

WirelessWERX, Inc.

TrakLITE C4-B

March 29, 2005

Report No. 7LAY0030.1

Report Prepared By



www.nwemc.com

1-888-EMI-CERT

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EMC Test Report



22975 NW Evergreen Parkway
Suite 400
Hillsboro, Oregon 97124

Certificate of Test
Issue Date: March 29, 2005
WirelessWERX, Inc.
Model: TrakLITE C4-B

Emissions			
Specification	Test Method	Pass	Fail
Effective Radiated Power: FCC 24.232(b): 2004	TIA/EIA-603:2001	☒	☐
FCC 22H & 24E Frequency Stability:2004	TIA/EIA-603:2001	☒	☐
FCC 22H & 24E Occupied Bandwidth:2004	TIA/EIA-603:2001	☒	☐
FCC 2.1046 Output Power:2004	TIA/EIA-603:2001	☒	☐
FCC 22H & 24E Spurious Conducted Emissions:2004	TIA/EIA-603:2001	☒	☐
FCC 22H & 24E Spurious Radiated Emissions:2004	TIA/EIA-603:2001	☒	☐
FCC 15.109 Radiated Emissions (Receive Mode):2004	ANSI C63.4:2003	☒	☐

Modifications made to the product

See the Modifications section of this report

Test Facility

- The measurement facility used to collect the data is located at:
Northwest EMC, Inc.; 22975 NW Evergreen Parkway, Suite 400; Hillsboro, OR 97124
Phone: (503) 844-4066 Fax: 844-3826
This site has been fully described in a report filed with and accepted by the FCC (Federal Communications Commission) and Industry Canada.

Approved By:

Dean Ghizzone, President

This report must not be used to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the federal government of the United States of America.

Product compliance is the responsibility of the client, therefore the tests and equipment modes of operation represented in this report were agreed upon by the client, prior to testing. This Report may only be duplicated in its entirety. The results of this test pertain only to the sample(s) tested, the specific description is noted in each of the individual sections of the test report supporting this certificate of test.

Revision Number	Description	Date	Page Number
00	None		

FCC: Accredited by NVLAP for performance of FCC radio, digital, and ISM device testing. Our Open Area Test Sites, certification chambers, and conducted measurement facilities have been fully described in reports filed with the FCC and accepted by the FCC in letters maintained in our files. Northwest EMC has been accredited by ANSI to ISO / IEC Guide 65 as a product certifier. We have been designated by the FCC as a Telecommunications Certification Body (TCB). This allows Northwest EMC to certify transmitters to FCC specifications in accordance with 47 CFR 2.960 and 2.962.



NVLAP: Northwest EMC, Inc. is recognized under the United States Department of Commerce, National Institute of Standards and Technology, and National Voluntary Laboratory Accreditation Program for satisfactory compliance with the requirements of ISO/IEC 17025 for Testing Laboratories. The NVLAP accreditation encompasses Electromagnetic Compatibility Testing in accordance with the European Union EMC Directive 89/336/EEC, ANSI C63.4, MIL-STD 461E, DO-160D and SAE J1113. Additionally, Northwest EMC is accredited by NVLAP to perform radio testing in accordance with the European Union R&TTE Directive 1999/5/EEC, the requirements of FCC, and the RSS radio standards for Industry Canada.



200629-0
200630-0
200676-0

Industry Canada: Accredited by NVLAP for performance of Industry Canada RSS and ICES testing. Our Open Area Test Sites and certification chambers comply with RSS 212, Issue 1 (Provisional) and have been filed with Industry Canada and accepted. Northwest EMC has been accredited by ANSI to ISO / IEC Guide 65 as a product certifier. We have been designated by NIST and recognized by Industry Canada as a Certification Body (CB) per the APEC Mutual Recognition Arrangement (MRA). This allows Northwest EMC to certify transmitters to Industry Canada technical requirements.



CAB: Designated by NIST and validated by the European Commission as a Conformity Assessment Body (CAB) to conduct tests and approve products to the EMC directive and transmitters to the R&TTE directive, as described in the U.S. - EU Mutual Recognition Agreement.



TÜV Product Service: Included in TÜV Product Service Group's Listing of Recognized Laboratories. It qualifies in connection with the TÜV Certification after Recognition of Agent's Testing Program for the product categories and/or standards shown in TÜV's current Listing of CARAT Laboratories, available from TÜV. A certificate was issued to represent that this laboratory continues to meet TÜV's CARAT Program requirements. Certificate No. USA0401C.



TÜV Rheinland: Authorized to carryout EMC tests by order and under supervision of TÜV Rheinland. This authorization is based on "Conditions for EMC-Subcontractors" of November 1992.



NEMKO: Assessed and accredited by NEMKO (Norwegian testing and certification body) for European emissions and immunity testing. As a result of NEMKO's laboratory assessment, they will accept test results from Northwest EMC, Inc. for product certification (Authorization No. ELA 119).



Technology International: Assessed in accordance with ISO Guide 25 defining the general international requirements for the competence of calibration and testing laboratories and with ITI assessment criteria LACO196. Based upon that assessment, Interference Technology International, Ltd., has granted approval for specifications implementing the EU Directive on EMC (89/336/EEC and amendments). The scope of the approval was provided on a Schedule of Assessment supplied with the certificate and is available upon request.



Australia/New Zealand: The National Association of Testing Authorities (NATA), Australia has been appointed by the ACA as an accreditation body to accredit test laboratories and competent bodies for EMC standards. Accredited test reports or assessments by competent bodies must carry the NATA logo. Test reports made by an overseas laboratory that has been accredited for the relevant standards by an overseas accreditation body that has a Mutual Recognition Agreement (MRA) with NATA are also accepted as technical grounds for product conformity. The report should be endorsed with the respective logo of the accreditation body (NVLAP).



VCCI: Accepted as an Associate Member to the VCCI, Acceptance No. 564. Conducted and radiated measurement facilities have been registered in accordance with Regulations for Voluntary Control Measures, Article 8. (*Registration Numbers. - Hillsboro: C-1071 and R-1025, Irvine: C-2094 and R-1943, Newberg: C-1877 and R-1760, Sultan: R-871, C-1784 and R-1761*).



BSMI: Northwest EMC has been designated by NIST and validated by C-Taipei (BSMI) as a CAB to conduct tests as described in the APEC Mutual Recognition Agreement. License No.SL2-IN-E-1017.



GOST: Northwest EMC, Inc. has been assessed and accredited by the Russian Certification bodies Certinform VNIINMASH, CERTINFO, SAMTES, and Federal CHEC, to perform EMC and Hygienic testing for Information Technology Products. As a result of their laboratory assessment, they will accept test results from Northwest EMC, Inc. for product certification



SCOPE

For details on the Scopes of our Accreditations, please visit:

<http://www.nwemc.com/scope.asp>

What is measurement uncertainty?

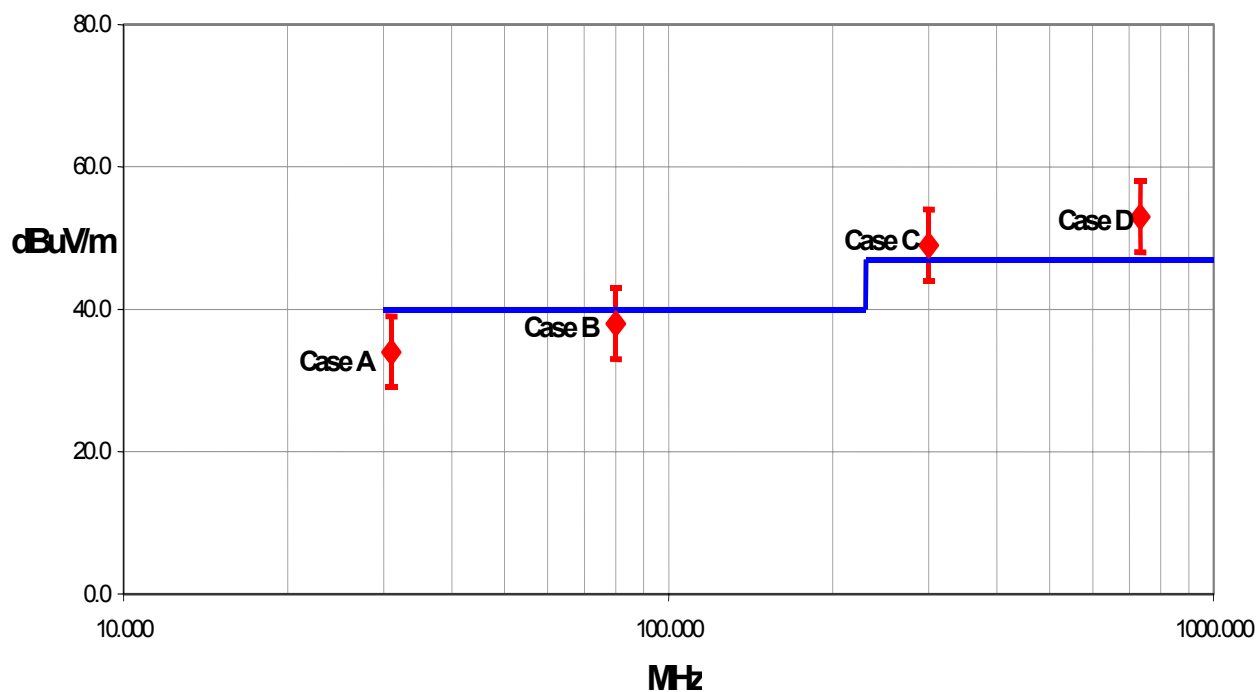
When a measurement is made, the result will be different from the true or theoretically correct value. The difference is the result of tolerances in the measurement system that cannot be completely eliminated. To the extent that technology allows us, it has been our aim to minimize this error. The following statement of measurement uncertainty is used to reflect the accuracy of the measured result as compared with its “true” value. In the case of transient tests (ESD, EFT, Surge, Voltage Dips and Interruptions), the test equipment has been demonstrated by calibration to provide at least a 95% confidence that it complies with the test specification requirements.

The following documents were the basis for determining the uncertainty levels of our measurements:

- “ISO Guide to the Expression of Uncertainty in Measurements”, October 1993
- “NIS81: The Treatment of Uncertainty in EMC Measurements”, May 1994
- “IEC CISPR 16-3 A1 f1 Ed.1: Radio-interference measurements and statistical techniques”, December 2000

How might measurement uncertainty be applied to test results?

If the diamond marks the measured value for the test and the vertical bars bracket the range of + and – measurement uncertainty, then test results can be interpreted from the diagram below.



Test Result Scenarios:

Case A: Product complies.

Case B: Product conditionally complies. It is not possible to say with 95% confidence that the product complies.

Case C: Product conditionally does not comply. It is not possible to say with 95% confidence that the product does not comply.

Case D: Product does not comply.

Radiated Emissions ≤ 1 GHz

Value (dB)

Test Distance	Probability Distribution	Biconical Antenna		Log Periodic Antenna		Dipole Antenna	
		3m	10m	3m	10m	3m	10m
Combined standard uncertainty $u_c(y)$	normal	+ 1.86 - 1.88	+ 1.82 - 1.87	+ 2.23 - 1.41	+ 1.29 - 1.26	+ 1.31 - 1.27	+ 1.25 - 1.25
Expanded uncertainty U (level of confidence $\approx 95\%$)	normal (k=2)	+ 3.72 - 3.77	+ 3.64 - 3.73	+ 4.46 - 2.81	+ 2.59 - 2.52	+ 2.61 - 2.55	+ 2.49 - 2.49

Radiated Emissions > 1 GHz

Value (dB)

Test Distance	Probability Distribution	Without High Pass Filter		With High Pass Filter	
		3m	10m	3m	10m
Combined standard uncertainty $u_c(y)$	normal	+ 1.29 - 1.25	+ 1.29 - 1.25	+ 1.38 - 1.35	+ 1.38 - 1.35
Expanded uncertainty U (level of confidence $\approx 95\%$)	normal (k=2)	+ 2.57 - 2.51	+ 2.57 - 2.51	+ 2.76 - 2.70	+ 2.76 - 2.70

Conducted Emissions

Test Distance	Probability Distribution	Value (+/- dB)
Combined standard uncertainty $u_c(y)$	normal	1.48
Expanded uncertainty U (level of confidence $\approx 95\%$)	normal (k = 2)	2.97

Radiated Immunity

Test Distance	Probability Distribution	Value (+/- dB)
Combined standard uncertainty $u_c(y)$	normal	1.05
Expanded uncertainty U (level of confidence $\approx 95\%$)	normal (k = 2)	2.11

Conducted Immunity

Test Distance	Probability Distribution	Value (+/- dB)
Combined standard uncertainty $u_c(y)$	normal	1.05
Expanded uncertainty U (level of confidence $\approx 95\%$)	normal (k = 2)	2.10

Legend

$u_c(y)$ = square root of the sum of squares of the individual standard uncertainties

U = combined standard uncertainty multiplied by the coverage factor: k . This defines an interval about the measured result that will encompass the true value with a confidence level of approximately 95%. If a higher level of confidence is required, then $k=3$ (CL of 99.7%) can be used. Please note that with a coverage factor of one, $u_c(y)$ yields a confidence level of only 68%.

**California****Orange County Facility****Labs OC01 – OC13**

41 Tesla Ave.
Irvine, CA 92618
(888) 364-2378
FAX (503) 844-3826

**Oregon****Evergreen Facility****Labs EV01 – EV10**

22975 NW Evergreen Pkwy.
Suite 400
Hillsboro, OR 97124
(503) 844-4066
FAX (503) 844-3826

**Oregon****Trails End Facility****Labs TE01 – TE03**

30475 NE Trails End Lane
Newberg, OR 97132
(503) 844-4066
FAX (503) 537-0735

**Washington****Sultan Facility****Labs SU01 – SU07**

14128 339th Ave. SE
Sultan, WA 98294
(888) 364-2378
FAX (360) 793-2536

Party Requesting the Test

Company Name:	WirelessWERX, Inc.
Address:	9361 Irvine Blvd
City, State, Zip:	Irvine, CA 92618
Test Requested By:	Dave Couchman
Model:	TrakLITE C4-B
First Date of Test:	03-19-2005
Last Date of Test:	03-25-2005
Receipt Date of Samples:	03-19-2005
Equipment Design Stage:	Production
Equipment Condition:	No visual damage.

Information Provided by the Party Requesting the Test

Clocks/Oscillators:	Not provided.
I/O Ports:	Serial, JTAG (factory use only), GSM Modem, GPS, Bluetooth, Vehicle Cable Harness

Functional Description of the EUT (Equipment Under Test):

Vehicle mounted radio with GSM modem, Bluetooth, and GPS capability

The TrakLITE is primarily intended for mounting on a mobile vehicle or cargo, and provides the means for remote positioning and communications on a global scale. The TrakLITE, when requested, can issue commands to a local system or cargo, receive and respond to requests for position and status, issue pre-programmed commands and status messages and log a combination of 4,500 position, velocity, and status records for subsequent download to a Control Center.

Client Justification for EUT Selection:

The product is a representative production sample.

Client Justification for Test Selection:

These tests satisfy the requirements of FCC Parts 22H and 24E for the GSM modem.

EUT Photo

Equipment modifications					
Item	Test	Date	Modification	Note	Disposition of EUT
1	Effective Radiated Power	03/20/2005	No EMI suppression devices were added or modified during this test.	Same configuration as delivered.	EUT remained at Northwest EMC.
2	Spurious Radiated Emissions	03/21/2005	No EMI suppression devices were added or modified during this test.	Same configuration as in previous test.	EUT remained at Northwest EMC.
3	Receive Mode Radiated Emissions	03/21/2005	No EMI suppression devices were added or modified during this test.	Same configuration as in previous test.	EUT remained at Northwest EMC.
4	Spurious Conducted Emissions	03/24/2005	No EMI suppression devices were added or modified during this test.	Same configuration as in previous test.	EUT remained at Northwest EMC.
5	Frequency Stability	03/24/2005	No EMI suppression devices were added or modified during this test.	Same configuration as in previous test.	EUT remained at Northwest EMC.
6	Output Power	03/25/2005	No EMI suppression devices were added or modified during this test.	Same configuration as in previous test.	EUT remained at Northwest EMC.
7	Occupied Bandwidth	03/25/2005	No EMI suppression devices were added or modified during this test.	Same configuration as in previous test.	EUT remained at Northwest EMC.

Justification

The individuals and/or the organization requesting the test provided the modes, configurations and settings available to evaluate. While scanning the radiated emissions, all of the EUT parameters listed below were investigated. This includes, but may not be limited to, antennas, tuned transmit frequency ranges, operating modes, and data rates.

Channels in Specified Band Investigated:

Cellular Low Channel, 824.2MHz
Cellular Mid Channel, 836.4MHz
Cellular High Channel, 848.8MHz
PCS Low Channel, 1850.2MHz
PCS Mid Channel, 1880MHz
PCS High Channel, 1909.8MHz

Operating Modes Investigated:

Typical

Data Rates Investigated:

Maximum

Power Input Settings Investigated:

12VDC

Software\Firmware Applied During Test

Exercise software	Hyperterminal	Version	1999
Description			
The system was tested using hyperterminal software on a remote pc to access the EUT during the testing. A call was originated by the wireless communications test set and answered via hyperterminal on the EUT.			

EUT and Peripherals

Description	Manufacturer	Model/Part Number	Serial Number
EUT	Wireless Werx	TrakLITE C4-B	100074
DC Power Supply	Topward Electric Instruments, Co. Ltd.	TPS-2000	Unknown
Cellular Antenna	Radiall/Larsen	MMC/P3ESMA	Unknown
GPS Antenna	Laipac Tech	GLP1	334083
Bluetooth Antenna	Radiall/Larsen	MS3E2400SMA	Unknown

Remote Equipment Outside of Test Setup Boundary

Description	Manufacturer	Model/Part Number	Serial Number
Wireless Communications Test Set	Agilent	8960 Series 10 E5515C	0844051960
Remote laptop	IBM	Thinkpad	78-HKYY6 10/00
Equipment isolated from the EUT so as not to contribute to the measurement result is considered to be outside the test setup boundary			

Cables

Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
Serial	Yes	6	No	EUT	Remote laptop
Wire harness (16)	No	1.0	No	EUT	Unterminated
Wire harness (3)	No	1.0	No	EUT	DC Power Supply
Bluetooth	Yes	2.0	No	EUT	Bluetooth Antenna
Cellular	Yes	3.0	No	EUT	Cellular Antenna
GPS	Yes	3.0	No	EUT	GPS Antenna
AC Power	No	2.0	No	DC Power Supply	AC Mains

Measurement Equipment

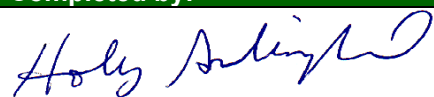
Description	Manufacturer	Model	Identifier	Last Cal	Interval
Antenna, Biconilog	EMCO	3141	AXE	12/03/2003	24 mo
Antenna, Horn	EMCO	3115	AHC	09/07/2004	12 mo
Quasi-Peak Adapter	Hewlett-Packard	85650A	AQF	12/02/2004	13 mo
Spectrum Analyzer	Hewlett-Packard	8566B	AAL	12/02/2004	13 mo
Spectrum Analyzer Display	Hewlett Packard	85662A	AALD	12/02/2004	13 mo
Attenuator	Coaxicom	66702 5910-20	RBJ	02/25/2005	13 mo
Antenna, Horn	EMCO	3115	AHF	03/18/2004	24 mo
Signal Generator	Hewlett Packard	8341B	TGN	02/07/2005	13 mo
Antenna, Dipole (ADAA included)	Roberts	Roberts	ADA	01/06/2005	24 mo

Test Description

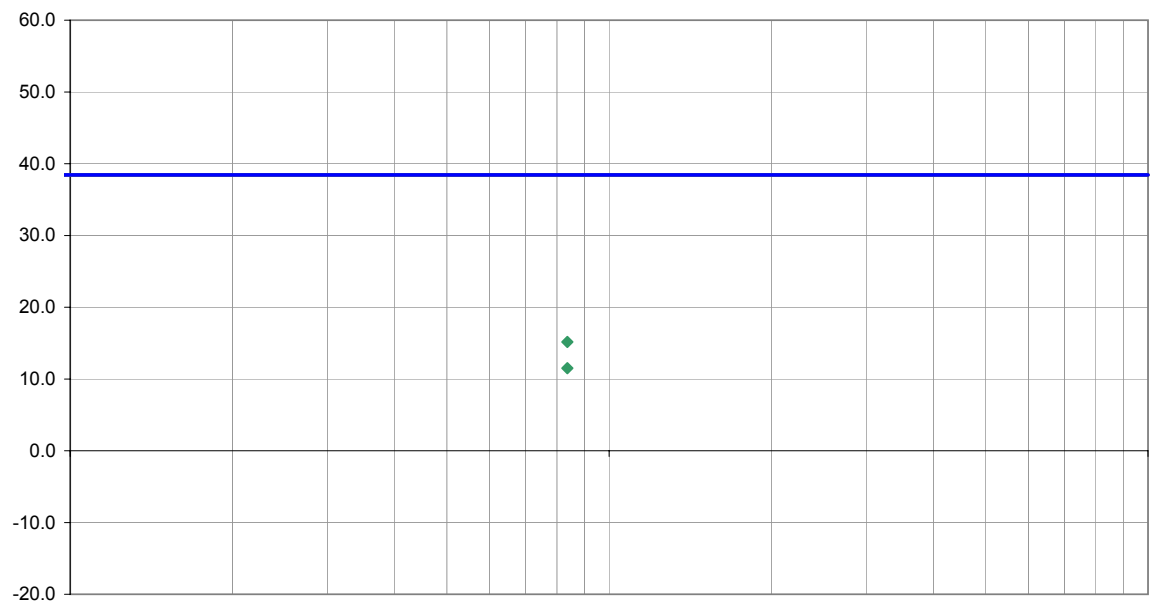
Requirement: The EIRP of the GSM Cellular and PCS radio's fundamental frequencies shall meet the requirements specified in FCC 22.913 and FCC 24.232, respectively.

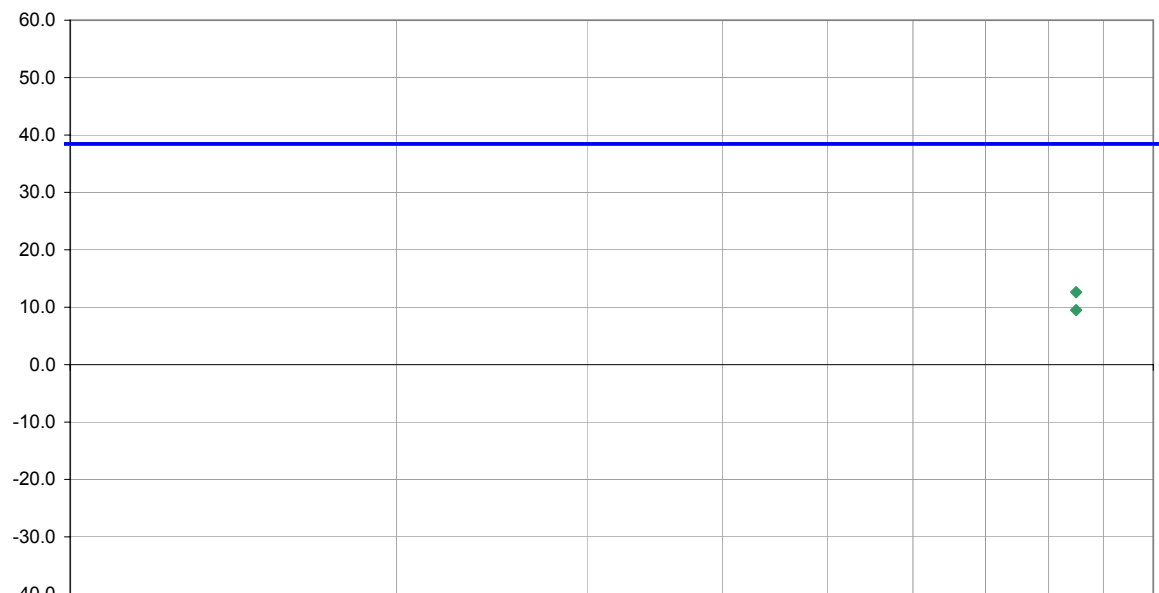
Configuration: The fundamental emissions from the EUT were maximized by rotating the EUT, adjusting the measurement antenna height (1-4 meters) and polarization. The amplitude of the emissions were noted. The EUT was then replaced with a $\frac{1}{2}$ wave dipole that was successively tuned to each of the highest spurious emissions. A signal generator was connected to the dipole, and its output was adjusted to match the level previously noted for each frequency. The output of the signal generator was recorded, and by factoring in the cable loss to the dipole antenna and its gain (dBi); the effective radiated power for each radiated emission was determined.

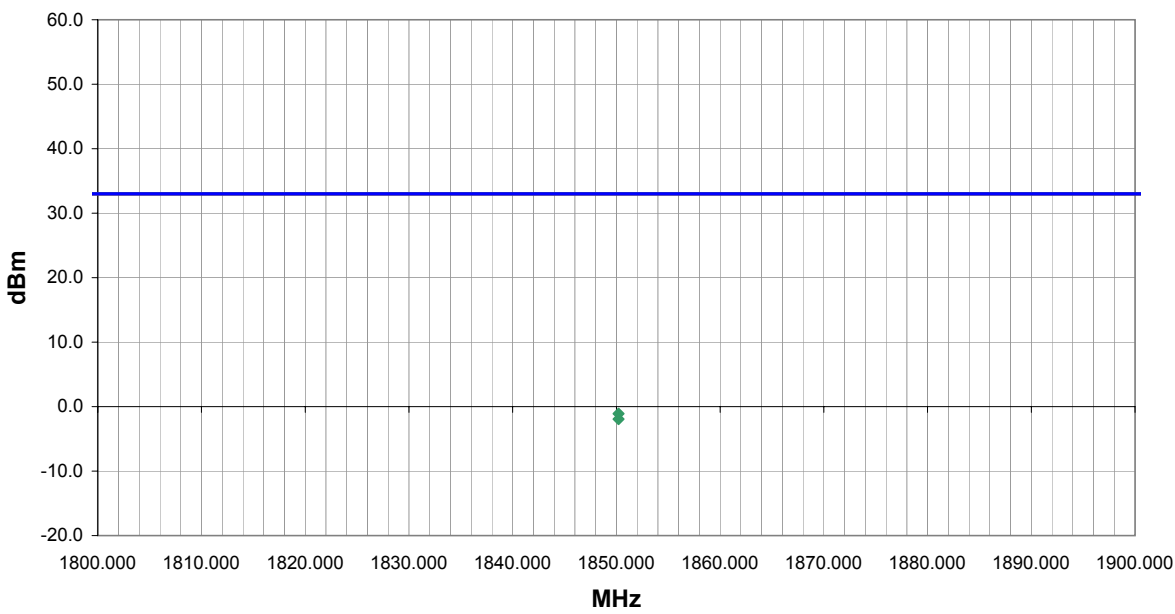
Completed by:

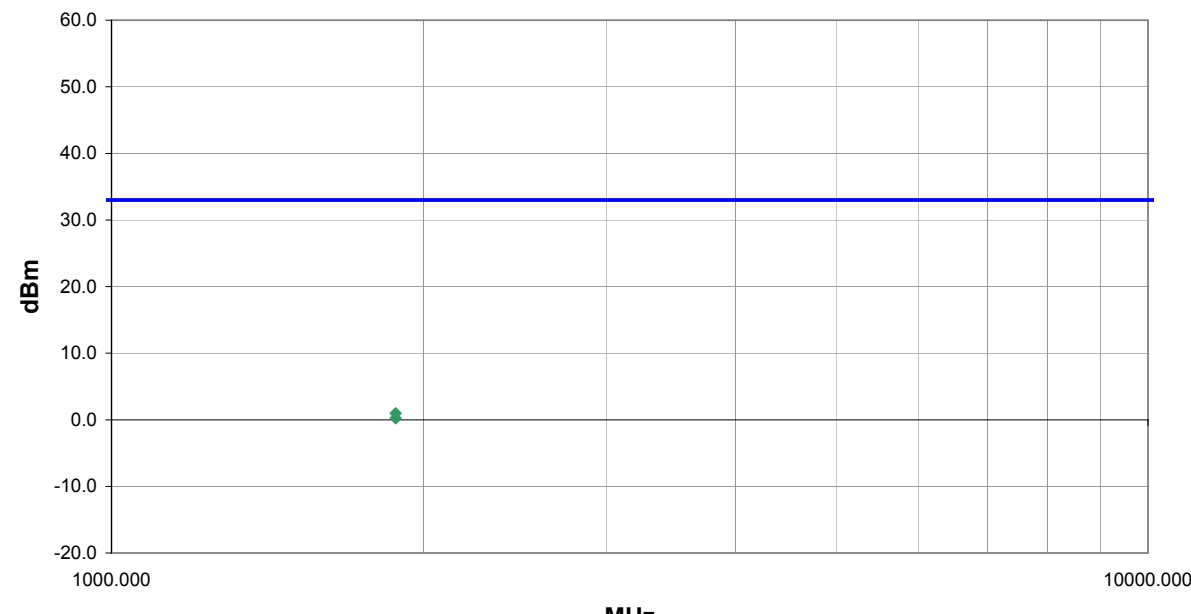


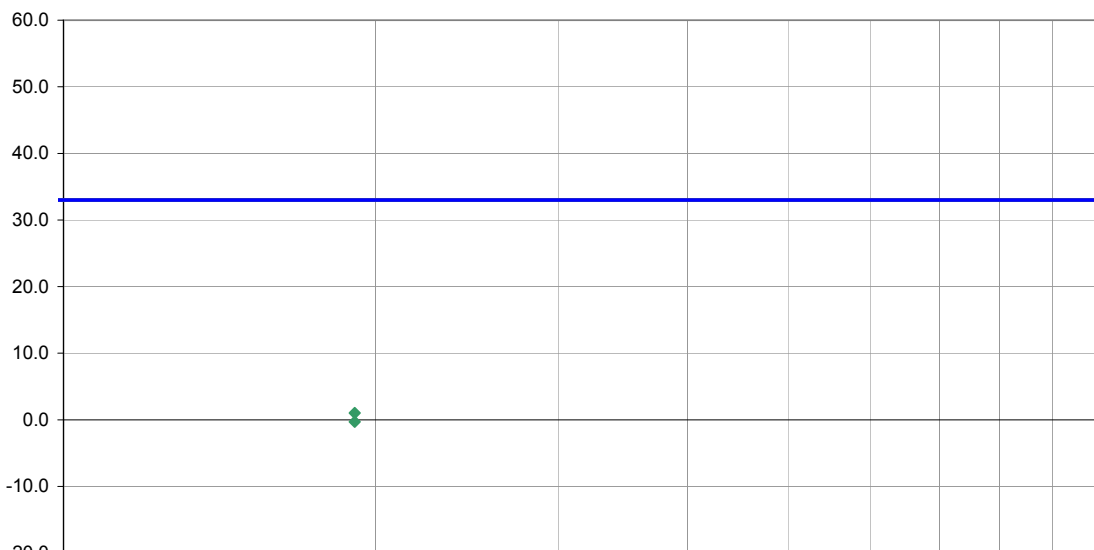
NORTHWEST		ACQ 2005.1.3 EMI 2005.1.3	
EMC		Apparent Power Data Sheet	
EUT: TrakLITE C4-B		Work Order: 7LAY0037	
Serial Number: 100074		Date: 03/19/05	
Customer: WirelessWERX, Inc.		Temperature: 24	
Attendees: none		Humidity: 31%	
Cust. Ref. No.:		Barometric Pressure: 29.67	
Tested by: Holly Ashkannejhad		Power: 12VDC	Job Site: EV01
TEST SPECIFICATIONS			
Specification: FCC 22.913(a): 2004		Method: TIA/EIA-603:2001	
SAMPLE CALCULATIONS			
Radiated Emissions: Field Strength = Measured Level + Antenna Factor + Cable Factor - Amplifier Gain + Distance Adjustment Factor + External Attenuation Conducted Emissions: Adjusted Level = Measured Level + Transducer Factor + Cable Attenuation Factor + External Attenuator			
COMMENTS			
10dB internal attenuation, no preamp			
EUT OPERATING MODES			
Transmitting GSM Cellular Low Channel			
DEVIATIONS FROM TEST STANDARD			
No deviations.			
RESULTS			Run #
Pass			1
Other		Tested By:	
Freq (MHz)		Azimuth (degrees)	Height (meters)
824.197		29.0	1.2
824.197		331.0	1.0
	Polarity	Detector	ERP (Watts)
	V-Bilog	PK	0.0167
	H-Bilog	PK	0.0076
	ERP (dBm)	Spec. Limit (dBm)	Compared to Spec. (dB)
	12.2	38.5	-26.2
	8.8	38.5	-29.6

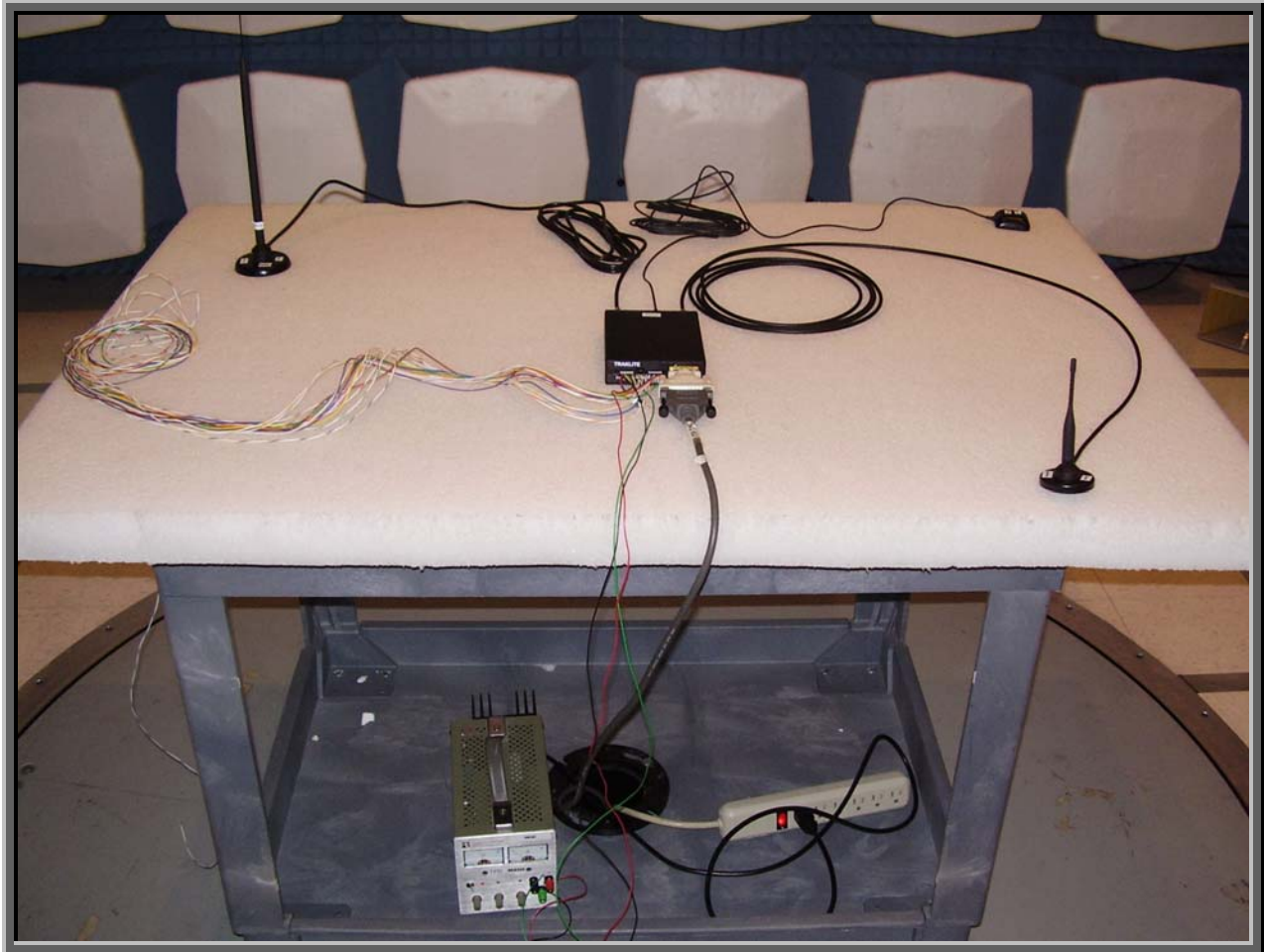
NORTHWEST		Apparent Power Data Sheet				ACQ 2005.1.3 EMI 2005.1.3				
EMC										
EUT: TrakLITE C4-B		Work Order: 7LAY0037								
Serial Number: 100074		Date: 03/19/05								
Customer: WirelessWERX, Inc.		Temperature: 24								
Attendees: none		Humidity: 31%								
Cust. Ref. No.:		Barometric Pressure: 29.67								
Tested by: Holly Ashkannejhad		Power: 12VDC		Job Site: EV01						
TEST SPECIFICATIONS										
Specification: FCC 22.913(a): 2004		Method: TIA/EIA-603:2001								
SAMPLE CALCULATIONS										
Radiated Emissions: Field Strength = Measured Level + Antenna Factor + Cable Factor - Amplifier Gain + Distance Adjustment Factor + External Attenuation										
Conducted Emissions: Adjusted Level = Measured Level + Transducer Factor + Cable Attenuation Factor + External Attenuator										
COMMENTS										
10dB internal attenuation, no preamp.										
EUT OPERATING MODES										
Transmitting GSM Cellular Mid Channel										
DEVIATIONS FROM TEST STANDARD										
No deviations.										
RESULTS						Run #				
Pass						2				
Other										
						 Tested By:				
										
Freq (MHz)		Azimuth (degrees)	Height (meters)		Polarity	Detector	ERP (Watts)	ERP (dBm)	Spec. Limit (dBm)	Compared to Spec. (dB)
836.400		30.0	1.3		V-Bilog	PK	0.0329	15.2	38.5	-23.4
836.400		331.0	1.0		H-Bilog	PK	0.0141	11.5	38.5	-27.0

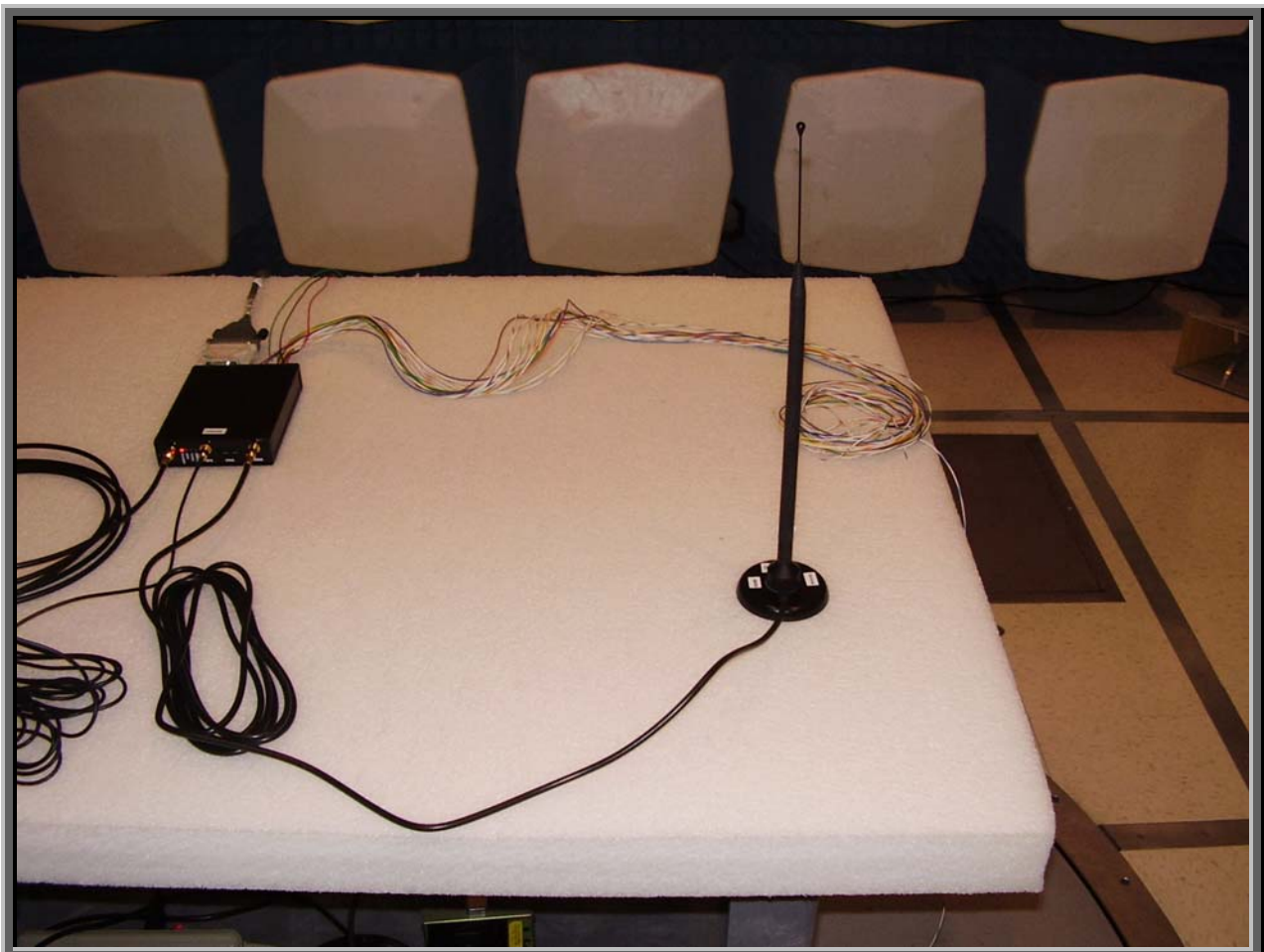
NORTHWEST EMC		Apparent Power Data Sheet				ACQ 2005.1.3 EMI 2005.1.3			
EUT: TrakLITE C4-B		Work Order: 7LAY0037							
Serial Number: 100074		Date: 03/19/05							
Customer: WirelessWERX, Inc.		Temperature: 24							
Attendees: none		Humidity: 31%							
Cust. Ref. No.:		Barometric Pressure: 29.67							
Tested by: Holly Ashkannejhad		Power: 12VDC		Job Site: EV01					
TEST SPECIFICATIONS									
Specification: FCC 22.913(a): 2004				Method: TIA/EIA-603:2001					
SAMPLE CALCULATIONS									
Radiated Emissions: Field Strength = Measured Level + Antenna Factor + Cable Factor - Amplifier Gain + Distance Adjustment Factor + External Attenuation									
Conducted Emissions: Adjusted Level = Measured Level + Transducer Factor + Cable Attenuation Factor + External Attenuator									
COMMENTS									
10dB internal attenuation, no preamp.									
EUT OPERATING MODES									
Transmitting GSM Cellular High Channel									
DEVIATIONS FROM TEST STANDARD									
No deviations.									
RESULTS						Run #			
Pass						3			
Other									
						 Tested By:			
									
Freq (MHz)		Azimuth (degrees)	Height (meters)	Polarity	Detector	ERP (Watts)	ERP (dBm)	Spec. Limit (dBm)	Compared to Spec. (dB)
848.800		23.0	1.3	V-Bilog	PK	0.0183	12.6	38.5	-25.8
848.800		360.0	1.0	H-Bilog	PK	0.0089	9.5	38.5	-29.0

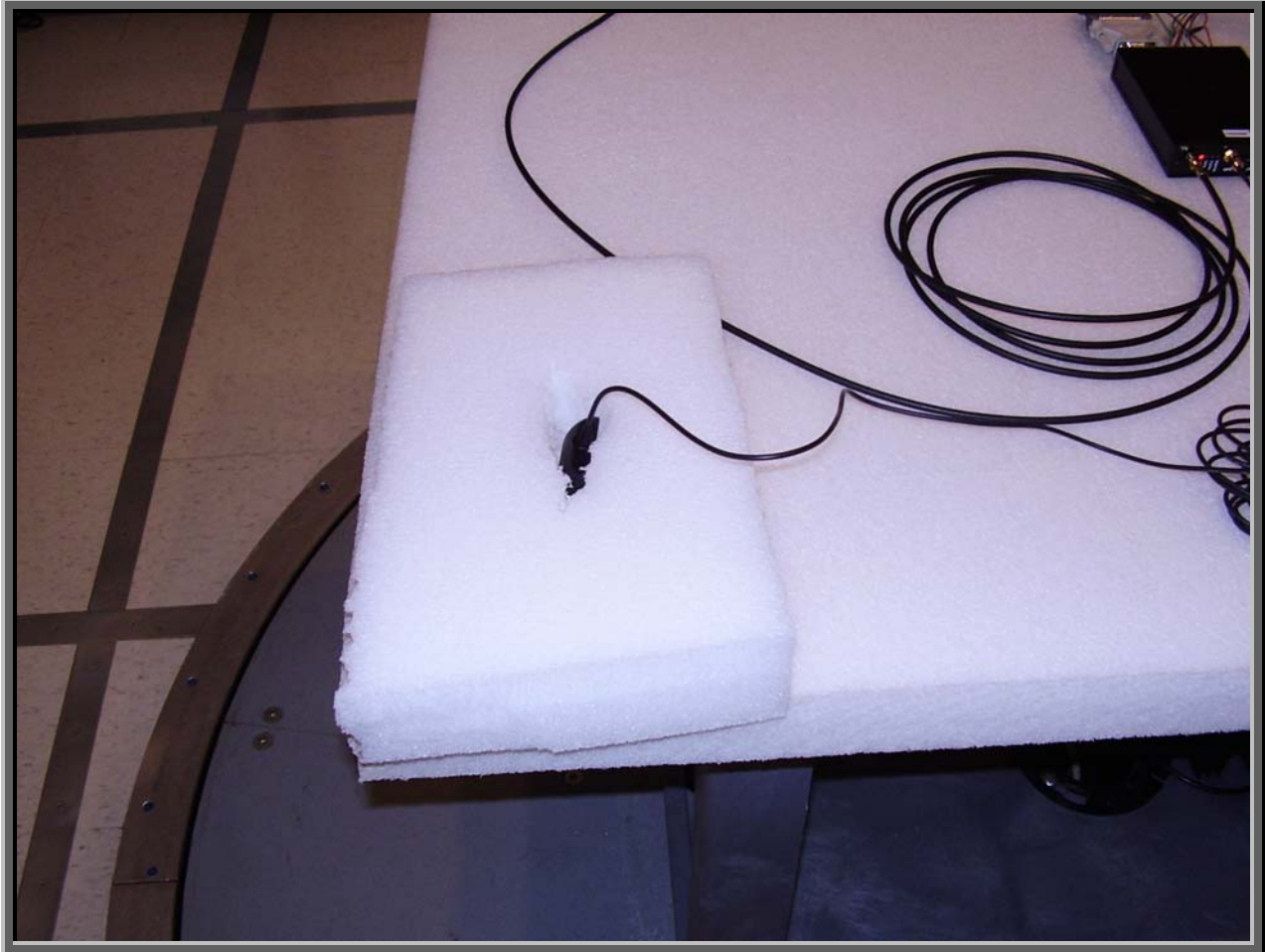
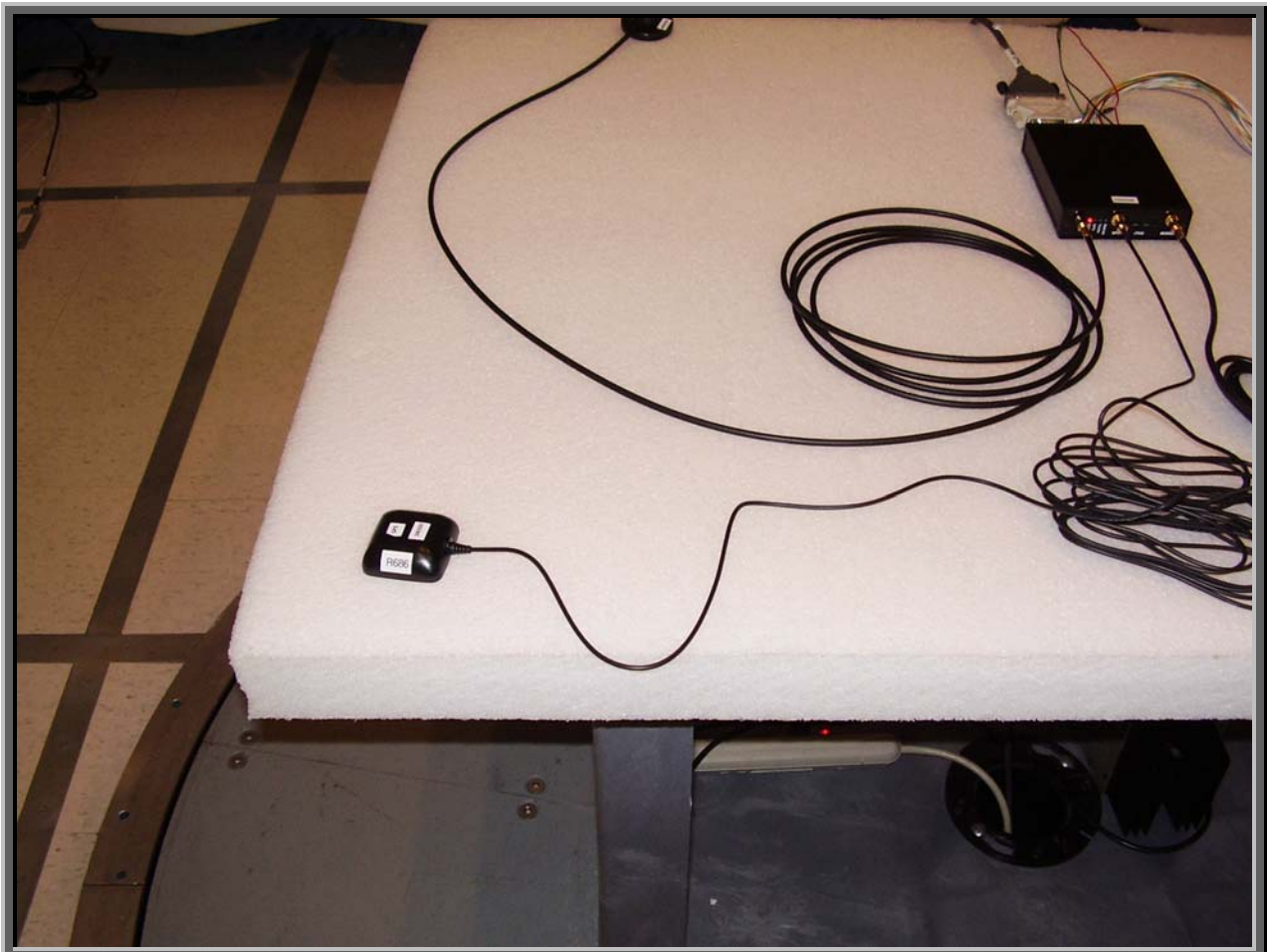
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		Job Site: EV01								
TEST SPECIFICATIONS										
Specification: FCC 24.232(b) :2004		Method: TIA/EIA-603:2001								
SAMPLE CALCULATIONS										
Radiated Emissions: Field Strength = Measured Level + Antenna Factor + Cable Factor - Amplifier Gain + Distance Adjustment Factor + External Attenuation										
Conducted Emissions: Adjusted Level = Measured Level + Transducer Factor + Cable Attenuation Factor + External Attenuator										
COMMENTS										
20dB external attenuation, 10dB internal attenuation										
EUT OPERATING MODES										
Transmitting GSM PCS Low Channel										
DEVIATIONS FROM TEST STANDARD										
No deviations.										
RESULTS			Run #							
Pass			4							
Other										
			 Tested By:							
										
Freq (MHz)		Azimuth (degrees)	Height (meters)		Polarity	Detector	EIRP (Watts)	EIRP (dBm)	Spec. Limit (dBm)	Compared to Spec. (dB)
1850.209		247.0	1.2		V-Horn	PK	6.3878E-04	-1.1	33.0	-34.1
1850.209		210.0	1.7		H-Horn	PK	7.7726E-04	-1.9	33.0	-34.9

NORTHWEST		Apparent Power Data Sheet				ACQ 2005.1.3 EMI 2005.1.3					
EMC											
EUT: TrakLITE C4-B		Work Order: 7LAY0037									
Serial Number: 100074		Date: 03/20/05									
Customer: WirelessWERX, Inc.		Temperature: 23									
Attendees: none		Humidity: 32%									
Cust. Ref. No.:		Barometric Pressure: 29.5									
Tested by: Holly Ashkannejhad		Power: 12VDC		Job Site: EV01							
TEST SPECIFICATIONS											
Specification: FCC 24.232(b):2004		Method: TIA/EIA-603:2001									
SAMPLE CALCULATIONS											
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Conducted Emissions: Adjusted Level = Measured Level + Transducer Factor + Cable Attenuation Factor + External Attenuator											
COMMENTS											
20dB external attenuation, 10dB internal attenuation.											
EUT OPERATING MODES											
Transmitting GSM PCS Mid Channel											
DEVIATIONS FROM TEST STANDARD											
No deviations.											
RESULTS						Run #					
Pass						6					
Other											
						 Tested By:					
											
Freq (MHz)			Azimuth (degrees)	Height (meters)		Polarity	Detector	EIRP (Watts)	EIRP (dBm)	Spec. Limit (dBm)	Compared to Spec. (dB)
1880.000			188.0	1.2		V-Horn	AV	0.0011	1.0	33.0	-32.0
1880.000			208.0	1.3		H-Horn	PK	0.0012	0.2	33.0	-32.8

NORTHWEST		Apparent Power Data Sheet				ACQ 2005.1.3 EMI 2005.1.3					
EMC											
EUT: TrakLITE C4-B		Work Order: 7LAY0037									
Serial Number: 100074		Date: 03/20/05									
Customer: WirelessWERX, Inc.		Temperature: 24									
Attendees: none		Humidity: 31%									
Cust. Ref. No.:		Barometric Pressure: 29.67									
Tested by: Holly Ashkannejhad		Power: 12VDC		Job Site: EV01							
TEST SPECIFICATIONS											
Specification: FCC 24.232(b):2004		Method: TIA/EIA-603:2001									
SAMPLE CALCULATIONS											
Radiated Emissions: Field Strength = Measured Level + Antenna Factor + Cable Factor - Amplifier Gain + Distance Adjustment Factor + External Attenuation											
Conducted Emissions: Adjusted Level = Measured Level + Transducer Factor + Cable Attenuation Factor + External Attenuator											
COMMENTS											
20dB external attenuation, 10dB internal attenuation.											
EUT OPERATING MODES											
Transmitting GSM PCS High Channel											
DEVIATIONS FROM TEST STANDARD											
No deviations.											
RESULTS						Run #					
Pass						7					
Other											
						 Tested By:					
dBm  MHz											
Freq (MHz)			Azimuth (degrees)	Height (meters)		Polarity	Detector	EIRP (Watts)	EIRP (dBm)	Spec. Limit (dBm)	Compared to Spec. (dB)
1909.800			52.0	1.7		V-Horn	PK	0.0009	1.0	33.0	-32.0
1909.800			211.0	1.3		H-Horn	PK	0.0013	-0.3	33.0	-33.3









Justification

The individuals and/or the organization requesting the test provided the modes, configurations and settings available to evaluate. While scanning the radiated emissions, all of the EUT parameters listed below were investigated. This includes, but may not be limited to, antennas, tuned transmit frequency ranges, operating modes, and data rates.

Channels in Specified Band Investigated:

Cellular Mid Channel, 836.4MHz

PCS Mid Channel, 1880MHz

Operating Modes Investigated:

Typical

Data Rates Investigated:

Maximum

Output Power Setting(s) Investigated:

Maximum

Power Input Settings Investigated:

12 VDC (nominal)

Software\Firmware Applied During Test

Exercise software		Version	
Hyperterminal		1999	

Description

The system was tested using hyperterminal software on a remote pc to access the EUT during the testing. A call was originated by the wireless communications test set and answered via hyperterminal on the EUT.
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EUT and Peripherals

Description	Manufacturer	Model/Part Number	Serial Number
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EUT	Wireless Werx	TrakLITE C4-B	100074
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DC Power Supply	Tektronix, Inc	PS280	TW60580
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Remote Equipment Outside of Test Setup Boundary

Description	Manufacturer	Model/Part Number	Serial Number
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Wireless Communications Test Set	Agilent	8960 Series 10 E5515C	0844051960
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Remote laptop	IBM	Thinkpad	78-HKYY6 10/00
---------------	-----	----------	----------------

Near Field Probe	EMCO	7405-901	3337
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Equipment isolated from the EUT so as not to contribute to the measurement result is considered to be outside the test setup boundary

Cables					
Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
Serial	Yes	6	No	EUT	Remote laptop
Wire harness (16)	No	1.0	No	EUT	Unterminated
Wire harness (3)	No	1.0	No	EUT	DC Power Supply
AC Power	No	2.0	No	DC Power Supply	AC Mains

Measurement Equipment					
Description	Manufacturer	Model	Identifier	Last Cal	Interval
Spectrum Analyzer	Tektronix	2784	AAO	01/02/2005	12 mo
Multimeter	Tektronix	DMM912	MMH	12/02/2004	13 mo
Chamber, Temp./Humidity Chamber	Cincinnati Sub Zero (CSZ)	ZH-32-2-2-H/AC	TBA	09/07/2004	12 mo

Test Description

Requirement: Per 47 CFR 2.1055 and 24.235, the frequency stability shall be measured with variation of ambient temperature and primary supply voltage. A spectrum analyzer or frequency counter can be used to measure the frequency stability. If using a spectrum analyzer, it must have a precision frequency reference that exceeds the stability requirement of the transmitter. A temperature / humidity chamber is required.

Configuration:

Variation of AC Mains Supply Voltage

The EUT is operated in motorized vehicles. There is no provision for connection to the AC mains.

Variation of Battery Supply Voltage

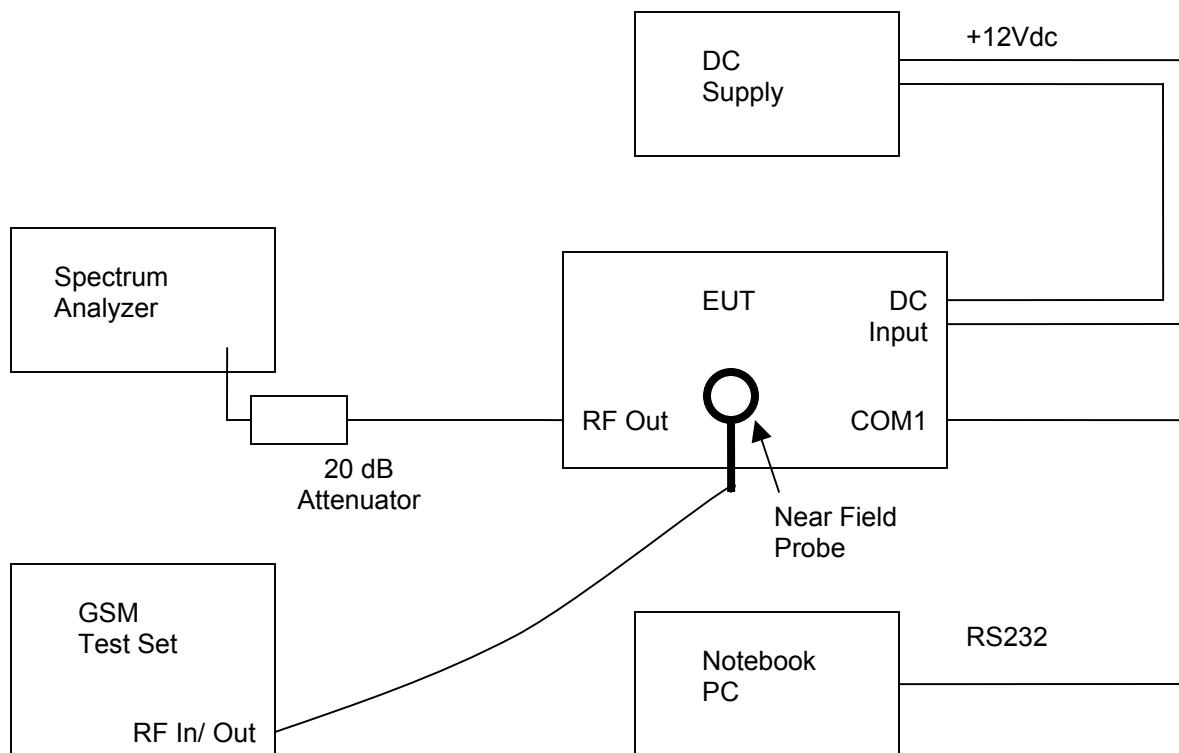
The EUT is designed to operate from either 12 Vdc or 24 Vdc vehicle power. A DC lab supply was used to vary the supply voltage from 24 Vdc down to the EUT's voltage end point.

Variation of Ambient Temperature

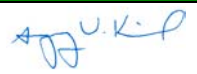
Using a temperature chamber, the transmit frequency was recorded at the extremes of the specified temperature range (-30° to +60° C) and at 10°C intervals.

Measurements were made at mid frequency in both the cellular and PCS bands. A direct connection was made between the RF output of the EUT and a spectrum analyzer. The spectrum analyzer is equipped with a precision frequency reference that exceeds the stability requirement of the EUT.

Test Setup Diagram



Completed by:

NORTHWEST EMC		EMISSIONS DATA SHEET		Rev BETA 01/30/01	
EUT:	TrakLITE C4-B			Work Order:	7LAY0037
Serial Number:	100074			Date:	03/24/05
Customer:	WirelessWERX, Inc.			Temperature:	see below
Attendees:	none	Tested by:	Greg Kiemel	Humidity:	42%
Customer Ref. No.:	N/A	Power:	see below	Job Site:	EV06, EV09
TEST SPECIFICATIONS					
Specification:	47 CFR 2.1055	Year:	Most Current	Method:	TIA/EIA - 603
				Year:	2001
SAMPLE CALCULATIONS					
COMMENTS					
EUT OPERATING MODES					
Transmitting mid band					
DEVIATIONS FROM TEST STANDARD					
None					
REQUIREMENTS					
Minimum frequency stability of 2.5 parts per million (ppm) for variations of temperature and supply voltage.					
RESULTS					
			MINIMUM FREQUENCY STABILITY		
Pass			0.20 ppm		
SIGNATURE					
 Tested By: _____					
DESCRIPTION OF TEST					
Frequency Stability					

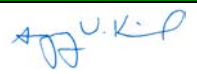
Frequency Stability with Variation of Ambient Temperature (Primary Supply = 12 Vdc)

Temp (°C)	Assigned Frequency (MHz)	Measured Frequency (MHz)	Tolerance (ppm)	Specification (ppm)
-30	836.40000	836.399900	0.12	2.5
-20	836.40000	836.399925	0.09	2.5
-10	836.40000	836.399930	0.08	2.5
0	836.40000	836.399895	0.13	2.5
10	836.40000	836.399940	0.07	2.5
20	836.40000	836.399865	0.16	2.5
30	836.40000	836.399860	0.17	2.5
40	836.40000	836.399830	0.20	2.5
50	836.40000	836.399880	0.14	2.5
60	836.40000	836.399865	0.16	2.5

Frequency Stability with Variation of Primary Supply Voltage (Ambient Temperature = 22°C)

12 Vdc or 24 Vdc = Nominal Battery Supply Voltage

Voltage (Vdc)	Assigned Frequency (MHz)	Measured Frequency (MHz)	Tolerance (ppm)	Specification (ppm)
24 (100%)	836.40000	836.399950	0.06	2.5
12 (100%)	836.40000	836.399885	0.14	2.5
11.4 (95%)	836.40000	836.399895	0.13	2.5
10.8 (90%)	836.40000	836.399925	0.09	2.5
10.2 (85%)	836.40000	836.399890	0.13	2.5
8.0 (end point)	836.40000	836.399830	0.20	2.5

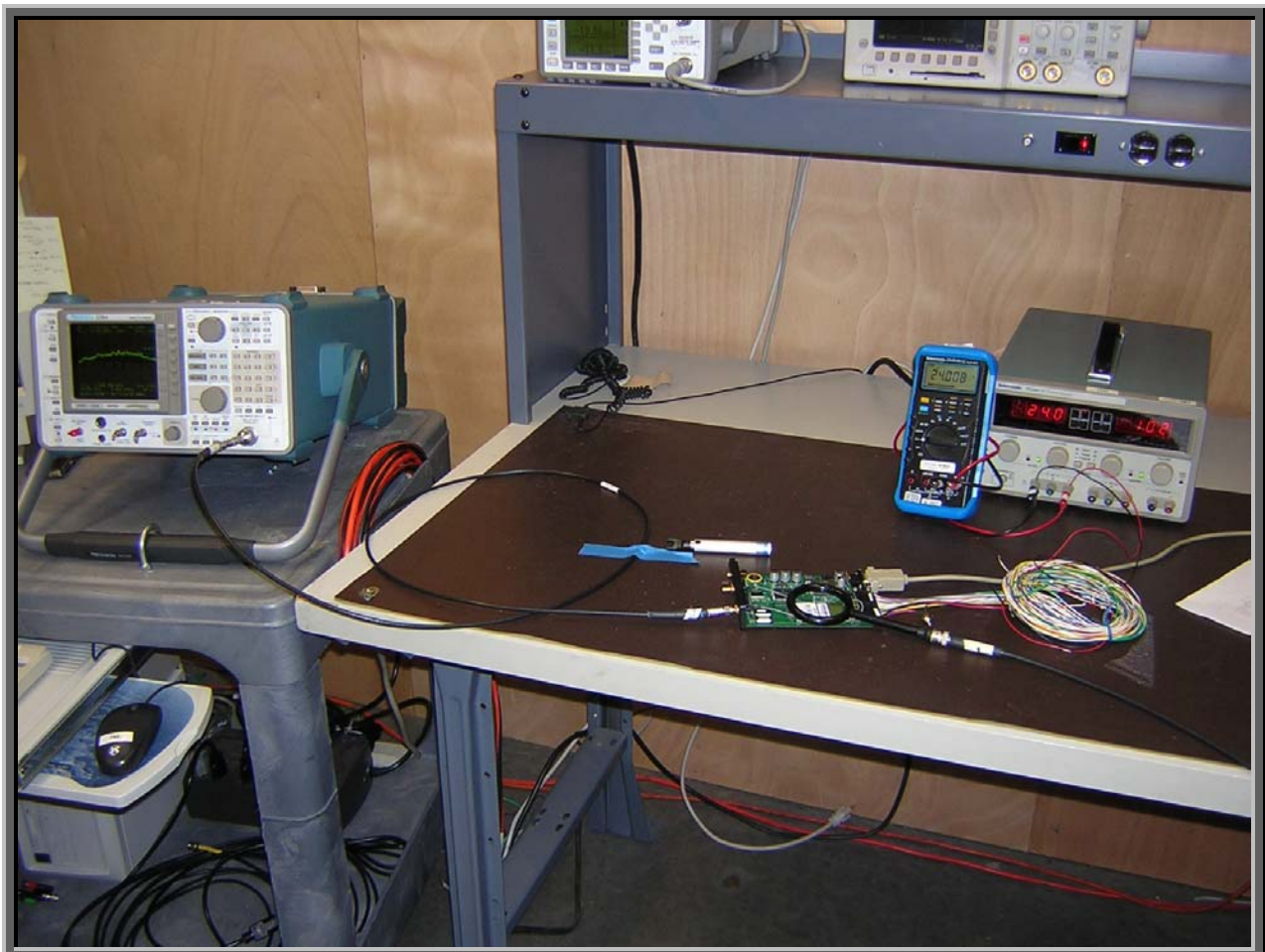
NORTHWEST EMC		EMISSIONS DATA SHEET		Rev BETA 01/30/01	
EUT:	TrakLITE C4-B			Work Order:	7LAY0037
Serial Number:	100074			Date:	03/24/05
Customer:	WirelessWERX, Inc.			Temperature:	see below
Attendees:	none	Tested by:	Greg Kiemel	Humidity:	42%
Customer Ref. No.:	N/A	Power:	see below	Job Site:	EV06, EV09
TEST SPECIFICATIONS					
Specification:	47 CFR 2.1055 , 24.235	Year:	Most Current	Method:	TIA/EIA - 603
				Year:	2001
SAMPLE CALCULATIONS					
COMMENTS					
EUT OPERATING MODES					
Transmitting mid band					
DEVIATIONS FROM TEST STANDARD					
None					
REQUIREMENTS					
Minimum frequency stability of 2.5 parts per million (ppm) for variations of temperature and supply voltage.					
RESULTS					
			MINIMUM FREQUENCY STABILITY		
Pass			0.90 ppm		
SIGNATURE					
 Tested By: _____					
DESCRIPTION OF TEST					
Frequency Stability					

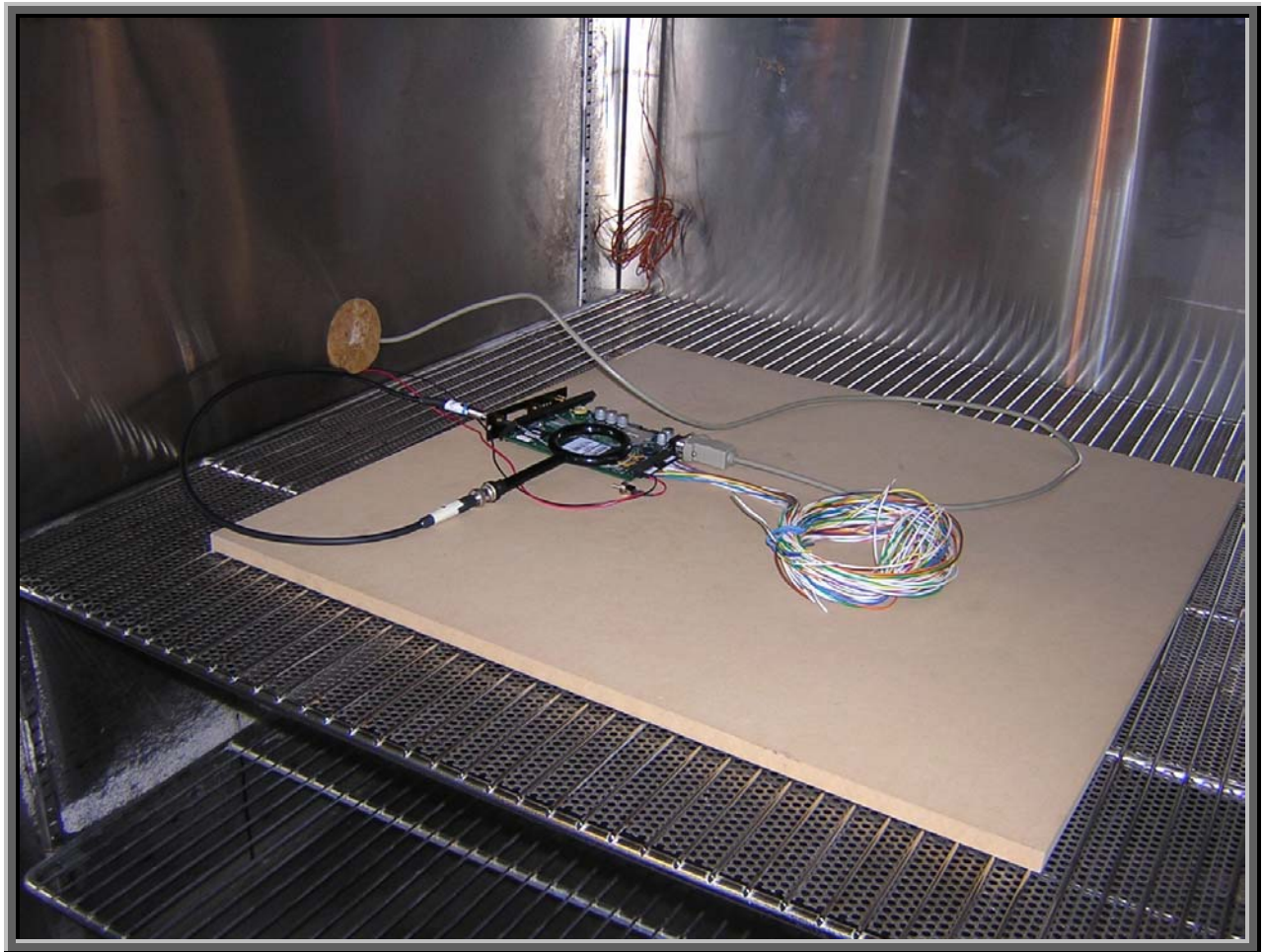
Frequency Stability with Variation of Ambient Temperature (Primary Supply = 12 Vdc)

Temp (°C)	Assigned Frequency (MHz)	Measured Frequency (MHz)	Tolerance (ppm)	Specification (ppm)
-30	1880.00000	1879.998500	0.80	2.5
-20	1880.00000	1879.998500	0.80	2.5
-10	1880.00000	1879.998900	0.59	2.5
0	1880.00000	1879.998600	0.74	2.5
10	1880.00000	1879.998900	0.59	2.5
20	1880.00000	1879.998800	0.64	2.5
30	1880.00000	1879.998900	0.59	2.5
40	1880.00000	1879.998700	0.69	2.5
50	1880.00000	1879.998600	0.74	2.5
60	1880.00000	1879.998300	0.90	2.5

Frequency Stability with Variation of Primary Supply Voltage (Ambient Temperature = 22°C)
12 Vdc or 24 Vdc = Nominal Battery Supply Voltage

Voltage (Vdc)	Assigned Frequency (MHz)	Measured Frequency (MHz)	Tolerance (ppm)	Specification (ppm)
24 (100%)	1880.00000	1879.998600	0.74	2.5
12 (100%)	1880.00000	1879.999200	0.43	2.5
11.4 (95%)	1880.00000	1879.999000	0.53	2.5
10.8 (90%)	1880.00000	1879.998800	0.64	2.5
10.2 (85%)	1880.00000	1879.998600	0.74	2.5
8.0 (end point)	1880.00000	1879.998600	0.74	2.5





Justification

The individuals and/or the organization requesting the test provided the modes, configurations and settings available to evaluate. While scanning the radiated emissions, all of the EUT parameters listed below were investigated. This includes, but may not be limited to, antennas, tuned transmit frequency ranges, operating modes, and data rates.

Channels in Specified Band Investigated:

GSM Cellular

Operating Modes Investigated:

Receive Mode

Antennas Investigated:

Bluetooth

GPS

Cellular

Data Rates Investigated:

Maximum

Power Input Settings Investigated:

12VDC

Frequency Range Investigated

Start Frequency	30 MHz	Stop Frequency	5 GHz
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Software\Firmware Applied During Test

Exercise software	Hyperterminal	Version	1999
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Description

The system was tested using hyperterminal software on a remote pc to access the EUT during the testing. A cellular band call was originated by the wireless communications test set and answered via hyperterminal on the EUT. The call was ended, but the radio remained in a receive mode

EUT and Peripherals

Description	Manufacturer	Model/Part Number	Serial Number
EUT	Wireless Werx	TrakLITE C4-B	100074
DC Power Supply	Topward Electric Instruments, Co. Ltd.	TPS-2000	Unknown
Cellular Antenna	Radiall/Larsen	MMC/P3ESMA	Unknown
GPS Antenna	Laipac Tech	GLP1	334083
Bluetooth Antenna	Radiall/Larsen	MS3E2400SMA	Unknown

Remote Equipment Outside of Test Setup Boundary

Description	Manufacturer	Model/Part Number	Serial Number
Wireless Communications Test Set	Agilent	8960 Series 10 E5515C	0844051960
Remote laptop	IBM	Thinkpad	78-HKYY6 10/00
Equipment isolated from the EUT so as not to contribute to the measurement result is considered to be outside the test setup boundary			

Cables

Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
Serial	Yes	6	No	EUT	Remote laptop
Wire harness (16)	No	1.0	No	EUT	Unterminated
Wire harness (3)	No	1.0	No	EUT	DC Power Supply
Bluetooth	Yes	2.0	No	EUT	Bluetooth Antenna
Cellular	Yes	3.0	No	EUT	Cellular Antenna
GPS	Yes	3.0	No	EUT	GPS Antenna
AC Power	No	2.0	No	DC Power Supply	AC Mains

Measurement Equipment

Description	Manufacturer	Model	Identifier	Last Cal	Interval
Antenna, Horn	EMCO	3115	AHC	09/07/2004	12 mo
Pre-Amplifier	Miteq	AMF-4D-005180-24-10P	APC	02/17/2005	13 mo
Antenna, Biconilog	EMCO	3141	AXE	12/03/2003	24 mo
Pre-Amplifier	Amplifier Research	LN1000A	APS	03/01/2005	13 mo
Quasi-Peak Adapter	Hewlett-Packard	85650A	AQF	12/02/2004	13 mo
Spectrum Analyzer	Hewlett-Packard	8566B	AAL	12/02/2004	13 mo
Spectrum Analyzer Display	Hewlett Packard	85662A	AALD	12/02/2004	13 mo

Test Description

The final radiated emissions test was performed using the parameters described above as worst case. That final test was conducted at a facility that meets the ANSI C63.4 NSA requirements. The frequency range noted in the data sheets was scanned/tested at that facility. Emissions were maximized as specified, by maximizing table azimuth, antenna height, and cable manipulation.

Using the mode of operation and configuration noted within this report, a final radiated emissions test was performed. The frequency range investigated (scanned), is also noted in this report. Radiated emissions measurements were made at the EUT azimuth and antenna height such that the maximum radiated emissions level will be detected. This requires the use of a turntable and an antenna positioner. The preferred method of a continuous azimuth search is utilized for frequency scans of the EUT field strength with both polarities of the measuring antenna. A calibrated, linearly polarized antenna was positioned at the specified distance from the periphery of the EUT.

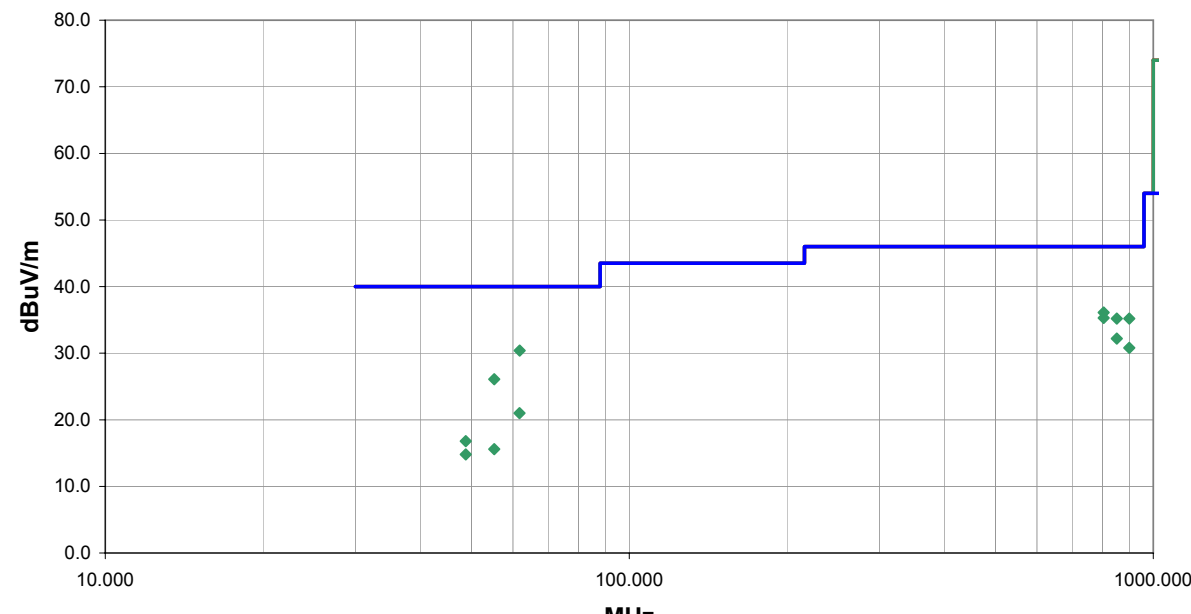
Note: The specified distance is the horizontal separation between the closest periphery of the EUT and the center of the axis of the elements of the receiving antenna. However, if the receiving antenna is a log-periodic array, the specified distance shall be the distance between the closest periphery of the EUT and the front-to-back center of the array of elements.

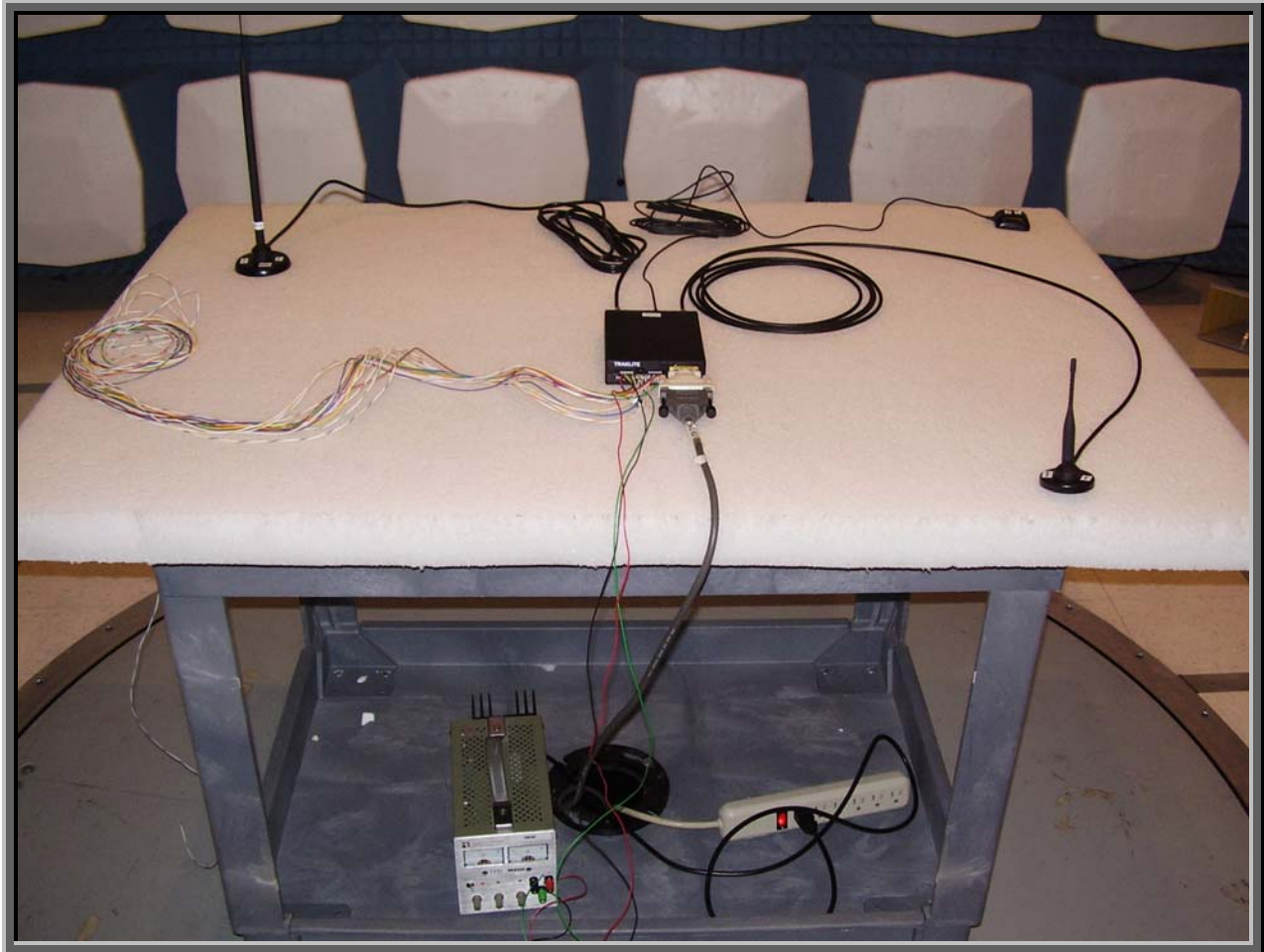
Tests were made with the antenna positioned in both the horizontal and vertical planes of polarization. The measurement was varied in height above the conducting ground plane to obtain the maximum signal strength. Though specified in the report, the measurement distance shall be 1 meter, 3 meters, 5 meters, 10 meters, or 30 meters. At any measurement distance, the antenna height was varied from 1 meter to 4 meters. These height scans apply for both horizontal and vertical polarization, except that for vertical polarization the minimum height of the center of the antenna shall be increased so that the lowest point of the bottom of the antenna clears the ground surface by at least 25 cm.

Measurement Bandwidths			
Frequency Range (MHz)	Peak Data (kHz)	Quasi-Peak Data (kHz)	Average Data (kHz)
0.01 – 0.15	1.0	0.2	0.2
0.15 – 30.0	10.0	9.0	9.0
30.0 - 1000	100.0	120.0	120.0
Above 1000	1000.0	N/A	1000.0
Measurements were made using the bandwidths and detectors specified. No video filter was used.			

Completed by:



NORTHWEST EMC		RADIATED EMISSIONS DATA SHEET				ACQ 2005.1.3 EMI 2005.1.3						
EUT: TrakLITE C4-B						Work Order: 7LAY0037						
Serial Number: 100074						Date: 03/21/05						
Customer: WirelessWERX, Inc.						Temperature: 24						
Attendees: none						Humidity: 31%						
Cust. Ref. No.:						Barometric Pressure: 29.67						
Tested by: Rod Peloquin				Power: 12VDC		Job Site: EV01						
TEST SPECIFICATIONS												
Specification: FCC 15.109(a) Class B:2004				Method: ANSI C63.4:2003								
SAMPLE CALCULATIONS												
Radiated Emissions: Field Strength = Measured Level + Antenna Factor + Cable Factor - Amplifier Gain + Distance Adjustment Factor + External Attenuation												
Conducted Emissions: Adjusted Level = Measured Level + Transducer Factor + Cable Attenuation Factor + External Attenuator												
COMMENTS												
EUT OPERATING MODES												
Receive mode GSM Cellular band												
DEVIATIONS FROM TEST STANDARD												
No deviations.												
RESULTS						Run #						
Pass						18						
Other												
						 Tested By:						
												
Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Azimuth (degrees)	Height (meters)	Distance (meters)	External Attenuation (dB)	Polarity	Detector	Distance Adjustment (dB)	Adjusted dBuV/m	Spec. Limit dBuV/m	Compared to Spec. (dB)
61.776	45.3	-14.9	-1.0	3.6	3.0	0.0	V-Bilog	QP	0.0	30.4	40.0	-9.6
804.010	36.4	-0.3	208.0	1.2	3.0	0.0	V-Bilog	QP	0.0	36.1	46.0	-9.9
803.976	35.6	-0.3	298.0	1.8	3.0	0.0	H-Bilog	PK	0.0	35.3	46.0	-10.7
851.998	35.1	0.1	262.0	1.2	3.0	0.0	V-Bilog	PK	0.0	35.2	46.0	-10.8
899.983	34.3	0.9	277.0	1.2	3.0	0.0	V-Bilog	PK	0.0	35.2	46.0	-10.8
851.998	32.1	0.1	308.0	1.0	3.0	0.0	H-Bilog	PK	0.0	32.2	46.0	-13.8
55.240	40.1	-14.0	187.0	1.0	3.0	0.0	V-Bilog	PK	0.0	26.1	40.0	-13.9
899.983	29.9	0.9	161.0	1.0	3.0	0.0	H-Bilog	PK	0.0	30.8	46.0	-15.2
61.751	35.9	-14.9	219.0	2.2	3.0	0.0	H-Bilog	PK	0.0	21.0	40.0	-19.0
48.748	29.5	-12.7	352.0	1.3	3.0	0.0	V-Bilog	PK	0.0	16.8	40.0	-23.2
55.240	29.6	-14.0	135.0	3.5	3.0	0.0	H-Bilog	PK	0.0	15.6	40.0	-24.4
48.748	27.5	-12.7	187.0	2.2	3.0	0.0	H-Bilog	PK	0.0	14.8	40.0	-25.2



Justification

The individuals and/or the organization requesting the test provided the modes, configurations and settings available to evaluate. While scanning the radiated emissions, all of the EUT parameters listed below were investigated. This includes, but may not be limited to, antennas, tuned transmit frequency ranges, operating modes, and data rates.

Channels in Specified Band Investigated:

Cellular Low Channel, 824.2MHz
Cellular Mid Channel, 836.4MHz
Cellular High Channel, 848.8MHz
PCS Low Channel, 1850.2MHz
PCS Mid Channel, 1880MHz
PCS High Channel, 1909.8MHz

Operating Modes Investigated:

Typical

Data Rates Investigated:

Maximum

Output Power Setting(s) Investigated:

Maximum

Power Input Settings Investigated:

12VDC

Software\Firmware Applied During Test

Exercise software	Hyperterminal	Version	1999
Description			
The system was tested using hyperterminal software on a remote pc to access the EUT during the testing. A call was originated by the wireless communications test set and answered via hyperterminal on the EUT.			

EUT and Peripherals

Description	Manufacturer	Model/Part Number	Serial Number
EUT	Wireless Werx	TrakLITE C4-B	100074
DC Power Supply	Tektronix, Inc	PS280	TW60580

Remote Equipment Outside of Test Setup Boundary			
Description	Manufacturer	Model/Part Number	Serial Number
Wireless Communications Test Set	Agilent	8960 Series 10 E5515C	0844051960
Remote laptop	IBM	Thinkpad	78-HKYY6 10/00
Near Field Probe	EMCO	7405-901	3337
Equipment isolated from the EUT so as not to contribute to the measurement result is considered to be outside the test setup boundary			

Cables					
Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
Serial	Yes	6	No	EUT	Remote laptop
Wire harness (16)	No	1.0	No	EUT	Unterminated
Wire harness (3)	No	1.0	No	EUT	DC Power Supply
AC Power	No	2.0	No	DC Power Supply	AC Mains

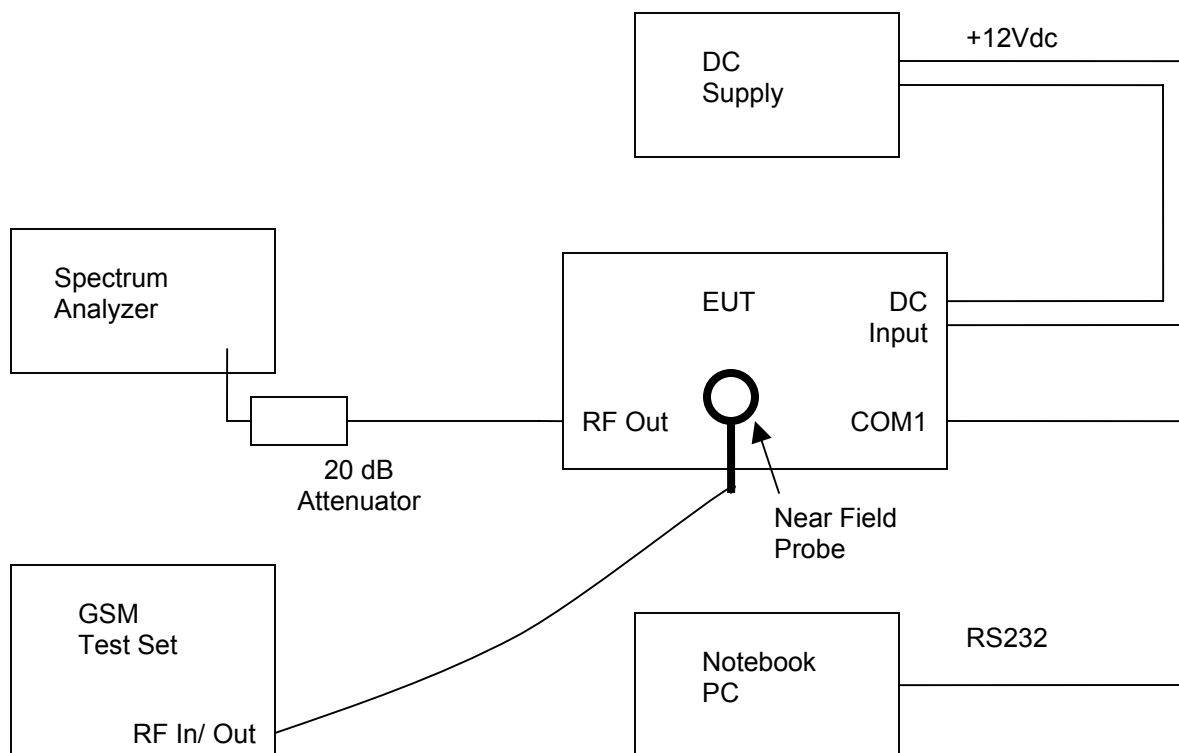
Measurement Equipment					
Description	Manufacturer	Model	Identifier	Last Cal	Interval
Spectrum Analyzer	Tektronix	2784	AAO	01/02/2005	12 mo

Test Description

Requirement: Per 47 CFR 22.917, and 24.238, the power of any emission shall be attenuated below the transmitter power (P) by at least $43 + 10\log(P)$ dB. Per 47 CFR 2.1049, the occupied bandwidth was measured at the RF output terminals with analyzer plots made for each band.

Configuration: A spectrum analyzer was used to measure the occupied bandwidth. A 20dB external attenuator was used on the RF input of the spectrum analyzer. In the 1 MHz bands immediately outside and adjacent to the frequency block, a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter was employed. The nominal carrier frequency was adjusted as close to the licensee's frequency block edges, both upper and lower, as the design permits. The emission power was measured relative to a reference baseline of the transmitter power.

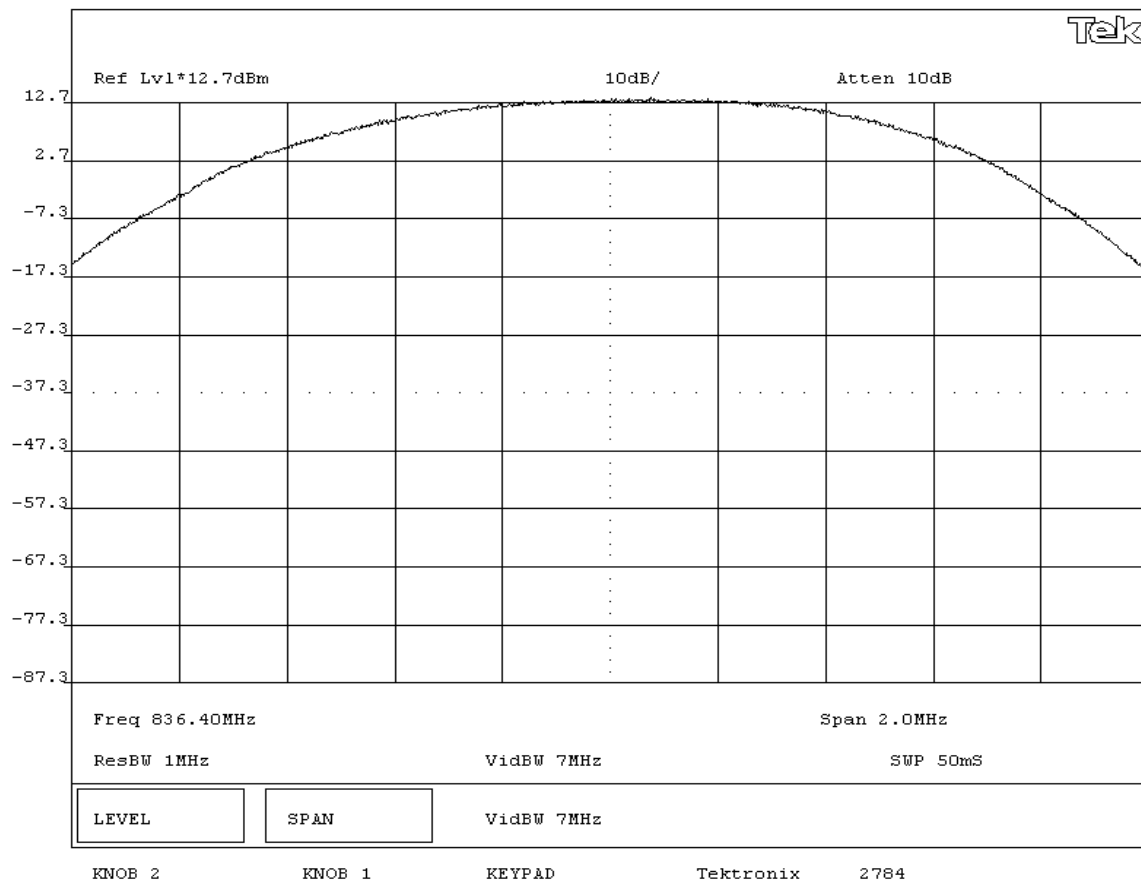
Test Setup Diagram



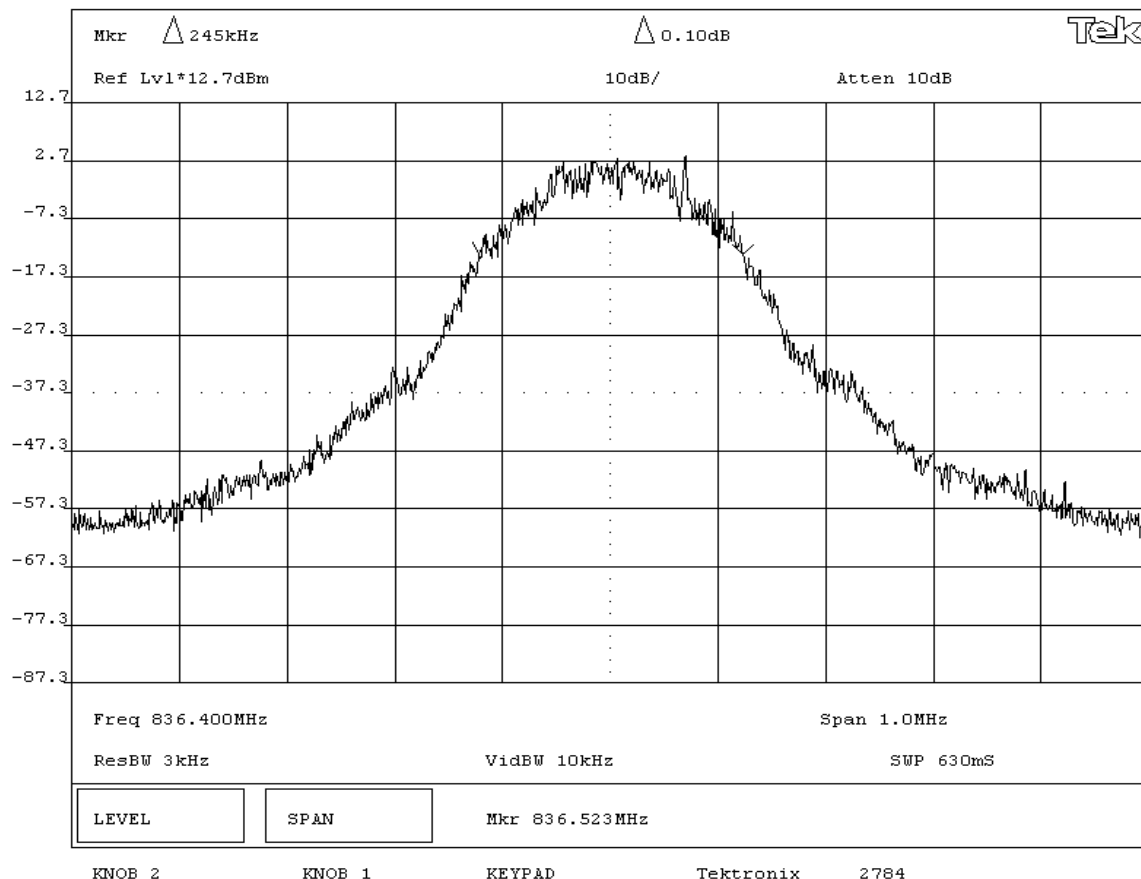
Completed by:

A. J. U.K. P.

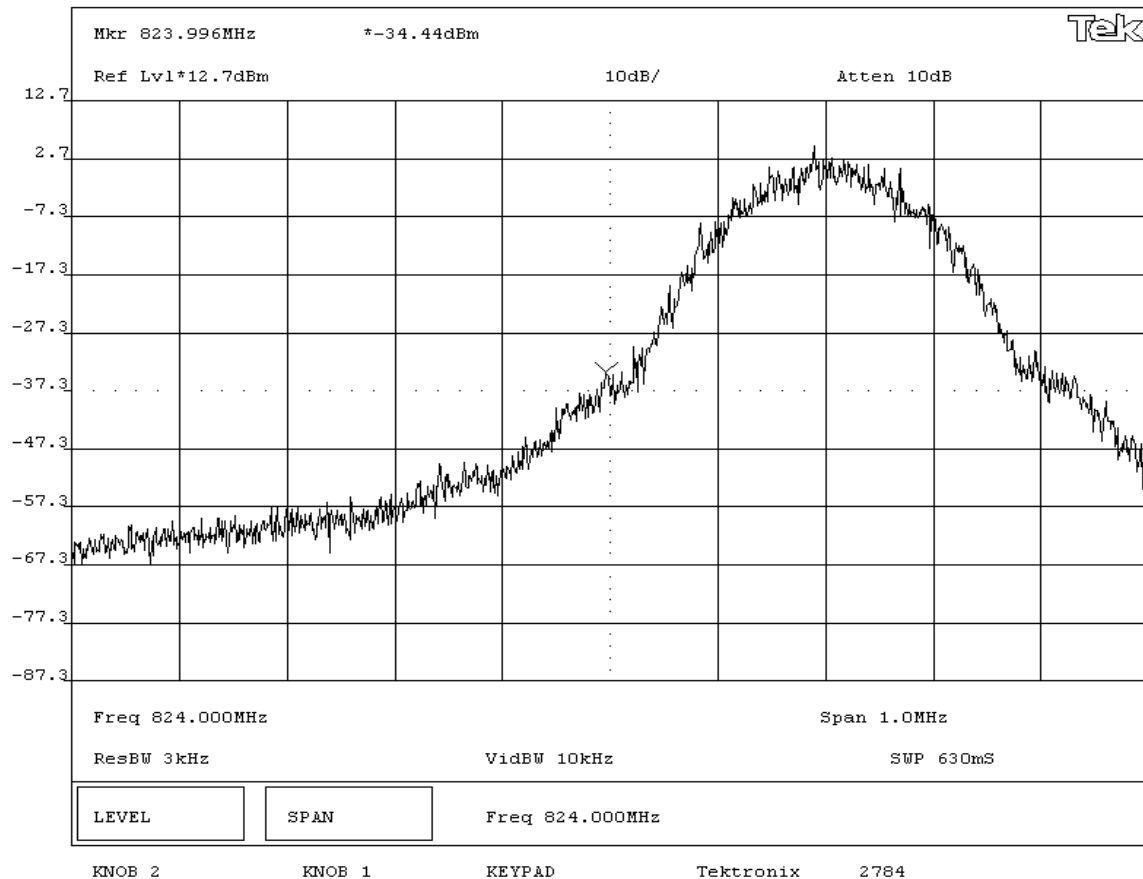
NORTHWEST EMC		EMISSIONS DATA SHEET		Rev BETA 01/30/01	
EUT: TrakLITE C4-B			Work Order: 7LAY0037		
Serial Number: 100074			Date: 03/25/05		
Customer: WirelessWERX, Inc.			Temperature: 22 C		
Attendees: none		Tested by: Greg Kiemel		Humidity: 42%	
Customer Ref. No.: N/A		Power: 12 Vdc		Job Site: EV06	
TEST SPECIFICATIONS					
Specification: 47 CFR 2.1049, 22.917, 24.238		Year: 2004		Method: TIA / EIA 603	
				Year: 2001	
SAMPLE CALCULATIONS					
COMMENTS					
EUT OPERATING MODES					
Modulated by PRBS at maximum data rate, at maximum output power.					
DEVIATIONS FROM TEST STANDARD					
None					
REQUIREMENTS					
On any frequency outside a licensee's frequency block, the power of any emission shall be attenuated below the transmitter power (P) by at least $43 + 10\log(P)$ dB.					
RESULTS					
Pass					
SIGNATURE					
 Tested By: _____					
DESCRIPTION OF TEST					
Occupied Bandwidth - Reference Level Plot - Cellular Band					



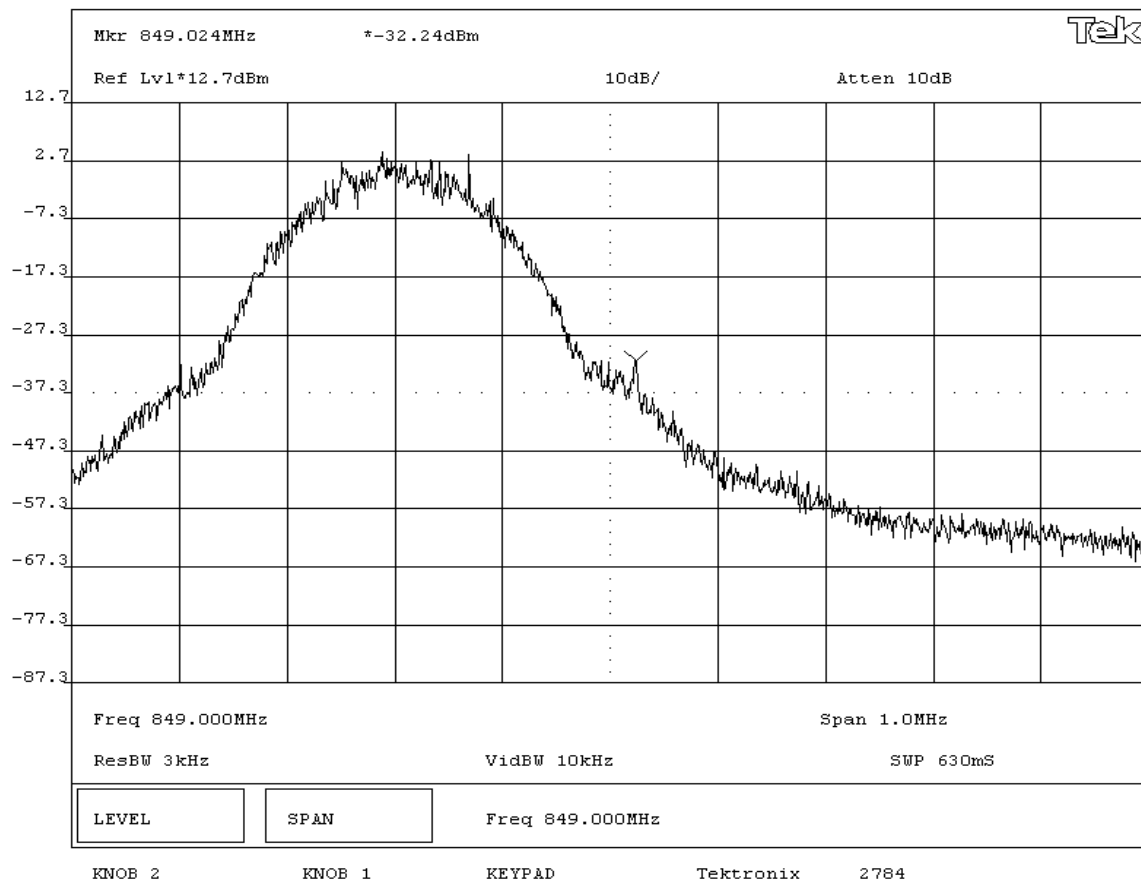
NORTHWEST EMC		EMISSIONS DATA SHEET		Rev BETA 01/30/01	
EUT: TrakLITE C4-B			Work Order: 7LAY0037		
Serial Number: 100074			Date: 03/25/05		
Customer: WirelessWERX, Inc.			Temperature: 22 C		
Attendees: none		Tested by: Greg Kiemel		Humidity: 42%	
Customer Ref. No.: N/A		Power: 12 Vdc		Job Site: EV06	
TEST SPECIFICATIONS					
Specification: 47 CFR 2.1049, 22.917, 24.238		Year: 2004		Method: TIA / EIA 603	
				Year: 2001	
SAMPLE CALCULATIONS					
COMMENTS					
EUT OPERATING MODES					
Modulated by PRBS at maximum data rate, at maximum output power.					
DEVIATIONS FROM TEST STANDARD					
None					
REQUIREMENTS					
On any frequency outside a licensee's frequency block, the power of any emission shall be attenuated below the transmitter power (P) by at least 43 + 10log(P) dB.					
RESULTS			OCCUPIED BANDWIDTH		
Pass			245 kHz		
SIGNATURE					
 Tested By: _____					
DESCRIPTION OF TEST					
Occupied Bandwidth - Mid Channel - Cellular Band					



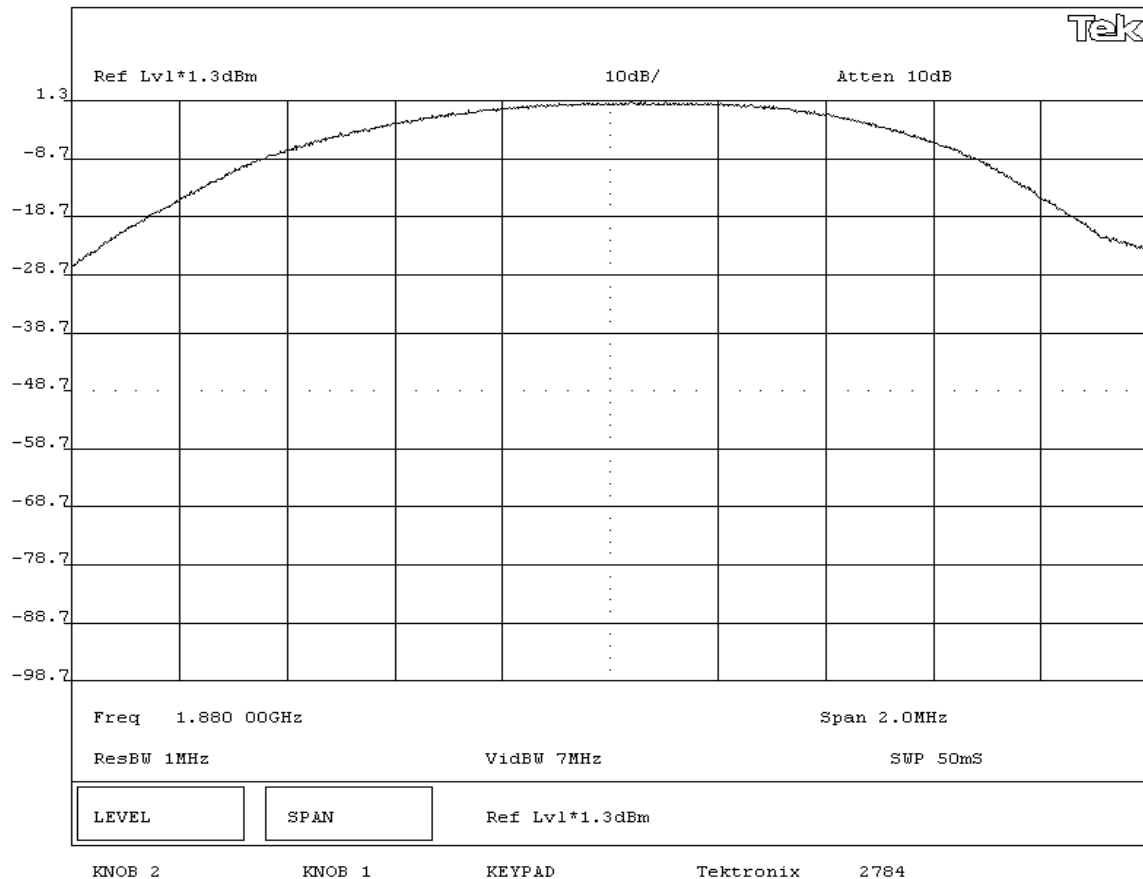
NORTHWEST EMC		EMISSIONS DATA SHEET		Rev BETA 01/30/01
EUT: TrakLITE C4-B		Work Order: 7LAY0037		
Serial Number: 100074		Date: 03/25/05		
Customer: WirelessWERX, Inc.		Temperature: 22 C		
Attendees: none	Tested by: Greg Kiemel	Humidity: 42%		
Customer Ref. No.: N/A	Power: 12 Vdc	Job Site: EV06		
TEST SPECIFICATIONS				
Specification: 47 CFR 2.1049, 22.917, 24.238	Year: 2004	Method: TIA / EIA 603	Year: 2001	
SAMPLE CALCULATIONS				
COMMENTS				
EUT OPERATING MODES				
Modulated by PRBS at maximum data rate, at maximum output power.				
DEVIATIONS FROM TEST STANDARD				
None				
REQUIREMENTS				
On any frequency outside a licensee's frequency block, the power of any emission shall be attenuated below the transmitter power (P) by at least 43 + 10log(P) dB.				
RESULTS				
Pass				
SIGNATURE				
 Tested By: _____				
DESCRIPTION OF TEST				
Occupied Bandwidth - Lower Band Edge - Cellular Band				



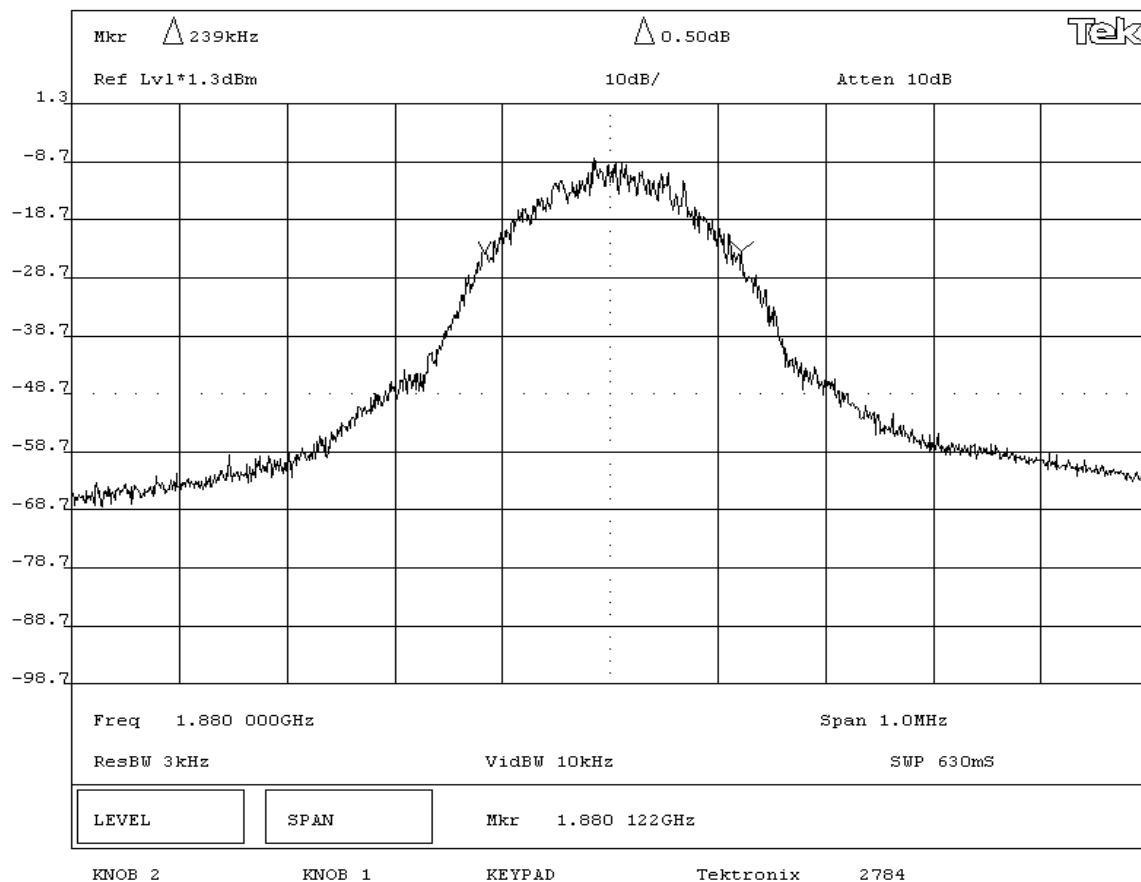
NORTHWEST EMC		EMISSIONS DATA SHEET		Rev BETA 01/30/01	
EUT: TrakLITE C4-B			Work Order: 7LAY0037		
Serial Number: 100074			Date: 03/25/05		
Customer: WirelessWERX, Inc.			Temperature: 22 C		
Attendees: none		Tested by: Greg Kiemel		Humidity: 42%	
Customer Ref. No.: N/A		Power: 12 Vdc		Job Site: EV06	
TEST SPECIFICATIONS					
Specification: 47 CFR 2.1049, 22.917, 24.238		Year: 2004		Method: TIA / EIA 603	
				Year: 2001	
SAMPLE CALCULATIONS					
COMMENTS					
EUT OPERATING MODES					
Modulated by PRBS at maximum data rate, at maximum output power.					
DEVIATIONS FROM TEST STANDARD					
None					
REQUIREMENTS					
On any frequency outside a licensee's frequency block, the power of any emission shall be attenuated below the transmitter power (P) by at least 43 + 10log(P) dB.					
RESULTS					
Pass					
SIGNATURE					
 Tested By: _____					
DESCRIPTION OF TEST					
Occupied Bandwidth - Upper Band Edge - Cellular Band					



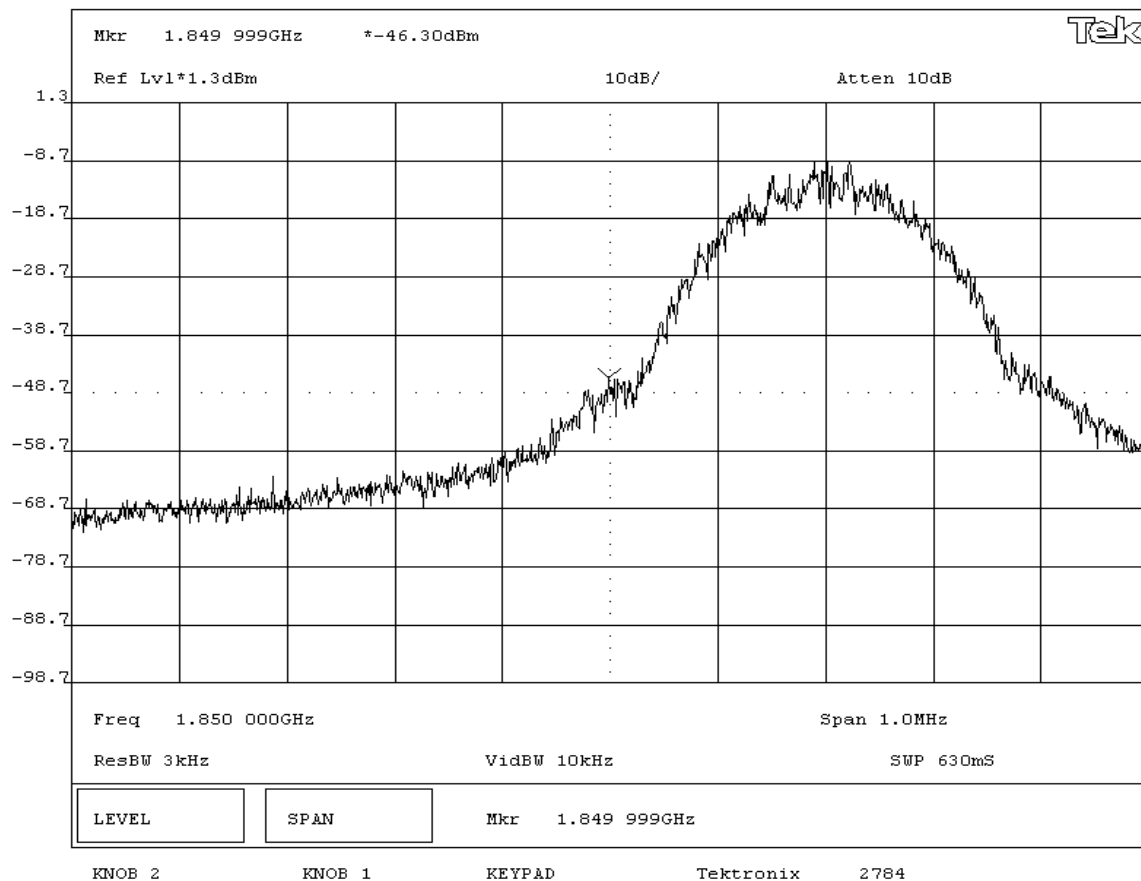
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EUT: TrakLITE C4-B			Work Order: 7LAY0037		
Serial Number: 100074			Date: 03/25/05		
Customer: WirelessWERX, Inc.			Temperature: 22 C		
Attendees: none		Tested by: Greg Kiemel		Humidity: 42%	
Customer Ref. No.: N/A		Power: 12 Vdc		Job Site: EV06	
TEST SPECIFICATIONS					
Specification: 47 CFR 2.1049, 22.917, 24.238		Year: 2004		Method: TIA / EIA 603	
				Year: 2001	
SAMPLE CALCULATIONS					
COMMENTS					
EUT OPERATING MODES					
Modulated by PRBS at maximum data rate, at maximum output power.					
DEVIATIONS FROM TEST STANDARD					
None					
REQUIREMENTS					
On any frequency outside a licensee's frequency block, the power of any emission shall be attenuated below the transmitter power (P) by at least $43 + 10\log(P)$ dB.					
RESULTS					
Pass					
SIGNATURE					
 Tested By: _____					
DESCRIPTION OF TEST					
Occupied Bandwidth - Reference Level Plot - PCS Band					



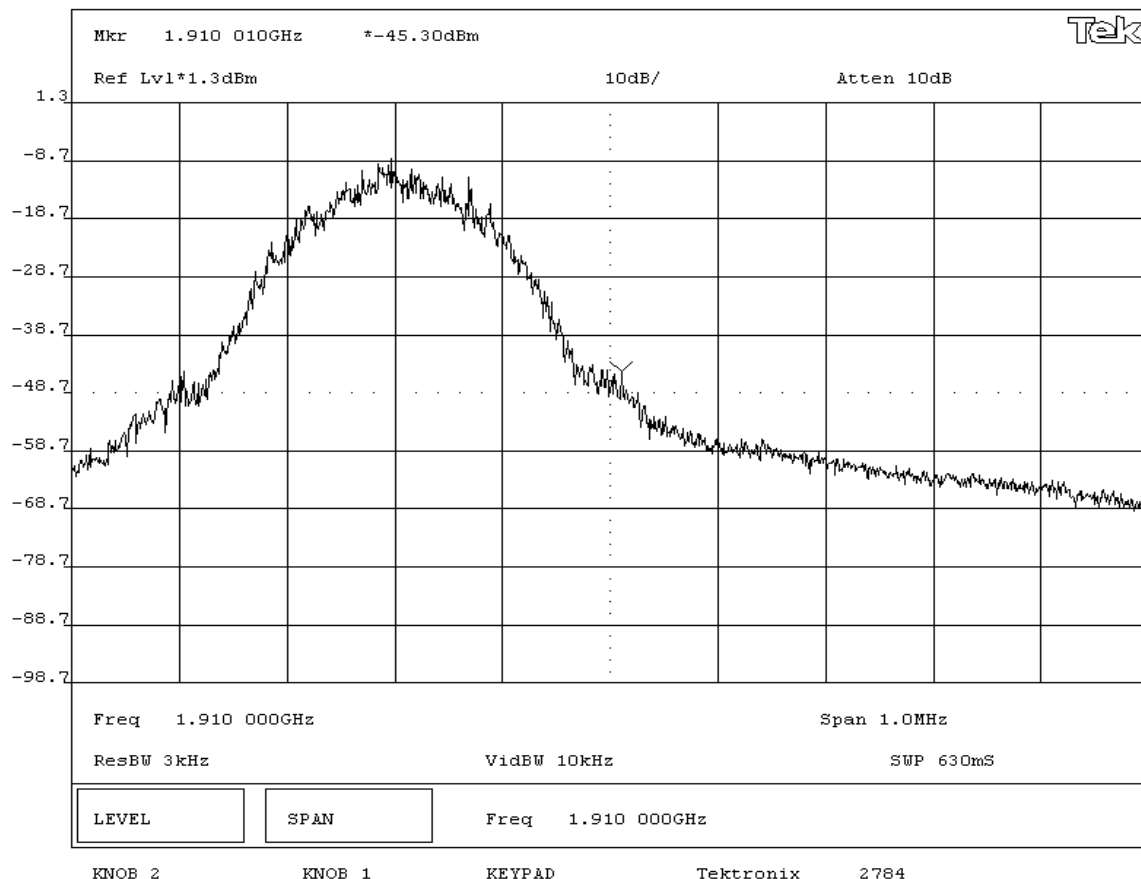
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EUT: TrakLITE C4-B			Work Order: 7LAY0037		
Serial Number: 100074			Date: 03/25/05		
Customer: WirelessWERX, Inc.			Temperature: 22 C		
Attendees: none		Tested by: Greg Kiemel		Humidity: 42%	
Customer Ref. No.: N/A		Power: 12 Vdc		Job Site: EV06	
TEST SPECIFICATIONS					
Specification: 47 CFR 2.1049, 22.917, 24.238		Year: 2004		Method: TIA / EIA 603	
				Year: 2001	
SAMPLE CALCULATIONS					
COMMENTS					
EUT OPERATING MODES					
Modulated by PRBS at maximum data rate, at maximum output power.					
DEVIATIONS FROM TEST STANDARD					
None					
REQUIREMENTS					
On any frequency outside a licensee's frequency block, the power of any emission shall be attenuated below the transmitter power (P) by at least $43 + 10\log(P)$ dB.					
RESULTS			OCCUPIED BANDWIDTH		
Pass			239 kHz		
SIGNATURE					
 Tested By: _____					
DESCRIPTION OF TEST					
Occupied Bandwidth - Mid Channel - PCS Band					



NORTHWEST EMC		EMISSIONS DATA SHEET		Rev BETA 01/30/01	
EUT: TrakLITE C4-B			Work Order: 7LAY0037		
Serial Number: 100074			Date: 03/25/05		
Customer: WirelessWERX, Inc.			Temperature: 22 C		
Attendees: none		Tested by: Greg Kiemel		Humidity: 42%	
Customer Ref. No.: N/A		Power: 12 Vdc		Job Site: EV06	
TEST SPECIFICATIONS					
Specification: 47 CFR 2.1049, 22.917, 24.238		Year: 2004		Method: TIA / EIA 603	
				Year: 2001	
SAMPLE CALCULATIONS					
COMMENTS					
EUT OPERATING MODES					
Modulated by PRBS at maximum data rate, at maximum output power.					
DEVIATIONS FROM TEST STANDARD					
None					
REQUIREMENTS					
On any frequency outside a licensee's frequency block, the power of any emission shall be attenuated below the transmitter power (P) by at least 43 + 10log(P) dB.					
RESULTS					
Pass					
SIGNATURE					
 Tested By: _____					
DESCRIPTION OF TEST					
Occupied Bandwidth - Lower Band Edge - PCS Band					



NORTHWEST EMC		EMISSIONS DATA SHEET		Rev BETA 01/30/01
EUT: TrakLITE C4-B		Work Order: 7LAY0037		
Serial Number: 100074		Date: 03/25/05		
Customer: WirelessWERX, Inc.		Temperature: 22 C		
Attendees: none	Tested by: Greg Kiemel	Humidity: 42%		
Customer Ref. No.: N/A	Power: 12 Vdc	Job Site: EV06		
TEST SPECIFICATIONS				
Specification: 47 CFR 2.1049, 22.917, 24.238	Year: 2004	Method: TIA / EIA 603	Year: 2001	
SAMPLE CALCULATIONS				
COMMENTS				
EUT OPERATING MODES				
Modulated by PRBS at maximum data rate, at maximum output power.				
DEVIATIONS FROM TEST STANDARD				
None				
REQUIREMENTS				
On any frequency outside a licensee's frequency block, the power of any emission shall be attenuated below the transmitter power (P) by at least 43 + 10log(P) dB.				
RESULTS				
Pass				
SIGNATURE				
 Tested By: _____				
DESCRIPTION OF TEST				
Occupied Bandwidth - Upper Band Edge - PCS Band				





Justification

The individuals and/or the organization requesting the test provided the modes, configurations and settings available to evaluate. While scanning the radiated emissions, all of the EUT parameters listed below were investigated. This includes, but may not be limited to, antennas, tuned transmit frequency ranges, operating modes, and data rates.

Channels in Specified Band Investigated:

Cellular Low Channel, 824.2MHz
Cellular Mid Channel, 836.4MHz
Cellular High Channel, 848.8MHz
PCS Low Channel, 1850.2MHz
PCS Mid Channel, 1880MHz
PCS High Channel, 1909.8MHz

Operating Modes Investigated:

Typical

Data Rates Investigated:

Maximum

Output Power Setting(s) Investigated:

Maximum

Power Input Settings Investigated:

12VDC

Software\Firmware Applied During Test

Exercise software	Hyperterminal	Version	1999
Description			
The system was tested using hyperterminal software on a remote pc to access the EUT during the testing. A call was originated by the wireless communications test set and answered via hyperterminal on the EUT.			

EUT and Peripherals

Description	Manufacturer	Model/Part Number	Serial Number
EUT	Wireless Werx	TrakLITE C4-B	100074
DC Power Supply	Tektronix, Inc	PS280	TW60580

Remote Equipment Outside of Test Setup Boundary			
Description	Manufacturer	Model/Part Number	Serial Number
Wireless Communications Test Set	Agilent	8960 Series 10 E5515C	0844051960
Remote laptop	IBM	Thinkpad	78-HKYY6 10/00
Near Field Probe	EMCO	7405-901	3337
Equipment isolated from the EUT so as not to contribute to the measurement result is considered to be outside the test setup boundary			

Cables					
Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
Serial	Yes	6	No	EUT	Remote laptop
Wire harness (16)	No	1.0	No	EUT	Unterminated
Wire harness (3)	No	1.0	No	EUT	DC Power Supply
AC Power	No	2.0	No	DC Power Supply	AC Mains

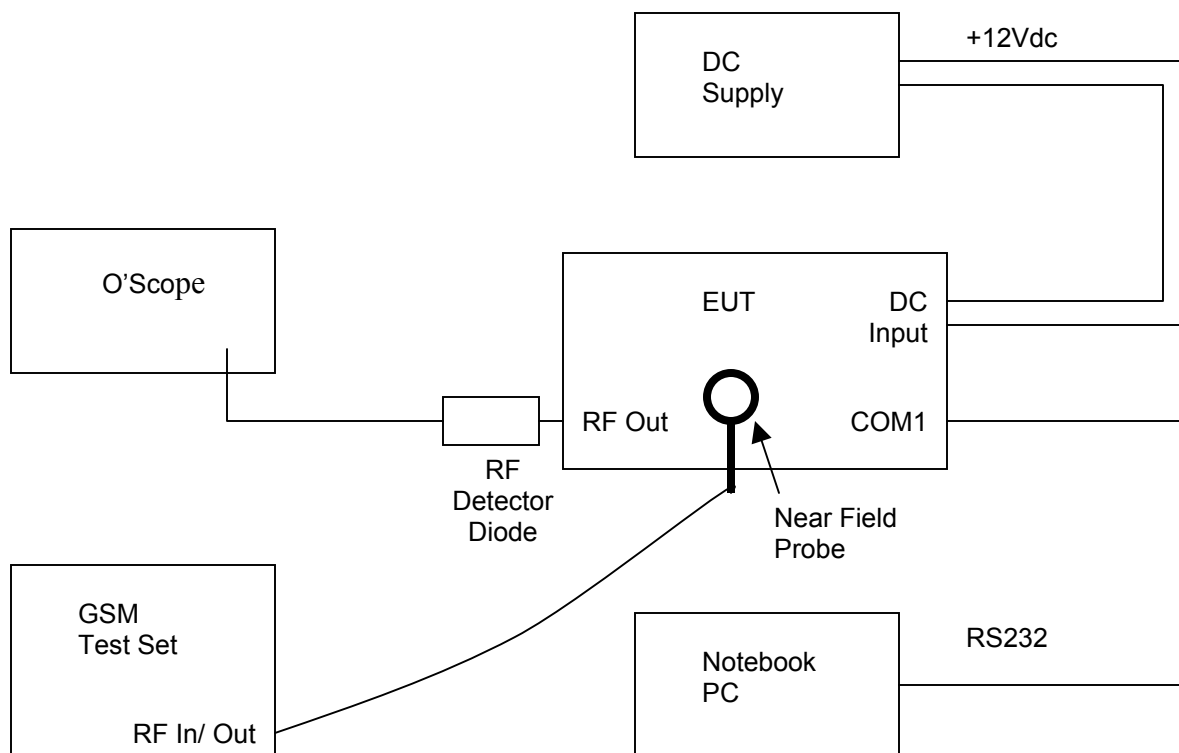
Measurement Equipment					
Description	Manufacturer	Model	Identifier	Last Cal	Interval
Power Meter	Hewlett Packard	E4418A	SPA	07/23/2004	24 mo
Power Sensor	Hewlett-Packard	8481H	SPB	07/23/2004	24 mo
Signal Generator	Hewlett Packard	8341B	TGN	02/07/2005	13 mo
Oscilloscope	Tektronix	TDS 3052	TOF	12/02/2004	13 mo
RF Detector	RLC Electronics	CR-133-R	ZZA	NCR	NA

Test Description

Requirement: Per 47 CFR 2.1046, the conducted power output was measured at the RF output terminals.

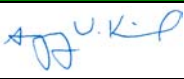
Configuration: The peak output power was measured with the EUT set to low, medium, and high transmit frequencies. The peak measurement was made using a direct connection between the RF output of the EUT and a RF detector diode. The output of the diode was measured with the oscilloscope. The signal generator, tuned to the transmit frequency, was then substituted for the EUT. The CW output of the signal generator was adjusted until the output of the RF detector diode match the level produced when connected to the EUT. The power meter and sensor were then used to measure the output power level of the signal generator.

Test Setup Diagram



Completed by:

A. J. U.K. P.

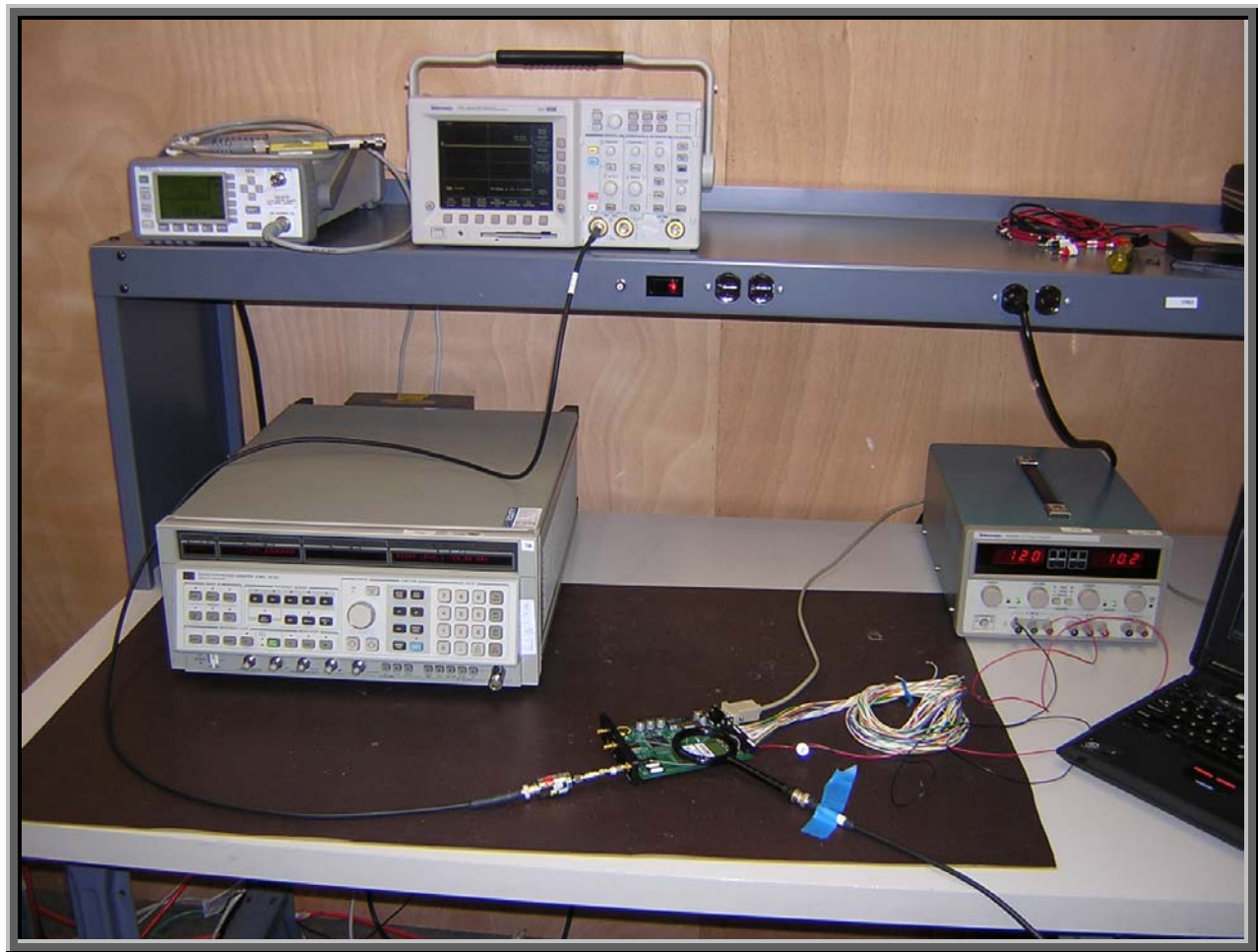
NORTHWEST EMC		EMISSIONS DATA SHEET		Rev BETA 01/30/01
EUT:	TrakLITE C4-B		Work Order:	7LAY0037
Serial Number:	100074		Date:	03/25/05
Customer:	WirelessWERX, Inc.		Temperature:	22 C
Attendees:	none	Tested by:	Greg Kiemel	Humidity:
Customer Ref. No.:	N/A	Power:	12 VDC	Job Site:
TEST SPECIFICATIONS				
Specification:	47 CFR 2.1046	Year:	2004	Method:
		TIA / EIA 603	Year:	2001
SAMPLE CALCULATIONS				
COMMENTS				
EUT OPERATING MODES				
Modulated by PRBS at maximum data rate, at maximum output power.				
DEVIATIONS FROM TEST STANDARD				
None				
REQUIREMENTS				
Maximum peak conducted output power is measured.				
RESULTS		AMPLITUDE		
Pass		18.49 mW (Cellular band), 1.34 mW (PCS band)		
SIGNATURE				
Tested By: 				
DESCRIPTION OF TEST				
Output Power - Low, Mid, & High Channels				

Cellular Band

Frequency (MHz)	Power (mW)
824.20	18.49
836.40	18.45
848.80	18.45

PCS Band

Frequency (MHz)	Power (mW)
1850.20	1.18
1880.00	1.34
1909.80	1.33



Justification

The individuals and/or the organization requesting the test provided the modes, configurations and settings available to evaluate. While scanning the radiated emissions, all of the EUT parameters listed below were investigated. This includes, but may not be limited to, antennas, tuned transmit frequency ranges, operating modes, and data rates.

Channels in Specified Band Investigated:

Cellular Low Channel, 824.2MHz
Cellular Mid Channel, 836.4MHz
Cellular High Channel, 848.8MHz
PCS Low Channel, 1850.2MHz
PCS Mid Channel, 1880MHz
PCS High Channel, 1909.8MHz

Operating Modes Investigated:

Typical

Data Rates Investigated:

Maximum

Output Power Setting(s) Investigated:

Maximum

Power Input Settings Investigated:

12VDC

Software\Firmware Applied During Test

Exercise software	Hyperterminal	Version	1999
Description			
The system was tested using hyperterminal software on a remote pc to access the EUT during the testing. A call was originated by the wireless communications test set and answered via hyperterminal on the EUT.			

EUT and Peripherals

Description	Manufacturer	Model/Part Number	Serial Number
EUT	Wireless Werx	TrakLITE C4-B	100074
DC Power Supply	Tektronix, Inc	PS280	TW60580

Remote Equipment Outside of Test Setup Boundary			
Description	Manufacturer	Model/Part Number	Serial Number
Wireless Communications Test Set	Agilent	8960 Series 10 E5515C	0844051960
Remote laptop	IBM	Thinkpad	78-HKYY6 10/00
Near Field Probe	EMCO	7405-901	3337
Equipment isolated from the EUT so as not to contribute to the measurement result is considered to be outside the test setup boundary			

Cables					
Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
Serial	Yes	6	No	EUT	Remote laptop
Wire harness (16)	No	1.0	No	EUT	Unterminated
Wire harness (3)	No	1.0	No	EUT	DC Power Supply
AC Power	No	2.0	No	DC Power Supply	AC Mains

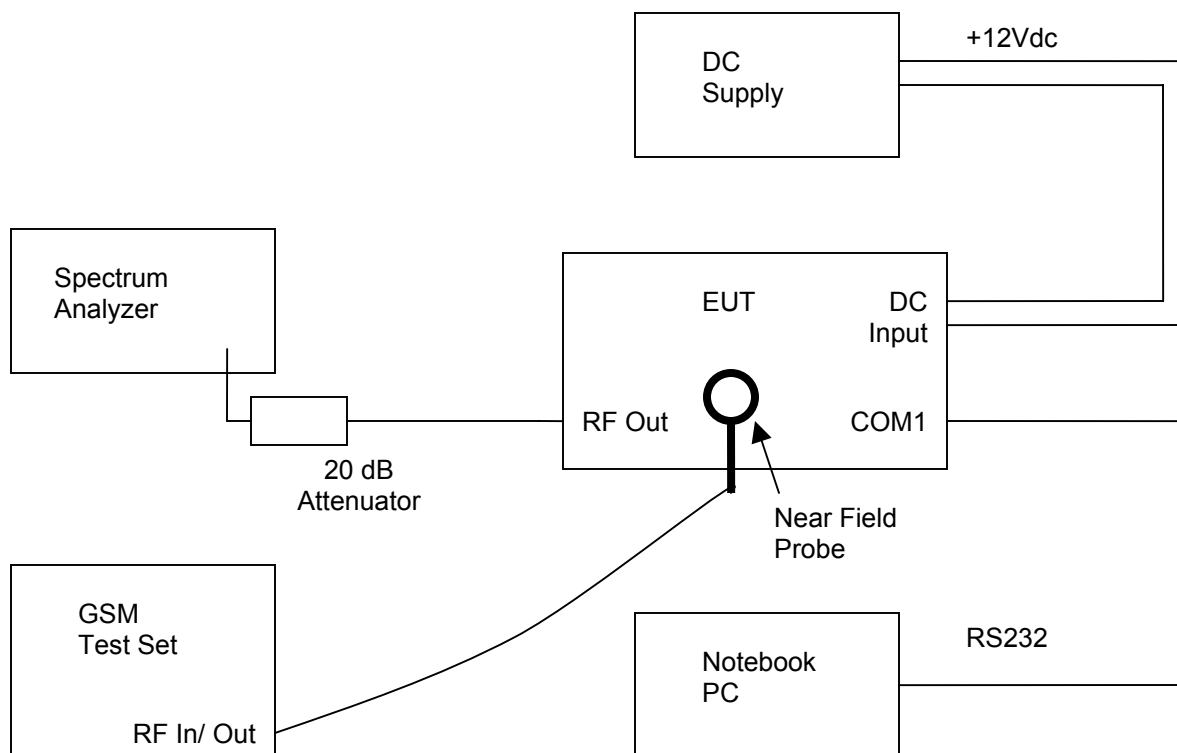
Measurement Equipment					
Description	Manufacturer	Model	Identifier	Last Cal	Interval
Spectrum Analyzer	Tektronix	2784	AAO	01/02/2005	12 mo

Test Description

Requirement: Per 47 CFR 22.917, and 24.238, the peak conducted power of spurious emissions, up to the 10th harmonic of the transmit frequency, must be less than or equal to -13 dBm. Per 47 CFR 2.1051, the spurious emissions were measured at the RF output terminals with analyzer plots made for each modulation type.

Configuration: A spectrum analyzer was used to scan from 0 to 20 GHz. A 1MHz resolution bandwidth was used. No video filtering was employed. A 20dB external attenuator was used on the RF input of the spectrum analyzer.

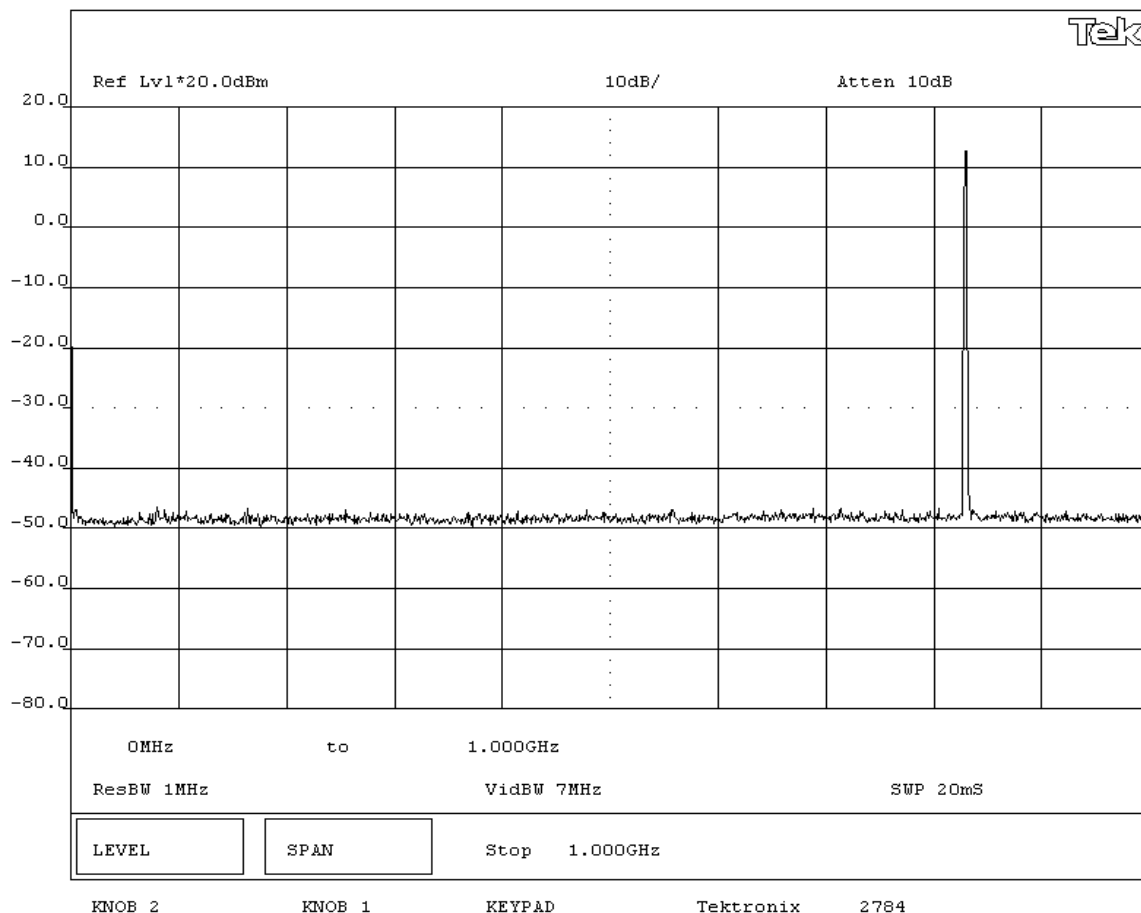
Test Setup Diagram



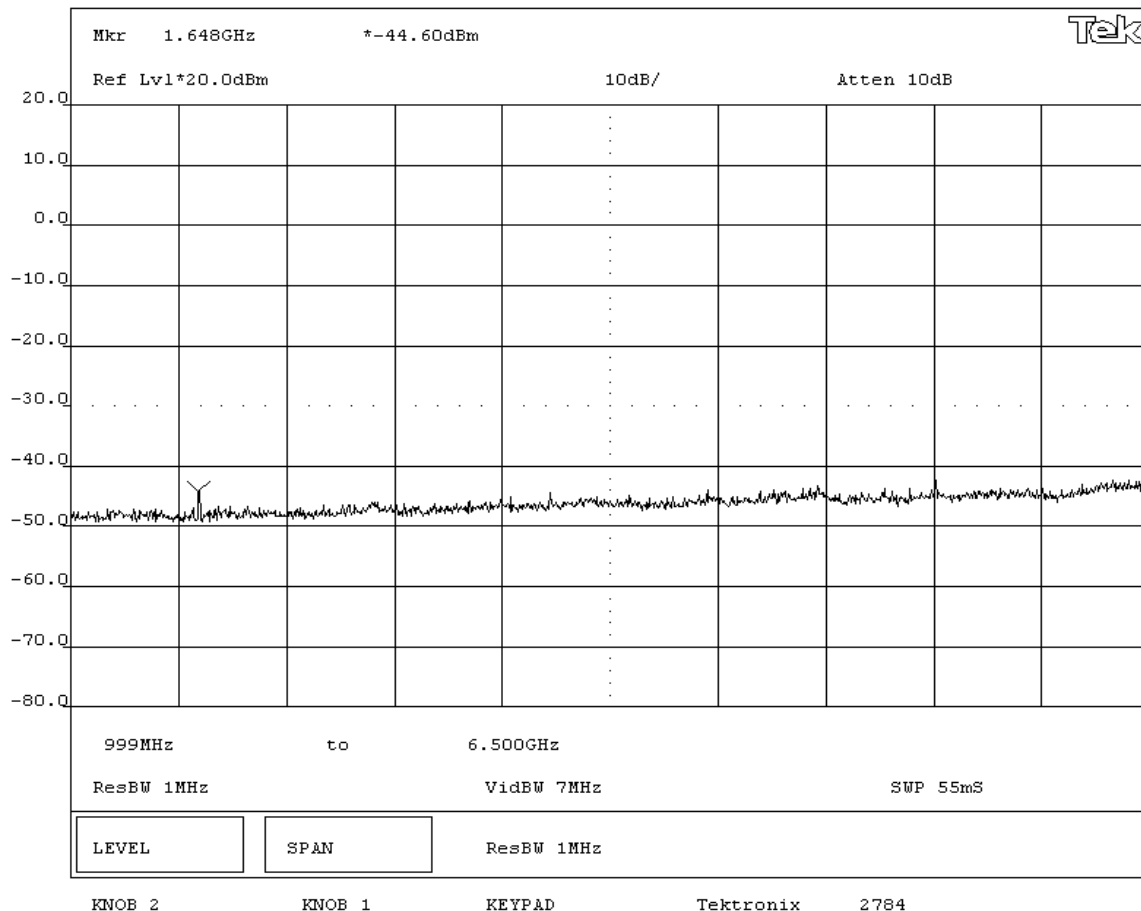
Completed by:

A. J. U.K. P.

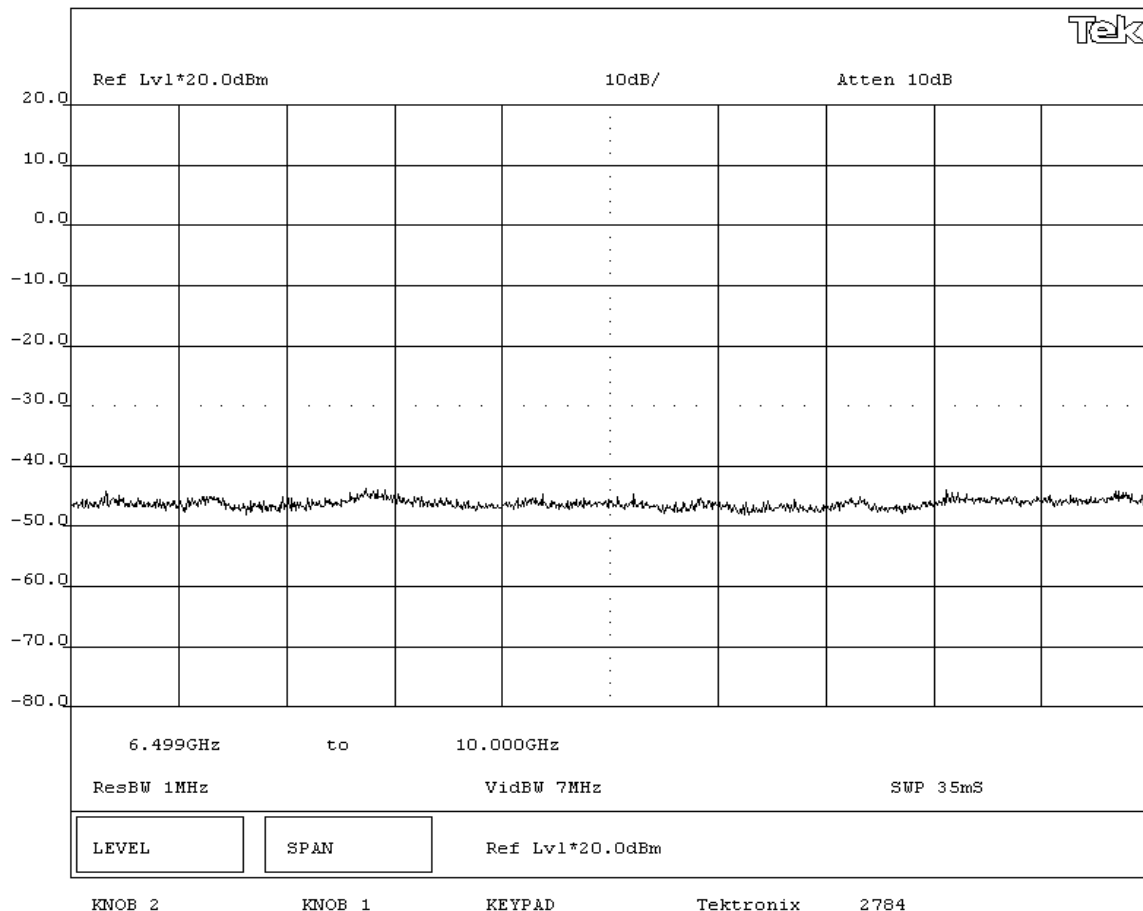
NORTHWEST EMC		EMISSIONS DATA SHEET		Rev BETA 01/30/01	
EUT: TrakLITE C4-B			Work Order: 7LAY0037		
Serial Number: 100074			Date: 03/24/05		
Customer: WirelessWERX, Inc.			Temperature: 22 C		
Attendees: none		Tested by: Greg Kiemel		Humidity: 42%	
Customer Ref. No.: N/A		Power: 12 Vdc		Job Site: EV06	
TEST SPECIFICATIONS					
Specification: 47 CFR 2.1051, 22.917, 24.238		Year: 2004		Method: TIA / EIA 603	
				Year: 2001	
SAMPLE CALCULATIONS					
COMMENTS					
EUT OPERATING MODES					
Modulated by PRBS at maximum data rate, at maximum output power.					
DEVIATIONS FROM TEST STANDARD					
None					
REQUIREMENTS					
The peak conducted power of spurious emissions, up to the 10th harmonic of the transmit frequency, must be less than or equal to -13 dBm					
RESULTS					
Pass					
SIGNATURE					
 Tested By: _____					
DESCRIPTION OF TEST					
Spurious Conducted Emissions - Low Channel - Cellular Band					



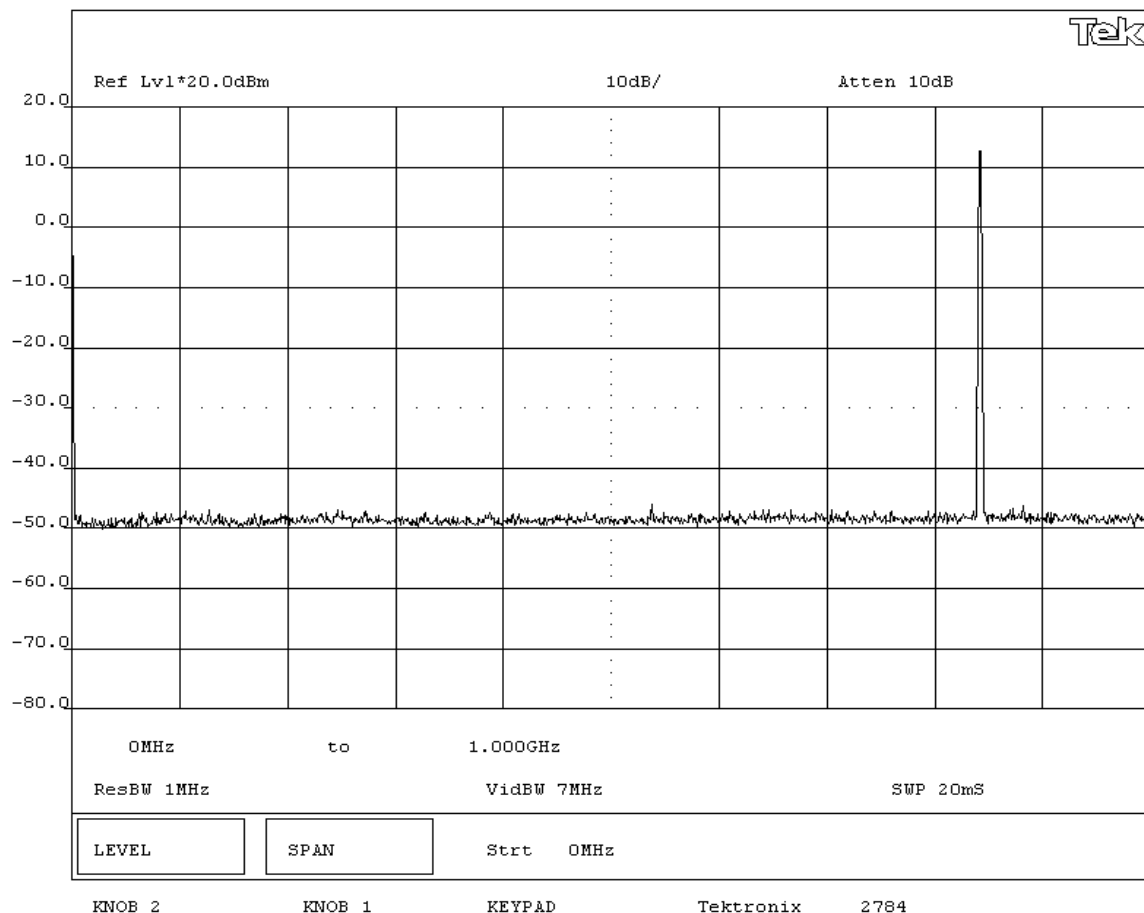
NORTHWEST EMC				EMISSIONS DATA SHEET				Rev BETA 01/30/01	
EUT: TrakLITE C4-B						Work Order: 7LAY0037			
Serial Number: 100074						Date: 03/24/05			
Customer: WirelessWERX, Inc.						Temperature: 22 C			
Attendees: none				Tested by: Greg Kiemel		Humidity: 42%			
Customer Ref. No.: N/A				Power: 12 Vdc		Job Site: EV06			
TEST SPECIFICATIONS									
Specification: 47 CFR 2.1051, 22.917, 24.238				Year: 2004		Method: TIA / EIA 603		Year: 2001	
SAMPLE CALCULATIONS									
COMMENTS									
EUT OPERATING MODES									
Modulated by PRBS at maximum data rate, at maximum output power.									
DEVIATIONS FROM TEST STANDARD									
None									
REQUIREMENTS									
The peak conducted power of spurious emissions, up to the 10th harmonic of the transmit frequency, must be less than or equal to -13 dBm									
RESULTS									
Pass									
SIGNATURE									
 Tested By: _____									
DESCRIPTION OF TEST									
Spurious Conducted Emissions - Low Channel - Cellular Band									



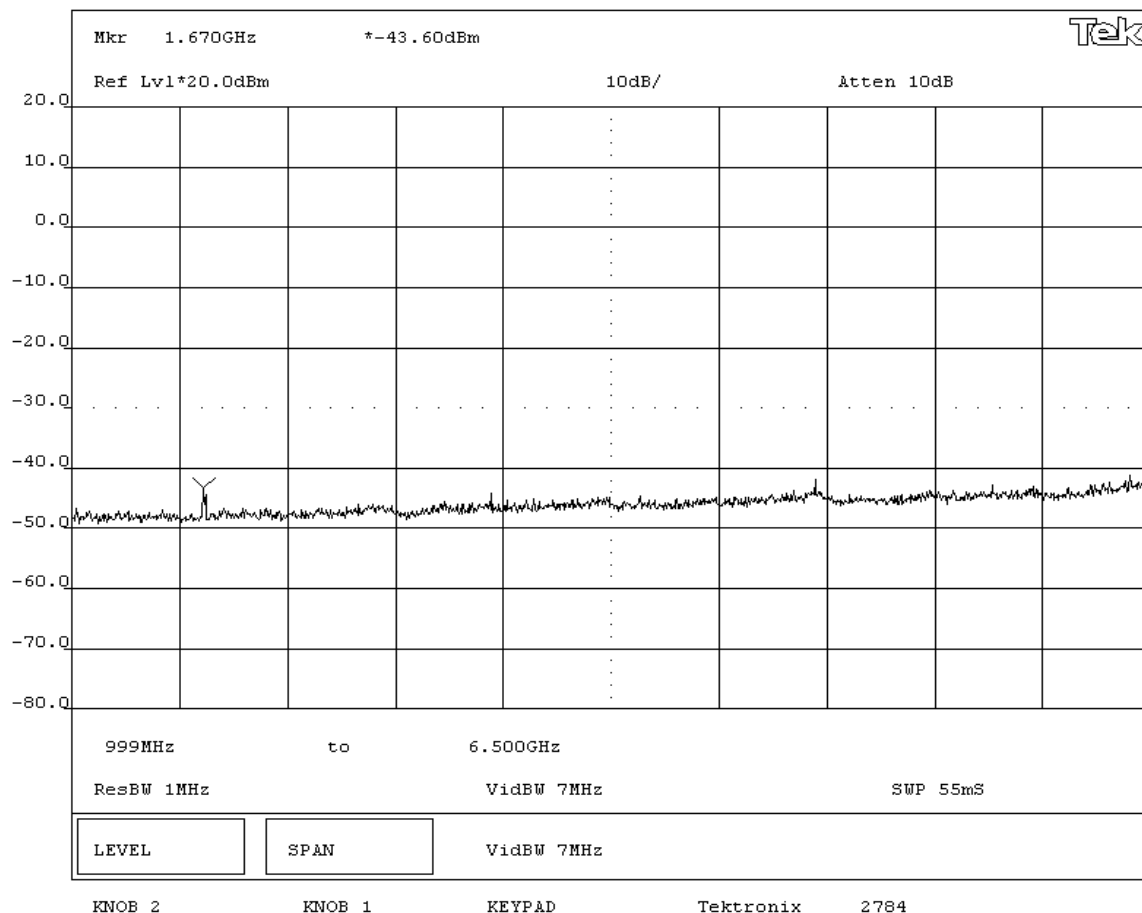
NORTHWEST EMC		EMISSIONS DATA SHEET		Rev BETA 01/30/01	
EUT: TrakLITE C4-B			Work Order: 7LAY0037		
Serial Number: 100074			Date: 03/24/05		
Customer: WirelessWERX, Inc.			Temperature: 22 C		
Attendees: none		Tested by: Greg Kiemel	Humidity: 42%		
Customer Ref. No.: N/A		Power: 12 Vdc	Job Site: EV06		
TEST SPECIFICATIONS					
Specification: 47 CFR 2.1051, 22.917, 24.238		Year: 2004	Method: TIA / EIA 603		Year: 2001
SAMPLE CALCULATIONS					
COMMENTS					
EUT OPERATING MODES					
Modulated by PRBS at maximum data rate, at maximum output power.					
DEVIATIONS FROM TEST STANDARD					
None					
REQUIREMENTS					
The peak conducted power of spurious emissions, up to the 10th harmonic of the transmit frequency, must be less than or equal to -13 dBm					
RESULTS					
Pass					
SIGNATURE					
 Tested By: _____					
DESCRIPTION OF TEST					
Spurious Conducted Emissions - Low Channel - Cellular Band					



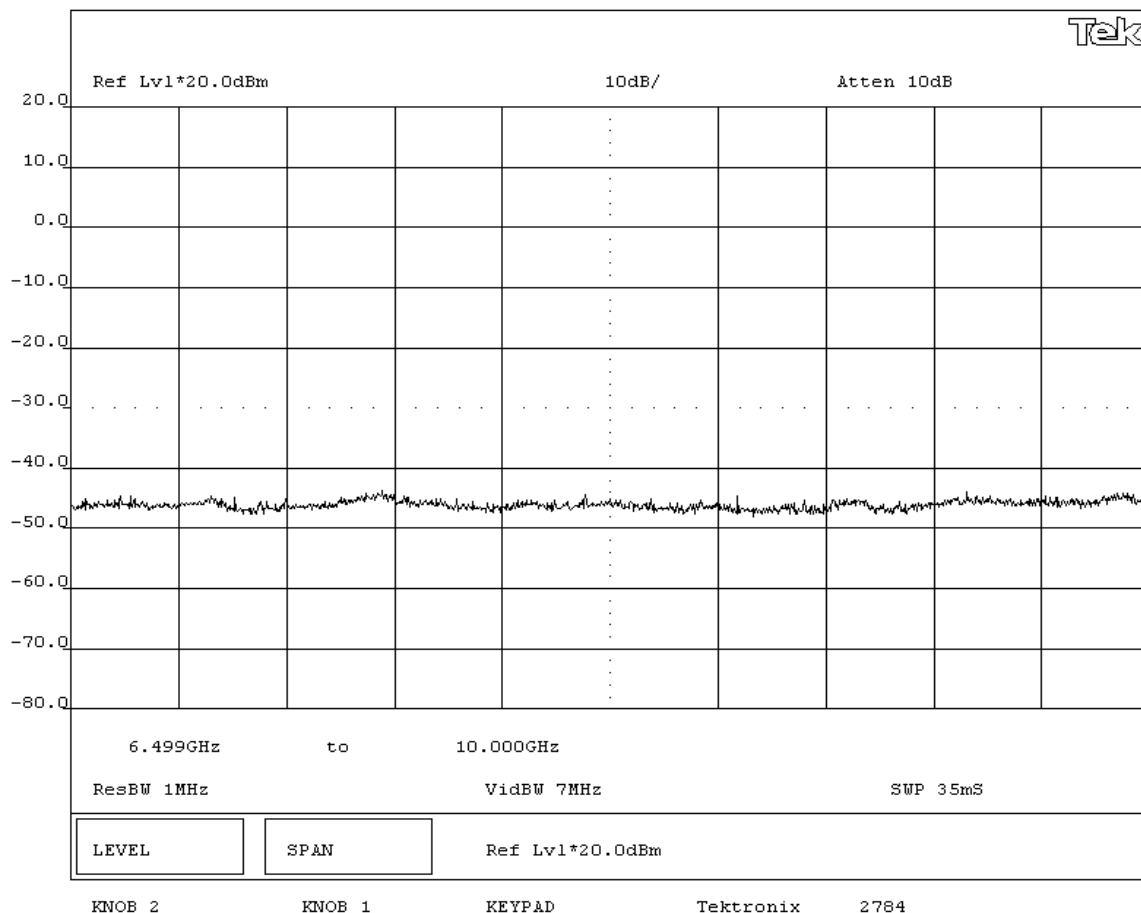
NORTHWEST EMC		EMISSIONS DATA SHEET		Rev BETA 01/30/01	
EUT: TrakLITE C4-B			Work Order: 7LAY0037		
Serial Number: 100074			Date: 03/24/05		
Customer: WirelessWERX, Inc.			Temperature: 22 C		
Attendees: none		Tested by: Greg Kiemel		Humidity: 42%	
Customer Ref. No.: N/A		Power: 12 Vdc		Job Site: EV06	
TEST SPECIFICATIONS					
Specification: 47 CFR 2.1051, 22.917, 24.238		Year: 2004		Method: TIA / EIA 603	
				Year: 2001	
SAMPLE CALCULATIONS					
COMMENTS					
EUT OPERATING MODES					
Modulated by PRBS at maximum data rate, at maximum output power.					
DEVIATIONS FROM TEST STANDARD					
None					
REQUIREMENTS					
The peak conducted power of spurious emissions, up to the 10th harmonic of the transmit frequency, must be less than or equal to -13 dBm					
RESULTS					
Pass					
SIGNATURE					
 Tested By: _____					
DESCRIPTION OF TEST					
Spurious Conducted Emissions - Mid Channel - Cellular Band					



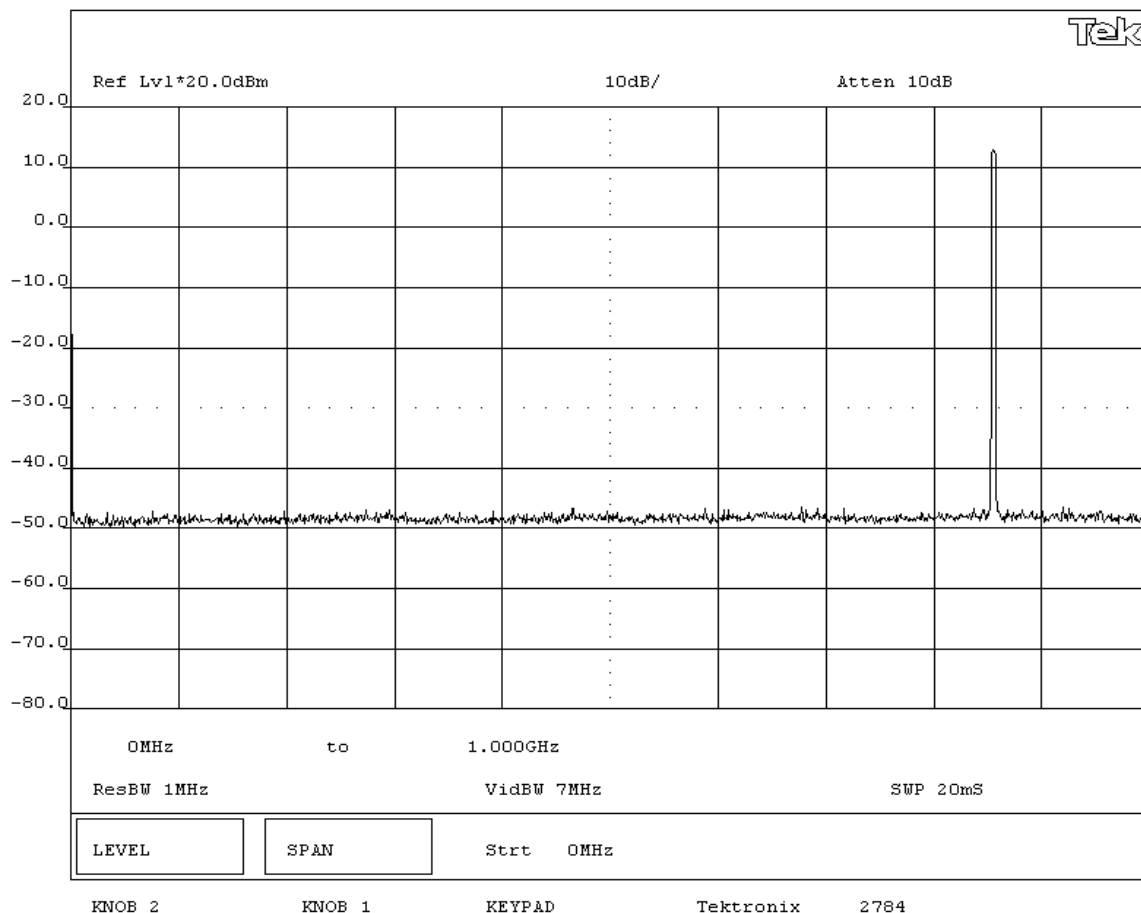
NORTHWEST EMC		EMISSIONS DATA SHEET		Rev BETA 01/30/01	
EUT: TrakLITE C4-B			Work Order: 7LAY0037		
Serial Number: 100074			Date: 03/24/05		
Customer: WirelessWERX, Inc.			Temperature: 22 C		
Attendees: none		Tested by: Greg Kiemel		Humidity: 42%	
Customer Ref. No.: N/A		Power: 12 Vdc		Job Site: EV06	
TEST SPECIFICATIONS					
Specification: 47 CFR 2.1051, 22.917, 24.238		Year: 2004		Method: TIA / EIA 603	
				Year: 2001	
SAMPLE CALCULATIONS					
COMMENTS					
EUT OPERATING MODES					
Modulated by PRBS at maximum data rate, at maximum output power.					
DEVIATIONS FROM TEST STANDARD					
None					
REQUIREMENTS					
The peak conducted power of spurious emissions, up to the 10th harmonic of the transmit frequency, must be less than or equal to -13 dBm					
RESULTS					
Pass					
SIGNATURE					
 Tested By: _____					
DESCRIPTION OF TEST					
Spurious Conducted Emissions - Mid Channel - Cellular Band					



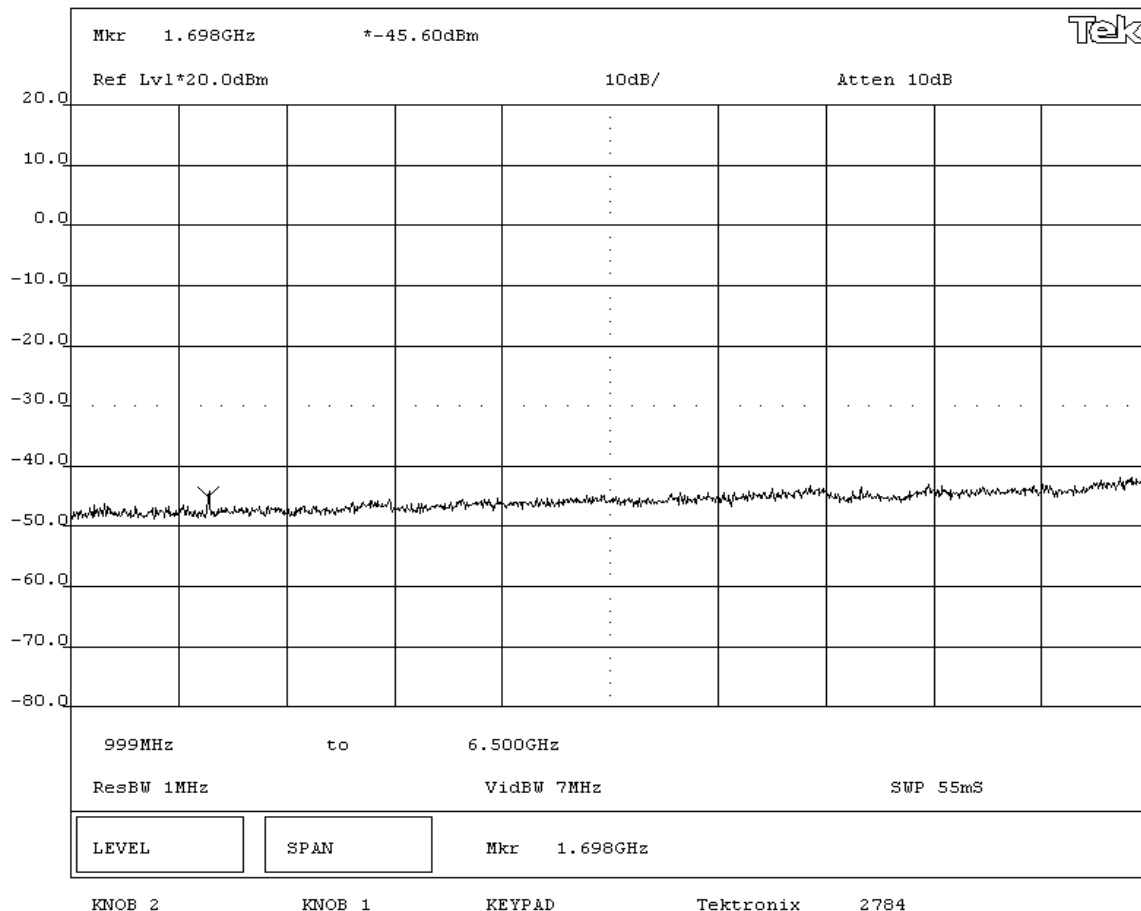
NORTHWEST EMC		EMISSIONS DATA SHEET		Rev BETA 01/30/01	
EUT: TrakLITE C4-B			Work Order: 7LAY0037		
Serial Number: 100074			Date: 03/24/05		
Customer: WirelessWERX, Inc.			Temperature: 22 C		
Attendees: none		Tested by: Greg Kiemel	Humidity: 42%		
Customer Ref. No.: N/A		Power: 12 Vdc	Job Site: EV06		
TEST SPECIFICATIONS					
Specification: 47 CFR 2.1051, 22.917, 24.238		Year: 2004	Method: TIA / EIA 603		Year: 2001
SAMPLE CALCULATIONS					
COMMENTS					
EUT OPERATING MODES					
Modulated by PRBS at maximum data rate, at maximum output power.					
DEVIATIONS FROM TEST STANDARD					
None					
REQUIREMENTS					
The peak conducted power of spurious emissions, up to the 10th harmonic of the transmit frequency, must be less than or equal to -13 dBm					
RESULTS					
Pass					
SIGNATURE					
 Tested By: _____					
DESCRIPTION OF TEST					
Spurious Conducted Emissions - Mid Channel - Cellular Band					



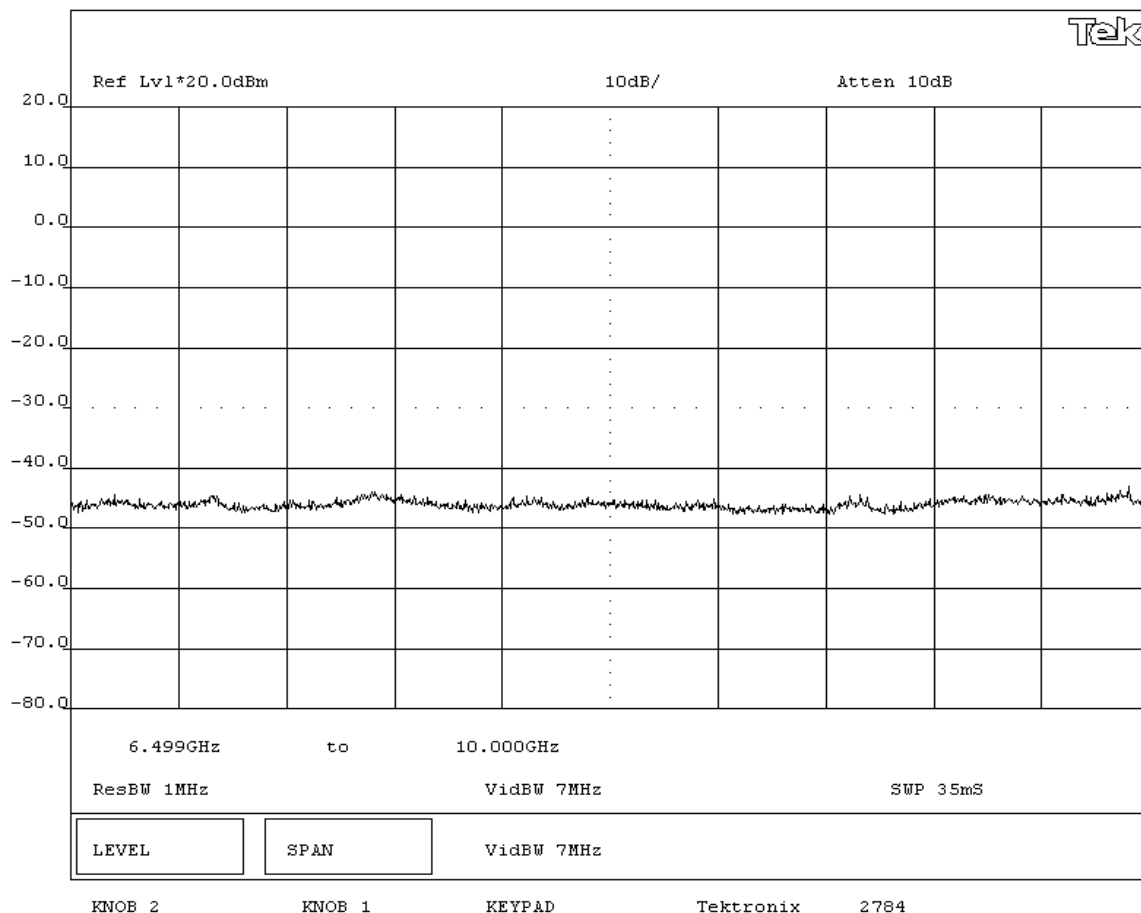
NORTHWEST EMC		EMISSIONS DATA SHEET		Rev BETA 01/30/01	
EUT: TrakLITE C4-B			Work Order: 7LAY0037		
Serial Number: 100074			Date: 03/24/05		
Customer: WirelessWERX, Inc.			Temperature: 22 C		
Attendees: none		Tested by: Greg Kiemel		Humidity: 42%	
Customer Ref. No.: N/A		Power: 12 Vdc		Job Site: EV06	
TEST SPECIFICATIONS					
Specification: 47 CFR 2.1051, 22.917, 24.238		Year: 2004		Method: TIA / EIA 603	
				Year: 2001	
SAMPLE CALCULATIONS					
COMMENTS					
EUT OPERATING MODES					
Modulated by PRBS at maximum data rate, at maximum output power.					
DEVIATIONS FROM TEST STANDARD					
None					
REQUIREMENTS					
The peak conducted power of spurious emissions, up to the 10th harmonic of the transmit frequency, must be less than or equal to -13 dBm					
RESULTS					
Pass					
SIGNATURE					
 Tested By: _____					
DESCRIPTION OF TEST					
Spurious Conducted Emissions - High Channel - Cellular Band					



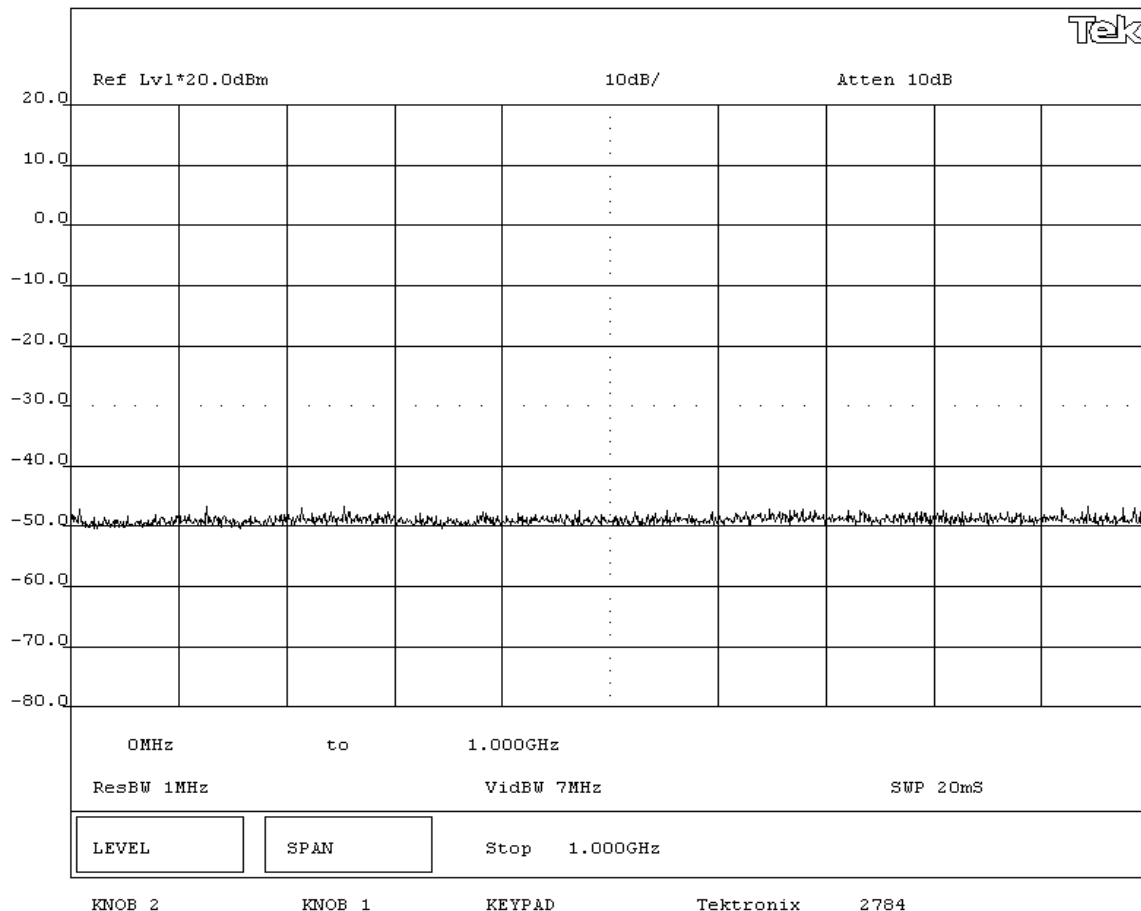
NORTHWEST EMC		EMISSIONS DATA SHEET		Rev BETA 01/30/01	
EUT: TrakLITE C4-B			Work Order: 7LAY0037		
Serial Number: 100074			Date: 03/24/05		
Customer: WirelessWERX, Inc.			Temperature: 22 C		
Attendees: none		Tested by: Greg Kiemel		Humidity: 42%	
Customer Ref. No.: N/A		Power: 12 Vdc		Job Site: EV06	
TEST SPECIFICATIONS					
Specification: 47 CFR 2.1051, 22.917, 24.238		Year: 2004		Method: TIA / EIA 603	
				Year: 2001	
SAMPLE CALCULATIONS					
COMMENTS					
EUT OPERATING MODES					
Modulated by PRBS at maximum data rate, at maximum output power.					
DEVIATIONS FROM TEST STANDARD					
None					
REQUIREMENTS					
The peak conducted power of spurious emissions, up to the 10th harmonic of the transmit frequency, must be less than or equal to -13 dBm					
RESULTS					
Pass					
SIGNATURE					
 Tested By: _____					
DESCRIPTION OF TEST					
Spurious Conducted Emissions - High Channel - Cellular Band					



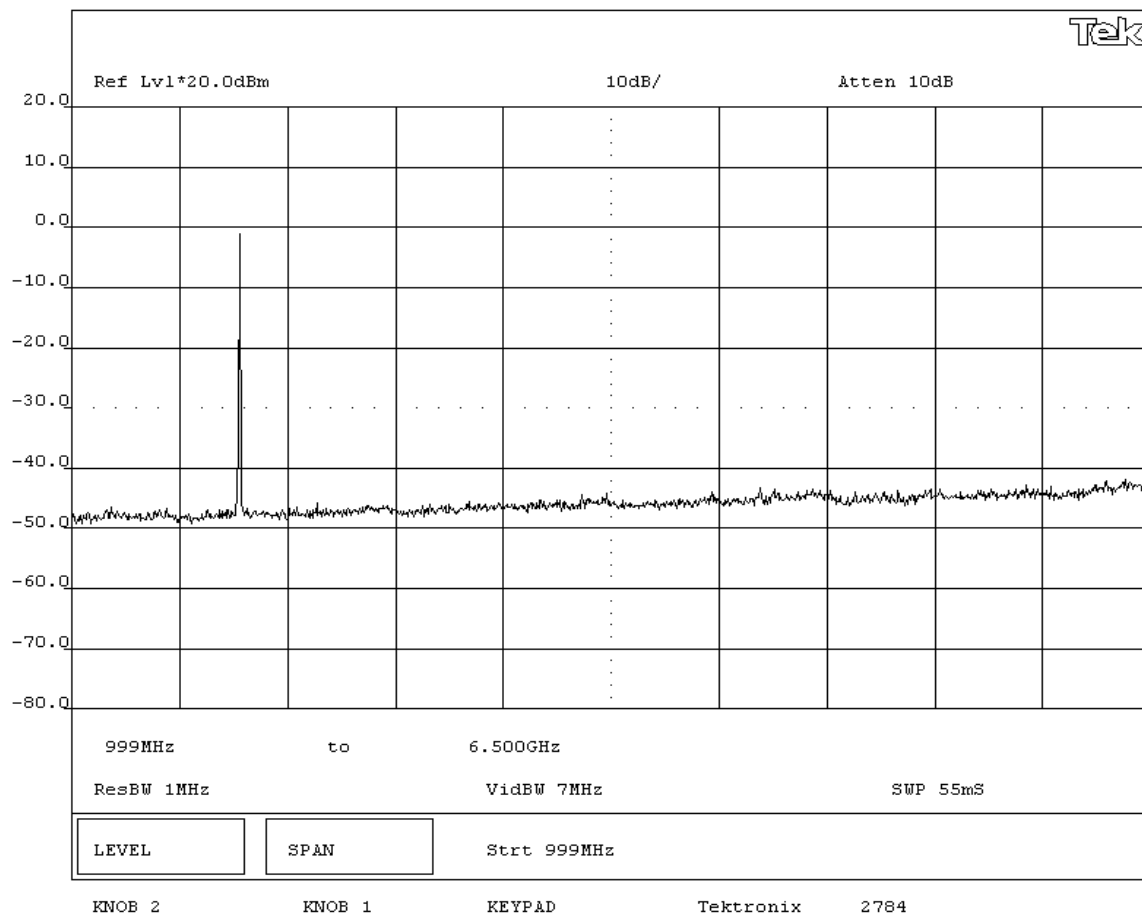
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Serial Number: 100074			Date: 03/24/05		
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Spurious Conducted Emissions - High Channel - Cellular Band					



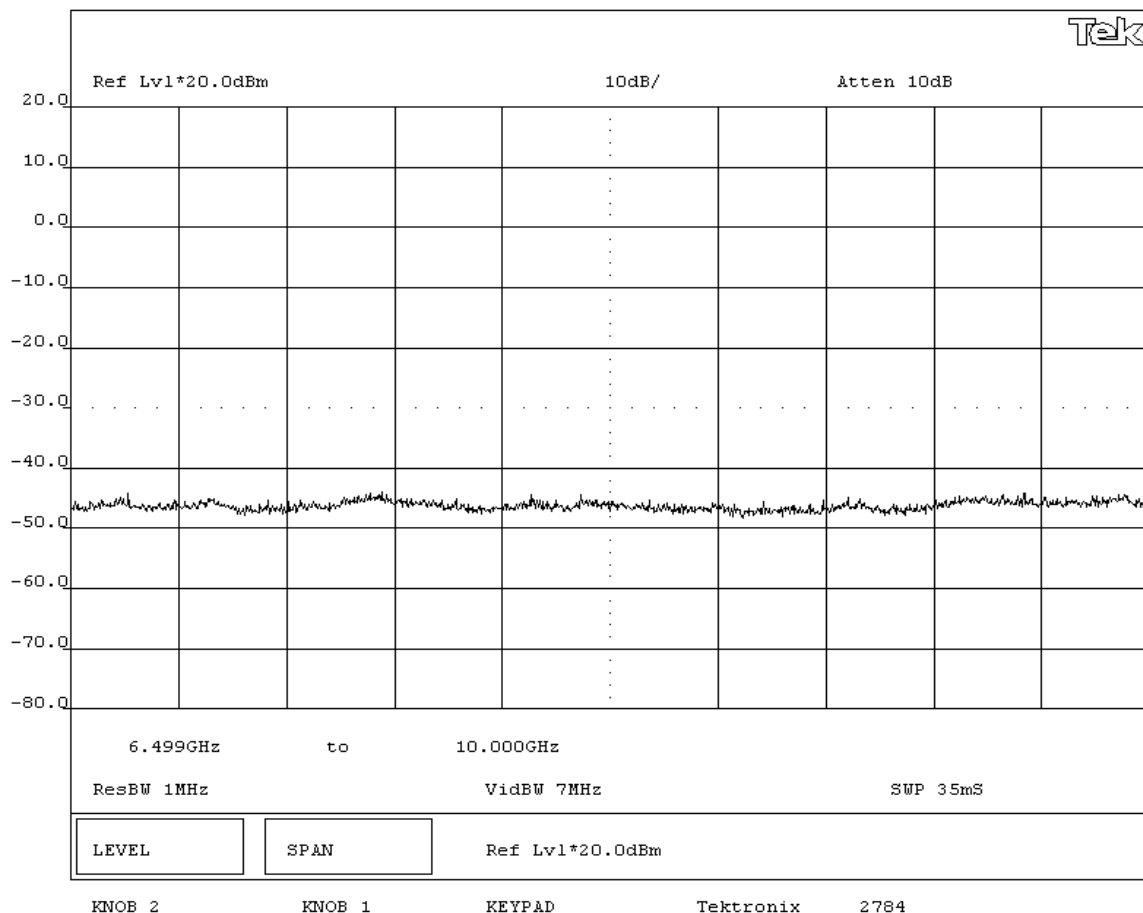
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Serial Number: 100074			Date: 03/24/05		
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The peak conducted power of spurious emissions, up to the 10th harmonic of the transmit frequency, must be less than or equal to -13 dBm					
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SIGNATURE					
 Tested By: _____					
DESCRIPTION OF TEST					
Spurious Conducted Emissions - Low Channel - PCS Band					



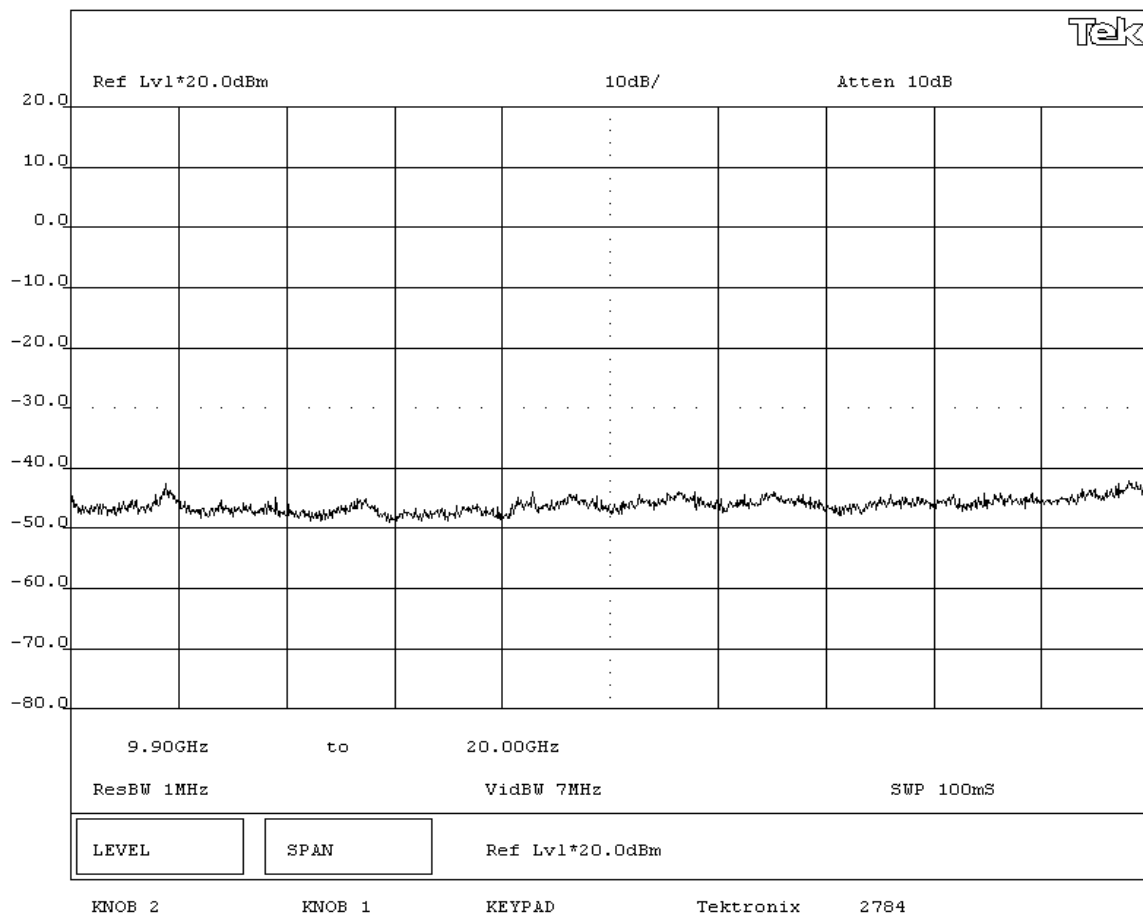
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Serial Number: 100074			Date: 03/24/05		
Customer: WirelessWERX, Inc.			Temperature: 22 C		
Attendees: none		Tested by: Greg Kiemel		Humidity: 42%	
Customer Ref. No.: N/A		Power: 12 Vdc		Job Site: EV06	
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 Tested By: _____					
DESCRIPTION OF TEST					
Spurious Conducted Emissions - Low Channel - PCS Band					



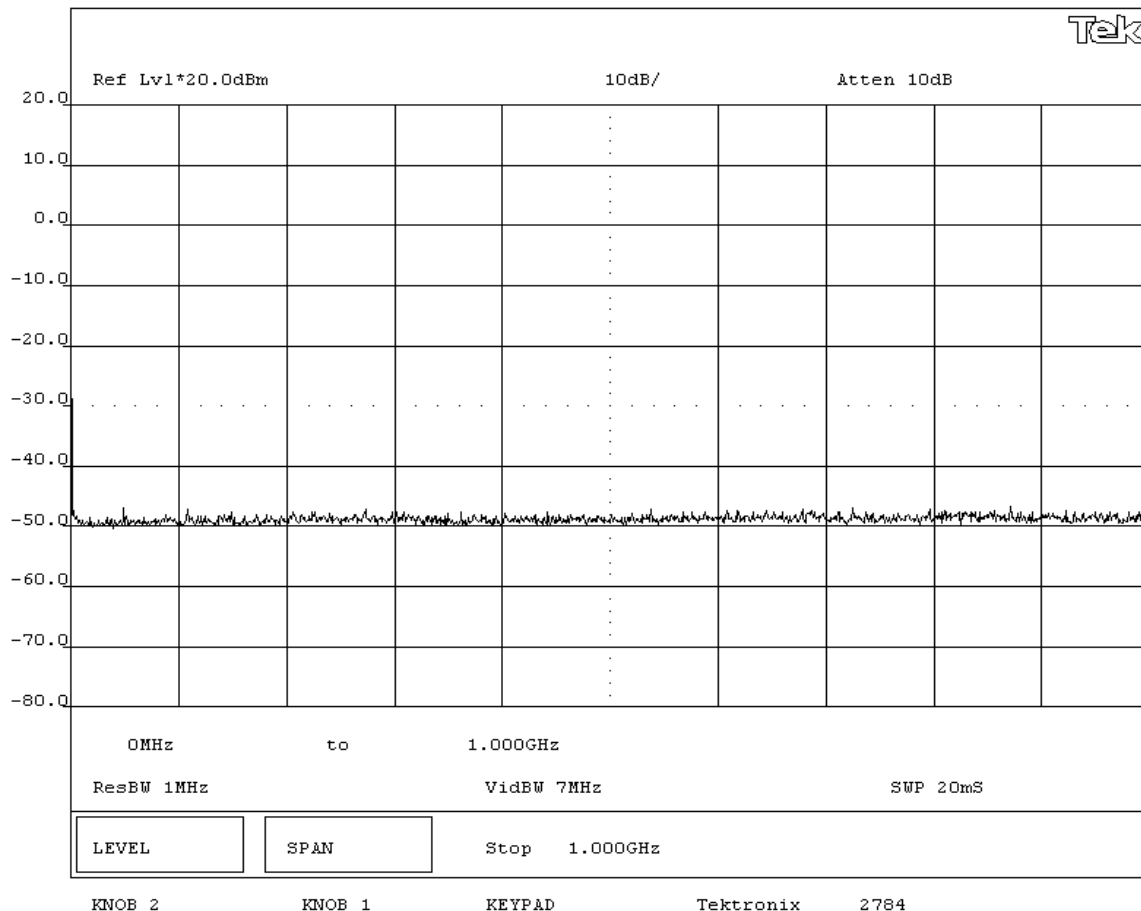
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DESCRIPTION OF TEST					
Spurious Conducted Emissions - Low Channel - PCS Band					



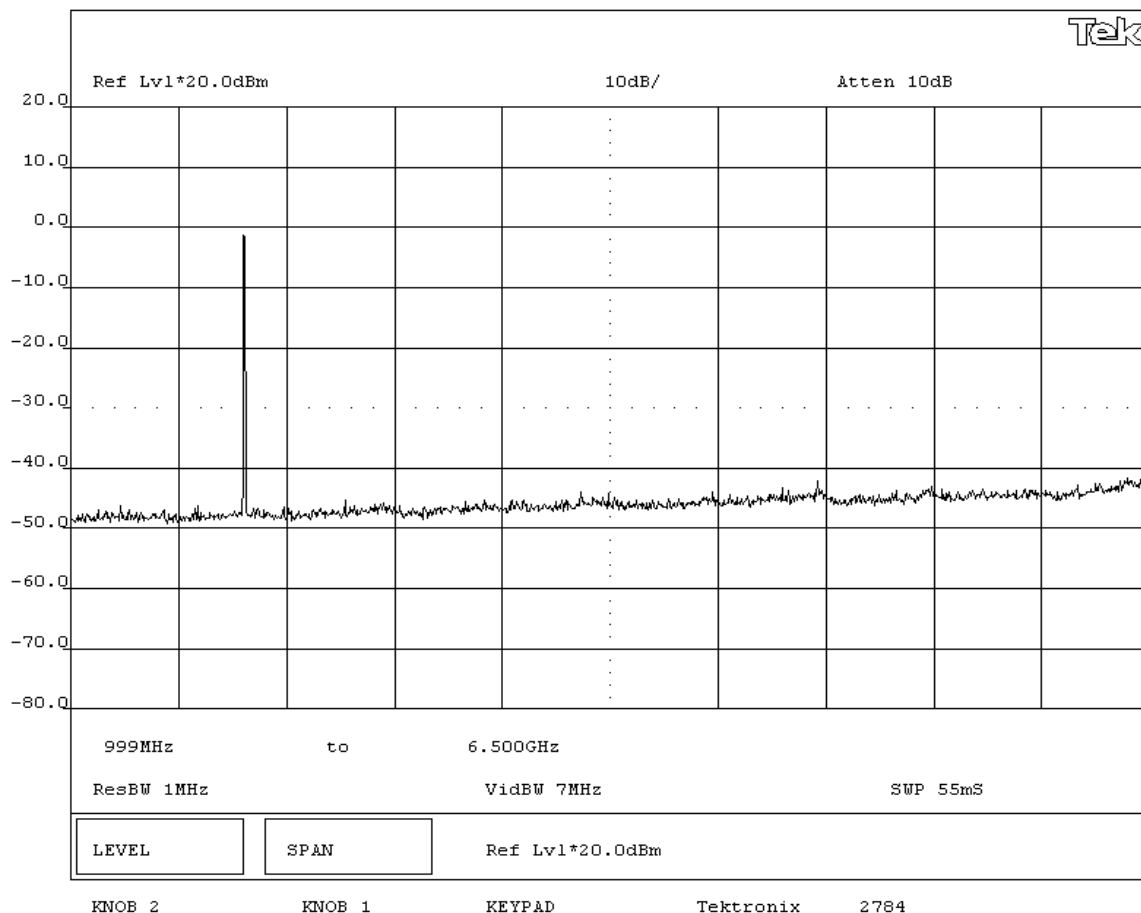
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RESULTS					
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SIGNATURE					
 Tested By: _____					
DESCRIPTION OF TEST					
Spurious Conducted Emissions - Low Channel - PCS Band					



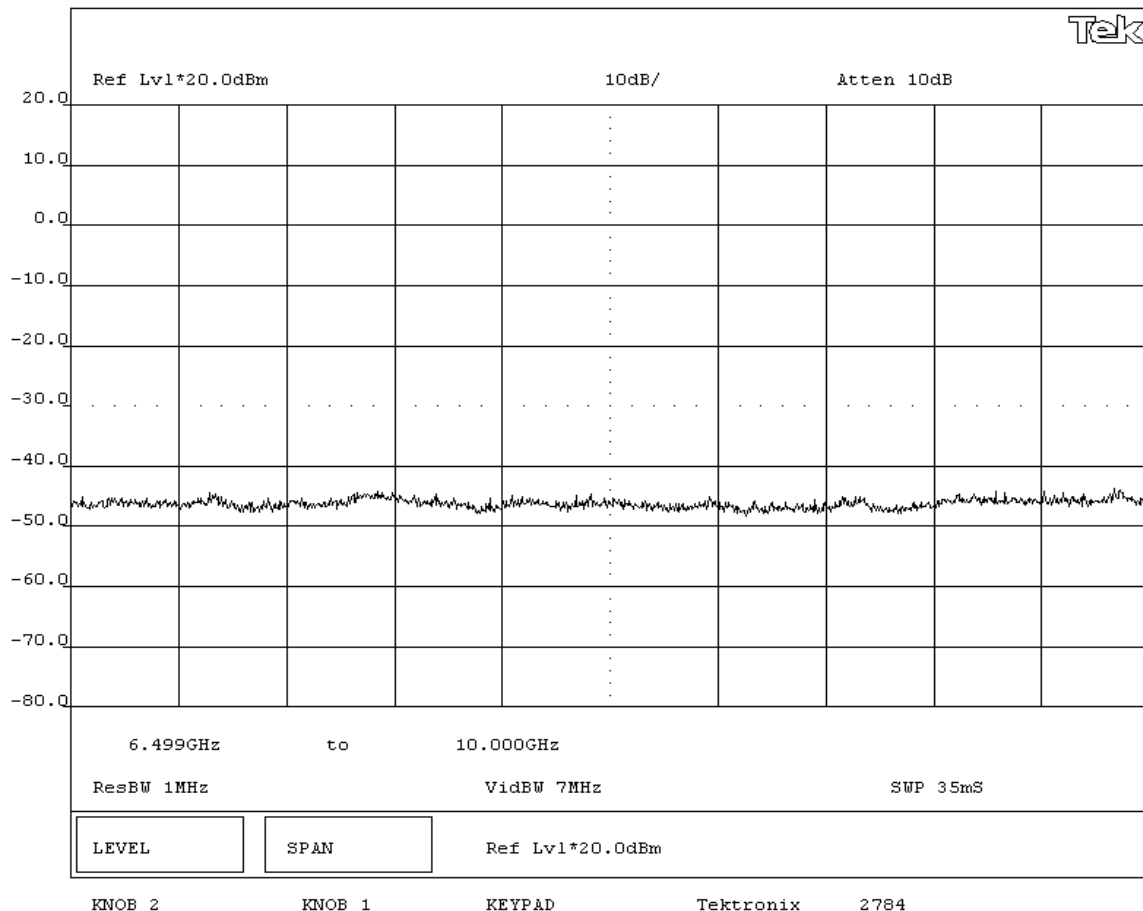
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Serial Number: 100074			Date: 03/24/05		
Customer: WirelessWERX, Inc.			Temperature: 22 C		
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TEST SPECIFICATIONS					
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EUT OPERATING MODES					
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DEVIATIONS FROM TEST STANDARD					
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REQUIREMENTS					
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RESULTS					
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SIGNATURE					
 Tested By: _____					
DESCRIPTION OF TEST					
Spurious Conducted Emissions - Mid Channel - PCS Band					



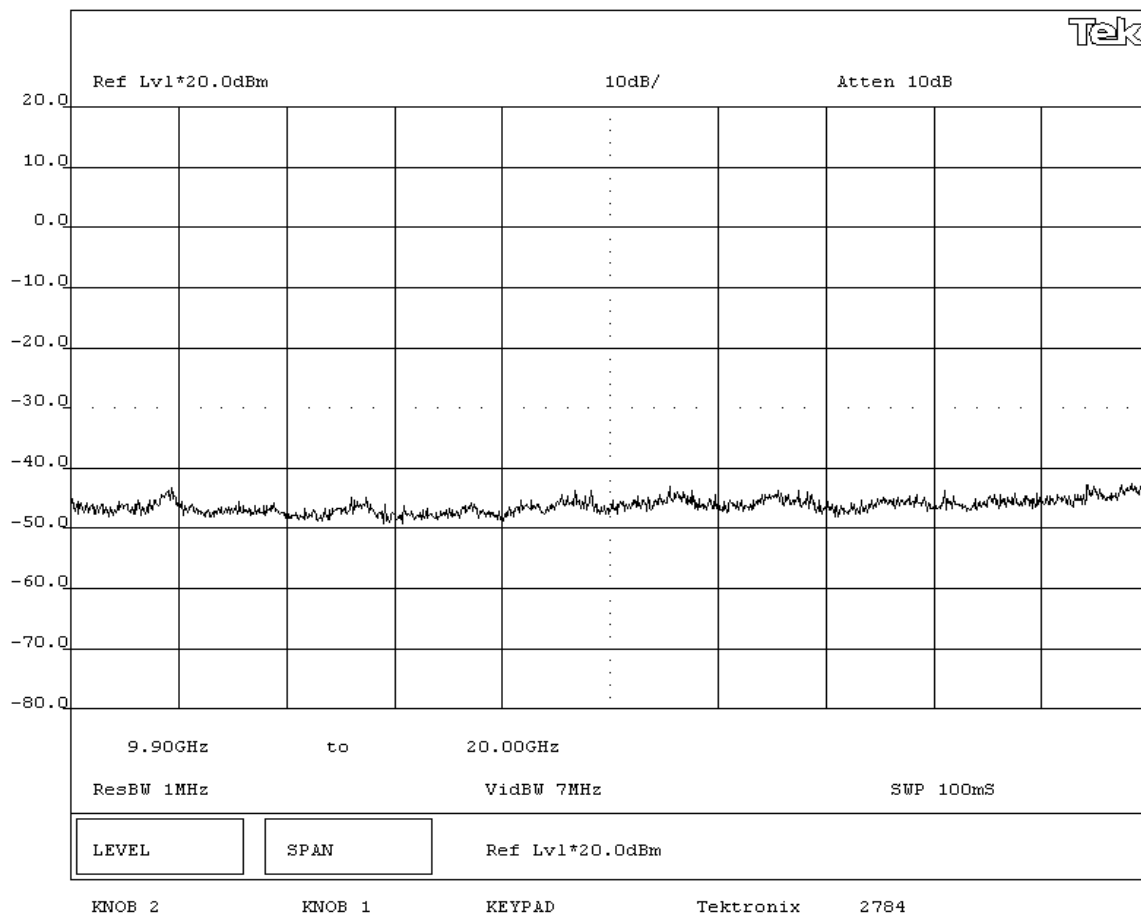
NORTHWEST EMC		EMISSIONS DATA SHEET		Rev BETA 01/30/01	
EUT: TrakLITE C4-B			Work Order: 7LAY0037		
Serial Number: 100074			Date: 03/24/05		
Customer: WirelessWERX, Inc.			Temperature: 22 C		
Attendees: none		Tested by: Greg Kiemel		Humidity: 42%	
Customer Ref. No.: N/A		Power: 12 Vdc		Job Site: EV06	
TEST SPECIFICATIONS					
Specification: 47 CFR 2.1051, 22.917, 24.238		Year: 2004		Method: TIA / EIA 603	
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SAMPLE CALCULATIONS					
COMMENTS					
EUT OPERATING MODES					
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DEVIATIONS FROM TEST STANDARD					
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REQUIREMENTS					
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RESULTS					
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SIGNATURE					
 Tested By: _____					
DESCRIPTION OF TEST					
Spurious Conducted Emissions - Mid Channel - PCS Band					



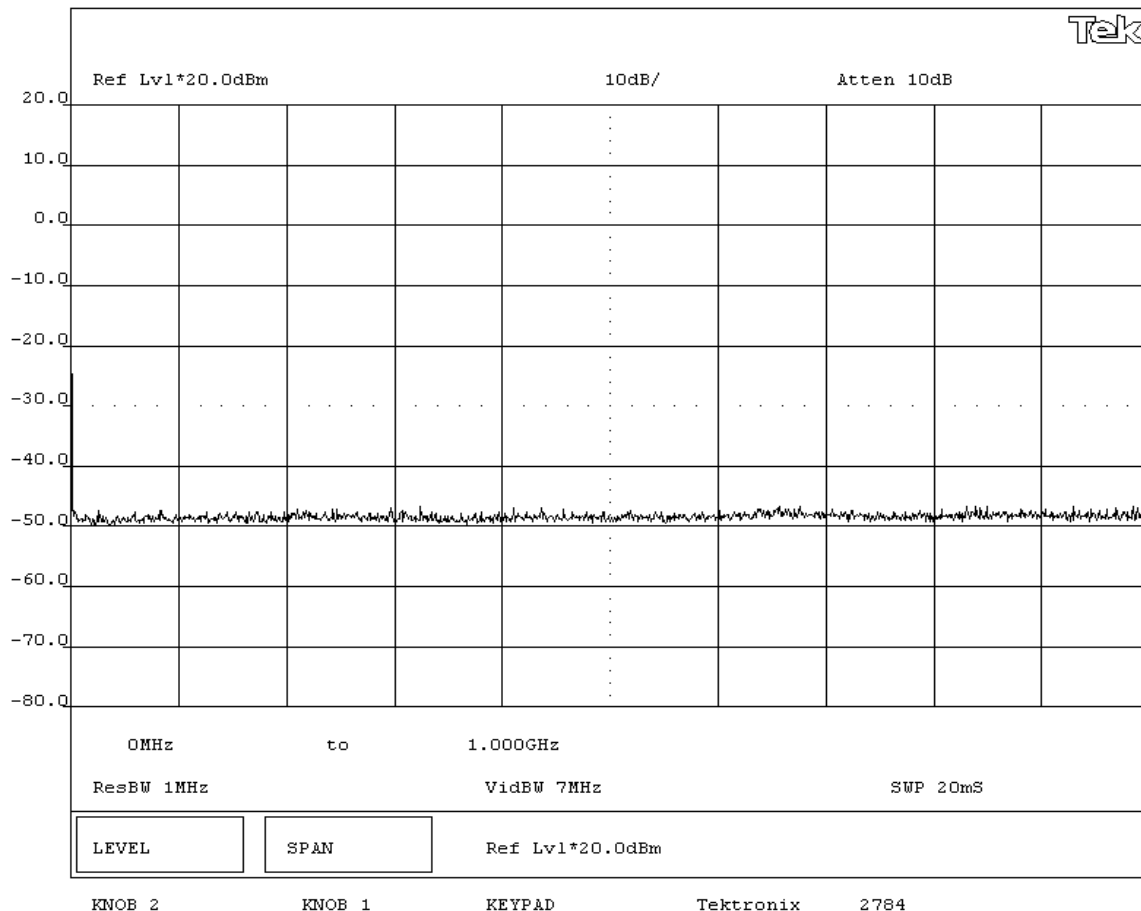
NORTHWEST EMC		EMISSIONS DATA SHEET		Rev BETA 01/30/01	
EUT: TrakLITE C4-B			Work Order: 7LAY0037		
Serial Number: 100074			Date: 03/24/05		
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DESCRIPTION OF TEST					
Spurious Conducted Emissions - Mid Channel - PCS Band					



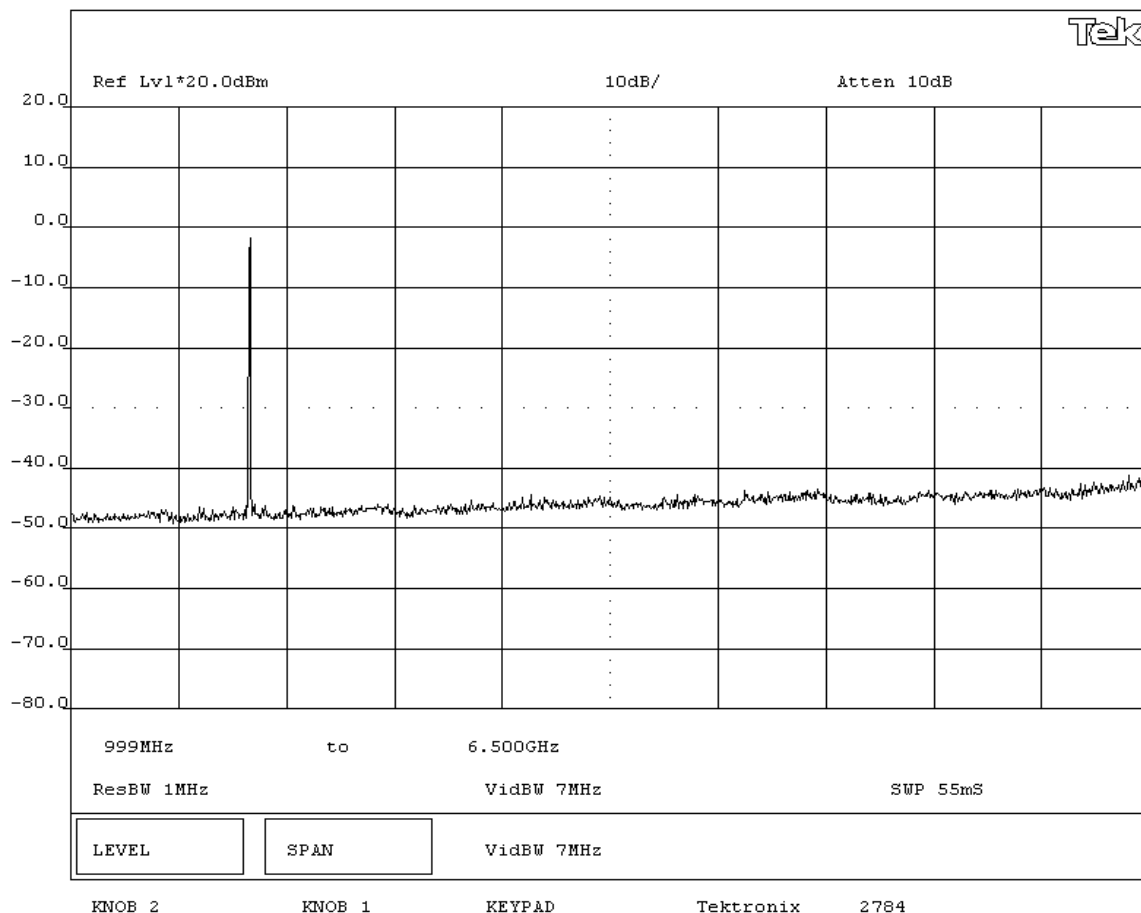
NORTHWEST EMC		EMISSIONS DATA SHEET		Rev BETA 01/30/01	
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DESCRIPTION OF TEST					
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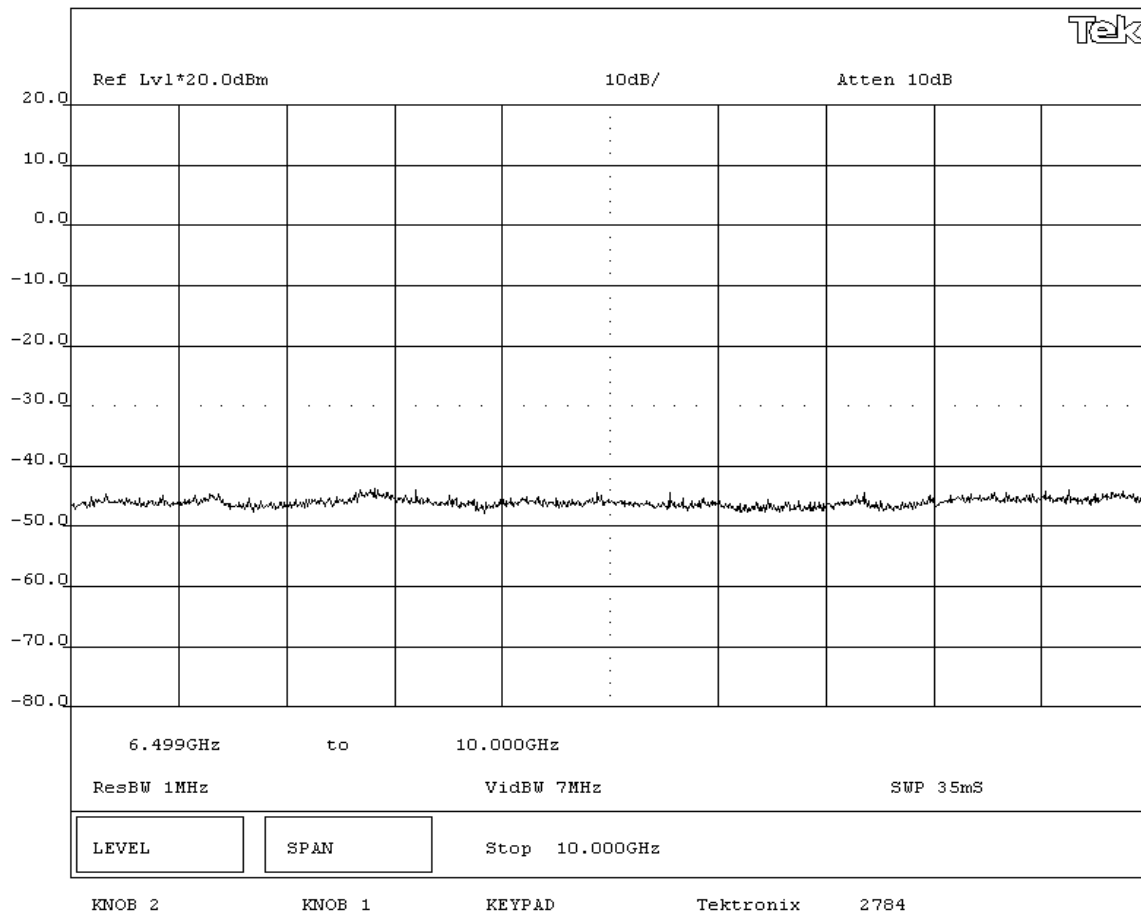
NORTHWEST EMC		EMISSIONS DATA SHEET		Rev BETA 01/30/01	
EUT: TrakLITE C4-B			Work Order: 7LAY0037		
Serial Number: 100074			Date: 03/24/05		
Customer: WirelessWERX, Inc.			Temperature: 22 C		
Attendees: none		Tested by: Greg Kiemel	Humidity: 42%		
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TEST SPECIFICATIONS					
Specification: 47 CFR 2.1051, 22.917, 24.238		Year: 2004	Method: TIA / EIA 603		Year: 2001
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 Tested By: _____					
DESCRIPTION OF TEST					
Spurious Conducted Emissions - High Channel - PCS Band					



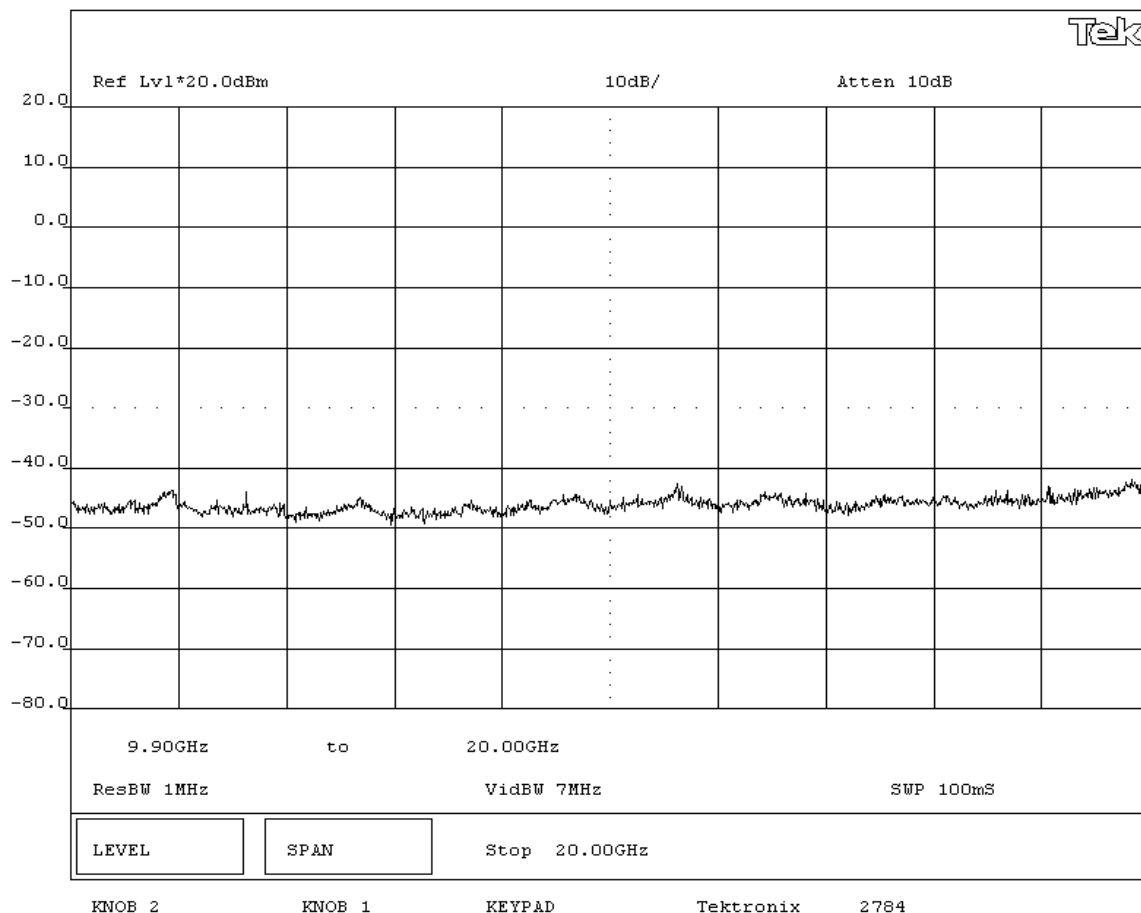
NORTHWEST EMC		EMISSIONS DATA SHEET		Rev BETA 01/30/01	
EUT: TrakLITE C4-B			Work Order: 7LAY0037		
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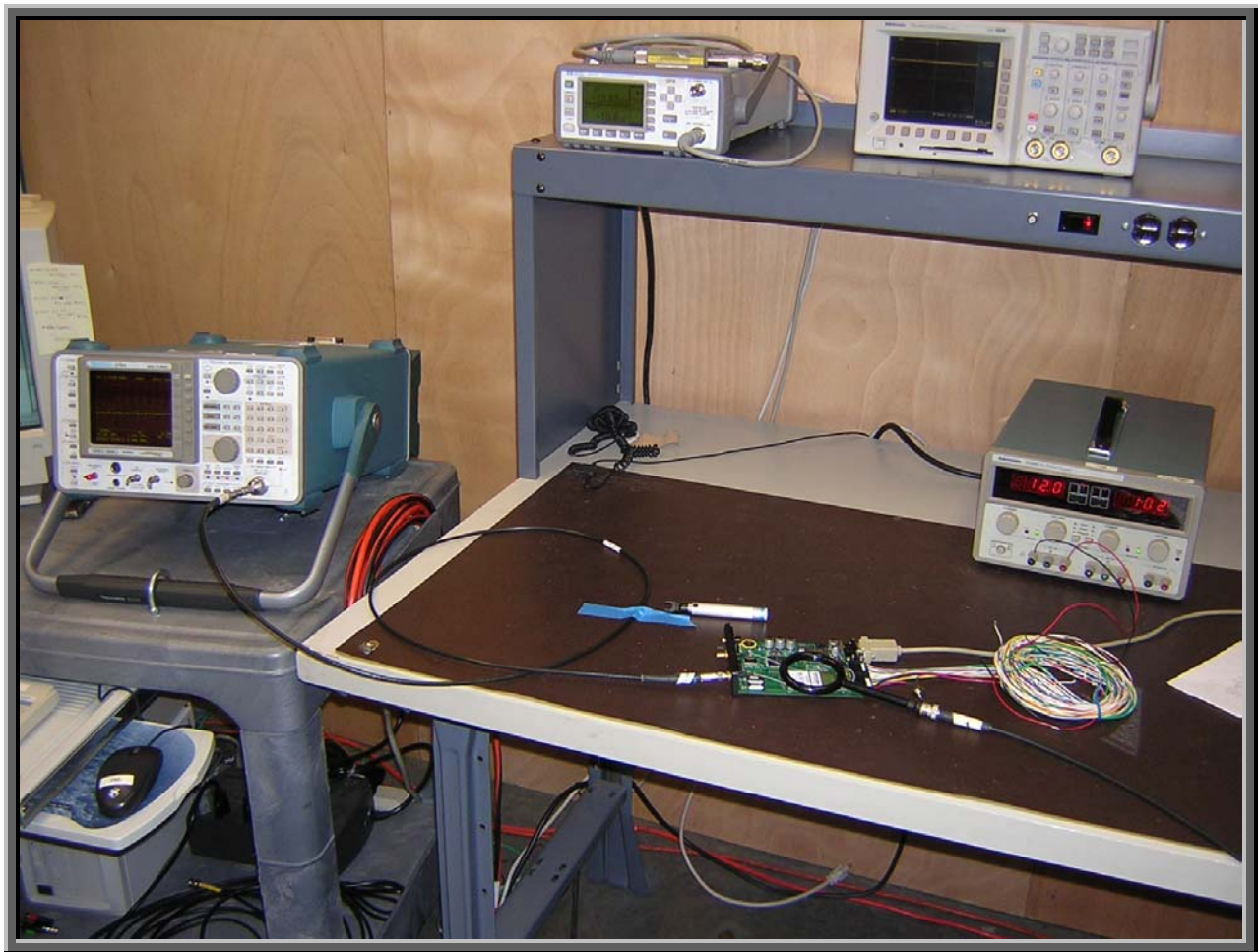


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Spurious Conducted Emissions - High Channel - PCS Band					





Justification

The individuals and/or the organization requesting the test provided the modes, configurations and settings available to evaluate. While scanning the radiated emissions, all of the EUT parameters listed below were investigated. This includes, but may not be limited to, antennas, tuned transmit frequency ranges, operating modes, and data rates.

Channels in Specified Band Investigated:

GSM Cellular Low Channel, 824.2MHz
GSM Cellular Mid Channel, 836.4MHz
GSM Cellular High Channel, 848.8MHz
GSM PCS Low Channel, 1850.2MHz
GSM PCS Mid Channel, 1880MHz
GSM PCS High Channel, 1909.8MHz
Simultaneous transmission of GSM Cellular Channel 132 and Bluetooth Channel 74
Simultaneous transmission of GSM Cellular Channel 251 and Bluetooth Channel 4
Simultaneous transmission of GSM Cellular Channel 207 and Bluetooth Channel 14
Simultaneous transmission of GSM PCS Channel 516 and Bluetooth Channel 67

Operating Modes Investigated:

Typical

Antennas Investigated:

Bluetooth
GPS
Cellular

Data Rates Investigated:

Maximum

Power Input Settings Investigated:

12VDC

Frequency Range Investigated

Start Frequency	30 MHz	Stop Frequency	26GHz
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Software\Firmware Applied During Test

Exercise software	Hyperterminal	Version	1999
Description			
The system was tested using hyperterminal software on a remote pc to access the EUT during the testing. A call was originated by the wireless communications test set and answered via hyperterminal on the EUT.			

EUT and Peripherals

Description	Manufacturer	Model/Part Number	Serial Number
EUT	Wireless Werx	TrakLITE C4-B	100074
DC Power Supply	Topward Electric Instruments, Co. Ltd.	TPS-2000	Unknown
Cellular Antenna	Radiall/Larsen	MMC/P3ESMA	Unknown
GPS Antenna	Laipac Tech	GLP1	334083
Bluetooth Antenna	Radiall/Larsen	MS3E2400SMA	Unknown

Remote Equipment Outside of Test Setup Boundary

Description	Manufacturer	Model/Part Number	Serial Number
Wireless Communications Test Set	Agilent	8960 Series 10 E5515C	0844051960
Remote laptop	IBM	Thinkpad	78-HKYY6 10/00
Equipment isolated from the EUT so as not to contribute to the measurement result is considered to be outside the test setup boundary			

Cables

Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
Serial	Yes	6	No	EUT	Remote laptop
Wire harness (16)	No	1.0	No	EUT	Unterminated
Wire harness (3)	No	1.0	No	EUT	DC Power Supply
Bluetooth	Yes	2.0	No	EUT	Bluetooth Antenna
Cellular	Yes	3.0	No	EUT	Cellular Antenna
GPS	Yes	3.0	No	EUT	GPS Antenna
AC Power	No	2.0	No	DC Power Supply	AC Mains

Measurement Equipment

Description	Manufacturer	Model	Identifier	Last Cal	Interval
Antenna, Horn	EMCO	3160-09	AHG	NCR	NA
Pre-Amplifier	Miteq	JSD4-18002600-26-8P	APU	02/15/2005	13 mo
Antenna, Horn	EMCO	3115	AHC	09/07/2004	12 mo
Pre-Amplifier	Miteq	AMF-4D-005180-24-10P	APC	02/17/2005	13 mo
Antenna, Horn	EMCO	3160-08	AHK	NCR	NA
Pre-Amplifier	Miteq	AMF-4D-005180-24-10P	APJ	01/05/2004	16 mo
Antenna, Biconilog	EMCO	3141	AXE	12/03/2003	24 mo
Pre-Amplifier	Amplifier Research	LN1000A	APS	03/01/2005	13 mo
Spectrum Analyzer	Tektronix	2784	AAO	01/02/2005	12 mo
Quasi-Peak Adapter	Hewlett-Packard	85650A	AQF	12/02/2004	13 mo
Spectrum Analyzer	Hewlett-Packard	8566B	AAL	12/02/2004	13 mo
Spectrum Analyzer Display	Hewlett Packard	85662A	AALD	12/02/2004	13 mo
Attenuator	Coaxicom	66702 5910-6	ATZ	02/25/2005	13 mo
Attenuator	Coaxicom	66702 5910-20	RBJ	02/25/2005	13 mo
High Pass Filter	Micro-Tronics	HPM50111	HFO	03/09/2005	13 mo
Antenna, Horn	EMCO	3115	AHF	03/18/2004	24 mo
Antenna, Dipole (ADAA included)	Roberts	Roberts	ADA	01/06/2005	24 mo
Signal Generator	Hewlett Packard	8341B	TGN	02/07/2005	13 mo

Test Description

Requirement: Per 2.1053, the field strength of spurious radiation was measured in the far-field at an FCC Listed semi-anechoic chamber up to 25 GHz. The applicable limits are 22.917(a) for the cellular band, and 24.238(a) for the PCS band.

Per 22.917(a), 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 (-13 dBm).

Per 24.238(a), 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 (-13 dBm).

Configuration: The highest gain of each type of antenna to be used with the EUT was tested. The EUT was configured for low, mid, and high band transmit frequencies. For each configuration, the spectrum was scanned throughout the specified range. In addition, measurements were made in the restricted bands to verify compliance. While scanning, emissions from the EUT were maximized by rotating the EUT on a turntable, adjusting the position of the EUT and EUT antenna in three orthogonal axis, and adjusting the measurement antenna height and polarization (per ANSI C63.4:1992). A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.

Simultaneous Transmission:

The following is an excerpt from the FCC / TCB Training Q & A, October 2002, Day 2, Question 7:

Assuming that the radios do not share an antenna, only radiated tests for simultaneous transmission is required. If the radios share an antenna, antenna conducted measurements would also be required. Only one set of worst case simultaneous transmission data is going to be requested to be submitted at this time. The test engineer should indicate the worst case condition and provide justification as to why the worst case condition was chosen. The grantee should be reminded that even if the FCC requests one set of data, they are responsible for compliance for all modes of simultaneous transmission.

All possible combinations of harmonic emissions from the GSM and Bluetooth radios were compared numerically. It was determined that there were no possible coincidental harmonics below 1 GHz. The frequency range from 1 GHz to 26 GHz was investigated for channel combinations that would produce coincidental harmonics.

The substitution method as described in ANSI/TIA-603-B Section 2.2.12 was used for the highest spurious emissions.

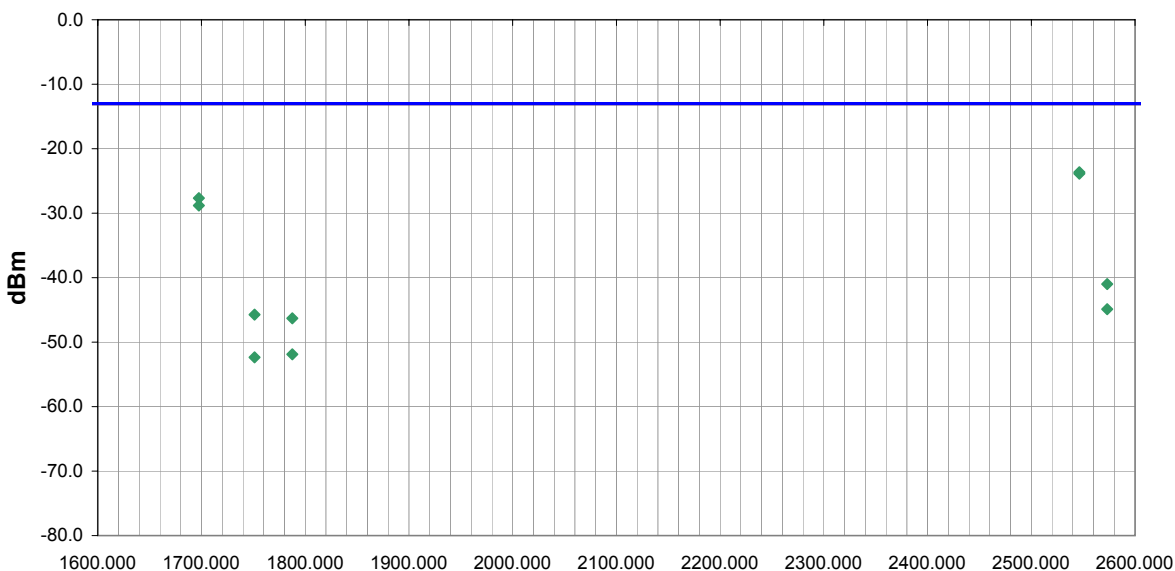
Test Methodology: For licensed transmitters, the FCC references ANSI/TIA-603-B as the measurement procedure standard. ANSI/TIA-603-B Section 2.2.12 describes a method for measuring radiated emissions that utilizes an antenna substitution method:

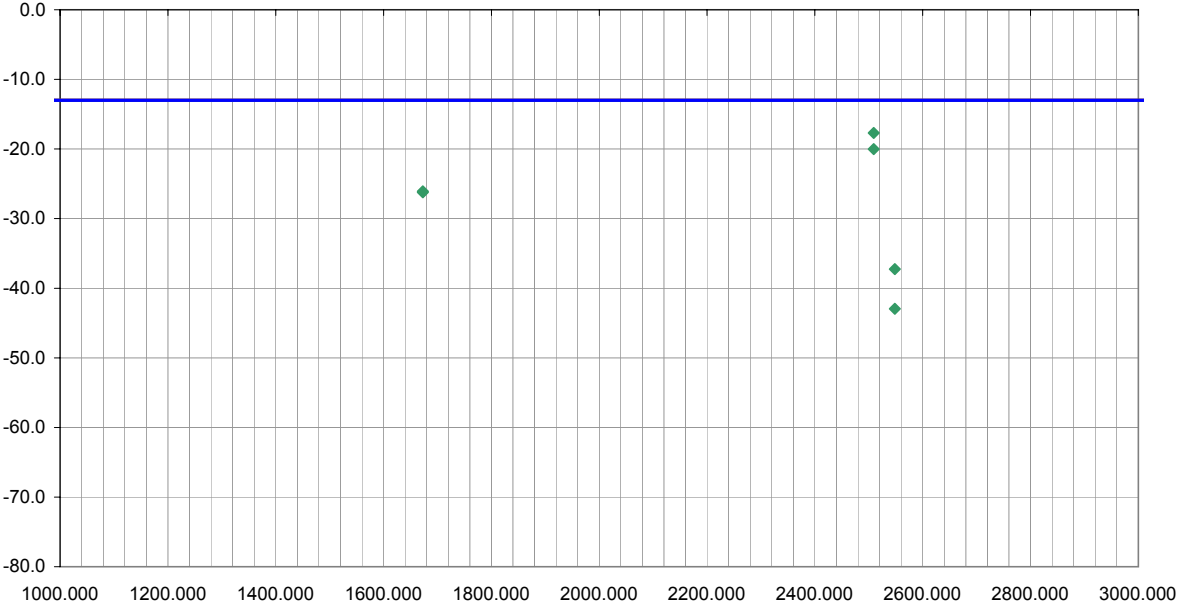
At an approved test site, the transmitter is placed on a remotely controlled turntable, and the measurement antenna is placed 3 meters from the transmitter. The turntable azimuth is varied to maximize the level of emissions. The height of the measurement antenna is also varied from 1 to 4 meters. The amplitude and frequency of the highest emissions are noted. The transmitter is then replaced with a $\frac{1}{2}$ wave dipole that is successively tuned to each of the highest emissions. A signal generator is connected to the dipole (horn antenna for frequencies above 1 GHz), and its output is adjusted to match the level previously noted for each frequency. The output of the signal generator is recorded, and by factoring in the cable loss to the dipole antenna and its gain, the power (ERP or e.i.r.p) is determined for each radiated emission.

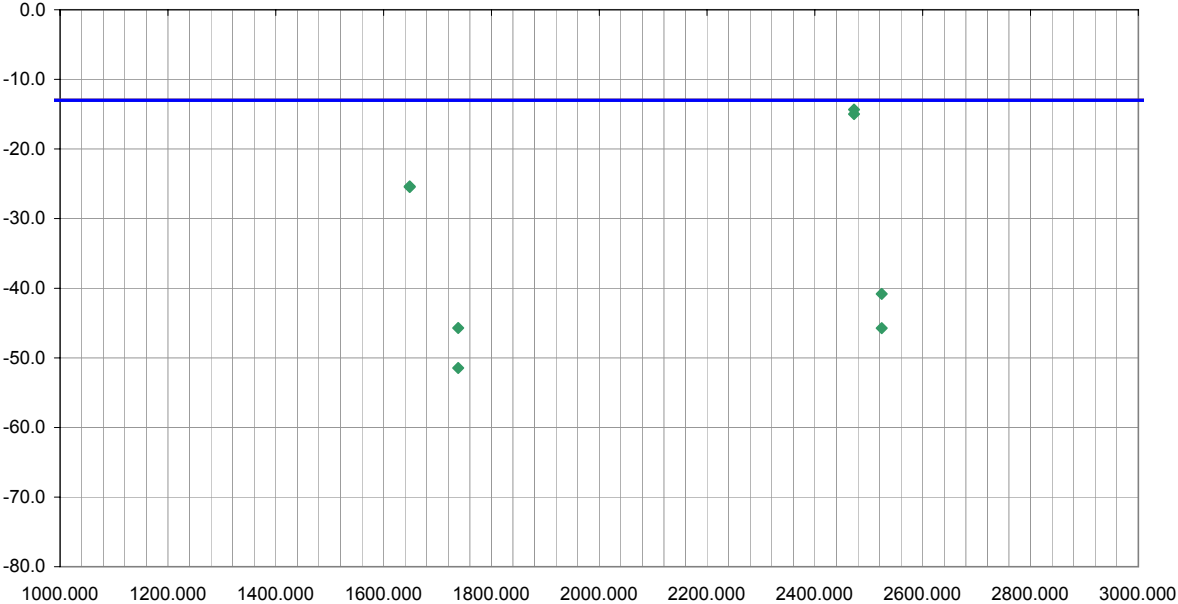
Bandwidths Used for Measurements			
Frequency Range (MHz)	Peak Data (kHz)	Quasi-Peak Data (kHz)	Average Data (kHz)
0.01 – 0.15	1.0	0.2	0.2
0.15 – 30.0	10.0	9.0	9.0
30.0 – 1000	100.0	120.0	120.0
Above 1000	1000.0	N/A	1000.0
<i>Measurements were made using the bandwidths and detectors specified. No video filter was used.</i>			

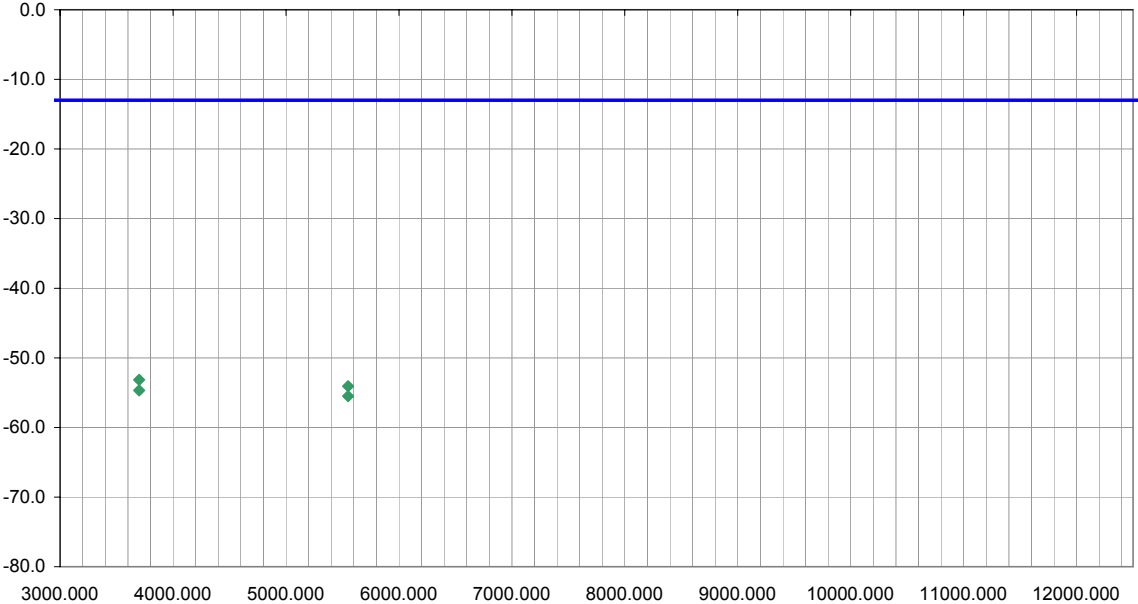
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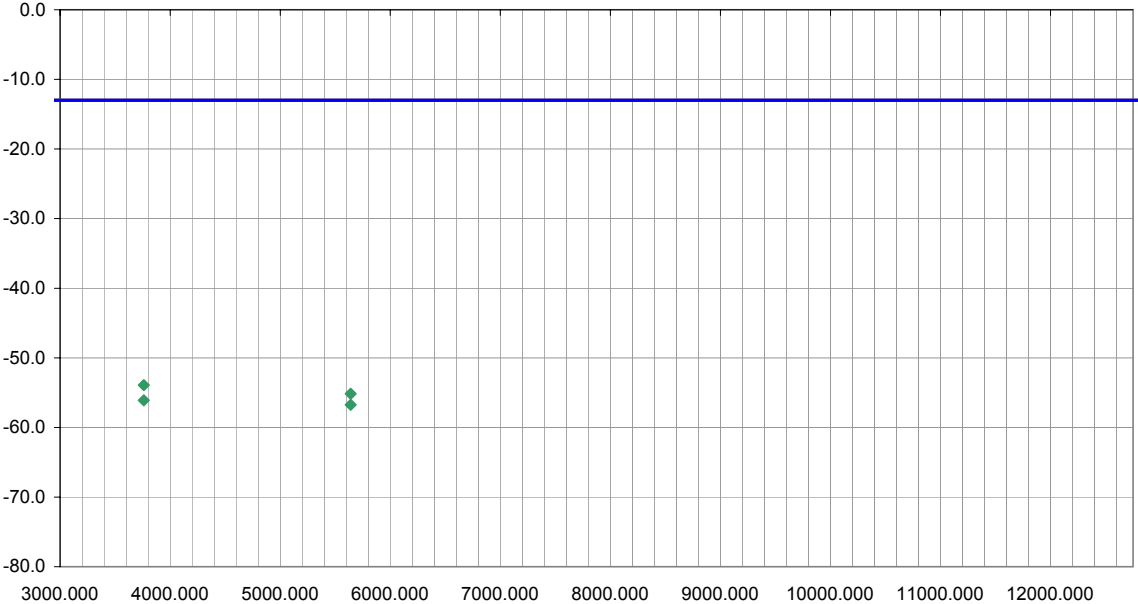


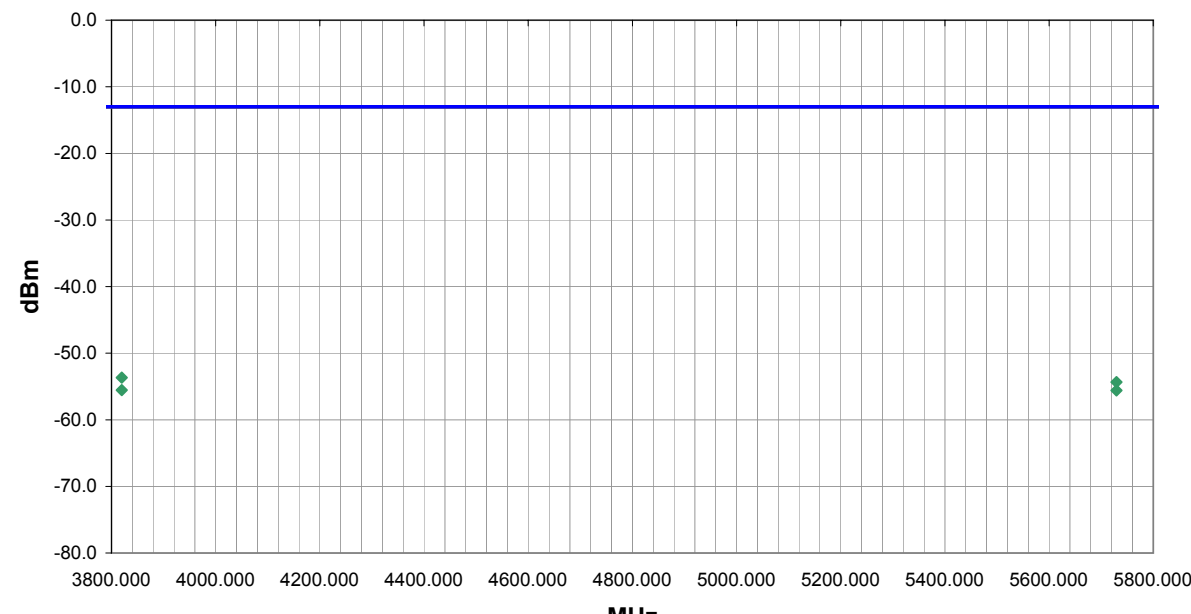
NORTHWEST		ACQ 2005.1.3 EMI 2005.1.3								
EMC		Apparent Power Data Sheet								
EUT: TrakLITE C4-B		Work Order: 7LAY0037								
Serial Number: 100074		Date: 03/20/05								
Customer: WirelessWERX, Inc.		Temperature: 24								
Attendees: none		Humidity: 31%								
Cust. Ref. No.:		Barometric Pressure: 29.67								
Tested by: Holly Ashkannejhad		Power: 12VDC								
		Job Site: EV01								
TEST SPECIFICATIONS										
Specification: FCC 22.917(a):2004		Method: TIA/EIA-603:2001								
SAMPLE CALCULATIONS										
Radiated Emissions: Field Strength = Measured Level + Antenna Factor + Cable Factor - Amplifier Gain + Distance Adjustment Factor + External Attenuation										
Conducted Emissions: Adjusted Level = Measured Level + Transducer Factor + Cable Attenuation Factor + External Attenuator										
COMMENTS										
10dB external attenuation										
EUT OPERATING MODES										
Transmitting GSM Cellular High Channel										
DEVIATIONS FROM TEST STANDARD										
No deviations.										
RESULTS			Run #							
Pass			9							
Other		 Tested By:								
										
Freq (MHz)		Azimuth (degrees)	Height (meters)		Polarity	Detector	EIRP (Watts)	EIRP (dBm)	Spec. Limit (dBm)	Compared to Spec. (dB)
2546.316		87.0	1.4		V-Horn	PK	4.3155E-06	-23.6	-13.0	-10.6
2546.316		353.0	1.3		H-Horn	PK	4.1126E-06	-23.9	-13.0	-10.9
1697.560		71.0	1.3		V-Horn	PK	1.7156E-06	-27.7	-13.0	-14.7
1697.560		143.0	1.3		H-Horn	PK	1.3153E-06	-28.8	-13.0	-15.8
2573.168		39.0	1.3		V-Horn	PK	7.9687E-08	-41.0	-13.0	-28.0
2573.168		139.0	1.3		H-Horn	PK	3.2476E-08	-44.9	-13.0	-31.9
1751.204		116.0	1.2		V-Horn	PK	2.6656E-08	-45.7	-13.0	-32.7
1787.642		270.0	1.2		V-Horn	PK	2.3447E-08	-46.3	-13.0	-33.3
1787.642		256.0	1.3		H-Horn	PK	6.4687E-09	-51.9	-13.0	-38.9
1751.204		219.0	1.5		H-Horn	PK	5.8087E-09	-52.4	-13.0	-39.4

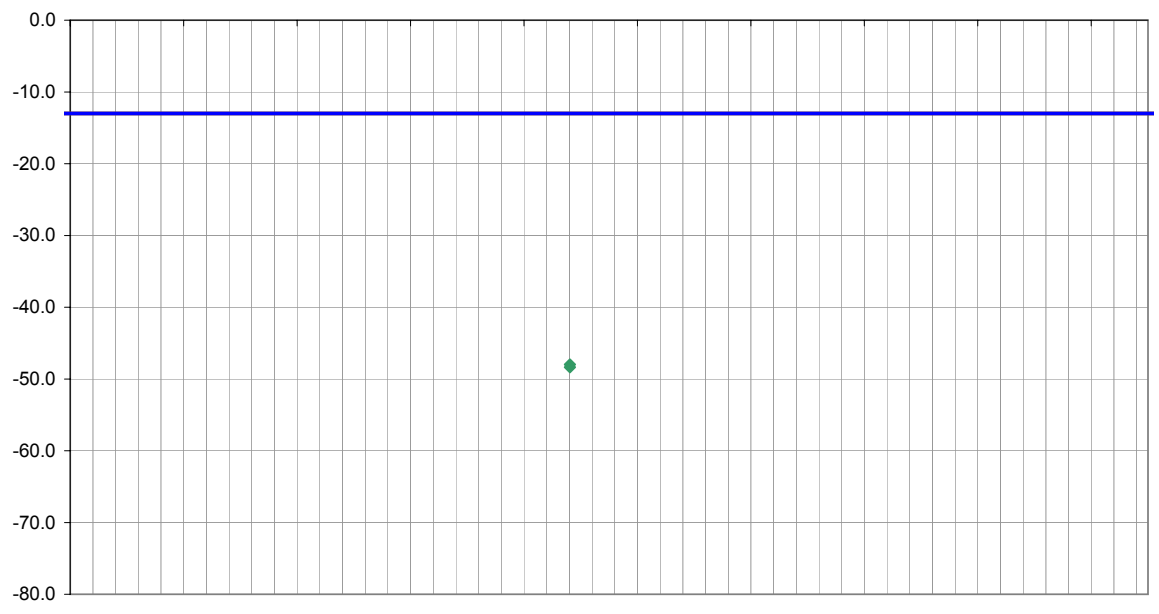
NORTHWEST		ACQ 2005.1.3 EMI 2005.1.3								
EMC		Apparent Power Data Sheet								
EUT: TrakLITE C4-B		Work Order: 7LAY0037								
Serial Number: 100074		Date: 03/20/05								
Customer: WirelessWERX, Inc.		Temperature: 24								
Attendees: none		Humidity: 31%								
Cust. Ref. No.:		Barometric Pressure: 29.67								
Tested by: Holly Ashkannejhad		Power: 12VDC								
		Job Site: EV01								
TEST SPECIFICATIONS										
Specification: FCC 22.917(a):2004		Method: TIA/EIA-603:2001								
SAMPLE CALCULATIONS										
Radiated Emissions: Field Strength = Measured Level + Antenna Factor + Cable Factor - Amplifier Gain + Distance Adjustment Factor + External Attenuation										
Conducted Emissions: Adjusted Level = Measured Level + Transducer Factor + Cable Attenuation Factor + External Attenuator										
COMMENTS										
10dB external attenuation										
EUT OPERATING MODES										
Transmitting GSM Cellular Mid Channel										
DEVIATIONS FROM TEST STANDARD										
No deviations.										
RESULTS			Run #							
Pass			10							
Other		 Tested By:								
										
Freq (MHz)		Azimuth (degrees)	Height (meters)		Polarity	Detector	EIRP (Watts)	EIRP (dBm)	Spec. Limit (dBm)	Compared to Spec. (dB)
2509.102		82.0	1.4		V-Horn	PK	1.6988E-05	-17.7	-13.0	-4.7
2509.102		131.0	1.3		H-Horn	PK	9.9474E-06	-20.0	-13.0	-7.0
1672.820		130.0	1.4		H-Horn	PK	2.4623E-06	-26.1	-13.0	-13.1
1672.820		46.0	1.3		V-Horn	PK	2.3905E-06	-26.2	-13.0	-13.2
2548.446		36.0	1.3		V-Horn	PK	1.8825E-07	-37.3	-13.0	-24.3
2548.446		135.0	1.5		H-Horn	PK	5.0573E-08	-43.0	-13.0	-30.0

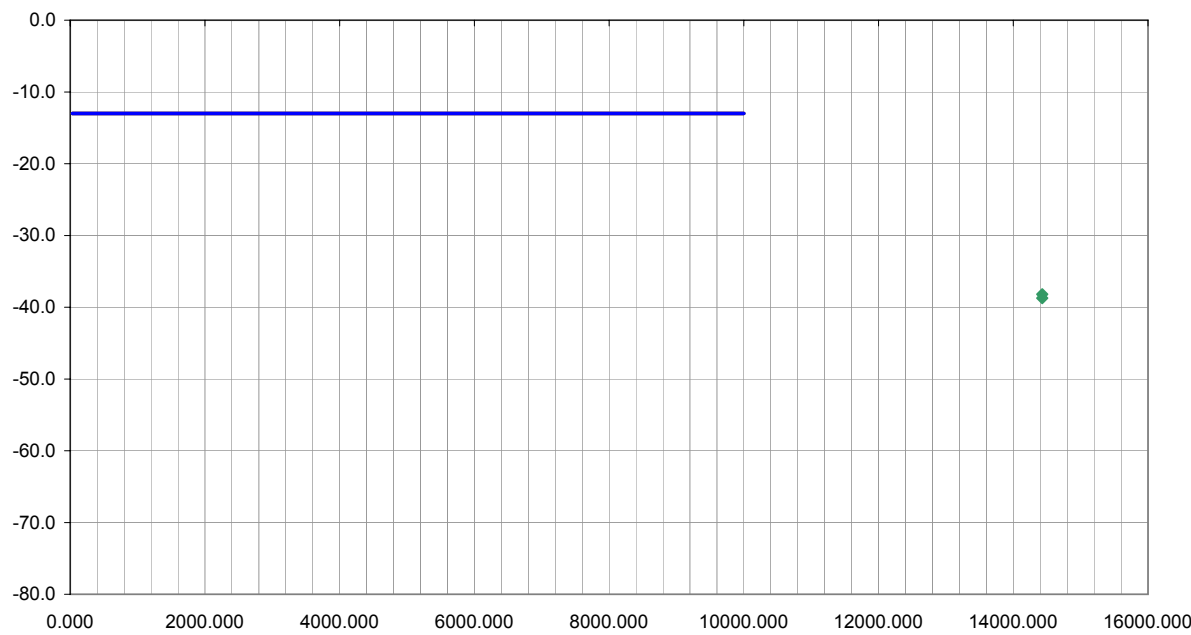
NORTHWEST		ACQ 2005.1.3 EMI 2005.1.3						
EMC		Apparent Power Data Sheet						
EUT: TrakLITE C4-B		Work Order: 7LAY0037						
Serial Number: 100074		Date: 03/20/05						
Customer: WirelessWERX, Inc.		Temperature: 24						
Attendees: none		Humidity: 31%						
Cust. Ref. No.:		Barometric Pressure: 29.67						
Tested by: Holly Ashkannejhad		Power: 12VDC						
		Job Site: EV01						
TEST SPECIFICATIONS								
Specification: FCC 22.917(a):2004		Method: TIA/EIA-603:2001						
SAMPLE CALCULATIONS								
Radiated Emissions: Field Strength = Measured Level + Antenna Factor + Cable Factor - Amplifier Gain + Distance Adjustment Factor + External Attenuation								
Conducted Emissions: Adjusted Level = Measured Level + Transducer Factor + Cable Attenuation Factor + External Attenuator								
COMMENTS								
10dB external attenuation								
EUT OPERATING MODES								
Transmitting GSM Cellular Low Channel								
DEVIATIONS FROM TEST STANDARD								
No deviations.								
RESULTS			Run #					
Pass			11					
Other								
			 Tested By:					
								
Freq (MHz)	Azimuth (degrees)	Height (meters)	Polarity	Detector	EIRP (Watts)	EIRP (dBm)	Spec. Limit (dBm)	Compared to Spec. (dB)
2472.560	75.0	1.5	V-Horn	PK	3.6750E-05	-14.3	-13.0	-1.3
2472.560	131.0	1.3	H-Horn	PK	3.1716E-05	-15.0	-13.0	-2.0
1648.423	137.0	1.4	H-Horn	PK	2.9086E-06	-25.4	-13.0	-12.4
1648.423	77.0	1.4	V-Horn	PK	2.8350E-06	-25.5	-13.0	-12.5
2524.077	34.0	1.3	V-Horn	PK	8.2810E-08	-40.8	-13.0	-27.8
1738.373	345.0	1.1	V-Horn	PK	2.6781E-08	-45.7	-13.0	-32.7
2524.077	134.0	1.3	H-Horn	PK	2.6684E-08	-45.7	-13.0	-32.7
1738.373	306.0	1.2	H-Horn	PK	7.1655E-09	-51.4	-13.0	-38.4

NORTHWEST		ACQ 2005.1.3 EMI 2005.1.3								
EMC		Apparent Power Data Sheet								
EUT: TrakLITE C4-B		Work Order: 7LAY0037								
Serial Number: 100074		Date: 03/20/05								
Customer: WirelessWERX, Inc.		Temperature: 24								
Attendees: none		Humidity: 31%								
Cust. Ref. No.:		Barometric Pressure: 29.67								
Tested by: Holly Ashkannejhad		Power: 12VDC								
		Job Site: EV01								
TEST SPECIFICATIONS										
Specification: FCC 24.238(a):2004		Method: TIA/EIA-603:2001								
SAMPLE CALCULATIONS										
Radiated Emissions: Field Strength = Measured Level + Antenna Factor + Cable Factor - Amplifier Gain + Distance Adjustment Factor + External Attenuation										
Conducted Emissions: Adjusted Level = Measured Level + Transducer Factor + Cable Attenuation Factor + External Attenuator										
COMMENTS										
EUT OPERATING MODES										
Transmitting GSM PCS Low Channel										
DEVIATIONS FROM TEST STANDARD										
No deviations.										
RESULTS			Run #							
Pass			12							
Other										
		 Tested By:								
										
Freq (MHz)		Azimuth (degrees)	Height (meters)		Polarity	Detector	EIRP (Watts)	EIRP (dBm)	Spec. Limit (dBm)	Compared to Spec. (dB)
3700.388		169.0	1.2		V-Horn	PK	4.8425E-09	-53.1	-13.0	-40.1
5550.600		193.0	1.2		V-Horn	PK	3.9206E-09	-54.1	-13.0	-41.1
3700.388		10.0	1.1		H-Horn	PK	3.4118E-09	-54.7	-13.0	-41.7
5550.600		321.0	2.1		H-Horn	PK	2.8115E-09	-55.5	-13.0	-42.5

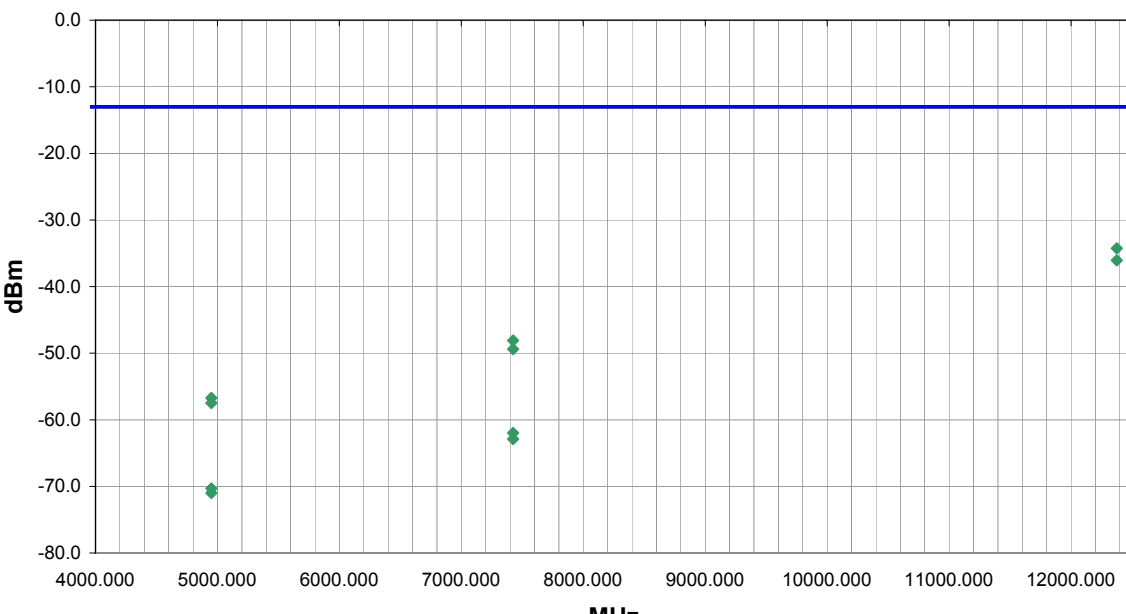
NORTHWEST		ACQ 2005.1.3 EMI 2005.1.3								
EMC		Apparent Power Data Sheet								
EUT: TrakLITE C4-B		Work Order: 7LAY0037								
Serial Number: 100074		Date: 03/20/05								
Customer: WirelessWERX, Inc.		Temperature: 24								
Attendees: none		Humidity: 31%								
Cust. Ref. No.:		Barometric Pressure: 29.67								
Tested by: Holly Ashkannejhad		Power: 12VDC								
		Job Site: EV01								
TEST SPECIFICATIONS										
Specification: FCC 24.238(a):2004		Method: TIA/EIA-603:2001								
SAMPLE CALCULATIONS										
Radiated Emissions: Field Strength = Measured Level + Antenna Factor + Cable Factor - Amplifier Gain + Distance Adjustment Factor + External Attenuation										
Conducted Emissions: Adjusted Level = Measured Level + Transducer Factor + Cable Attenuation Factor + External Attenuator										
COMMENTS										
EUT OPERATING MODES										
Transmitting GSM PCS Mid Channel										
DEVIATIONS FROM TEST STANDARD										
No deviations.										
RESULTS			Run #							
Pass			13							
Other										
		 Tested By:								
										
Freq (MHz)		Azimuth (degrees)	Height (meters)		Polarity	Detector	EIRP (Watts)	EIRP (dBm)	Spec. Limit (dBm)	Compared to Spec. (dB)
3759.949		117.0	2.0		V-Horn	PK	4.0693E-09	-53.9	-13.0	-40.9
5640.000		204.0	1.2		V-Horn	PK	3.0486E-09	-55.2	-13.0	-42.2
3759.949		10.0	1.3		H-Horn	PK	2.4496E-09	-56.1	-13.0	-43.1
5640.000		245.0	1.3		H-Horn	PK	2.1160E-09	-56.7	-13.0	-43.7

NORTHWEST EMC		Apparent Power Data Sheet				ACQ 2005.1.3 EMI 2005.1.3					
EUT: TrakLITE C4-B				Work Order: 7LAY0037							
Serial Number: 100074				Date: 03/20/05							
Customer: WirelessWERX, Inc.				Temperature: 24							
Attendees: none				Humidity: 31%							
Cust. Ref. No.:				Barometric Pressure: 29.67							
Tested by: Holly Ashkannejhad			Power: 12VDC		Job Site: EV01						
TEST SPECIFICATIONS											
Specification: FCC 24.238(a):2004				Method: TIA/EIA-603:2001							
SAMPLE CALCULATIONS											
Radiated Emissions: Field Strength = Measured Level + Antenna Factor + Cable Factor - Amplifier Gain + Distance Adjustment Factor + External Attenuation											
Conducted Emissions: Adjusted Level = Measured Level + Transducer Factor + Cable Attenuation Factor + External Attenuator											
COMMENTS											
EUT OPERATING MODES											
Transmitting GSM PCS High Channel											
DEVIATIONS FROM TEST STANDARD											
No deviations.											
RESULTS							Run #				
Pass							14				
Other				 Tested By: _____							
											
Freq (MHz)			Azimuth (degrees)	Height (meters)		Polarity	Detector	EIRP (Watts)	EIRP (dBm)	Spec. Limit (dBm)	Compared to Spec. (dB)
3819.713			211.0	1.2		V-Horn	PK	0.0000	-53.7	-13.0	-40.7
5729.400			316.0	1.2		V-Horn	PK	0.0000	-54.4	-13.0	-41.4
3819.713			182.0	1.9		H-Horn	PK	0.0000	-55.5	-13.0	-42.5
5729.400			154.0	1.3		H-Horn	PK	0.0000	-55.6	-13.0	-42.6

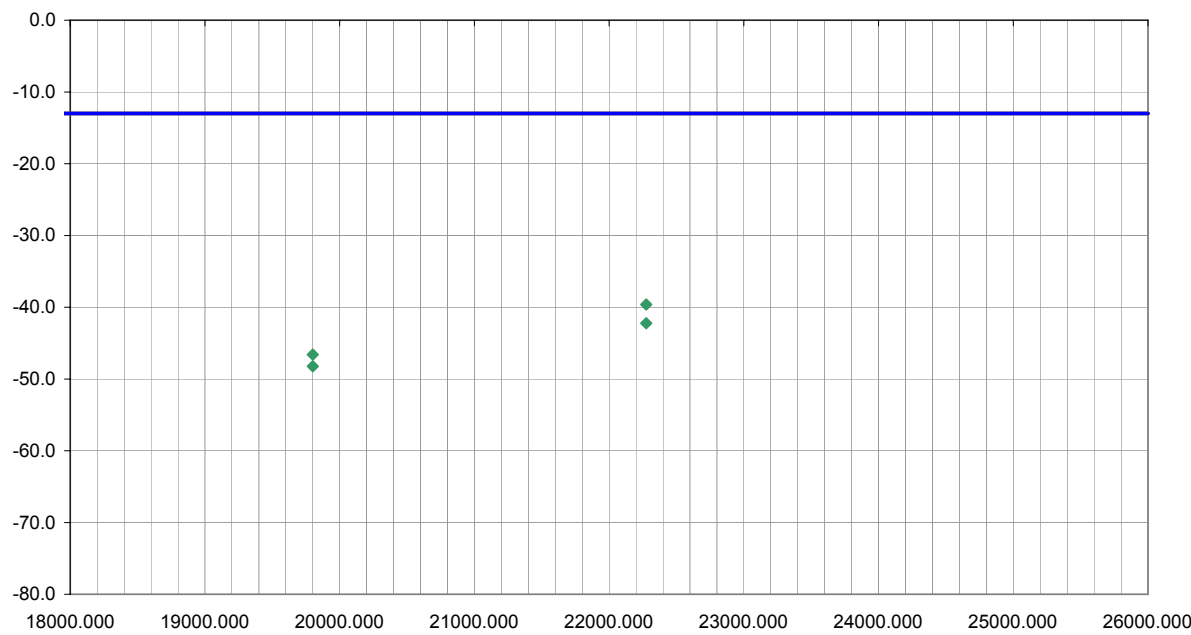
NORTHWEST EMC		Apparent Power Data Sheet				ACQ 2005.1.3 EMI 2005.1.3					
EUT: TrakLITE C4-B		Work Order: 7LAY0037									
Serial Number: 100074		Date: 03/21/05									
Customer: WirelessWERX, Inc.		Temperature: 24									
Attendees: none		Humidity: 31%									
Cust. Ref. No.:		Barometric Pressure: 29.67									
Tested by: Rod Peloquin		Power: 12VDC		Job Site: EV01							
TEST SPECIFICATIONS											
Specification: FCC 22.917(a):2004				Method: TIA/EIA-603:2001							
SAMPLE CALCULATIONS											
Radiated Emissions: Field Strength = Measured Level + Antenna Factor + Cable Factor - Amplifier Gain + Distance Adjustment Factor + External Attenuation											
Conducted Emissions: Adjusted Level = Measured Level + Transducer Factor + Cable Attenuation Factor + External Attenuator											
COMMENTS											
EUT OPERATING MODES											
Transmitting GSM PCS 516, Bluetooth 67											
DEVIATIONS FROM TEST STANDARD											
No deviations.											
RESULTS						Run #					
Pass						15					
Other						 Tested By:					
											
Freq (MHz)			Azimuth (degrees)	Height (meters)		Polarity	Detector	EIRP (Watts)	EIRP (dBm)	Spec. Limit (dBm)	Compared to Spec. (dB)
7404.000			139.0	3.2		H-Horn	PK	0.0000	-48.0	-13.0	-35.0
7404.000			181.0	2.4		V-Horn	PK	0.0000	-48.4	-13.0	-35.4

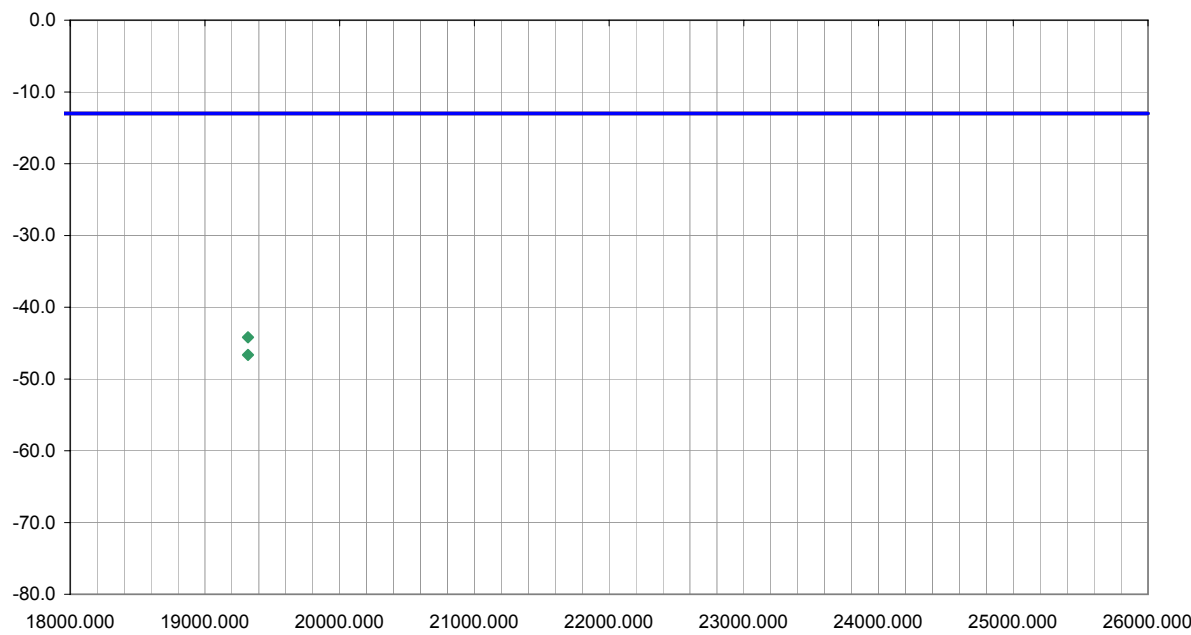
NORTHWEST EMC		Apparent Power Data Sheet				ACQ 2005.1.3 EMI 2005.1.3				
EUT: TrakLITE C4-B		Work Order: 7LAY0037								
Serial Number: 100074		Date: 03/21/05								
Customer: WirelessWERX, Inc.		Temperature: 24								
Attendees: none		Humidity: 31%								
Cust. Ref. No.:		Barometric Pressure: 29.67								
Tested by: Rod Peloquin		Power: 12VDC		Job Site: EV01						
TEST SPECIFICATIONS										
Specification: FCC 22.917(a):2004		Method: TIA/EIA-603:2001								
SAMPLE CALCULATIONS										
Radiated Emissions: Field Strength = Measured Level + Antenna Factor + Cable Factor - Amplifier Gain + Distance Adjustment Factor + External Attenuation										
Conducted Emissions: Adjusted Level = Measured Level + Transducer Factor + Cable Attenuation Factor + External Attenuator										
COMMENTS										
EUT OPERATING MODES										
Transmitting GSM Cellular 251, Bluetooth 4										
DEVIATIONS FROM TEST STANDARD										
No deviations.										
RESULTS						Run #				
Pass						16				
Other						 Tested By:				
										
Freq (MHz)		Azimuth (degrees)	Height (meters)		Polarity	Detector	EIRP (Watts)	EIRP (dBm)	Spec. Limit (dBm)	Compared to Spec. (dB)
14429.800		145.0	1.3		H-Horn	PK	0.0000	-38.2	-13.0	-25.2
14429.800		276.0	1.2		V-Horn	PK	0.0000	-38.7	-13.0	-25.7

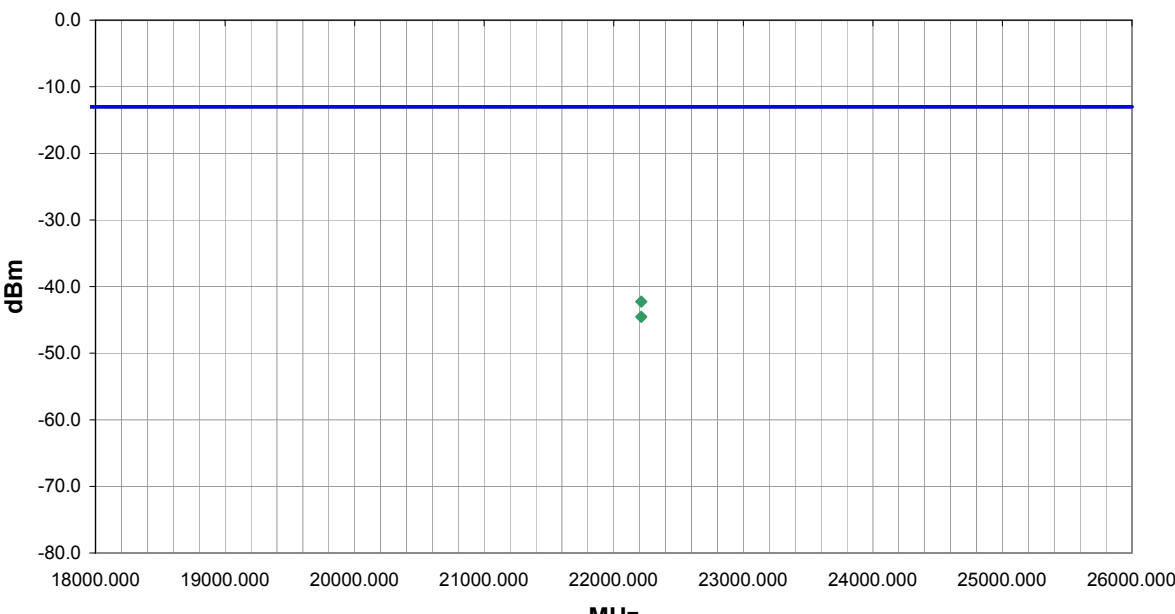
NORTHWEST EMC		Apparent Power Data Sheet				ACQ 2005.1.3 EMI 2005.1.3	
EUT: TrakLITE C4-B				Work Order: 7LAY0037			
Serial Number: 100074				Date: 03/21/05			
Customer: WirelessWERX, Inc.				Temperature: 24			
Attendees: none				Humidity: 31%			
Cust. Ref. No.:				Barometric Pressure: 29.67			
Tested by: Rod Peloquin		Power: 12VDC		Job Site: EV01			
TEST SPECIFICATIONS							
Specification: FCC 22.917(a):2004				Method: TIA/EIA-603:2001			
SAMPLE CALCULATIONS							
Radiated Emissions: Field Strength = Measured Level + Antenna Factor + Cable Factor - Amplifier Gain + Distance Adjustment Factor + External Attenuation							
Conducted Emissions: Adjusted Level = Measured Level + Transducer Factor + Cable Attenuation Factor + External Attenuator							
COMMENTS							
EUT OPERATING MODES							
Transmitting GSM Cellular 132, Bluetooth 74							
DEVIATIONS FROM TEST STANDARD							
No deviations.							
RESULTS						Run #	
Pass						17	
Other				 Tested By:			



Freq (MHz)			Azimuth (degrees)	Height (meters)			Polarity	Detector	EIRP (Watts)	EIRP (dBm)	Spec. Limit (dBm)	Compared to Spec. (dB)
12375.000			181.0	3.7			H-Horn	PK	0.0000	-34.3	-13.0	-21.3
12375.000			35.0	1.2			V-Horn	PK	0.0000	-36.1	-13.0	-23.1
7425.000			360.0	1.3			H-Horn	PK	0.0000	-48.1	-13.0	-35.1
7425.000			307.0	1.2			V-Horn	PK	0.0000	-49.4	-13.0	-36.4
4950.000			91.0	2.7			V-Horn	PK	0.0000	-56.7	-13.0	-43.7
4950.000			254.0	1.2			H-Horn	PK	0.0000	-57.5	-13.0	-44.5
7425.000			360.0	1.3			H-Horn	AV	0.0000	-62.0	-13.0	-49.0
7425.000			307.0	1.2			V-Horn	AV	0.0000	-62.9	-13.0	-49.9
4950.000			91.0	2.7			V-Horn	AV	0.0000	-70.3	-13.0	-57.3
4950.000			254.0	1.2			H-Horn	AV	0.0000	-71.0	-13.0	-58.0

NORTHWEST EMC		Apparent Power Data Sheet		ACQ 2005.1.3 EMI A2.13							
EUT: TrakLITE C4-B			Work Order: 7LAY0037								
Serial Number: 100074			Date: 03/21/05								
Customer: WirelessWERX, Inc.			Temperature: 24								
Attendees: none			Humidity: 31%								
Cust. Ref. No.:			Barometric Pressure: 29.67								
Tested by: Holly Ashkannejhad		Power: 12VDC		Job Site: EV01							
TEST SPECIFICATIONS											
Specification: FCC 22.917(a):2004			Method: TIA/EIA-603:2001								
SAMPLE CALCULATIONS											
Radiated Emissions: Field Strength = Measured Level + Antenna Factor + Cable Factor - Amplifier Gain + Distance Adjustment Factor + External Attenuation											
Conducted Emissions: Adjusted Level = Measured Level + Transducer Factor + Cable Attenuation Factor + External Attenuator											
COMMENTS											
Bluetooth and GSM co-located.											
EUT OPERATING MODES											
Transmitting Bluetooth Channel 74 and GSM (cellular) Channel 132											
DEVIATIONS FROM TEST STANDARD											
No deviations.											
RESULTS					Run #						
Pass					19						
Other					 Tested By:						
											
Freq (MHz)			Azimuth (degrees)	Height (meters)		Polarity	Detector	EIRP (Watts)	EIRP (dBm)	Spec. Limit (dBm)	Compared to Spec. (dB)
22275.000			360.0	1.0		V-High Horr	PK	0.0000	-39.6	-13.0	-26.6
22275.000			-1.0	1.0		H-High Horr	PK	0.0000	-42.2	-13.0	-29.2
19800.000			-1.0	1.0		V-High Horr	PK	0.0000	-46.6	-13.0	-33.6
19800.000			360.0	1.0		H-High Horr	PK	0.0000	-48.2	-13.0	-35.2

NORTHWEST		Apparent Power Data Sheet				ACQ 2005.1.3 EMI A2.13					
EMC											
EUT: TrakLITE C4-B		Work Order: 7LAY0037									
Serial Number: 100074		Date: 03/21/05									
Customer: WirelessWERX, Inc.		Temperature: 24									
Attendees: none		Humidity: 31%									
Cust. Ref. No.:		Barometric Pressure: 29.67									
Tested by: Holly Ashkannejhad		Power: 12VDC		Job Site: EV01							
TEST SPECIFICATIONS											
Specification: FCC 22.917(a):2004		Method: TIA/EIA-603:2001									
SAMPLE CALCULATIONS											
Radiated Emissions: Field Strength = Measured Level + Antenna Factor + Cable Factor - Amplifier Gain + Distance Adjustment Factor + External Attenuation											
Conducted Emissions: Adjusted Level = Measured Level + Transducer Factor + Cable Attenuation Factor + External Attenuator											
COMMENTS											
Bluetooth and GSM co-located.											
EUT OPERATING MODES											
Transmitting Bluetooth Channel 14 and GSM (cellular) Channel 207											
DEVIATIONS FROM TEST STANDARD											
No deviations.											
RESULTS											
Pass						Run # 20					
Other				 Tested By:							
											
Freq (MHz)			Azimuth (degrees)	Height (meters)		Polarity	Detector	EIRP (Watts)	EIRP (dBm)	Spec. Limit (dBm)	Compared to Spec. (dB)
19320.000			360.0	1.0		V-High Horr	PK	0.0000	-44.2	-13.0	-31.2
19320.000			-1.0	1.0		H-High Horr	PK	0.0000	-46.6	-13.0	-33.6

NORTHWEST		ACQ 2005.1.3 EMI A2.13	
EMC		Apparent Power Data Sheet	
EUT: TrakLITE C4-B		Work Order: 7LAY0037	
Serial Number: 100074		Date: 03/21/05	
Customer: WirelessWERX, Inc.		Temperature: 24	
Attendees: none		Humidity: 31%	
Cust. Ref. No.:		Barometric Pressure: 29.67	
Tested by: Holly Ashkannejhad		Power: 12VDC	Job Site: EV01
TEST SPECIFICATIONS			
Specification: FCC 24.238(a):2004		Method: TIA/EIA-603:2001	
SAMPLE CALCULATIONS			
Radiated Emissions: Field Strength = Measured Level + Antenna Factor + Cable Factor - Amplifier Gain + Distance Adjustment Factor + External Attenuation			
Conducted Emissions: Adjusted Level = Measured Level + Transducer Factor + Cable Attenuation Factor + External Attenuator			
COMMENTS			
Bluetooth and GSM co-located.			
EUT OPERATING MODES			
Transmitting Bluetooth Channel 67 and GSM (PCS) Channel 516			
DEVIATIONS FROM TEST STANDARD			
No deviations.			
RESULTS			Run #
Pass			21
Other			
		 Tested By:	
			
Freq (MHz)		Azimuth (degrees)	Height (meters)
22212.000		360.0	1.0
22212.000		-1.0	1.0
	Polarity	Detector	EIRP (Watts)
	V-High Horr	PK	0.0000
	H-High Horr	PK	0.0000
	EIRP (dBm)	Spec. Limit (dBm)	Compared to Spec. (dB)
	-42.3	-13.0	-29.3
	-44.5	-13.0	-31.5

