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PART 15.249, SUBPART C
RSS 210

CERTIFICATION TEST REPORT

The Wireless Transmitter

Model: A6042

PREPARED FOR:

Windrock, Inc.
431 Park Village Dr
Knoxville, TN, 37923

PREPARED ON FEBRUARY 26, 2008

REPORT NUMBER: 2008 0210270-FCC

QUOTE NUMBER: 10270-1

NEX NUMBER: 100276

DOCUMENT HISTORY

REVISION	DATE	COMMENTS
-	February 26, 2008	Prepared By: Alan Laudani
-	February 26, 2008	Initial Release: Michael T. Krumweide

NOTE: Nemko USA, Inc. hereby makes the following statements so as to conform to the Subclause 5.10 Requirements of ISO/IEC 17025 "General Criteria For the Competence Of Testing and Calibration Laboratories":

- The unit described in this report was received at Nemko USA, Inc.'s facilities on January 30, 200.
- Testing was performed on the unit described in this report on January 30, 2008 to February 26, 2008.
- The Test Results reported herein apply only to the Unit actually tested, and to substantially identical Units.
- This report does not imply the endorsement of the Federal Communications Commission (FCC), NVLAP or any other government agency.

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CERTIFICATION

The compatibility testing and this report have been prepared by Nemko USA, Inc., an independent electromagnetic compatibility consulting and test laboratory.

Testing and data collection were accomplished in accordance with the test methods listed in this report.

I certify the data evaluation and equipment configuration herein to be a true and accurate representation of the sample's test characteristics, as of the test date(s), and for the design of the test sample utilized to compile this report.

Michael T. Krumweide
EMC Supervisor

1. ADMINISTRATIVE DATA AND TEST SUMMARY

1.1. Administrative Data

CLIENT:	Windrock, Inc. 431 Park Village Dr Knoxville, TN, 37923 865-539-5944 x11
CONTACT: E-Mail:	Edward Flanagan eflanagan@windrock.com
DATE (S) OF TEST:	January 30, 2008 to February 26, 2008
EQUIPMENT UNDER TEST (EUT):	Wireless Transmitter
Model:	A6042
Highest frequency generated or used:	921.37 MHz
CONDITION UPON RECEIPT	Suitable for Test
TEST SPECIFICATION:	FCC, Part 15.249, Subpart B and RSS-Gen Issue 2, June 2007, RSS-210 A2.9 Issue 7, June 2007

1.2. Test Summary

This section contains the following:

The column headed "Required" indicates whether the associated clauses were invoked for the apparatus under test. The following abbreviations are used:

N No: not applicable / not relevant
Y Yes: Mandatory i.e. the apparatus shall conform to these tests.
N/T Not Tested, mandatory but not assessed. (See section 4.4 Test deleted)

The results contained in this section are representative of the operation of the apparatus as originally submitted.

FCC, CFR 47	*RSS-210*	*Compliance Status*
Section 15.207 Conducted Emissions0.15 MHz - 30.00 MHz	RSS-GEN Section 7, Table 2	NA1
Section 15.209 Radiated Emissions 30 MHz - 9500 MHz	A2.9(a)	Pass
Radiated Emissions within Restricted Bands 15.215 (c)	A2.9(a) & (b)	Pass
Occupied Bandwidth 15.215 (a)	RSS-GEN 4.6.1 Reported	Pass
Radiated Emissions not in Restricted Bands	A2.9(b)	Pass
15.249 (b) Operation in the 902--928 MHZ Band		NA3
15.107 (a) Receiver Spurious Emissions	RSS-GEN Section 6, Table 1	NA2

Notes:
1 EUT does not operate directly or indirectly from the public utility AC power supply
2 Receiver Spurious Emissions for the EUT do not apply as there is no "Receive" or "Standby" mode.
3 EUT does not transmit point-to-point.

2. SYSTEM CONFIGURATION

2.1. Description and Method of Exercising the EUT

The A6042 is a Wireless Transmitter. The A6042 acts as a wire eliminator between a shaft encoder and Windrock's 6310 portable machinery analyzer. It transmits shaft position and rpm by FSK modulating an RF carrier at 921.37 MHz. The A6042 uses a 12 V Li-Ion battery that is charged with an external charger. This is an external charger and it will not charge in the transmitter unit. There is no connection to AC power. The design output power is 0 dbm at 921 MHz. The modulation format is FSK. It is modulated by a shaft encoder (for test only) continuously, so it will be modulated by a 360 pulse per revolution rate.

The EUT's performance during test was evaluated against the performance criterion specified by applicable test standards. Performance results are detailed in the test results section of this report.

2.2. System Components and Power Cables

DEVICE	MANUFACTURER MODEL # SERIAL #	POWER CABLE
EUT - Wireless Transmitter	Windrock, Inc. Model: A6042 Serial #:	None
Support – Test Encoder	Windrock	Powered by Wireless Transmitter

2.3. Device Interconnection and I/O Cables

Connection	I/O Cable
Encoder to Wireless Transmitter	Multi wire 20 awg cable

2.4. Design Modifications for Compliance

Device: Wireless Transmitter
Model: A6042

The following design modifications were made to the EUT during testing.

None. No design modifications were made to the EUT during testing.

2.5. Deviations From Laboratory Test Procedures

No deviations from Laboratory Test Procedure

3. DESCRIPTION OF TEST SITE AND EQUIPMENT

3.1. Description of Test Site

The test site is located at 11696 Sorrento Valley Road, Suite F, San Diego, CA 92121. The site is physically located 18 miles Northwest of downtown San Diego. The general area is a valley 1.5 miles east of the Pacific Ocean. This particular part of the valley tends to minimize ambient levels, i.e. radio and TV broadcast stations and land mobile communications. The three and ten-meter Open Area Test Site (OATS) is located behind the office/lab building. It conforms to the normalized site attenuation limits and construction specifications as set in the EN 55022: 2006, CISPR 16: 2003and ANSI C63.4: 2003 documents. The OATS normalized site attenuation characteristics are verified for compliance every year, and registered with the Federal Communications Commission under Registration Number 90579 and Industry Canada under 2040B-1 and 2040B-2.

4. DESCRIPTION OF TESTING METHODS

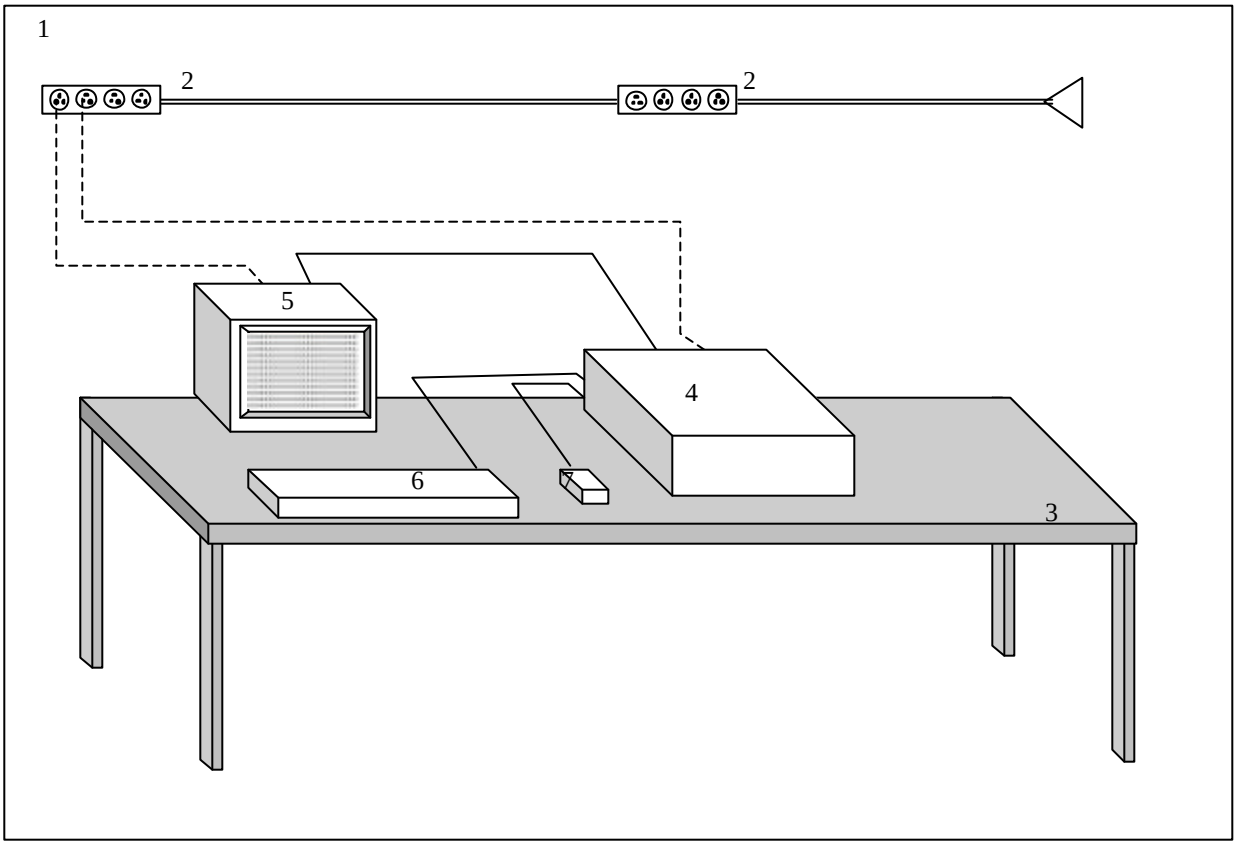
4.1. Introduction

As required in 47 CFR, Parts 2 and 15, the methods employed to test the radiated and conducted emissions (as applicable) of the EUT are those contained within the American National Standards Institute (ANSI) document ANSI C63.4: 2003, titled "Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz." All applicable FCC Rule Sections that provide further guidance for performance of such testing are also observed.

Digital devices sold in Canada are required to comply with the Interference Causing Equipment Standard for Digital Apparatus, ICES-003, Issue 4. These test methods and limits are specified in the Canadian Standards Association's Standard CAN/CSA-CISPR 22-02 and are "essentially equivalent" with the CISPR 22 (EN55022) rules for unintentional radiators per EMCAB-3, Issue 4 (December 2005). No further testing is required for compliance to ICES-003.

Note: Until further notice, Canada will continue its policy of accepting compliance of devices that meet FCC Part 15 compliance. FCC approval can be met by meeting the FCC, Part 15 limits or the CISPR 22 limits referenced in Part 15.

Figure 1. General EUT Test Setup Diagram



NOT TO SCALE, Sketch Typical, not representational of actual EUT

CONFIGURATION LEGEND

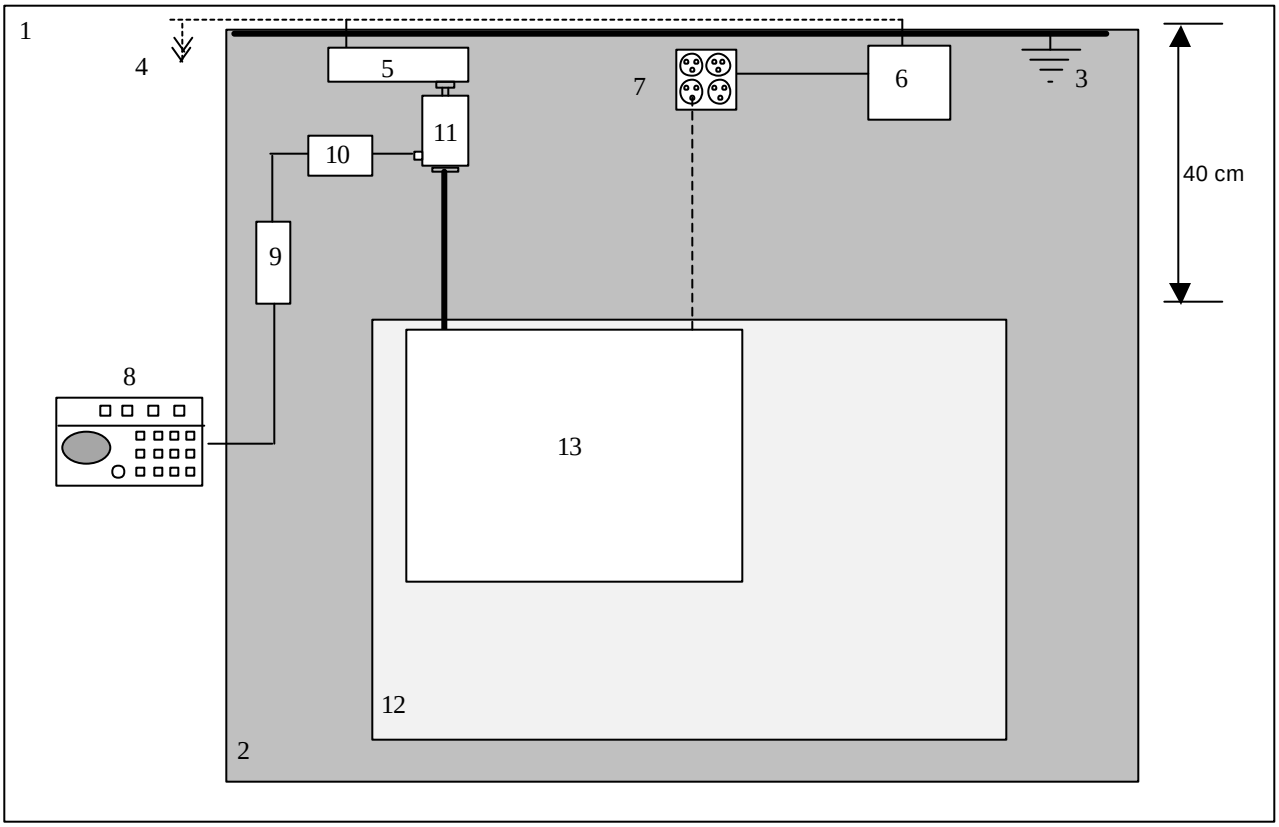
1. Test Laboratory
2. AC Power for Peripheral Devices (120V, 60 cycles, single phase)
3. Non-Conducting tables 80 cm above ground plane
4. EUT: Wireless Transmitter

4.2. Configuration and Methods of Measurements for Conducted Emissions

Section 7 of ANSI C63.4 determines the general configuration of the EUT and associated equipment, as well as the test platform for conducted emissions testing. Tabletop devices are placed on a non-conducting surface 80 centimeters above the ground plane floor and 40 centimeters from the ground plane wall. The EUT and associated system are configured to operate continuously, representing a "normally operating" mode. The EUT is powered via a Line Impedance Stabilization Network (LISN). The emissions are recorded using the required bandwidth of 9 kHz in the quasi-peak mode. The emission levels are then compared to the applicable FCC limits to determine compliance.

For Conducted Emissions Test Configuration please refer to Figure 2 on the following page.

Figure 2. Conducted Emissions Test Setup Diagram



NOT TO SCALE, Sketch Typical, not representational of actual EUT

CONFIGURATION LEGEND

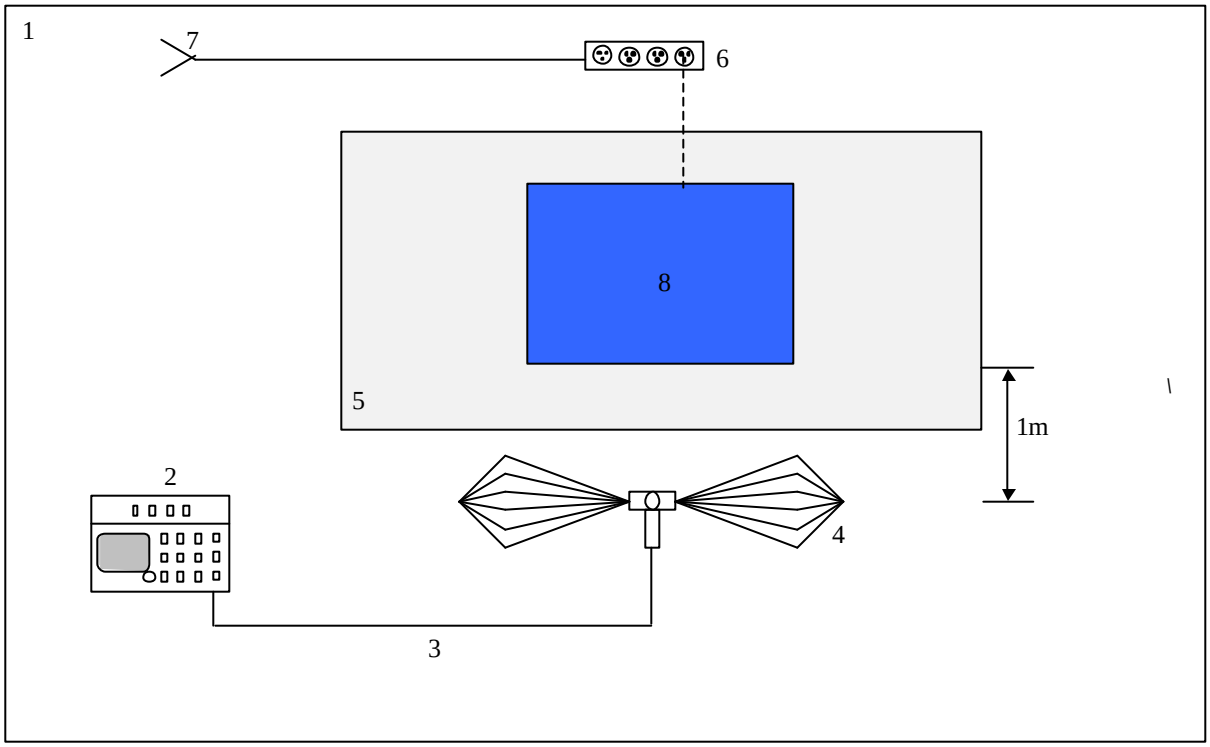
1. Test Laboratory (6 X 6 meters)
2. Ground Plane (15 square meters)
3. Vertical Conducting Wall (Grounded through Ground Plane via 10' ground rod)
4. AC Power for Devices
5. Power Line Filter, Lindgren, 120 dB, 30 amp
6. Line Impedance Stabilization Network (LISN) for peripheral devices
7. Power Distribution Box for peripheral devices
8. Spectrum Analyzer with Quasi-Peak Adapter
9. High Pass Filter
10. Transient Limiter
11. LISN for EUT
12. Non-Conducting table 80 cm above ground plane
13. EUT: Wireless Transmitter and Associated System

4.3. Configuration and Methods of Measurements for Frequency Identification

When performing all testing of equipment, the actual emissions of the EUT are segregated from ambient signals present within the laboratory or the open-field test range. Preliminary testing is performed to ensure that ambient signals are sufficiently low to allow for proper observation of the emissions from the EUT. Incoming power lines are filtered using a 120 dB, 30-ampere; 115/208-volt filter to assist in reducing ambient signals for tests of levels of conducted emissions. Ambients within the laboratory are compared to those noted at the nearby open-field site to discriminate between signals produced from the EUT and ambient signals. In the event that a significant emission is produced by the EUT at a frequency which is also demonstrating significant ambient signals, the spectrum analyzer is placed in the peak mode, the bandwidth is narrowed, the EUT's signal is centered on the analyzer, the scan width is expanded to 50 kHz while monitoring the audio to ensure that only the EUT signal is present, the analyzer is switched to quasi-peak mode, and the level of the EUT signal is recorded.

For Frequency ID Test Configuration please refer to Figure 3 on the following page.

Figure 3. Frequency ID of Radiated Emissions Test Setup Diagram



NOT TO SCALE, Sketch Typical, not representational of actual EUT

CONFIGURATION LEGEND

1. Test Laboratory
2. Spectrum Analyzer with Quasi-Peak Adapter
3. Coax interconnect from Antenna to Spectrum Analyzer
4. Receive Antenna (basic relative position)
5. Non-Conducting table 80 cm above ground plane
6. Power strip for EUT and peripherals
7. AC power for devices, if necessary
8. EUT: Wireless Transmitter and Associated System

4.4. Configuration and Methods of Measurements for Radiated Emissions

Section 8 of ANSI C63.4 determines the general configuration and procedures for measuring the radiated emissions of equipment under test. Initially, the primary emission frequencies are identified inside the test lab by positioning a broadband receive antenna one meter from the EUT to locate frequencies of significant radiation. Next, the EUT and associated system are placed on a turntable on a ten meter open area test site (registered with the FCC in accord with its Rules and ANSI C63.4) and the receive antenna is located at a distance of three or ten meters from the EUT, as determined by the FCC Part 15 rules.

The EUT and associated system are configured to operate continuously, representing a "normally operating" mode. All significant radiated emissions are recorded when maximum radiation on each frequency is observed, in accordance with part 8 of ANSI C63.4 and Section 15.33 of the FCC Rules. To ensure that the maximum emission at each discrete frequency of interest is observed, the receive antenna is varied in height from one to four meters and rotated to horizontal and vertical polarities, and the turntable is also rotated to determine the worst emitting configuration. The numerical results of the test are included herein to demonstrate compliance.

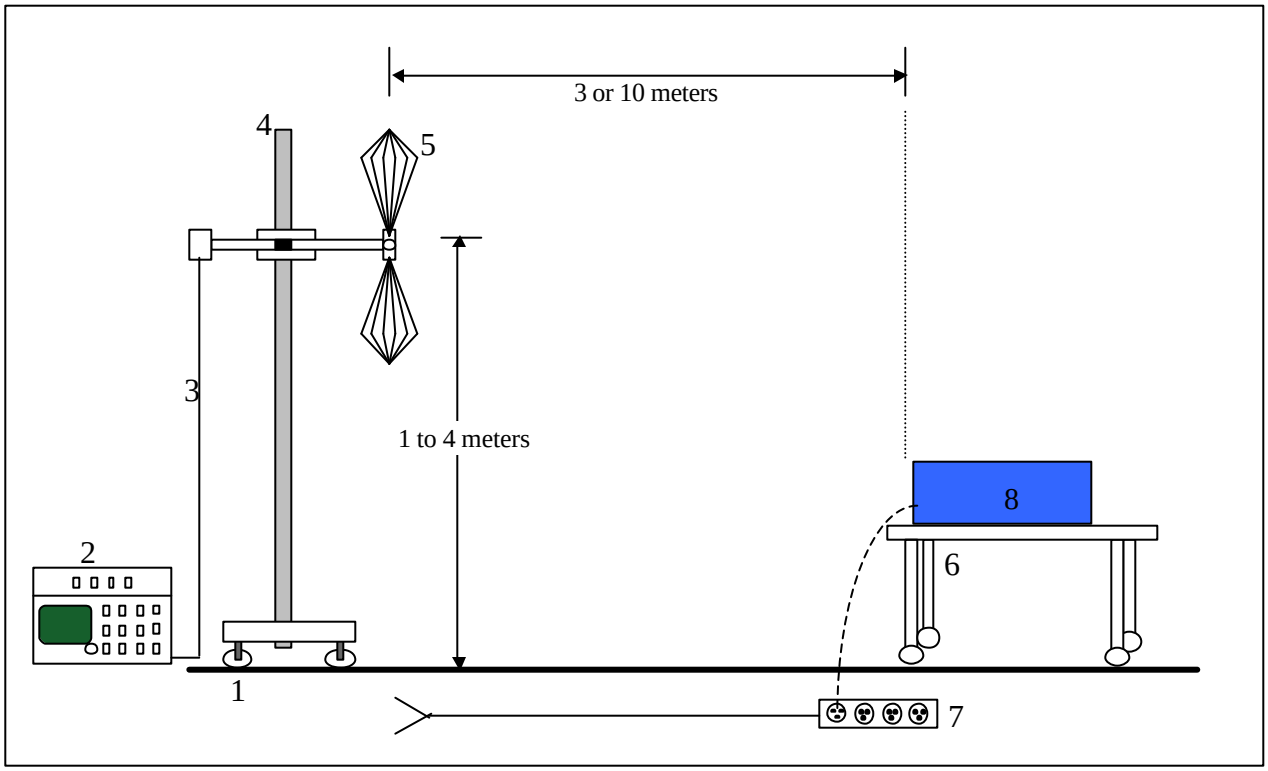
The numerical results that are applied to the emissions limits are arrived at by the following method:
Example: A=RR+CL+AF
A = Amplitude dBuV/m
RR = Receiver Reading dBuV
CL = cable loss dB
AF = antenna factor dB/m

Example Frequency = 110MHz
18.5 dBµV (spectrum analyzer reading)
+3.0 dB (cable loss @ frequency)
21.5 dBuV
+15.4 dB/m (antenna factor @ frequency)
36.9 dBuV/m Final adjusted value

The final adjusted value is then compared to the appropriate emission limit to determine compliance.

For Radiated Emissions Test Configuration please refer to Figure 4 on the following page.

Figure 4. Radiated Emissions Test Setup Diagram



NOT TO SCALE, Sketch Typical, not representational of actual EUT

CONFIGURATION LEGEND

1. Ground plane (11 X 17 meters)
2. Spectrum Analyzer with Quasi-Peak Adapter
3. Coax interconnect from Receive Antenna to Spectrum Analyzer
4. Antenna Mast with motorized mounting assembly
5. Receive Antenna (basic relative position)
6. Non-Conducting table 80 cm above ground plane
7. AC power for devices
8. EUT: Wireless Transmitter and Associated System

5. TEST RESULTS

5.1. Conducted Emissions Test Data

Client	Windrock, Inc.	Temperature		°F
Quote #	10270-1	Relative Humidity		%
EUT Name	Wireless Transmitter	Barometric Pressure		Hg
EUT Model	A6042	Test Location	Enclosure 2	
Governing Doc	CFR 47, Part 15B	Test Engineer	Alan Laudani	
Basic Standard	Sec. 15.107 Class "B"	Date of test		
Test Parameters	Peak RBW: 100kHz VBW: 100kHz Quasi-Peak: RBW 9kHz, VBW 30 kHz Average: RBW 100 kHz, VBW 1 Hz Quasi-Peak Limit Blue Line, Average Limit Green Line			

Battery Operated, no test required.

5.2. Radiated Emissions Test Data

15.249 Operation within the bands 902–928 MHz, 2400–2483.5 MHz, 5725–5875 MHZ, and 24.0–24.25 GHz.

(a) Except as provided in paragraph (b) of this section, the field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

Fundamental frequency	Field strength of fundamental (millivolts/meter)	Field strength of harmonics (microvolts/meter)
902–928 MHz	50	500
2400–2483.5 MHz	50	500
5725–5875 MHz	50	500
24.0–24.25 GHz	250	2500

(c) Field strength limits are specified at a distance of 3 meters.
(d) Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in §15.209, whichever is the lesser attenuation.

RSS210: A2.9 902-928, 2400-2483.5 and 5725-5875 MHz
This section provides standards for low-power devices that can be used for any application provided the following conditions are met:

(a) The field strengths measured at 3 metres shall not exceed the following:

Fundamental Frequencies MHz)	Field Strength (millivolts/m)	
	Fundamental	Harmonics
902-928	50 (Note 1)	0.5
2400-2483. 5	50 (Note 1)	0.5
5725-5875	50 (Note 1)	0.5

Note 1: Equivalent to 0.75 mW e.i.r.p.

(b) Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to Table 2 limits, whichever is the less stringent.

Section 4.4 of RSS-Gen (Pulsed Operation) does not apply to CISPR measurement for the band 902-928 MHz.

Measurement Notes:

EUT tested with a newly charged battery.
Emissions were searched from 30 MHz to 9500 MHz and emissions presented were the only ones found within 20 dB of the Limits above.
The EUT's output power was investigated on the three ordinate axes with the following results with the antenna perpendicular to the ground plane indicative of the greatest output power.

93.9 dBµV/m calculates to 0.00073 Watts

or –1.36 dBm in line with the Manufacturer's nominal rating of 0 dBm

Radiated Emissions Data

Job # :	10270-1	Date :	2-26-08	Page 1 of 1	
NEX #:	100276	Time :	1:pm		
		Staff :	AAL		
Client Name :	Windrock, Inc			EUT Voltage :	
EUT Name :	Wireless Transmitter			EUT Frequency :	
EUT Model # :	A6042			Phase:	1
EUT Serial # :	NA			NOATS	
EUT Config. :	Transmitting			SOATS	X
				Distance < 1000 MHz:	3 m
				Distance > 1000 MHz:	3 m
Specification :	CFR47 Part 15C 15.249, 15.209(a)				
Loop Ant. #:	NA				
Bicon Ant.#:	114	Temp. (°C) :	16		
Log Ant.#:	755	Humidity (%) :	33		
DRG Ant. #	829	Spec An.#:	674		
Cable LF#:	SOATS	Spec An. Display #:	675		
Cable HF#:	NA	QP #:	676		
Preamp LF#:	902	PreSelect#:	NA		
Preamp HF#	317	Spec An. Display #:	835		

Quasi-Peak	RBW:	120 kHz
	Video Bandwidth	300 kHz
Peak	RBW:	100 kHz
	Video Bandwidth	300 kHz

Measurements below 1 GHz are Quasi-Peak values, unless otherwise stated.
Measurements above 1 GHz are Average values, unless otherwise stated.

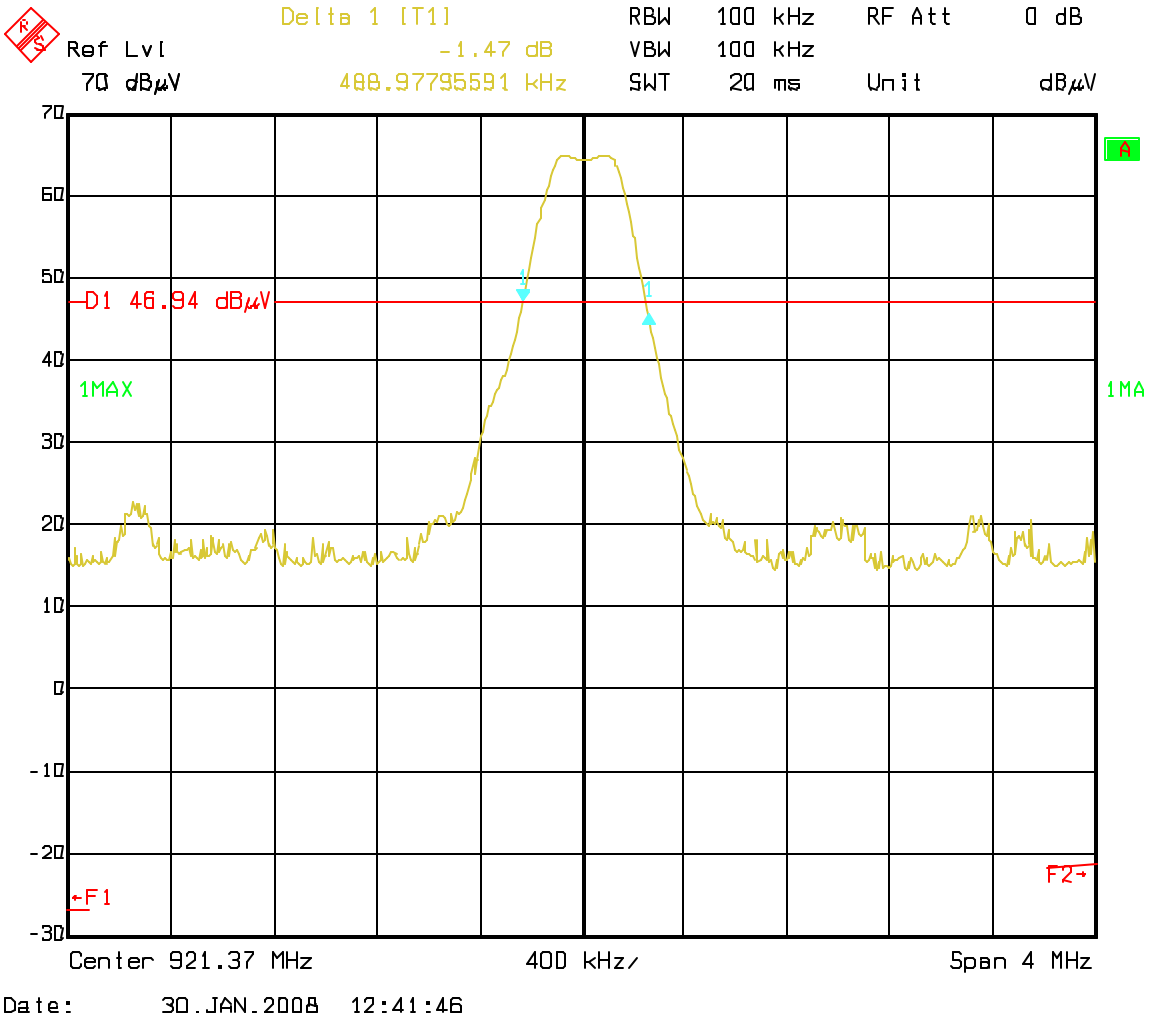
Meas. Freq. (MHz)	Meter Reading **Vertical**	Meter Reading **Horizontal**	Det.	EUT Side F/L/R/B	Ant. Height m	Max. Reading (dBµV)	Corrected Reading (dBµV/m)	Spec. limit (dBµV/m)	CR/SL Diff. (dB)	Pass Fail	Comment
902.0	22.0	23.2	Q	F	1.0	23.2	19.1	46.0	-26.9	Pass	noise floor
921.37	66.8	57.8	Q	F	1.5	66.8	93.9	94.0	-0.1	Pass	no preamp
928.0	29.1	25.1	Q	F	1.0	29.1	25.2	46.0	-20.8	Pass	ambient

5.3. 20 dB Bandwidth

Clause 15.215(c) Occupied Bandwidth

Intentional radiators operating under the alternative provisions to the general emission limits, as contained in Sec. Sec. 15.217 through 15.257 and in Subpart E of this part, must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated. The requirement to contain the designated bandwidth of the emission within the specified frequency band includes the effects from frequency sweeping, frequency hopping and other modulation techniques that may be employed as well as the frequency stability of the transmitter over expected variations in temperature and supply voltage. If a frequency stability is not specified in the regulations, it i s recommended that the fundamental emission be kept within at least the central 80% of the permitted band in order to minimize the possibility of out-of-band operation.

Results: 489 kHz



5.4. **Test Equipment**

Nemko ID	Device	Manufacturer	Model	Serial Number	Cal Date	Cal Due Date
114	Antenna, Bicon	EMCO	3104	2997	12/20/2007	12/20/08
317	Preamplifier	HP	8449A	2749A00167	2/9/2007	2/9/08
674	Spectrum Analyzer	HP	8568B	2007A00910	3/13/2007	03/13/08
675	Spectrum Analyzer Display	HP	85662A	2005A01282	3/13/2007	03/13/08
676	Quasi-Peak Adapter	HP	85650A	2430A00576	3/13/2007	03/13/08
755	Antenna, LPA	EMCO	3147	1246	10/10/2007	10/10/09
835	Spectrum Analyzer	Rohde & Schwarz	RHDFSEK	829058/005	6/20/2007	6/20/08
877	Antenna, DRG	AH Systems	SAS-571	688	7/10/2007	7/10/08
902	Preamplifier	Sonoma	310 N	185803	7/10/2007	7/10/08