MHz SN A0032406 1371 SN	Signal Asset 1510 Asset 1218 756 Asset	Cat I Cat I Cat I Cat I Cat	Calibration Du 4/15/2014 Calibration Du 5/11/2015 Calibration Du 1/8/2015 12/28/2014 Calibration Du
Test Site: Analyzer: ev. 5/15/201 Spectro	1DCC-OATS-3 Rental SA#1 3 um Analyze Renta 1DC 1DC 1DC 1DC Meteor Weather C DCC-OATS-3	3M-II R rs / Receivers /P I SA #1 (Brown) d Emissions Site CC-OATS-3M-II Antennas d-Brown Bilog ustable Dipole rological Meters dock (Pressure Or 3M-I Thermohygro Cables	Receive Antenna: Receive Cable: Preselectors S	Red-Brown #1506 9kHz-26.5GHz FCC Code 719150 Range 30-2000MHz 30-1000MHz	E4407B IC Code 2762A-10 MN JB1 3121C MN BA928 35519-044	Mfr Agilent VCCI Code A-0015 Mfr Sunol EMCO Mfr Oregon Scientific Control Company Mfr	:: Dipole #756 :: #1787 SN SG44210511 Range 30-1000MHz SN A0032406 1371 SN C3166-1	Signal Asset 1510 Asset 1218 756 Asset 831	Generato Cat I Cat I Cat I Cat I U Cat	Calibration Du 4/15/2014 Calibration Du 5/11/2015 Calibration Du 1/8/2015 12/28/2014 Calibration Du 3/20/2014 8/19/2013 Calibration Du
Test Site: Analyzer: ev. 5/15/201 Spectro	1DCC-OATS-3 Rental SA#1 3 a Manalyze Renta 1DC 1DC 1DC 4dju Meteor Weather C DCC-OATS-3	3M-II R rs / Receivers /P I SA #1 (Brown) d Emissions Site CC-OATS-3M-II Antennas d-Brown Bilog ustable Dipole rological Meters lock (Pressure Or 3M-I Thermohygro Cables usset #1506	Receive Antenna: Receive Cable: Preselectors S	Red-Brown #1506 9kHz-26.5GHz FCC Code 719150 Range 30-2000MHz 30-1000MHz 80-1000MHz	E4407B IC Code 2762A-10 MN JB1 3121C MN BA928 35519-044	Mfr Agilent VCCI Code A-0015 Mfr Sunol EMCO Mfr Oregon Scientific Control Company Mfr Florida RF	:: Dipole #756 :: #1787 SN SG44210511 Range 30-1000MHz SN A0032406 1371 SN C3166-1	Signal Asset 1510 Asset 1218 756 Asset 831	Generato Cat I Cat I Cat I I Cat I I Cat I I	Calibration Du 4/15/2014 Calibration Du 5/11/2015 Calibration Du 1/8/2015 12/28/2014 Calibration Du 3/20/2014 8/19/2013 Calibration Du 2/2/2014
Test Site: Analyzer: ev. 5/15/201 Spectro	1DCC-OATS-3 Rental SA#1 3 a Manalyze Renta 1DC 1DC 1DC 4dju Meteor Weather C DCC-OATS-3	3M-II R rs / Receivers /P I SA #1 (Brown) d Emissions Site CC-OATS-3M-II Antennas d-Brown Bilog ustable Dipole rological Meters dock (Pressure Or 3M-I Thermohygro Cables	Receive Antenna: Receive Cable: Preselectors S	Red-Brown #1506 9kHz-26.5GHz FCC Code 719150 Range 30-2000MHz 30-1000MHz	E4407B IC Code 2762A-10 MN JB1 3121C MN BA928 35519-044	Mfr Agilent VCCI Code A-0015 Mfr Sunol EMCO Mfr Oregon Scientific Control Company Mfr	:: Dipole #756 :: #1787 SN SG44210511 Range 30-1000MHz SN A0032406 1371 SN C3166-1	Signal Asset 1510 Asset 1218 756 Asset 831	Generato Cat I Cat I Cat I Cat I U Cat	Calibration Du 4/15/2014 Calibration Du 5/11/2015 Calibration Du 1/8/2015 12/28/2014 Calibration Du 3/20/2014 8/19/2013 Calibration Du
Test Site: Analyzer: ev. 5/15/201 Spectro	1DCC-OATS-C Rental SA#1 3 um Analyze Renta 1DC 1DC 1DC 1DC 1DC 1DC 1DC 1DC 1DC 1DC	3M-II R rs / Receivers /P I SA #1 (Brown) d Emissions Site CC-OATS-3M-II Antennas d-Brown Bilog ustable Dipole rological Meters lock (Pressure Or 3M-I Thermohygro Cables usset #1506	Receive Antenna: Receive Cable: Preselectors S	Red-Brown #1506 9kHz-26.5GHz FCC Code 719150 Range 30-2000MHz 30-1000MHz 80-1000MHz	E4407B IC Code 2762A-10 MN JB1 3121C MN BA928 35519-044	Mfr Agilent VCCI Code A-0015 Mfr Sunol EMCO Mfr Oregon Scientific Control Company Mfr Florida RF	:: Dipole #756 :: #1787 SN SG44210511 Range 30-1000MHz SN A0032406 1371 SN C3166-1	Signal Asset 1510 Asset 1218 756 Asset 831	Generato Cat I Cat I Cat I I Cat I I Cat I I	Calibration Du 4/15/2014 Calibration Du 5/11/2015 Calibration Du 1/8/2015 12/28/2014 Calibration Du 3/20/2014 8/19/2013 Calibration Du 2/2/2014

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





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Emission Mask LIMITS

47 CFR 90.961:

(a) Out-of-band emission requirement shall apply only to the "outer" channels included in an EA license and to spectrum adjacent to interior channels used by incumbent licensees. The emission limits are as follows:

(1) 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.

(2) 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 + 10Log₁₀ (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.

MEASUREMENTS / RESULTS

Spectrum Analyzer settings:

Resolution Bandwidth: 30kHz Video Bandwidth: 300kHz Peak detector

Emission Mask:

The following limits are applied in the spectral plots:

Attenuation within 37.5kHz of band: 50 + 10Log(P), resulting in -20dBm Attenuation beyond 37.5kHz from band: 43 + 10Log(P), resulting in -13dBm

TEST EQUIPMENT USED

Rev. 5/15/2013							
Spectrum Analyzers / Receivers / Preselectors	Range	MN	Mfr	SN	Asset	Cat	Calibration Due
Rental SA #1 (Brown)	9kHz-26.5GHz	E4407B	Agilent	SG44210511	1510	I	4/15/2014
Radiated Emissions Sites	FCC Code	IC Code	VCCI Code	Range		Cat	Calibration Due
1DCC-OATS-3M-II	719150	2762A-10	A-0015	30-1000MHz		Ш	5/11/2015
Preamps /Couplers Attenuators / Filters	Range	MN	Mfr	SN	Asset	Cat	Calibration Due
HF 20dB 50W Attenuator	0.009-18 GHz	PE 7019-20	Pasternack	1	791	Ш	6/1/2013

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



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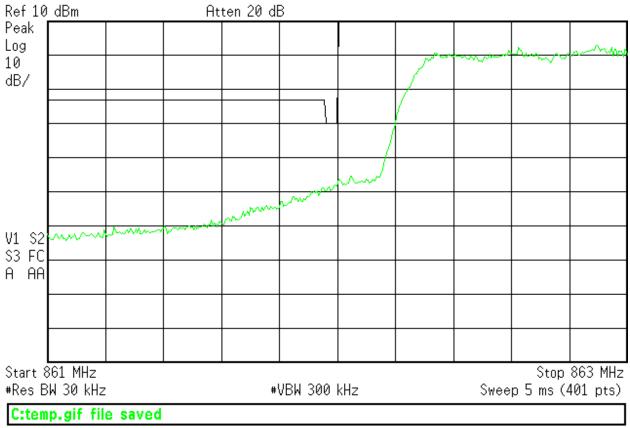


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<u>PLOTS</u>

🔆 Agilent





Beacon BC10 Low Channel

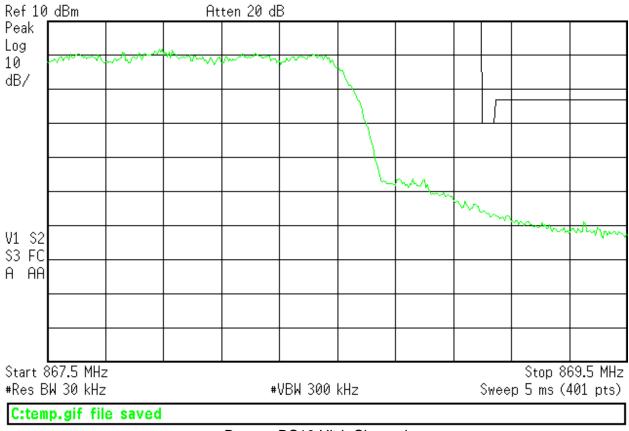




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Beacon BC10 High Channel





Conducted Spurious Emissions at Antenna Port

90.669 Emission limits.

(a) On any frequency in an MTA licensee's spectrum block that is adjacent to a non-MTA frequency, the power of any emission shall be attenuated below the transmitter power (P) by at least 43 plus 10 log₁₀
 (P) decibels or 80 decibels, whichever is the lesser attenuation.

Limit = 10*log(P[mW]) - (43 + 10*log(P[W])) = -13dBm

TEST EQUIPMENT USED

Rev. 5/15/2013

Spectrum Analyzers / Receivers / Preselectors	Range	MN	Mfr	SN	Asset	Cat	Calibration Due
Rental SA #1 (Brown)	9kHz-26.5GHz	E4407B	Agilent	SG44210511	1510	I	4/15/2014
Radiated Emissions Sites	FCC Code	IC Code	VCCI Code	Range		Cat	Calibration Due
1DCC-OATS-3M-II	719150	2762A-10	A-0015	30-1000MHz		II	5/11/2015
Preamps /Couplers Attenuators / Filters	Range	MN	Mfr	SN	Asset	Cat	Calibration Due
HF 20dB 50W Attenuator	0.009-18 GHz	PE 7019-20	Pasternack	1	791	II	6/1/2013

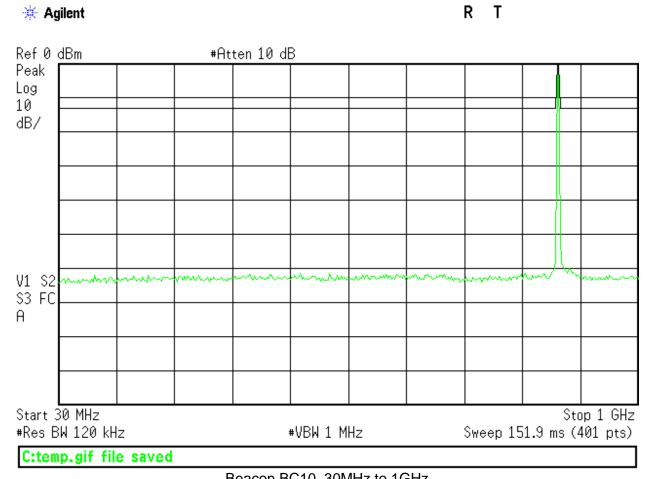
All equipment is calibrated using standards traceable to NIST or other nationally recognized calibration standard.





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PLOTS



Beacon BC10, 30MHz to 1GHz

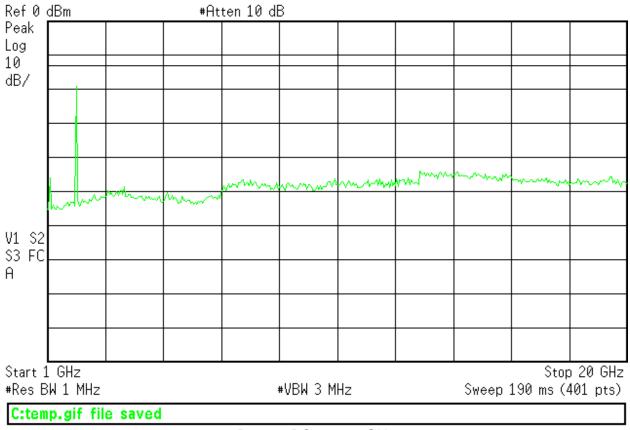




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Beacon BC10, 1-20GHz





Tests for Parts 22, 24, & 90

Radiated Spurious Emissions Measurements

MEASUREMENTS / RESULTS

Note that the EUT passes the FCC Class B limit, which is much lower than the -13dBm limit (82.158dBuV/m at 3 meters) for licensed transmitter spurious emissions. Only worst-case radiated spurious data is presented.





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Radiated Emissions Table

Engineer: Edward Temp: 22°C Notes: Antenna Polarization (H/V) V 42.9 H 42.9 V 42.1 H 42.1 V 47.1 H 47.1 V 79.7 H 79.7 V 2500 H 2500 H 3755 H 3755	requency Ra	Humidity	: Train 7 Fe : 18%	mpto Cell	(750721)						
Antenna Polarization (H/V) Freque (Мн2 V 42.9 V 42.9 V 42.9 V 42.9 V 47.4 V 47.4 V 79.7 H 79.7 V 250. H 250. V 375.	requency Ra	,	: 18%		D	4000 D		EUT Operat	ing voltage/	Frequency:	120V/60HZ
Notes: Antenna Polarization (H/V) Freque (M+b) V 42.9 H 42.4 V 47.4 V 47.4 V 79.7 H 79.7 V 250. H 250. V 375.	requency Ra				Pressure:	1020mBar					
Antenna Polarization (H/V) Freque (M+z V 42. V 42.5 H 42.5 V 47.1 H 47.3 V 79.7 H 79.7 V 2500 H 2500 V 375.5		ige. 30-10000	IHZ					Measureme		-	
Polarization (H/V) Freque (MHz) V 42.5 H 42.5 V 47.4 V 79.7 H 79.7 V 2500 H 375.5								EUT	Max Freq:	1000MHz	
Polarization (H/V) Freque (MHz) V 42.9 H 42.9 V 47.1 H 47.2 V 79.7 H 250. H 250. V 375.		Preamp	Antenna	Cable	Adjusted					FCC Class	3
Н 42.1 V 47.1 H 47.1 V 79.7 H 79.7 V 250. H 250. V 375.		ng Factor	Factor (dB/m)	Factor (dB)	Reading (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result (Pass/Fail)	Limit (dBµV/m)	Margin (dB)	Result (Pass/Fail)
Н 42.1 V 47.1 H 47.1 V 79.7 H 79.7 V 250. H 250. V 375.											
V 47.1 H 47.4 V 79.7 H 79.7 V 250. H 250. V 375.	9 48.	2 25.8	11.3	0.4	34.1				40.0	-5.9	Pass
н 47.4 V 79.7 H 79.7 V 250. H 250. V 375.	9 33.	2 25.8	11.3	0.4	19.1				40.0	-20.9	Pass
н 47.4 V 79.7 H 79.7 V 250. H 250. V 375.											
V 79.7 H 79.7 V 250. H 250. V 375.	8 49.	4 25.8	8.6	0.5	32.7				40.0	-7.3	Pass
н 79.7 V 250. H 250. V 375.	8 41.	3 25.8	8.6	0.5	25.1				40.0	-14.9	Pass
н 79.7 V 250. H 250. V 375.											
V 250. H 250. V 375.	-	-	7.6	0.6	33.8				40.0	-6.2	Pass
H 250. V 375.	77 40.) 25.7	7.6	0.6	22.5				40.0	-17.5	Pass
H 250. V 375.											
V 375.	-		11.6	1.0	29.6				46.0	-16.4	Pass
	.0 42.	-	11.6	1.0	28.9				46.0	-17.1	Pass
H 375.			15.1	1.3	32.8				46.0	-13.2	Pass
	.0 46.		15.1	1.3	36.9				46.0	-9.1	Pass
V 500.			18.0	1.3	30.7				46.0	-15.3	Pass
Н 500.	.0 41.	5 25.9	18.0	1.3	34.9				46.0	-11.1	Pass
V 625.	.0 39.		19.4	1.7	 34.6				46.0	-11.4	Pass
V 625. H 625.		-	19.4	1.7	34.6 33.1				46.0 46.0	-11.4	Pass
11 023.									40.0	-12.5	
V 750.	.0 32.		20.8	1.9	29.0				46.0	-17.0	Pass
H 750.	-		20.8	1.9	34.4				46.0	-11.6	Pass
V 875.	.0 46.	25.7	22.0	2.1	45.3				46.0	-0.7	Pass
Н 875.			22.0	2.1	45.0				46.0	-1.0	Pass
Table Res	ult: Pa	S by	-0.7	dB				We	orst Freq:	875.0	MHz
Test Site: EMI Cha			: Asset #17	82				Asset #1784			
Analyzer: Rental S	SA#1	Preamp	: Orange				Antenna:	Red-Brown			

Rev. 4/21/2013

50. 4/21/2013							
Spectrum Analyzers / Receivers /Preselectors Rental SA #1 (Brown)	Range 9kHz-26.5GHz	MN E4407B	Mfr Agilent	SN SG44210511	Asset 1510	Cat I	Calibration Due 4/15/2014
Radiated Emissions Sites EMI Chamber 2	FCC Code 719150	IC Code 2762A-7	VCCI Code A-0015	Range		Cat ∥	Calibration Due 2/15/2014
Preamps /Couplers Attenuators / Filters Orange	Range 0.009-2000MHz	MN ZFL-1000-LN	Mfr CS	SN N/A	Asset 765	Cat II	Calibration Due 2/2/2014
Antennas Red-Brown Bilog	Range 30-2000MHz	MN JB1	Mfr Sunol	SN A0032406	Asset 1218	Cat I	Calibration Due 1/8/2015
Meteorological Meters Weather Clock (Pressure Only) CHAMBER2 Thermohygrometer		MN BA928 35519-044	Mfr Oregon Scientific Control Company	SN C3166-1 72457639	Asset 831 1347	Cat I	Calibration Due 3/20/2014 8/19/2013
Cables Asset #1782 Asset #1784	Range 9kHz - 18GHz 9kHz - 18GHz		Mfr Florida RF Florida RF			Cat II II	Calibration Due 3/6/2014 3/14/2014

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





Date:	26-Apr-13			Company:	Airvana							۰ ۱	Vork Order:	N1043
Engineer:	Edward Breen			EUT Desc:	Train 7 Fer	npto Cell	(750721)				EUT Operat	ing Voltage/	Frequency:	120V/60Hz
Temp:	22°C			Humidity:	18%			Pressure:	1020mBar					
		Freque	ncy Range:	1-5GHz							Measureme	nt Distance:	3 m	
Notes:	Unintentional	radiators									EU'	Г Max Freq:	1000MHz	
Antenna		Peak	Average	Preamp	Antenna	Cable	Adjusted	Adjusted	FCC Clas	s B High Fro Peak	equency -	FCC Cla	ss B High Fr Average	equency -
Polarization (H/V)	Frequency (MHz)	Reading (dBµV)	Reading (dBµV)	Factor (dB)	Factor (dB/m)	Factor (dB)	Peak Reading (dBµV/m)	Avg Reading (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result (Pass/Fail)	Limit (dBµV/m)	Margin (dB)	Result (Pass/Fai
H V	1125.0 1125.0	36.0 36.6	26.4 27.2	19.5 19.5	25.0 25.0	2.3 2.3	43.8 44.4	34.2 35.0	74.0 74.0	-30.2 -29.6	Pass Pass	54.0 54.0	-19.8 -19.0	Pass Pass
v	1125.0	30.0	21.2	19.5	25.0	2.3	44.4	35.0	74.0	-29.0	Pass	54.0	- 19.0	Pass
н	1250.0	31.3	18.8	19.0	25.7	2.3	40.3	27.8	74.0	-33.7	Pass	54.0	-26.2	Pass
V	1250.0	31.8	18.8	19.0	25.7	2.3	40.8	27.8	74.0	-33.2	Pass	54.0	-26.2	Pass
н	1500.0	32.9	22.4	18.2	25.8	2.7	43.2	32.7	74.0	-30.8	Pass	54.0	-21.3	Pass
V	1500.0	31.5	20.7	18.2	25.8	2.7	41.8	31.0	74.0	-32.2	Pass	54.0	-23.0	Pass
Tabl	e Result:		Pass	by	-19.0	dB					W	orst Freq:	1125.0	MHz

Rev. 4/29/2013 Spectrum Analyzers / Receivers / Preselectors	Range	MN	Mfr	SN	Asset	Cat	Calibration Due
Rental SA #1 (Brown)	9kHz- 26.5GHz	E4407B	Agilent	SG44210511	1510	I	4/15/2014
Radiated Emissions Sites EMI Chamber 2	FCC Code 719150	IC Code 2762A-7	VCCI Code A-0015	Range		Cat II	Calibration Due 2/15/2014
Preamps /Couplers Attenuators / Filters Brown	Range 1-18GHz	MN CS	Mfr CS	SN N/A	Asset 1523	Cat II	Calibration Due 2/27/2014
Antennas Orange Horn	Range 1-18GHz	MN 3115	Mfr EMCO	SN 0004-6123	Asset 390	Cat I	Calibration Due 7/27/2013
Meteorological Meters		MN 35519-	Mfr Control	SN	Asset	Cat	Calibration Due
CHAMBER2 Thermohygrometer		044	Company	72457639	1347	Ш	8/19/2013





Date:	26-Apr-13			Company:	Airvana							۱ ۱	Vork Order:	N1043
Engineer:	Edward Breen			EUT Desc:	Train 7 Fe	mpto Cell	(750721)				EUT Operat	ing Voltage/	Frequency:	120V/60H
Temp:	22°C			Humidity:	18%			Pressure:	1020mBar					
		Freque	ncy Range:	1-6GHz							Measureme			
Notes:	Intentional rad	iators									EUT	「Max Freq:	1000MHz	
Antenna		Peak	Average	Preamp	Antenna	Cable	Adjusted	Adjusted		s B High Fro Peak			ss B High Fr Average	
Polarization (H/V)	Frequency (MHz)	Reading (dBµV)	Reading (dBµV)	Factor (dB)	Factor (dB/m)	Factor (dB)	Peak Reading (dBµV/m)	Avg Reading (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result (Pass/Fail)	Limit (dBµV/m)	Margin (dB)	Result (Pass/Fa
н	1979.0	48.9	34.0	 18.2	28.1	 3.0	 61.8	 46.9	 74.0		 Pass	 54.0	 -7.1	 Pass
н V	1979.0	48.9 46.2	34.0 27.3	18.2	28.1	3.0	59.1	46.9 40.2	74.0	-12.2 -14.9	Pass Pass	54.0 54.0	-7.1	Pass Pass
·	107010	10.2	21.0											
н	1061.0	39.6	26.1	19.7	24.5	2.2	46.6	33.1	74.0	-27.4	Pass	54.0	-20.9	Pass
V	1061.0	42.8	29.3	19.7	24.5	2.2	49.8	36.3	74.0	-24.2	Pass	54.0	-17.7	Pass
н	3910.0	29.9	18.0	 18.0	32.7	4.4	 49.0	 37.1	 74.0	-25.0	 Pass	 54.0	 -16.9	 Pass
v	3910.0	37.0	27.2	18.0	32.7	4.4	56.1	46.3	74.0	-17.9	Pass	54.0	-7.7	Pass
Table	e Result:		Pass	by	-7.1	dB					We	orst Freq:	1979.0	MHz
	o neodina													
	EMI Chamber Rental SA#1 /2013			Preamp:				Bongo		Antenna:	Asset #1784 Orange Horn			SN
Analyzer:	EMI Chamber Rental SA#1 /2013	m Analyz	ers / Rece al SA #1 (Preamp: eivers /Pi	Brown		ç	Range 9kHz-26.5GH;			Orange Horn		SG4	SN 1421051
Analyzer:	EMI Chamber Rental SA#1 /2013	m Analyz Rent Radiate		Preamp: eivers /Pr Brown) ons Sites	Brown reselecto		ç	•	z E4	Antenna:	Orange Horn M Agi VCCI	lfr		
Analyzer:	EMI Chamber Rental SA#1 /2013 Spectru	m Analyz Rent Radiate E	al SA #1(ed Emissi	Preamp: Pivers /Pi Brown) ons Sites er 2	Brown reselecto s		s	KHz-26.5GH	z E4 IC 276	Antenna: MN 407B Code	N N Agi VCCI A-C	lfr ilent Code		421051
Analyzer:	EMI Chamber Rental SA#1 /2013 Spectru	m Analyz Rent Radiate E mps /Cou	al SA #1 (ed Emissi MI Chamb plers Atte	Preamp: eivers /Pr Brown) ons Sites er 2 enuators s	Brown reselecto s		ç	KHz-26.5GH: FCC Code 719150 Range	z E4 IC 276	Antenna: MN 407B Code 52A-7 MN	Norange Horm M Agi VCCI A-C N C N	lfr ilent Ode 015	F	1421051 Range SN
Analyzer:	EMI Chamber Rental SA#1 /2013 Spectru Prear	m Analyz Rent Radiate E mps /Cou	al SA #1 (ed Emissi MI Chamb plers Atte Brown Antenna	Preamp: pivers /Pr Brown) ons Sites er 2 enuators s orn Meters	Brown reselecto s / Filters		S	FCC Code 719150 Range 1-18GHz Range	z E4	Antenna: MN 407B Code 52A-7 MN CS MN	Norange Hom M Agi VCCI A-C N C N EM	lfr Code 0015 Ifr CS	F 000	4421051 Range SN N/A SN
Analyzer:	EMI Chamber Rental SA#1 /2013 Spectru Preat	m Analyz Rent Radiate E mps /Cou	eal SA #1 (ed Emissi MI Chamb plers Atte Brown Antenna Orange Ho orological R2 Thermo	Preamp: pivers /Pr Brown) ons Sites er 2 enuators s orn Meters	Brown reselecto s / Filters	ors	S	FCC Code 719150 Range 1-18GHz Range	z E4 IC 27(1 3 3 355	Antenna: MN 407B Code 32A-7 MN CS MN 115 MN	Norange Hom M Agi VCCI A-C N C N EM	lfr ilent 0015 Ifr ICO Ifr COD	F 000	SN N/A SN 04-6123 SN 457639
Analyzer: Rev. 4/29,	EMI Chamber Rental SA#1 /2013 Spectru Preat	m Analyz Rent Radiate E mps /Cou Metee CHAMBE CAbl	eal SA #1 (ead Emissi MI Chamb plers Atte Brown Antenna Orange Ho orological R2 Thermo es	Preamp: pivers /Pr Brown) ons Sites er 2 enuators s orn Meters	Brown reselecto s / Filters	ors Ra 9k	inge Hz -	MHZ-26.5GH: FCC Code 719150 Range 1-18GHz Range 1-18GHz Mit Flor	z E4 IC 27(1 3 3 355 ⁻	Antenna: MN 407B Code 32A-7 MN CS MN 115 MN	Orange Hom Agi VCCI A-C M C EM Control (Ca	Ifr Code 1015 Ifr IGO Ifr Company at Calik	600 72 1000	SN N/A SN 04-6123 SN 457639
Analyzer: Rev. 4/29,	EMI Chamber Rental SA#1 /2013 Spectru Preat	m Analyz Rent Radiate E mps /Cou Meter CHAMBE CHAMBE Cabl Asset #	eal SA #1 (ed Emissi MI Chamb plers Atte Brown Antenna Orange Ho orological R2 Thermo es 1782	Preamp: pivers /Pr Brown) ons Sites er 2 enuators s orn Meters	Brown reselecto s / Filters	ors Ra 9k 18 9k	inge Hz - GHz Hz -	FCC Code 719150 Range 1-18GHz Range 1-18GHz 1-18GHz Mi Flor Ri Flor Flor	z E4 IC 276 1 3 3 355 ida = ida	Antenna: MN 407B Code 32A-7 MN CS MN 115 MN	Orange Hom Agi VCCI A-C N C M EM Control C	Ifr Code 1015 Ifr ICO Ifr Company at Calik	00 72 07 07 07 07 07 07 07 07 07 07 07 07 07	SN N/A SN 04-6123 SN 457639
Analyzer: Rev. 4/29,	EMI Chamber Rental SA#1 /2013 Spectru Preat	m Analyz Rent Radiate E mps /Cou Metee CHAMBE CAbl	eal SA #1 (ed Emissi MI Chamb plers Atte Brown Antenna Orange Ho orological R2 Thermo es 1782	Preamp: pivers /Pr Brown) ons Sites er 2 enuators s orn Meters	Brown reselecto s / Filters	ors 8 9k 18 9k 18	inge Hz - GHz	FCC Code 719150 Range 1-18GHz Range 1-18GHz 1-18GHz Flor Ri	z E4 IC 27(1 3 3 355 ⁻¹ - -	Antenna: MN 407B Code 32A-7 MN CS MN 115 MN	Orange Hom Agi VCCI A-C M C EM Control (Ca	Ifr Code 1015 Ifr ICO Ifr Company at Calik	600 72 1000	421051 Range SN N/A SN 04-6123 SN 457639





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	: 26-Apr-13			Company:	Airvana								Work	Order: N104	3
Engineer	: Edward Breen			EUT Desc:	Train 7 Fer	npto Cell	(750721)				EUT Operati	ng Voltage	e/Freq	uency: 120V	60Hz
Temp	: 22°C			Humidity:	18%	•	. ,	Pressure	: 1020mBar		•				
		Freque	ncy Range:	6-18GHz							Measuremer	nt Distance	:3 m		
Notes	: Intentional rad	iators									EUT	Max Freq	: 1000	MHz	
Antenna		Peak	Average	Preamp	Antenna	Cable	Adjusted	Adjusted	FCC Class B	High Fre Peak	quency -	FCC CI		ligh Frequer erage	ncy -
Polarization (H/V)	Frequency (MHz)	Reading (dBµV)	Reading (dBµV)	Factor (dB)	Factor (dB/m)	Factor (dB)	Peak Reading (dBµV/m)	Avg Reading (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result (Pass/Fail)	Limit (dBµV/m)		5	e sult ss/Fai
lo emissions i	in this range														
Tabl	le Result:			by		dB					Wo	orst Freq.		MHz	
	: EMI Chamber	2		Cable 1:	Asset #17	32				Cable 2:	Asset #1784				
Analyzer	: Rental SA#1			Preamp:	Brown					Antenna:	Orange Horn				
			ceivers /Pre	eselectors			ange	MN E4407B	Mfr Agilent	S	SN 344210511	Asset	Cat	Calibratio	
	R	tental SA #1	(Brown)	eselectors		9kHz	26.5GHz	E4407B	Agilent	SC	G44210511	Asset 1510	Ι	4/15/20)14
	R	tental SA #1	(Brown) sions Sites	eselectors		9kHz FC	26.5GHz			SC					14 n Du
	Rad	iated Emise EMI Charr Couplers At	(Brown) sions Sites nber 2 ttenuators /			9kHz FC 7 R	26.5GHz C Code 19150 ange	E4407B IC Code 2762A-7 MN	Agilent VCCI Code A-0015 Mfr	SC	G44210511 Range SN	1510 Asset	। Cat ॥ Cat	4/15/20 Calibratio 2/15/20 Calibratio)14 n Di)14 n Di
	Rad	iated Emis EMI Chan Couplers At Brow	l (Brown) sions Sites hber 2 t tenuators / n			9kHz FC 7 [.] R 1-	26.5GHz C Code 19150 ange 18GHz	E4407B IC Code 2762A-7 MN CS	Agilent VCCI Code A-0015 Mfr CS	so	G44210511 Range SN N/A	1510 Asset 1523	I Cat II Cat II	4/15/20 Calibratio 2/15/20 Calibratio 2/27/20)14 n D i)14 n D i)14
	Rad	iated Emise EMI Charr Couplers At	I (Brown) sions Sites hber 2 ttenuators / n nas			9kHz FC 7' R 1-' R	26.5GHz C Code 19150 ange	E4407B IC Code 2762A-7 MN	Agilent VCCI Code A-0015 Mfr	-	G44210511 Range SN	1510 Asset	। Cat ॥ Cat	4/15/20 Calibratio 2/15/20 Calibratio)14 n Du)14 n Du)14 n Du
	Rad Preamps /C	iated Emise EMI Charr Couplers At Brow Antenr Orange I eteorologic	(Brown) sions Sites nber 2 ttenuators / n nas Horn	Filters		9kHz FC 7' R 1-' R	28.5GHz C Code 19150 ange 18GHz 18GHz	E4407B IC Code 2762A-7 MN CS MN	Agilent VCCI Code A-0015 Mfr CS Mfr	C	344210511 Range SN N/A SN	1510 Asset 1523 Asset	I Cat II Cat II Cat	4/15/20 Calibratio 2/15/20 Calibratio 2/27/20 Calibratio)14 n Di)14 n Di)14 n Di)13 n Di
Rev. 4/29/	Rad Preamps /C CHAM (2013	iated Emis: EMI Chan Couplers At Brow Antenr Orange I eteorologic BER2 Therr	i (Brown) sions Sites nber 2 ttenuators / n nas Horn cal Meters	Filters	Banco	9kHz FC(7' R 1-' R 1-'	20.5GHz 2 Code 19150 ange 18GHz 88GHz 88GHz	E4407B IC Code 2762A-7 MN CS MN 3115 MN	Agilent VCCI Code A-0015 Mfr CS Mfr EMCO Mfr Control Compan	c y 7	344210511 Range SN N/A SN 0004-6123 SN 72457639	1510 Asset 1523 Asset 390 Asset	I Cat II Cat I Cat I Cat	4/15/20 Calibratio 2/15/20 Calibratio 2/27/20 Calibratio 7/27/20 Calibratio)14 n Di)14 n Di)14 n Di)13 n Di
Rev. 4/29/	Rad Preamps /C CHAM (2013	iated Emise EMI Charr Couplers At Brow Antenr Orange I eteorologic	i (Brown) sions Sites nber 2 ttenuators / n nas Horn cal Meters	Filters	Range 9kHz -	9kHz FC 7 [.] R 1- [.] R 1-	28.5GHz C Code 19150 ange 18GHz 18GHz	E4407B IC Code 2762A-7 MN CS MN 3115 MN 355519-044	Agilent VCCI Code A-0015 Mfr CS Mfr EMCO Mfr	c y 7	344210511 Range SN N/A SN 0004-6123 SN	1510 Asset 1523 Asset 390 Asset	I Cat II Cat I Cat I Cat	4/15/20 Calibratio 2/15/20 Calibratio 2/27/20 Calibratio 7/27/20 Calibratio)14 n Di)14 n Di)14 n Di)13 n Di
Rev. 4/29/	Rad Preamps /C Mu CHAM	iated Emis: EMI Chan Couplers At Brow Antenr Orange I eteorologic BER2 Therr	i (Brown) sions Sites nber 2 ttenuators / n nas Horn cal Meters	Filters	9kHz - 18GHz	9kHz: FCI 7 ⁻ R 1- ⁻ R	20.5GHz 2 Code 19150 ange 18GHz 18GHz 18GHz Kfr Florid RF	E4407B IC Code 2762A-7 MN CS MN 3115 MN 35519-044	Agilent VCCI Code A-0015 Mfr CS Mfr EMCO Mfr Control Compan	y 7 Calibr	344210511 Range SN N/A SN 0004-6123 SN 72457639	1510 Asset 1523 Asset 390 Asset	I Cat II Cat I Cat I Cat	4/15/20 Calibratio 2/15/20 Calibratio 2/27/20 Calibratio 7/27/20 Calibratio)14 n Du)14 n Du)14 n Du)13 n Du
Rev. 4/29/	Rad Preamps /C Mu (2013 As	iated Emis: EMI Char Couplers At Brow Antenr Orange I eteorologic BER2 Therr Cables	i (Brown) sions Sites nber 2 ttenuators / n nas Horn cal Meters	Filters	9kHz - 18GHz 9kHz - 18GHz	9kHz FCI 7 8 1-' R 1-'	20.5GHz 20.5GHz 19150 ange 18GHz ange 18GHz Florid RF Florid RF	E4407B IC Code 2762A-7 MN CS MN 3115 MN 355519-044 a a	Agilent VCCI Code A-0015 Mfr CS Mfr EMCO Mfr Control Compan	C y 7 Calibr 3/	3442105111 Range SN N/A SN 0004-6123 SN 72457639 ration Due	1510 Asset 1523 Asset 390 Asset	I Cat II Cat I Cat I Cat	4/15/20 Calibratio 2/15/20 Calibratio 2/27/20 Calibratio 7/27/20 Calibratio)14 n Di)14 n Di)14 n Di)13 n Di
Rev. 4/29/	Rad Preamps /C CHAM /2013 As	iated Emissi EMI Char Couplers At Brow Antenr Orange I eteorologic BER2 Ther Cables	i (Brown) sions Sites nber 2 ttenuators / n nas Horn cal Meters	Filters	9kHz - 18GHz 9kHz -	9kHz FCI 7 R 1- ⁻ R 1- ⁻	20.5GHz C Code 19150 ange 18GHz ange 18GHz 18GHz Sigger Florid RF Florid	E4407B IC Code 2762A-7 MN CS MN 3115 MN 355519-044 a a	Agilent VCCI Code A-0015 Mfr CS Mfr EMCO Mfr Control Compan Cat	c y 7 Calibr 3/ 3/	344210511 Range N/A SN 0004-6123 SN 72457639 ration Due 6/2014	1510 Asset 1523 Asset 390 Asset	I Cat II Cat I Cat I Cat	4/15/20 Calibratio 2/15/20 Calibratio 2/27/20 Calibratio 7/27/20 Calibratio)14 n D)14 n D)14 n D)13 n D





Date:	: 26-Apr-13			Company:	Airvana								Worl	Order:	N1043
Engineer: Edward Breen EU				EUT Desc:		mpto Cell	(750721)				EUT Operat	ting Volta			
				Humidity: 18% Pressure: 1020mBar								5		, ,	
		Freque	ncy Range:	18-26.5GH	lz						Measureme	nt Distan	ce: 0.1	m	
Notes	Intentional rad	iators	, ,												
Antenna Peak A		Average	Preamp	Antenna	Cable	Adjusted	Adjusted	FCC Class B High Fre Peak		equency - FCC		Class B High Frequer Average		equency -	
Polarization	Frequency	Reading	Reading	Factor	Factor	Factor	Peak Reading	Avg Reading	Limit	Margin	Result	Limit	N	largin	Result
(H / V)	(MHz)	(dBµV)	(dBµV)	(dB)	(dB/m)	(dB)	(dBµV/m)	(dBµV/m)	(dBµV/m)	(dB)	(Pass/Fail)	(dBµV/m	1)	(dB)	(Pass/Fai
No emissions i	n this range														
Tabl	e Result:			by		dB					W	orst Fre	q:		MHz
	EMI Chamber	2			EMIR-HIG										
Anaryzen	: Rental SA#1			r reamp.	18-26.5GH	12				Antenna.	18-26.5GHz	nom			
Rev. 4/29/2															
	2013				_				•••				•	.	
	2013	Cables				ange			Mfr				Cat	Calibr	ation Du
		Cables EMI-High-2	2		94	ange (Hz - iGHz			Mfr C-S				Cat II		ration Dเ 2/2014
		MI-High-2		lectors	94 15 R a	kHz - GHz ange	M	N			SN	Asset		2/2	2/2014
	RE rum Analyze	MI-High-2	vers /Prese	lectors	94 15 R a 91	(Hz - GHz	M I E44(C-S	SG4	SN 44210511	Asset 1510	II	2/2 Calibr	ration Du 2/2014 ration Du 5/2014
	RE rum Analyze Rental Radiated	EMI-High-2 rs / Receiv	vers /Prese rown) ns Sites	lectors	94 15 R 91 26. FCC	kHz - GHz ange kHz-		07B ode	C-S Mfr		•		II Cat	2/: Calibr 4/1 Calibr	2/2014 ration Du
Spect	RE rum Analyze Rental Radiated	EMI-High-2 rs / Receiv I SA #1 (Br I Emission I Chamber	vers /Prese rown) ns Sites · 2		94 15 91 26. FCC 71	kHz - GHz ange kHz- 5GHz Code	E44(IC C 2762 MI	07B ode 2A-7 N	C-S Mfr Agilent VCCI Cod		44210511		II Cat I Cat	2/: Calibr 4/1 Calibr 2/1	2/2014 ration Du 5/2014 ration Du 5/2014
Spect	RE rum Analyzer Rental Radiated EM eamps /Coup	EMI-High-2 rs / Receiv I SA #1 (Br I Emission I Chamber	vers /Prese rown) ns Sites 2 uators / Fil		94 15 83 91 26. FCC 71 R	kHz - GGHz ange kHz- 5GHz Code 9150	E440 IC C 2762	07B 0de 2A-7 N 02650-60-	C-S Mfr Agilent VCCI Cod A-0015	e l	44210511 Range	1510	 Cat Cat 	2/: Calibr 4/1 Calibr 2/1 Calibr	2/2014 ration Du 5/2014 ration Du
Spect	RE rum Analyzer Rental Radiated EM eamps /Coup	EMI-High-2 rs / Receiv I SA #1 (Br I Emission I Chamber Iers Atten	vers /Prese rown) ns Sites 2 uators / Fil		94 15 99 26. FCC 71 R; 18-2	kHz - iGHz kHz- 5GHz Code 9150 ange	E440 IC C 2762 MI AFS4-1800	07B 0de 2A-7 N 02650-60- -4	C-S Mfr Agilent VCCI Cod A-0015 Mfr	e l	44210511 Range SN	1510 Asset	II Cat I Cat II Cat	2/: Calibr 4/1 Calibr 2/1 Calibr 10/	2/2014 ration Du 5/2014 ration Du 5/2014 ration Du
Spect	RE rum Analyzer Rental Radiated EM eamps /Coup H	EMI-High-2 rs / Receiv I SA #1 (Br I Emission I Chamber Iers Atten IF (Yellow)	vers /Prese rown) ns Sites · 2 uators / Fil		94 15 91 26. FCC 71 R; 18-21 R;	kHz - GGHz ange kHz- 5GHz Code 9150 ange 6.5GHz	E44(IC C 2762 MI AFS4-180(8P	07B ode ?A-7 N 02650-60- -4 N	C-S Mfr Agilent VCCI Cod A-0015 Mfr CS	e I	44210511 Range SN 467559	1510 Asset 1266	II Cat I Cat II Cat I	2/2 Calibr 4/1 Calibr 2/1 Calibr 10/ Calibr	2/2014 ration Du 5/2014 ration Du 5/2014 ration Du 13/2013
Spect	RE rum Analyzen Rental Radiated EM eamps /Coup H HF	EMI-High-2 rs / Receiv I SA #1 (Br I Emission I Chamber Iers Attenn IF (Yellow) Antennas	vers /Prese rown) ns Sites 2 uators / Fil		94 15 91 26. FCC 71 R; 18-21 R;	kHZ - GGHZ ange kHZ- 5GHZ Code 9150 ange 6.5GHZ ange	E44(IC C 2762 MI AFS4-1800 8P	07B ode 2A-7 N 22650-60- -4 N WLM	C-S Mfr Agilent VCCI Cod A-0015 Mfr CS Mfr	e I	44210511 Range SN 467559 SN	1510 Asset 1266 Asset	II Cat I Cat II Cat I Cat	2/: Calibr 4/1 Calibr 2/1 Calibr 10/ Calibr Verify	2/2014 ration Do 5/2014 ration Do 5/2014 ration Do 13/2013 ration Do





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Conducted AC Mains Spurious Emissions Measurements

MEASUREMENTS / RESULTS

Note that only worst-case conducted spurious data is presented.

Date: 26-Apr-13 Engineer: Edward Breen						Company: Airvana EUT Desc: Train 7 Fempto Cell (750721)						Work Order: N1043		
Temp: 22.8 °C					Humidity: 18%							Pressure: 1020 mE		
Note	S:					Frequency Ran	ge: 0.15-30MHz		FUT In	put Voltage	/Frequency	120\//60Hz		
Quasi-Peak Avera				age	LISN	requency Ran	chey runge: 0.10 000012				riequency	requency. 1200/00112		
_	Readings		Readings		Factors	Cable	ATTN	FCC/CISPR Class				C/CISPR Class B		
Frequency (MHz)	QP1 (dBµV)	QP2 (dBµV)	AVG1 (dBµV)	AVG2 (dBµV)		L2 Factor dB) (dB)	Factor (dB)	QP Limit (dBµV)	Margin (dB)	Result (Pass/Fail)	AVG Limit (dBµV)	Margin (dB)	Res (Pass	
0.18	8.0	7.7	2.7	2.4		0.1 -0.1	-20.8	64.7	-35.7	Pass	(dDµV) 54.7	-31.0	Pa	
4.27	13.1	14.0	10.6	11.3	0.0 -	0.1 -0.1	-20.8	56.0	-21.0	Pass	46.0	-13.7	Pa	
4.84	17.1	17.5	13.8	14.0		0.1 -0.1	-20.8	56.0	-17.5	Pass	46.0	-11.0	Pa	
10.90	15.2	15.4	12.7	13.4		0.1 -0.2	-20.8	60.0	-23.5	Pass	50.0	-15.5	Pa	
14.32	17.3	14.1	15.7	12.1		0.1 -0.3	-20.8	60.0	-21.6	Pass	50.0	-13.2	Pa	
29.91	5.2	5.8	1.4	2.1	-0.2 -	0.3 -0.3	-20.8	60.0	-32.9	Pass	50.0	-26.6	Pa	
Result	: Pass					Wors	st Margin:	-11.	0 dB	Freq	uency:	4.843	3 MHz	
surement Device	: LISN ASSE	T 1726(Line	1) LISN AS	SET 1727	(Line 2)	Cab	le: CEMI-09		s	Spectrum	Analyzer:	Gold		
						Attenuate	or: 20dB Atter	1-4			Site:	CEMI2		
/21/2013 Spectrum Anal		ivers/Pres	electors		Range	MN	Mfr		SN	Asset	Cat	Calibrati		
	yzers / Rece Gold	ivers/Pres	electors	100	Range Hz-26.5 GHz		Mfr Agilent	r	SN MY45113816		Cat I	Calibrati 3/18/2		
Spectrum Anal			electors	100	•			١					2014	
Spectrum Anal LISNs	Gold	nt Probes	electors		Hz-26.5 GHz	E4407B	Agilent		MY45113816	5 1284	I	3/18/2	2014 ion Du	
Spectrum Anal	Gold	nt Probes 726	electors	150	Hz-26.5 GHz Range	E4407B	Agilent Mfr	/er	MY45113816 SN	6 1284 Asset	I	3/18/2 Calibrati	2014 ion D u 2014	
Spectrum Anal	Gold / Measureme LISN Asset 1 LISN Asset 1	nt Probes 726 727		150 150	Hz-26.5 GHz Range kHz-30MHz	E4407B MN LI-150A	Agilent Mfr Com-Pow	ver ver	MY45113816 SN 201092	5 1284 Asset 1726	l Cat	3/18/2 Calibrati 1/11/2	2014 ion Du 2014 2014	
Spectrum Anal	Gold /Measureme LISN Asset 1	nt Probes 726 727		150 150	Hz-26.5 GHz Range kHz-30MHz kHz-30MHz	E4407B MN LI-150A	Agilent Mfr Com-Pow Com-Pow	ver ver de	MY45113816 SN 201092	5 1284 Asset 1726	I Cat I	3/18/2 Calibrati 1/11/2 1/2/2	2014 ion Du 2014 2014 ion Du	
Spectrum Anal LISNs Conducted	Gold /Measureme LISN Asset 1 LISN Asset 1 I Test Sites (I CEMI 2	nt Probes 726 727 Mains / Tel		150 150	Hz-26.5 GHz Range kHz-30MHz kHz-30MHz CC Code	E4407B MN LI-150A	Agilent Mfr Com-Pow Com-Pow	ver ver de	MY45113816 SN 201092	5 1284 Asset 1726	I Cat I Cat	3/18/2 Calibrati 1/11/2 1/2/2 Calibrati	2014 ion Du 2014 2014 ion Du A	
Spectrum Analy LISNs Conducted Met	Gold (Measureme LISN Asset 1 LISN Asset 1 I Test Sites (I CEMI 2 ceorological	nt Probes 726 727 Mains / Tel Meters		150 150	Hz-26.5 GHz Range kHz-30MHz kHz-30MHz CC Code	E4407B MN LI-150A LI-150A	Agilent Mfr Com-Pow Com-Pow Com-Pow VCCI Coo A-0015 Mfr	ver ver de	MY45113816 SN 201092 201093 SN	6 1284 Asset 1726 1727 Asset	I Cat I Cat Ⅲ Cat	3/18/2 Calibrati 1/11/2 1/2/2 Calibrati N/ Calibrati	2014 ion Du 2014 2014 ion Du A ion Du	
Spectrum Analy LISNs Conducted Met Weathe	Gold (Measureme LISN Asset 1 LISN Asset 1 I Test Sites (I CEMI 2 teorological er Clock (Pres	nt Probes 726 727 Mains / Tel Meters sure Only)		150 150	Hz-26.5 GHz Range kHz-30MHz kHz-30MHz CC Code	E4407B MN LI-150A LI-150A MN BA928	Agilent Mfr Com-Pow Com-Pow VCCI Coo A-0015 Mfr Oregon Scie	ver ver de entific	MY45113816 SN 201092 201093 SN C3166-1	6 1284 Asset 1726 1727 Asset 831	I Cat I Cat Ⅲ Cat II	3/18/2 Calibrati 1/11/2 1/2/2 Calibrati N/ Calibrati 3/20/2	2014 ion Du 2014 2014 ion Du A ion Du 2014	
Spectrum Analy LISNs Conducted Met Weathe	Gold (Measureme LISN Asset 1 LISN Asset 1 I Test Sites (I CEMI 2 ceorological	nt Probes 726 727 Mains / Tel Meters sure Only)		150 150	Hz-26.5 GHz Range kHz-30MHz kHz-30MHz CC Code	E4407B MN LI-150A LI-150A	Agilent Mfr Com-Pow Com-Pow Com-Pow VCCI Coo A-0015 Mfr	ver ver de entific	MY45113816 SN 201092 201093 SN	6 1284 Asset 1726 1727 Asset	I Cat I Cat Ⅲ Cat	3/18/2 Calibrati 1/11/2 1/2/2 Calibrati N/ Calibrati	2014 ion Du 2014 2014 ion Du A ion Du 2014	
Spectrum Analy LISNs Conducted Met Weathe	Gold (Measureme LISN Asset 1 LISN Asset 1 I Test Sites (I CEMI 2 teorological er Clock (Pres	nt Probes 726 727 Mains / Tel Meters sure Only)		150 150	Hz-26.5 GHz Range kHz-30MHz kHz-30MHz CC Code	E4407B MN LI-150A LI-150A MN BA928	Agilent Mfr Com-Pow Com-Pow VCCI Coo A-0015 Mfr Oregon Scie	ver ver de entific	MY45113816 SN 201092 201093 SN C3166-1	6 1284 Asset 1726 1727 Asset 831	I Cat I Cat Ⅲ Cat II	3/18/2 Calibrati 1/11/2 1/2/2 Calibrati N/ Calibrati 3/20/2	2014 ion Du 2014 2014 ion Du A ion Du 2014 2013	
Spectrum Analy LISNs Conducted Met Weathe	Gold /Measureme LISN Asset 1 LISN Asset 1 I Test Sites (I CEMI 2 reorological or Clock (Press I2 Thermohyg	nt Probes 726 727 Mains / Tel Meters sure Only)		150 150 F	Hz-26.5 GHz Range kHz-30MHz kHz-30MHz KHZ-30MHz CC Code 719150	E4407B MN LI-150A LI-150A MN BA928	Agilent Mfr Com-Pow Com-Pow VCCI Coo A-0015 Mfr Oregon Scie Control Com	ver ver de entific	MY45113816 SN 201092 201093 SN C3166-1	6 1284 Asset 1726 1727 Asset 831	Cat I Cat III Cat III II	3/18/2 Calibrati 1/11/2 1/2/2 Calibrati N/ Calibrati 3/20/2 8/19/2	2014 ion Du 2014 2014 ion Du 2014 2014 2013 ion Du 2013	
Spectrum Analy LISNs Conducted Met Weathe	Gold /Measureme LISN Asset 1 LISN Asset 1 I Test Sites (I CEMI 2 reorological reclock (Pres II2 Thermohys Cables	nt Probes 726 727 Mains / Tel Meters usure Only) grometer		150 150 F	Hz-26.5 GHz Range kHz-30MHz kHz-30MHz CC Code 719150 Range	E4407B MN LI-150A LI-150A MN BA928	Agilent Mfr Com-Pov Com-Pov VCCI Coo A-0015 Mfr Oregon Scie Control Com	ver ver de entific	MY45113816 SN 201092 201093 SN C3166-1	6 1284 Asset 1726 1727 Asset 831	Cat I Cat II Cat II Cat I I Cat II	3/18/2 Calibrati 1/11/2 Calibrati N/ Calibrati 3/20/2 8/19/2 Calibrati	2014 ion Du 2014 2014 ion Du 2014 2013 ion Du 2013	

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





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Frequency Stability REQUIREMENTS

Part 22:

Per 22.355, Table C-1, the frequency stability shall remain within 1.5ppm for this device.

Part 24:

"The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block." [24.235]

Part 90:

Per 90.213(a), the frequency stability shall remain within 1.5ppm for this device.

MEASUREMENTS / RESULTS

Frequency Sta	bility		Curtis-Straus LLC
Engineer	: Arik Zwirner	Company:	Airvana
Date	: 16-Nov-12	EUT:	Femto Cell 750721 T7
Spectrum Analyzer	: Rental #1	Work Order:	M2419
	: EMIR-High-06		
Notes	: Reference Conditions: 1	10Vac/60Hz, 20°C	
Temperature	Supply Voltage	Center Frequency	Frequency Deviation
(°C)	(60Hz)	(Hz)	(ppm)
-30	110Vac	1956250000	0.0
-20	110Vac	1956250000	0.0
-10	110Vac	1956250000	0.0
0	110Vac	1956250000	0.0
10	110Vac	1956250000	0.0
20	93.5Vac	1956250000	0.0
20	110Vac	1956250000	0.0
20	126.5Vac	1956250000	0.0
30	110Vac	1956250000	0.0
40	110Vac	1956250000	0.0
50	110Vac	1956250000	0.0
The EUT has an intention	onal transmitter that opera	tes at both 800 and 1900M	MHz bands. The

The EUT has an intentional transmitter that operates at both 800 and 1900MHz bands. The hardware utilized for both bands is the same while the software controls the different bands. Testing was performed at the 1900MHz band only to satisfy the 800MHz band requirements as a single oscillator is used as the source for both.

Note: Frequency stability data is presented from the original Train 7 testing since the RF oscillator(s) are same between the two units.





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 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.

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