FCC PART 15, SUBPART B and C
TEST REPORT

for

902-928 MHz FHSS TRANCEIVER MODULE

MODEL: VikingX

Prepared for

VALHALLA WIRELESS
507 SOUTH BUCHANAN PLACE
KENNEWICK, WASHINGTON 99336

Prepared by: Scott McCutchan Date: 2010.04.16 16:39:15 -07'00'

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DATE: APRIL 15, 2010

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GENERAL REPORT SUMMARY

This electromagnetic emission test report is generated by Compatible Electronics Inc., which is an independent testing and consulting firm. The test report is based on testing performed by Compatible Electronics personnel according to the measurement procedures described in the test specifications given below and in the "Test Procedures" section of this report.

The measurement data and conclusions appearing herein relate only to the sample tested and this report may not be reproduced without the written permission of Compatible Electronics, unless done so in full.

This report must not be used to claim product endorsement by NVLAP or any other agency of the U.S. Government.

Device Tested:	902-928 MHz FHSS Transceiver Module Model: VikingX S/N: N/A
Product Description:	See Operational Description.
Modifications:	The EUT was not modified during the testing.
Manufacturer:	Valhalla Wireless 507 S. Buchanan Place Kennewick, Washington 99336
Test Dates:	February 1, 15, 17, 23, March 2 and April 2, 9, 12, 13, 15, 2010
Test Specifications:	EMI requirements CFR Title 47, Part 15, Subpart B, sections 15.31, 15.107, and 15.109; and Subpart C, sections 15.205, 15.207, 15.209, and 15.247
Test Procedure:	ANSI C63.4: 2003 and ANSI C63.10: 2009
Test Deviations:	The test procedure was not deviated from during the testing.

SUMMARY OF TEST RESULTS

TEST	DESCRIPTION	RESULTS
1	Conducted RF Emissions, 150 kHz – 30 MHz	Complies with the **Class B** limits of CFR Title 47, Part 15 Subpart B; and the limits of CFR Title 47, Part 15, Subpart C, section 15.207
2	Spurious Radiated RF Emissions, 30 MHz – 1 GHz	Complies with the **Class B** limits of CFR Title 47, Part 15 Subpart B; and the limits of CFR Title 47, Part 15, Subpart C, section 15.209.
3	Spurious Radiated RF Emissions, 10 kHz – 30 MHz and 1 GHz – 10 GHz	Complies with the **Class B** limits of CFR Title 47, Part 15, Subpart B; and CFR Title 47, Part 15, Subpart C, section 15.247(d)
4	Fundamental and Emissions produced by the intentional radiator in non-restricted bands, 10 kHz – 10 GHz	Complies with the relevant requirements of CFR Title 47, Part 15, Subpart C, section 15.247(d) *at its nominal AC operating voltage and 85% to 115% of nominal per section 15.31(e).*
5	Emissions produced by the intentional radiator in restricted bands, 10 kHz – 10 GHz	Complies with the relevant requirements of CFR Title 47, Part 15, Subpart C, section 15.205, 15.209, and section 15.247(d)
6	-20 dB Bandwidth	Complies with the relevant requirements of FCC Title 47, Part 15, Subpart C, section 15.247(a)(1) and (a)(1)(i)
7	Peak Power Output	Complies with the relevant requirements of FCC Title 47, Part 15, Subpart C, section 15.247(b)(2)
8	RF Conducted Antenna Test	Complies with the relevant requirements of FCC Title 47, Part 15, Subpart C, section 15.247(d)
9	Carrier Frequency Separation	Complies with the relevant requirements of CFR Title 47, Part 15, Subpart C, section 15.247(a)(1) and 15.247(a)(1)(i)
10	Average Time of Occupancy	Complies with the relevant requirements of CFR Title 47, Part 15, Subpart C, section 15.247 (a)(1)(i)
11	Maximum Input Level Test for Repeaters	Complies with the requirements contained in KDB updates 113857 and 602159.

1. PURPOSE

This document is a qualification test report based on the Electromagnetic Interference (EMI) tests performed on the 902-928 MHz FHSS Transceiver Module, Model: VikingX. The EMI measurements were performed according to the measurement procedure described in ANSI C63.4: 2003. The tests were performed in order to determine whether the electromagnetic emissions from the equipment under test, referred to as EUT hereafter, are within the Class B specification limits defined by CFR Title 47, Part 15, Subpart B; and Subpart C, sections 15.31(e), 15.205, 15.207, 15.209, and 15.247.

Note: For the unintentional radiator portion of the test, the EUT was within the **Class B** specification limits defined by CFR Title 47, Part 15, Subpart B.

2. ADMINISTRATIVE DATA

2.1 Location of Testing

The EMI tests described herein were performed at the test facility of Compatible Electronics, 19121 El Toro Road, Silverado, CA 92676.

2.2 Traceability Statement

The calibration certificates of all test equipment used during the test are on file at the location of the test. The calibration is traceable to the National Institute of Standards and Technology (NIST).

2.3 Cognizant Personnel

Valhalla Wireless

Todd Elliott President

Compatible Electronics Inc.

Scott McCutchan Lab Manager
Jeff Klinger Director of Engineering

2.4 Date Test Sample was Received

The test sample was received on November 24, 2010.

2.5 Disposition of the Test Sample

The test sample has not been returned as of the date of this report.

2.6 Abbreviations and Acronyms

The following abbreviations and acronyms may be used in this document.

RF	Radio Frequency
EMI	Electromagnetic Interference
EUT	Equipment Under Test
P/N	Part Number
S/N	Serial Number
HP	Hewlett Packard
ITE	Information Technology Equipment
CML	Corrected Meter Limit
LISN	Line Impedance Stabilization Network
N/A	Not Applicable

3. APPLICABLE DOCUMENTS

The following documents are referenced or used in the preparation of this EMI Test Report.

SPEC	TITLE
FCC Title 47, Part 15 Subpart B	FCC Rules - Radio frequency devices (including digital devices) – Unintentional Radiators
FCC Title 47, Part 15 Subpart C	FCC Rules - Radio frequency devices (including digital devices) – Intentional Radiators
ANSI C63.4 2003	Methods of measurement of radio-noise emissions from low-voltage electrical and electronic equipment in the range of 9 kHz to 40 GHz
ANSI C63.10 2009	American National Standard for Unlicensed Wireless Devices
DA 00-705 March 30, 2000	Filing and Measurement Guidelines for Frequency Hopping Spread Spectrum Systems

4. DESCRIPTION OF TEST CONFIGURATION

4.1 Description of Test Configuration - EMI

EUT CONFIGURATION: The 902-928 MHz FHSS Transceiver Module, Model: VikingX (EUT) was connected to notebook computer, power supply and a battery via its ethernet, solar power/power supply and battery ports, respectively. A 1 GB microSD card was inserted into the microSD slot. A temperature sensor was connected to sensor port JP105. Sensor ports JP100 and JP101 were each connected to a 5.6 kΩ resistor via cabling. Sensor inputs JP102, JP103 and JP104 were each connected to two 5.6 kΩ resistors via cabling. Unterminated cabling was connected to sensor inputs JP106 and JP108 to simulate a "normally open" connection. Sensor input JP107 was not connected, as this input will not be used. The USB and RS485 I/O ports were not connected as they will not be used. The EUT was powered by 122 VAC throughout the testing, except where indicated otherwise.The notebook computer was also connected to a mouse, modem and printer via its USB, serial and parallel ports, respectively.

The notebook computer was running a proprietary software program which controls the following radio operating parameters of the EUT for testing purposes: Tx or Rx mode, channel frequency, modulation on/off and operating mode (frequency hopping or single-channel). For transmit-mode tests where frequency hopping is to be halted and single-channel operation employed, the tests were performed with the EUT transmitting on its lowest, middle and highest channels available. During the receive-mode tests, the EUT was receiving on its lowest, middle and highest channels available. The EUT is affixed with a permanent reverse-polarity SMA antenna connector.

EUT MODES OF OPERATION AND ALTERNATE CONFIGURATIONS: For spurious emissions testing, preliminary testing was performed to determine the affects that different modes of operation had on the emissions emanating from the device. It was determined that there was little or no difference between the transmit and receive mode for frequencies other than the fundamental and its harmonics. Also, since this device can be powered by either a battery or a power supply connected to their respective power inputs, investigations were made to find the worst-case emissions mode, and it was determined that the worst-case mode was with the device powered by AC, with a battery also connected.

The Viking also works as an RF repeater. The RF circuitry is exactly the same as that used for normal transmit mode. The RF parameters, such as power output, dwell time, number of channels, transmit and receive bandwidth remain identical to transmit mode. The only difference being, that in repeater-mode, it only transmits on every other hopping channel, but alternates between even and odd channels every 50 hops to maintain equal usage overall of all channels. Test data in this mode of operation is included in Appendix E for dwell time, time of occupancy, as well as number of hopping frequencies. Testing was also performed to ensure that the RF output of the repeater unit does not increase regardless of the amplitude of its input signal. The EUT functions as a repeater only when it is linked with a master unit, so a second VikingX was configured as a master in order to perform these tests. Due to the fact that the RF parameters and signal circuit path are identical to transmit mode, further testing of the repeater mode would have been redundant; and was therefore deemed unnecessary. See operational description for more details.

It was determined that the emissions were at their highest level when the EUT was operating in the above configuration for spurious emissions testing (Tx mode, powered by AC, with battery connected). The final emissions data was taken in this mode of operation and cable placements were maximized. Photographs of the test setup are in Appendix D of this report.

4.1.1 Cable Construction and Termination

Cable 1 This is a 5 foot unshielded CAT 6 UTP ethernet cable connecting the EUT to the notebook computer. The cable has an RJ-45 connector at each end.

Cable 2 This is a 6 foot, unshielded, two-wire power cable connecting the EUT to an AC adapter. It is hard-wired at both ends. The cable was bundled to a length of 1 meter

Cables 3-4 These are 11-inch, unshielded, 12-guage wires connecting the EUT to the battery post terminals. The wires are soldered to the EUT and to the battery, and there is a 2-conductor power connector near the middle of the wires for battery disconnection.

Cable 5 This is a 6 foot, foil shielded round cable connecting the notebook to the mouse. It has a USB connector at the notebook end and is hard wired into the mouse. The shield of the cable is grounded to the chassis via the connector.

Cable 6 This is a 5 meter, two-untwisted-conductor cable connecting sensor input JP105 to a temperature sensor. It was hard-wired at each end. The cable was bundled to a length of 1 meter.

Cables 7-8 These are 20 centimeter, two-untwisted-conductor cables connecting sensor inputs JP100 and JP101 to 5.6 kΩ resistors. Both cables were hard-wired at each end.

Cables 9-11 These are 20 centimeter, three-untwisted-conductor cables connecting sensor inputs JP102, JP103 and JP104 to resistive networks, each consisting of a 5.6 kΩ resistor between pins 1 and 2, and another 5.6 kΩ resistor between pins 2 and 3. They are hard-wired at each end.

Cables 12-13 These are unterminated, 20 centimeter, two-untwisted-conductor cables connected to sensor inputs JP106 and JP108. Both cables were hard-wired to the PCB.

Cable 14 This is a 5 foot braid and foil shielded cable connecting the notebook computer to the modem. It has a D-9 pin metallic connector at the notebook end, and a D-25 pin metallic connector at the modem end. The shield of the cable was grounded to the chassis via the connectors. The cable was bundled to a length of 1 meter.

Cable 15 This is a 5 foot braid and foil shielded cable connecting the notebook computer to the printer. It has a D-25 pin metallic connector at the notebook end, and a Centronics type connector at the printer end. The shield of the cable was grounded to the chassis via the connectors.

5. LISTS OF EUT, ACCESSORIES AND TEST EQUIPMENT

5.1 EUT and Accessory List

EQUIPMENT	MANUFACTURER	MODEL NUMBER	SERIAL NUMBER	FCC ID
902-928 MHz FHSS TRANCEIVER MODULE (EUT)	VALHALLA WIRELESS	VikingX	0003054	W4OVIKINGX
902-928 MHz FHSS TRANCEIVER MODULE *(accessory master unit for repeater-mode testing)*	VALHALLA WIRELESS	VikingX	0003088	W4OVIKINGX
RPSMA 5 dBi WHIP ANTENNA	VALHALLA WIRELESS	P/N: VW-410-0002-00	N/A	N/A
TEMPERATURE SENSOR ASSEMBLY	VALHALLA WIRELESS	P/N: VW-410-0001-00	N/A	N/A
1 GB MicroSD CARD	SanDisk	N/A	N/A	N/A
POWER ADAPTER (EUT)	AsianPowerDevices, Inc.	WA-24C12V	729243023	N/A
NOTEBOOK COMPUTER	IBM	Type 2647	N/A	N/A
AC ADAPTER FOR NOTEBOOK	IBM	P/N: 08K8213	N/A	N/A
MOUSE	MICROSOFT	P/N: XOB-71118	N/A	N/A
PRINTER	HP	C6430A	MX1BF6D03B	N/A
MODEM	HAYES	231AA	A04531083061	N/A

5.2 EMI Test Equipment

EQUIPMENT TYPE	MANU-FACTURER	MODEL NUMBER	SERIAL NUMBER	CALIBRATION DATE	CALIBRATION DUE DATE
GENERAL TEST EQUIPMENT USED FOR ALL RF EMISSIONS TESTS					
Computer	Hewlett Packard	4530	US91925900	N.C.R.	N/A
Spectrum Analyzer – Main Section	Hewlett Packard	8566B	2747A04875	5-8-2009	5-8-2010
Spectrum Analyzer – Display Section	Hewlett Packard	85662A	2848A18214	5-8-2009	5-8-2010
Quasi-Peak Adapter	Hewlett Packard	85650A	2811A01081	5-8-2009	5-8-2010
Monitor	Envision	EFT720	I9CG48A767451	N.C.R.	N/A
RF RADIATED EMISSIONS TEST EQUIPMENT					
Biconical Antenna	Com Power	AB-900	2819	10-16-2009	10-16-2010
Log Periodic Antenna	Com Power	AL-100	1116	10-16-2009	10-16-2010
Preamplifier	Com-Power	PA-103A	161206	12-7-2009	12-7-2010
Loop Antenna	Com-Power	AL-130	17085	8-12-2008	8-12-2010
Horn Antenna	Com-Power	AH-118	1319	8-8-2008	8-8-2010
Microwave Preamplifier	Com Power	PA-122	181923	2-1-2010	2-1-2011
High-Pass Filter	Microwave Circuits	P/N: H1G63G01	061703-01R	N/A	N/A
Notch Filter	Microwave Circuits	P/N: N03915M1	061703-01	N/A.	N/A
Antenna Mast	Com Power	AM-100	N/A	N/A	N/A
RF CONDUCTED EMISSIONS TEST EQUIPMENT					
Emissions Program	Compatible Electronics	SR21	N/A	N/A	N/A
LISN	Com Power	LI-215	12081	7-9-2009	7-9-2010
LISN	Com Power	LI-215	12072	7-9-2009	7-9-2010
Attenuator (10 dB)	Weinschell	2	BX9285	1-21-2010	1-21-2011

6. TEST SITE DESCRIPTION

6.1 Test Facility Description

Please refer to section 2.1 and 7.1 of this report for EMI test location.

6.2 EUT Mounting, Bonding and Grounding

The EUT was mounted on a 1.0 by 1.5 meter non-conductive table 0.8 meters above the ground plane.

The EUT was not grounded

7. CHARACTERISTICS OF THE TRANSMITTER

7.1 Transmitter Power

Transmit power is herein defined as the power delivered to a 50 ohm load at the RF output of the EUT.

Power	Channel
27.0 dBm	902.765 MHz
28.1 dBm	914.412 MHz
28.0 dBm	926.536 MHz

7.2 Channel Number and Frequencies

There are a total of 50 channels. The low channel is at 902.765 MHz and the high channel is at 926.536 MHz. There is 480 kHz separation between channels.

Channel 1: 902.765 MHz
Channel 2: 903.245 MHz
(etc.)

7.3 Antenna Gain

The antenna has a gain of 5 dBi.

8. TEST PROCEDURES

The following sections describe the test methods and the specifications for the tests. Test results are also included in this section. Data sheets and/or plots for all tests are located in Appendix E.

8.1 RF Emissions

8.1.1 Conducted Emissions Test

The spectrum analyzer was used as a measuring meter. The data was collected with the spectrum analyzer in the peak detect mode with the "Max Hold" feature activated. The quasi-peak was used only where indicated in the data sheets. A transient limiter was used for the protection of the spectrum analyzer input stage, and the offset was adjusted accordingly to read the actual data measured. The LISN output was measured using the spectrum analyzer. The output of the second LISN was terminated by a 50 ohm termination. The effective measurement bandwidth used for this test was 9 kHz.

Please see section 6.2 of this report for mounting, bonding and grounding of the EUT. The EUT was powered through the LISN, which was bonded to the ground plane. The LISN power was filtered and the filter was bonded to the ground plane. The EUT was set up with the minimum distances from any conductive surfaces as specified in ANSI C63.4: 2003. The excess power cord was wrapped in a figure eight pattern to form a bundle not exceeding 0.4 meters in length.

The conducted emissions from the EUT were maximized for operating mode as well as cable placement. The final data was collected under program control by the Compatible Electronics conducted emissions software in several overlapping sweeps by running the spectrum analyzer at a minimum scan rate of 10 seconds per octave.

Test Results:

Complies with the **Class B** limits of CFR Title 47, Part 15 Subpart B; and the limits of CFR Title 47, Part 15, Subpart C, section 15.207.

8.1.2 Radiated Emissions (Spurious and Harmonics) Test

The spectrum analyzer was used as a measuring meter along with the quasi-peak adapter. Amplifiers were used to increase the sensitivity of the instrument. The Com Power Preamplifier Model: PA-102 was used for frequencies from 30 MHz to 1 GHz and the Com Power Microwave Preamplifier Model: PA-122 was used for frequencies above 1 GHz. The spectrum analyzer was used in the peak detect mode with the "Max Hold" feature activated. In this mode, the spectrum analyzer records the highest measured reading over all the sweeps.

The quasi-peak adapter was used only for those readings which are marked accordingly on the data sheets. The frequencies above 1 GHz were averaged manually by narrowing the video filter down to 10 Hz and putting the sweep time on AUTO on the EMI Receiver to keep the amplitude reading calibrated. A "duty cycle correction factor" [20 log (dwell time/100 ms)] was then subtracted from the average reading for comparison with the applicable limit.

The measurement bandwidths and transducers used for the radiated emissions test were:

FREQUENCY RANGE	EFFECTIVE MEASUREMENT BANDWIDTH	TRANSDUCER
10 kHz to 150 kHz	200 Hz	Active Loop Antenna
150 kHz to 30 MHz	9 kHz	Active Loop Antenna
30 MHz to 300 MHz	120 kHz	Biconical Antenna
300 MHz to 1 GHz	120 kHz	Log Periodic Antenna
1 GHz to 10 GHz	1 MHz	Horn Antenna

The open field test site of Compatible Electronics, Inc. was used for radiated emission testing. This test site is set up according to ANSI C63.4: 2003. Please see section 6.2 of this report for mounting, bonding and grounding of the EUT. The turntable supporting the EUT is remote controlled using a motor. The turntable permits EUT rotation of 360 degrees in order to maximize emissions. Also, the antenna mast allows height variation of the antenna from 1 meter to 4 meters. Data was collected in the worst case (highest emission) configuration of the EUT by the Radiated Emission Manual Test software. At each reading, the EUT was rotated 360 degrees and the antenna height was varied from 1 to 4 meters (for E field radiated field strength). The gunsight method was used when measuring with the horn antenna in order to ensure accurate results.

Radiated Emissions (Spurious and Harmonics) Test (con't)

The presence of ambient signals was verified by turning the EUT off. In case an ambient signal was detected, the measurement bandwidth was reduced temporarily and verification was made that an additional adjacent peak did not exist. This ensures that the ambient signal does not hide any emissions from the EUT. The EUT was tested at a 3 meter test distance.

Test Results:

The EUT complies with the **Class B** limits of CFR Title 47, Part 15, Subpart B; and the limits of CFR Title 47, Part 15, Subpart C, Sections 15.31, 15.209 and 15.247(d) for radiated emissions. The radiated signal level of the fundamental emission remains constant with the input voltage varied between 85% and 115% of the nominal voltage.

8.2 20 dB Bandwidth

The 20 dB Bandwidth was measured using the Spectrum Analyzer. The bandwidth was measured using a direct connection from the RF output of the EUT. The resolution bandwidth was 10 kHz and the video bandwidth was 30 kHz.

Test Results:

The EUT complies with the relevant requirements of FCC Title 47, Part 15, Subpart C section 15.247(a)(1) and (a)(1)(i). The 20 dB bandwidth is less than the separation between channels.

8.3 Peak Output Power

The Peak Output Power was measured using the Spectrum Analyzer. The peak output power was measured using a direct connection from the RF output of the EUT. The resolution bandwidth was 1 MHz and the video bandwidth was 3 MHz. The cable loss was also added back into the reading using the reference level offset.

Test Results:

The EUT complies with the relevant requirements of FCC Title 47, Part 15, Subpart C section 15.247(b)(1). The maximum peak output power is less than 1 watt. In repeater mode, the output does not increase regardless of the amplitude of the input signal.

8.4 RF Antenna Conducted Test

The RF antenna conducted test was performed using the Spectrum Analyzer. The RF antenna conducted test measured using a direct connection from the RF out on the EUT into the input of the EMI Receiver. The resolution bandwidth was 100 kHz, and the video bandwidth was 300 kHz. The spans were wide enough to include all the harmonics and emissions that were produced by the intentional radiator.

Test Results:

The EUT complies with the relevant requirements of FCC Title 47, Part 15, Subpart C section 15.247(d). The RF power that is produced by the intentional radiator is at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of desired power.

8.5 RF Band Edges

The RF band edges were taken at the edges of the ISM spectrum (902 MHz when the EUT was on the low channel and 928 MHz when the EUT was on the high channel) using the Spectrum Analyzer. The RBW was set to 100 kHz and the VBW was set to 300 kHz. Plots of the fundamental were taken to ensure the amplitude at the band edges were at least 20 dB down from the peak of the fundamental emission.

Test Results:

The EUT complies with the relevant requirements of FCC Title 47, Part 15, Subpart C section 15.247(d). The RF power at the band edges at 902 MHz and 928 MHz meet the requirements of FCC Title 47, Part 15, Subpart C section 15.247(d).

8.6 Carrier Frequency Separation

The Channel Hopping Separation Test was measured using the Spectrum Analyzer. The EUT was operating in its normal operating mode. The resolution bandwidth was 10 kHz, and the video bandwidth 30 kHz. The frequency span was wide enough to include the peaks of two adjacent channels.

Test Results:

The EUT complies with the relevant requirements of FCC Title 47, Part 15, Subpart C section 15.247(a)(1) and 15.247 (a)(1)(i). The Channel Hopping Separation is greater than the 20 dB bandwidth.

8.7 Number of Hopping Frequencies

The Channel Hopping Separation Test was measured using the Spectrum Analyzer. Data is included for the hopping test mode, repeater mode, as well as master mode. The resolution bandwidth was 300 kHz, and the video bandwidth was 1 MHz. The frequency span was wide enough to include all of the peaks in the frequency band of operation.

Test Results:

The EUT complies with the relevant requirements of FCC Title 47, Part 15, Subpart C section 15.247(a)(1) and 15.247 (a)(1)(i). The EUT employs 50 hopping channels in all modes of operation.

8.8 Average Time of Occupancy Test

This test consists of two time-domain measurements on any single hop frequency of the device with its hopping function is enabled in a test mode, which demonstrates the actual dwell time of the device. In normal operation, the dwell time per channel remains the same, but the overall transmitter on-time during any single hop will always be less than that in test mode.

A second set of tests was performed in "master" mode, which is its normal transmit mode, and also in "repeater" mode. In order to activate the "repeater" mode, one unit had to be configured as a "master" unit, sending synchronization packets as would occur in a normal operating environment. Data is included for both the "master" and "slave" modes.

Tests were performed

Measurement 1 (Dwell Time): The measuring instrument was placed in time-domain mode, and tuned to the frequency of one of the hopping channels. The sweep time was set just large enough to accommodate the measurement of the dwell time of the carrier at that frequency.

Plot 1 **–** With a sweep time of 20 ms, the measured **dwell times** for each mode were:

Test mode: **4.5 ms** *Master mode:* **400 µS** *Repeater Mode:* **400 µS**

Measurement 2 (Number of Hops Over Time): With the instrument remaining in time-domain mode, the sweep time for the measurement was increased significantly to allow the number of hops over a period of time to be counted.

Plot 2**–** The measured number of hops/time period for each mode was:

Test mode: **21/5 seconds** *Master mode:* **21/5 seconds** *Repeater Mode:* **21/10 seconds**

The time of occupancy is determined by multiplying the dwell time by the number of hops over a period of time.

Test mode: 4.5ms x 21 = 94.5 ms per 5-second period, *or* **189 ms in a 10-second period**.
Master mode: 400µS x 21 = 8.4 ms per 5-second period, *or* **16.8 ms in a 10-second period**.
Repeater mode: 400µS x 21 = **8.4 ms in a-10 second period**.

Test Results:

The EUT complies with the relevant requirements of FCC Title 47, Part 15, Subpart C section 15.247 (a)(1)(i). The EUT does not transmit for more than 400 ms in a 10 second period on any frequency.

8.9 Maximum Input Level Test for Repeaters

A master unit was set up to transmit data. The EUT is placed in repeater mode, and the repeater receives the signal from the master unit, determines that the signal being received is being transmitted by its intended master unit, and then retransmit the same signal.

This link is established with the repeater unit about 10 meters away from the master unit. In order to determine that the repeater's output signal will not increase when its input signal is too high, the distance between the units was reduced until the devices were less than 1 foot apart.

Test Results:

The RF output remains constant regardless of the level of its input signal.

9. CONCLUSIONS

With the EUT configured and operating as described in this report, the 902-928 MHz FHSS Transceiver Module Model: VikingX meets all of the specification limits defined in FCC Title 47, Part 15, Subpart C, sections 15.205, 15.207, 15.209, and 15.247.

Note: For the unintentional radiator portion of the test, the EUT was within the **Class B** specification limits defined by CFR Title 47, Part 15, Subpart B.

APPENDIX A

LABORATORY RECOGNITIONS

LABORATORY ACCREDITATIONS AND RECOGNITIONS

NVLAP LAB CODES 200063-0, 200528-0, 200527-0

For US, Canada, Australia/New Zealand, Taiwan and the European Union, Compatible Electronics is currently accredited by NVLAP to ISO/IEC 17025 an ISO 9002 equivalent. Please follow the link to the NIST site for each of our facilities NVLAP certificate and scope of accreditation.

NVLAP listing links
Agoura Division - http://ts.nist.gov/Standards/scopes/2000630.htm
Brea Division - http://ts.nist.gov/Standards/scopes/2005280.htm
Silverado/Lake Forest Division - http://ts.nist.gov/Standards/scopes/2005270.htm

ANSI listing
CETCB
https://www.ansica.org/wwwversion2/outside/ALLdirectoryDetails.asp?menuID=1&prgID=3&orgID=123&status=4

Compatible Electronics has been nominated as a Conformity Assessment Body (CAB) for EMC under the US/EU Mutual Recognition Agreement (MRA).

Compatible Electronics has been nominated as a Conformity Assessment Body (CAB) for Taiwan/BSMI under the US/APEC (Asia-Pacific Economic Cooperation) Mutual Recognition Agreement (MRA).

We are also certified/listed for IT products by the following country/agency:

VCCI Listing, from VCCI site
Enter "Compatible" in search form http://www.vcci.or.jp/vcci_e/activity/registration/setsubi.html

FCC Listing, from FCC OET site
FCC test lab search https://fjallfoss.fcc.gov/oetcf/eas/reports/TestFirmSearch.cfm

Compatible Electronics IC listing can be found at:
http://www.ic.gc.ca/eic/site/ic1.nsf/eng/home

APPENDIX B

MODIFICATIONS TO THE EUT

MODIFICATIONS TO THE EUT

The modifications listed below were made to the EUT to pass FCC Subpart B and FCC 15.247 specifications.

All the rework described below was implemented during the test in a method that could be reproduced in all the units by the manufacturer.

THE EUT WAS NOT MODIFIED DURING THE TESTING

APPENDIX C

ADDITIONAL MODELS COVERED UNDER THIS REPORT

ADDITIONAL MODELS COVERED UNDER THIS REPORT

USED FOR THE PRIMARY TEST

902-928 MHz FHSS Transceiver Module
Model: VikingX
S/N: N/A

There were no additional models covered under this report.

APPENDIX D

DIAGRAMS, CHARTS, AND PHOTOS

FIGURE 1: CONDUCTED EMISSIONS TEST SETUP

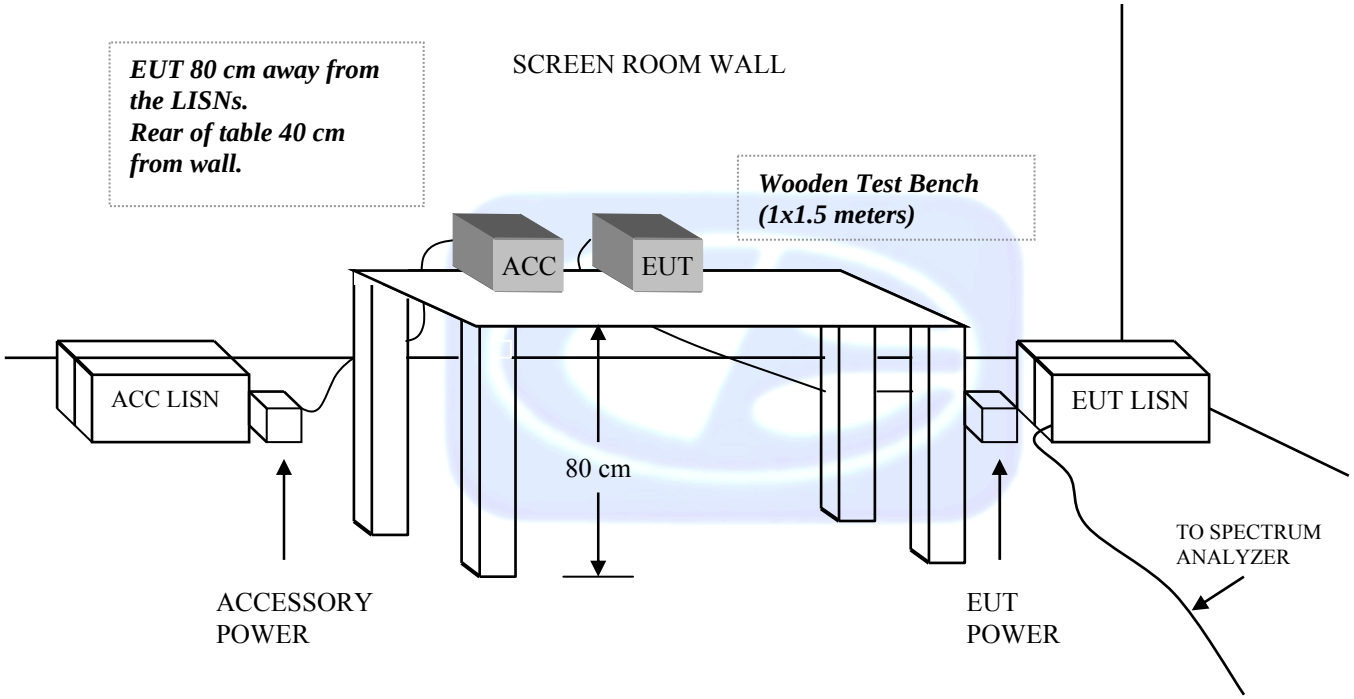
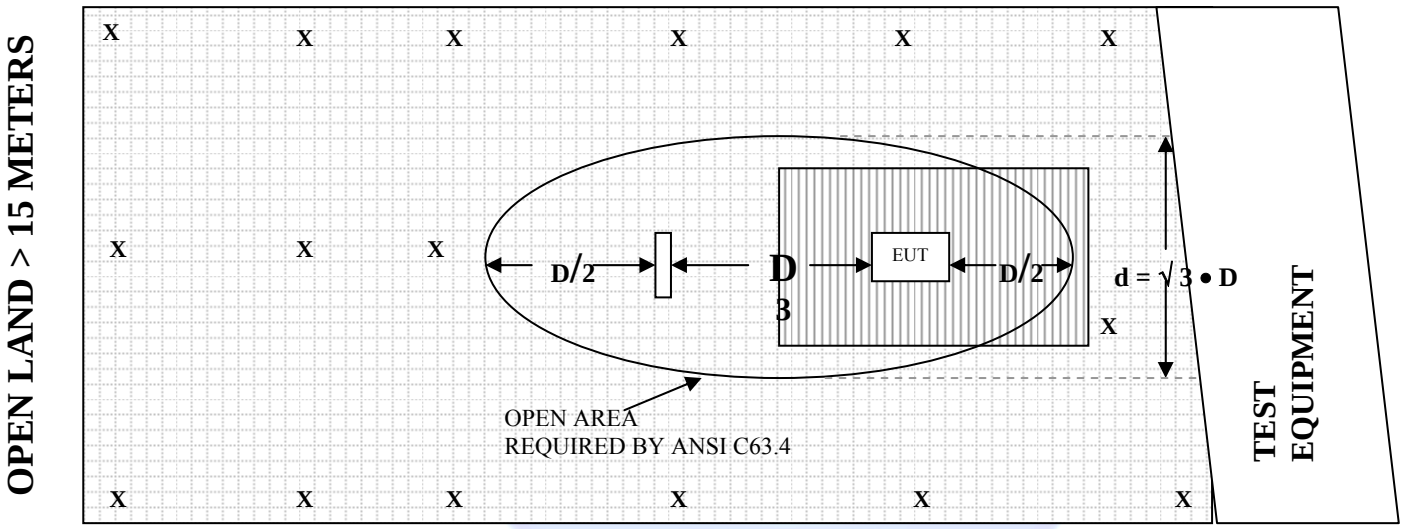


FIGURE 2: PLOT MAP AND LAYOUT OF RADIATED SITE – 3 METERS

OPEN LAND > 15 METERS



OPEN LAND > 15 METERS

X = GROUND RODS	= GROUND SCREEN
D = TEST DISTANCE (meters)	= WOOD COVER

COM-POWER AL-130

ACTIVE LOOP ANTENNA (E-FIELD)

S/N: 17085

CALIBRATION DATE: AUGUST 27, 2008

FREQUENCY (MHz)	FACTOR (dB)	FREQUENCY (MHz)	FACTOR (dB)
0.009	8.5	0.8	9.97
0.01	9.57	0.9	10.04
0.02	10.21	1.0	10.21
0.03	10.77	2.0	10.53
0.4	10.47	3.0	10.4
0.05	9.13	4.0	10.14
0.06	9.9	5.0	10.57
0.07	9.54	6.0	10.83
0.08	9.4	7.0	10.43
0.09	9.67	8.0	10.6
0.1	9.67	9.0	11.4
0.2	7.04	10.0	10.34
0.3	9.77	15.0	3.53
0.4	9.7	20.0	10.73
0.5	9.7	25.0	7.13
0.6	10.17	30.0	8.4
0.7	10.14		

COM-POWER AB-900

LAB J - BICONICAL ANTENNA

S/N: 2819

CALIBRATION DATE: OCTOBER 16, 2009

FREQUENCY (MHz)	FACTOR (dB)	FREQUENCY (MHz)	FACTOR (dB)
30.0	12.3	100.0	11.4
35.0	11.3	120.0	14.3
40.0	11.5	140.0	12.1
45.0	12.7	160.0	15
50.0	11.7	180.0	18.3
60.0	11	200.0	16.2
70.0	8.9	250.0	16.8
80.0	7.6	275.0	18.7
90.0	9.3	300.0	19.8

COM-POWER AL-100

LAB J - LOG PERIODIC ANTENNA

S/N: 1116

CALIBRATION DATE: OCTOBER 16, 2009

FREQUENCY (MHz)	FACTOR (dB)
300	16.4
400	17.5
500	18.8
600	20.3
700	22.6
800	22.2
900	23.6
1000	25.2

COM-POWER AH-118

LAB J - HORN ANTENNA

S/N: 1319

CALIBRATION DATE: AUGUST 8, 2008

FREQUENCY (MHz)	FACTOR (dB)	FREQUENCY (MHz)	FACTOR (dB)
1000	24.6	10000	39.5
1500	24.5	10500	40.9
2000	28.4	11000	40.6
2500	28.5	11500	42.3
3000	29.6	12000	43.2
3500	30.9	12500	43.7
4000	30.8	13000	48.7
4500	31.2	13500	46.2
5000	32.2	14000	44
5500	32.5	14500	42.7
6000	34.9	15000	42.3
6500	36.2	15500	44.1
7000	37.9	16000	41.6
7500	38.6	16500	40
8000	38.3	17000	45.1
8500	38.3	17500	47
9000	40.3	18000	45.5
9500	39.4		

COM-POWER PA-103

LAB J - PREAMPLIFIER

S/N: 161206

CALIBRATION DATE: DECEMBER 7, 2009

FREQUENCY (MHz)	FACTOR (dB)	FREQUENCY (MHz)	FACTOR (dB)
30	31.7	300	31.6
40	31.9	350	31.6
50	31.8	400	31.5
60	31.8	450	31.4
70	31.7	500	31.2
80	31.8	550	31.6
90	31.9	600	31.1
100	31.8	650	31.4
125	31.8	700	30.3
150	31.9	750	31.0
175	31.8	800	29.1
200	31.9	850	29.7
225	31.8	900	28.1
250	31.7	950	32.4
275	31.9	1000	32.3

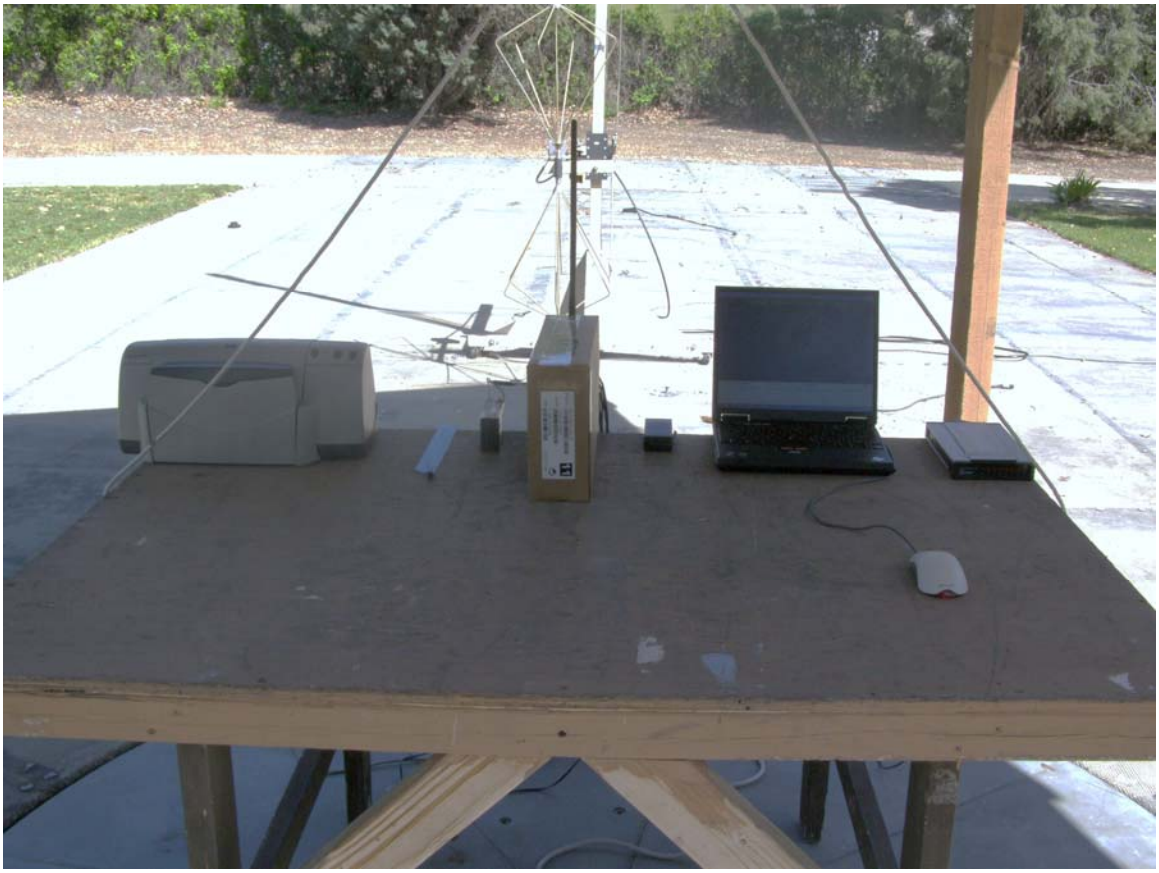
COM-POWER PA-122

LAB J – HI-FREQUENCY PREAMPLIFIER

S/N: 181923

CALIBRATION DATE: FEBRUARY 1, 2010

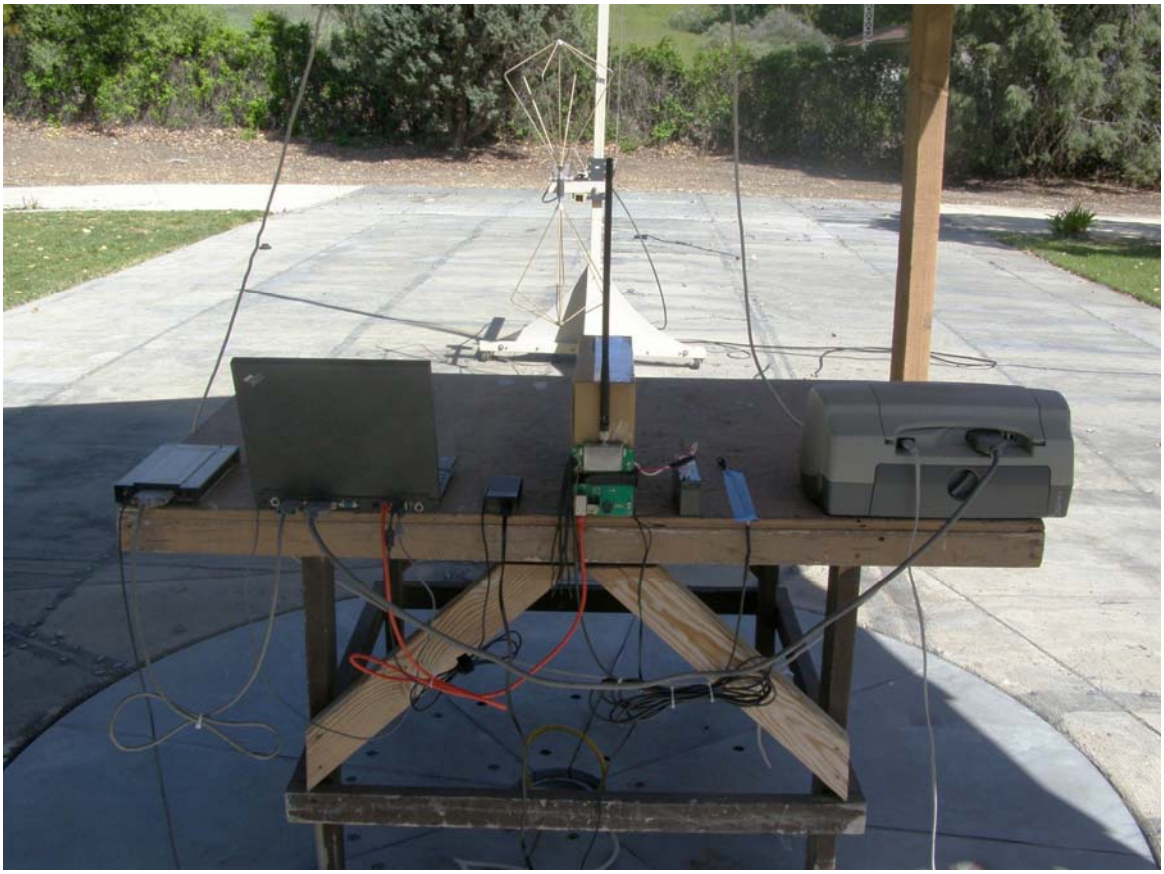
FREQUENCY (MHz)	FACTOR (dB)	FREQUENCY (MHz)	FACTOR (dB)
1000	37.03	12000	34.89
1500	36.17	12500	35.69
2000	35.77	13000	35.81
2500	35.88	13500	35.25
3000	35.74	14000	35.34
3500	35.61	14500	35.59
4000	35.56	15000	34.88
4500	35.35	15500	34.38
5000	35.1	16000	35.25
5500	35.3	16500	35.75
6000	35.48	17000	35.76
6500	35.37	17500	35.28
7000	35.35	18000	34.81
7500	34.49	18500	34.06
8000	33.9	19000	34.26
8500	33.29	19500	34.23
9000	34.36	20000	35.04
9500	34.96	20500	35.23
10000	34.24	21000	35.06
10500	32.77	21500	36.2
11000	32.72	22000	34.76
11500	33.73		



FRONT VIEW

VALHALLA WIRELESS
902-928 MHz FHSS TRANCEIVER MODULE
MODEL: VikingX
FCC SUBPART B AND C – RADIATED EMISSIONS

PHOTOGRAPH SHOWING THE EUT CONFIGURATION FOR MAXIMUM EMISSIONS



REAR VIEW

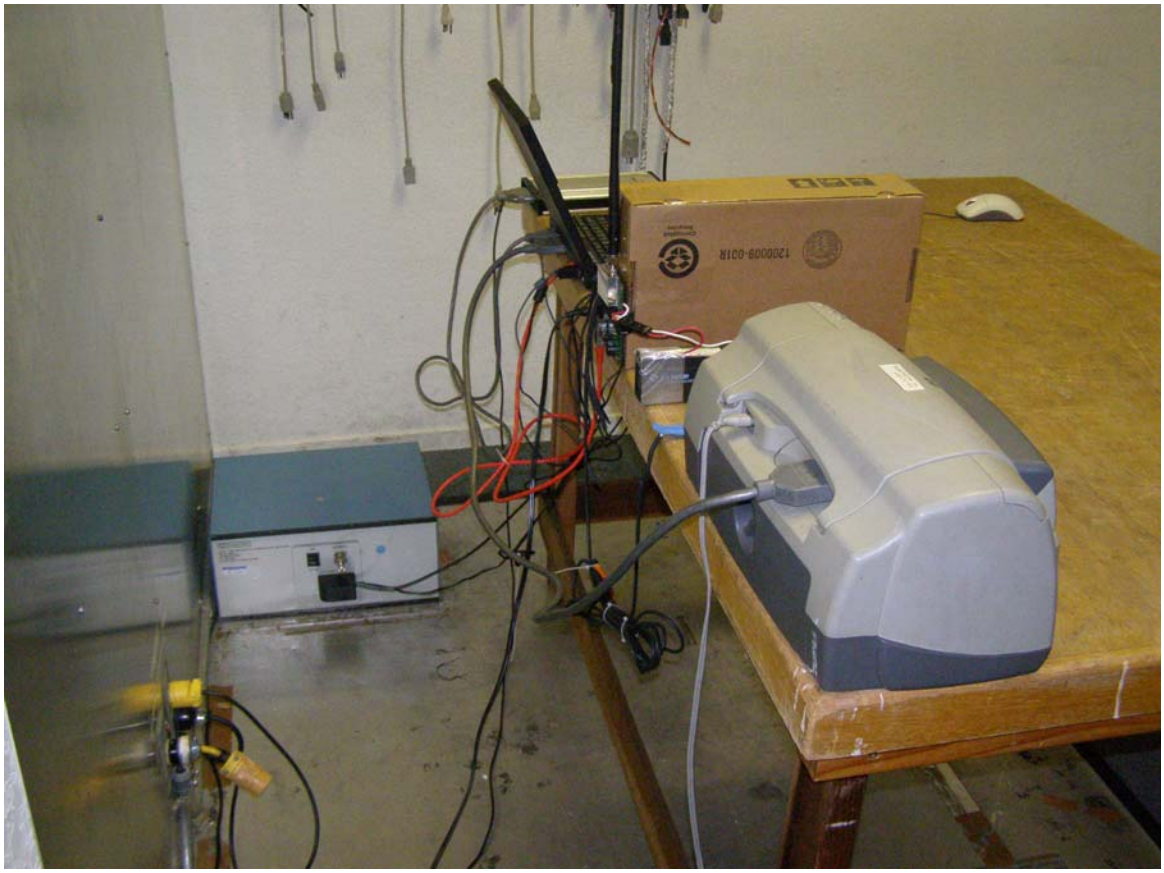
VALHALLA WIRELESS
902-928 MHz FHSS TRANCEIVER MODULE
MODEL: VikingX
FCC SUBPART B AND C – RADIATED EMISSIONS

PHOTOGRAPH SHOWING THE EUT CONFIGURATION FOR MAXIMUM EMISSIONS

FRONT VIEW

VALHALLA WIRELESS
902-928 MHz FHSS TRANCEIVER MODULE
MODEL: VikingX
FCC SUBPART B AND C – CONDUCTED EMISSIONS

PHOTOGRAPH SHOWING THE EUT CONFIGURATION FOR MAXIMUM EMISSIONS



REAR VIEW

VALHALLA WIRELESS
902-928 MHz FHSS TRANCEIVER MODULE
MODEL: VikingX
FCC SUBPART B AND C – CONDUCTED EMISSIONS

PHOTOGRAPH SHOWING THE EUT CONFIGURATION FOR MAXIMUM EMISSIONS

APPENDIX E

DATA SHEETS

RADIATED EMISISONS

DATA SHEETS

COMPATIBLE ELECTRONICS

Test Location : Compatible Electronics
Customer : Todd Elliott
Manufacturer : Valhalla Wireless
Eut name : 902-928 MHz FHSS Transmitter
Model : VikingX
Serial # : 0003054
Specification : FCC Pt. 15 B
Distance correction factor (20 * log(test/spec)) : 0.00
Test Mode : 10 kHz to 1 GHz - Qualification
Clocks: 14.7456 MHz, 25 MHz, 26 MHz, 29.49 MHz
Tx Mode, Powered by AC adapter, Battery Connected
Scott McCutchan

Page : 1/3
Date : 04/09/2010
Time : 12:22:59 PM
Lab : J
Test Distance : 3.00 Meters

Pol	Freq MHz	Reading dBuV	Cable loss dB	Antenna factor dB	Amplifier gain dB	Corr'd rdg = R dBuV/m	Limit = L dBuV/m	Delta R-L dB
V	41.250	51.90	1.20	11.81	31.89	33.03	40.00	-6.97
V	53.121	55.60	1.33	11.47	31.80	36.60	40.00	-3.40
V	81.157	56.00	1.80	7.81	31.81	33.80	40.00	-6.20
V	82.560	57.10	1.80	8.05	31.83	35.13	40.00	-4.87
V	86.300	51.20	1.80	8.69	31.86	29.83	40.00	-10.17
V	125.040	49.50	2.20	13.71	31.80	33.61	43.50	-9.89
V	128.690	53.60	2.22	13.30	31.82	37.30	43.50	-6.20
V	135.455	59.80	2.24	12.57	31.84	42.77	43.50	-0.73
V	135.455Qp	58.51	2.24	12.57	31.84	41.48	43.50	-2.02
V	137.860	60.40	2.25	12.32	31.85	43.12	43.50	-0.38
V	137.866Qp	59.10	2.25	12.32	31.85	41.82	43.50	-1.68
V	139.440	60.20	2.26	12.16	31.86	42.76	43.50	-0.74
V	139.441Qp	57.98	2.26	12.16	31.86	40.54	43.50	-2.96
V	143.177	57.10	2.27	12.59	31.87	40.09	43.50	-3.41
V	148.112	55.50	2.29	13.32	31.89	39.22	43.50	-4.28
V	181.900	49.60	2.66	18.09	31.83	38.52	43.50	-4.98
V	192.300	49.80	2.74	16.98	31.87	37.65	43.50	-5.85
V	211.500	52.00	2.94	16.35	31.85	39.44	43.50	-4.06
V	220.890	54.20	3.05	16.47	31.82	41.90	46.00	-4.10
V	226.520	53.50	3.11	16.53	31.79	41.35	46.00	-4.65
V	228.910	50.60	3.12	16.56	31.78	38.50	46.00	-7.50
V	233.920	48.60	3.14	16.62	31.76	36.60	46.00	-9.40
V	236.110	49.30	3.15	16.65	31.75	37.34	46.00	-8.66
V	240.160	50.50	3.16	16.69	31.74	38.62	46.00	-7.38
V	245.480	45.40	3.18	16.75	31.72	33.62	46.00	-12.38
V	259.300	49.30	3.31	17.53	31.78	38.37	46.00	-7.63
V	267.000	46.90	3.41	18.11	31.84	36.58	46.00	-9.42
V	286.409	47.40	3.50	19.21	31.76	38.35	46.00	-7.65
H	42.499	41.90	1.20	12.12	31.87	23.34	40.00	-16.66
H	52.144	42.90	1.29	11.54	31.80	23.93	40.00	-16.07
H	84.324	45.90	1.80	8.36	31.84	24.22	40.00	-15.78
H	84.985	46.50	1.80	8.47	31.85	24.92	40.00	-15.08
H	86.096	49.10	1.80	8.66	31.86	27.70	40.00	-12.30
H	122.700	54.60	2.18	13.98	31.80	38.97	43.50	-4.53
H	125.090	51.70	2.20	13.71	31.80	35.81	43.50	-7.69

COMPATIBLE ELECTRONICS

Test Location : Compatible Electronics — **Page** : 2/3
Customer : Todd Elliott — **Date** : 04/09/2010
Manufacturer : Valhalla Wireless — **Time** : 12:22:59 PM
Eut name : 902-928 MHz FHSS Transmitter — **Lab** : J
Model : VikingX — **Test Distance** : 3.00 Meters
Serial # : 0003054
Specification : FCC Pt. 15 B
Distance correction factor (20 * log(test/spec)) : 0.00
Test Mode : 10 kHz to 1 GHz - Qualification
Clocks: 14.7456 MHz, 25 MHz, 26 MHz, 29.49 MHz
Tx Mode, Powered by AC adapter, Battery Connected
Scott McCutchan

Pol	Freq MHz	Reading dBuV	Cable loss dB	Antenna factor dB	Amplifier gain dB	Corr'd rdg = R dBuV/m	Limit = L dBuV/m	Delta R-L dB
H	131.190	55.60	2.23	13.03	31.83	39.03	43.50	-4.47
H	136.450	57.30	2.25	12.47	31.85	40.17	43.50	-3.33
H	140.960	59.50	2.27	12.25	31.87	42.15	43.50	-1.35
H	140.993Qp	56.74	2.27	12.25	31.87	39.39	43.50	-4.11
H	143.970	58.30	2.28	12.71	31.88	41.41	43.50	-2.09
H	143.967Qp	55.37	2.28	12.71	31.88	38.48	43.50	-5.02
H	147.160	54.90	2.29	13.18	31.89	38.48	43.50	-5.02
H	150.150	52.00	2.30	13.62	31.90	36.02	43.50	-7.48
H	151.700	56.30	2.32	13.84	31.89	40.57	43.50	-2.93
H	151.634Qp	51.76	2.32	13.83	31.89	36.02	43.50	-7.48
H	154.800	53.40	2.36	14.28	31.88	38.16	43.50	-5.34
H	157.150	54.50	2.39	14.61	31.87	39.63	43.50	-3.87
H	161.410	52.60	2.44	15.25	31.85	38.44	43.50	-5.06
H	165.520	52.00	2.49	15.95	31.84	38.61	43.50	-4.89
H	171.300	49.90	2.56	16.91	31.81	37.56	43.50	-5.94
H	177.320	48.10	2.62	17.88	31.81	36.79	43.50	-6.71
H	195.030	47.10	2.76	16.70	31.88	34.68	43.50	-8.82
H	220.600	47.10	3.05	16.46	31.82	34.80	46.00	-11.20
H	226.200	46.80	3.11	16.53	31.79	34.64	46.00	-11.36
H	237.350	46.90	3.15	16.66	31.75	34.96	46.00	-11.04
H	244.150	49.40	3.18	16.74	31.72	37.59	46.00	-8.41
H	247.900	49.40	3.19	16.78	31.71	37.66	46.00	-8.34
H	251.850	49.30	3.22	16.95	31.72	37.75	46.00	-8.25
H	261.050	46.20	3.34	17.66	31.79	35.41	46.00	-10.59
H	273.550	41.40	3.48	18.59	31.89	31.59	46.00	-14.41
H	286.418	44.60	3.50	19.21	31.76	35.55	46.00	-10.45
V	300.061	43.40	3.50	16.40	31.60	31.70	46.00	-14.30
V	325.026	40.10	3.76	16.71	31.60	28.97	46.00	-17.03
V	500.156	40.00	4.70	18.80	31.20	32.30	46.00	-13.70
V	625.182	37.20	5.00	20.91	31.25	31.86	46.00	-14.14
V	750.227	39.50	6.11	22.39	30.99	37.01	46.00	-8.99
V	611.348	44.10	4.95	20.58	31.17	38.46	46.00	-7.54
H	300.136	47.40	3.50	16.40	31.60	35.70	46.00	-10.30
H	325.134	41.80	3.76	16.71	31.60	30.67	46.00	-15.33
H	429.593	50.90	4.38	17.92	31.44	41.76	46.00	-4.24

COMPATIBLE ELECTRONICS

Test Location : Compatible Electronics — **Page** : 3/3
Customer : Todd Elliott — **Date** : 04/09/2010
Manufacturer : Valhalla Wireless — **Time** : 12:22:59 PM
Eut name : 902-928 MHz FHSS Transmitter — **Lab** : J
Model : VikingX — **Test Distance** : 3.00 Meters
Serial # : 0003054
Specification : FCC Pt. 15 B
Distance correction factor (20 * log(test/spec)) : 0.00
Test Mode : 10 kHz to 1 GHz - Qualification
Clocks: 14.7456 MHz, 25 MHz, 26 MHz, 29.49 MHz
Tx Mode, Powered by AC adapter, Battery Connected
Scott McCutchan

Pol	Freq	Reading	Cable loss	Antenna factor	Amplifier gain	Corr'd rdg = R	Limit = L	Delta R-L
	MHz	dBuV	dB	dB	dB	dBuV/m	dBuV/m	dB
H	500.171	42.30	4.70	18.80	31.20	34.60	46.00	-11.40
H	600.327	42.60	4.90	20.31	31.10	36.71	46.00	-9.29
H	611.240	40.10	4.95	20.58	31.17	34.45	46.00	-11.55
H	750.202	37.20	6.10	22.39	30.99	34.71	46.00	-11.29

RADIATED EMISSIONS TEST DATA

Test Location : Compatible Electronics
Customer : Todd Elliott
Manufacturer : Valhalla Wireless
EUT name : 902-928 MHz FHSS Transceiver
Model : VikingX
Serial # : 003054
Specification : FCC Part 15, Section 15.205, 15.209, 15.247
Distance correction factor (20 * log(test/spec)) : 0
Test Mode : Transmit Mode, Low Channel

Page : 1/1
Date : 4/9/2010
Time : 5:32:17 PM
Lab : J
Test Distance : 3 Meters

Qualification Data; Frequency Range: 1 GHz to 10 GHz (restricted bands)
Tested by: Scott McCutchan
Tempurate: 16 degrees C; Humidity: 30%; Barometric Pressure: 102.0 kPa

Pol	Freq. MHz	Reading dBuV	Meas. Type	Cable Loss dB	Antenna factor dB	Amplifier gain dB	Corr'd rdg = R dBuV/m	Limit = L dBuV/m	Delta R-L dB
V	2708.66	67.70	Peak	2.74	28.98	35.82	63.60	73.98	-10.38
V	2708.67	63.13	Vid Avg*	2.74	28.98	35.82	59.03	53.98	5.05
V	2708.67	43.13	DC<10%**	2.74	28.98	35.82	39.03	53.98	-14.95
V	3611.54	65.70	Peak	3.02	30.88	35.60	64.00	73.98	-9.98
V	3611.81	59.10	Vid Avg*	3.02	30.88	35.60	57.40	53.98	3.42
V	3611.81	39.10	DC<10%**	3.02	30.88	35.60	37.40	53.98	-16.58
V	4515.37	63.90	Peak	3.60	31.23	35.34	63.39	73.98	-10.59
V	4515.38	58.26	Vid Avg*	3.60	31.23	35.34	57.75	53.98	3.77
V	4515.38	38.26	DC<10%**	3.60	31.23	35.34	37.75	53.98	-16.23
V	5417.42	57.20	Peak	3.28	32.45	35.27	57.66	73.98	-16.32
V	5417.33	49.43	Vid Avg*	3.28	32.45	35.27	49.89	53.98	-4.09
V	5417.33	29.43	DC<10%**	3.28	32.45	35.27	29.89	53.98	-24.09
V	8127.52	48.60	Peak	5.04	38.30	33.74	58.20	73.98	-15.78
V	8127.72	39.40	Vid Avg*	5.04	38.30	33.74	49.00	53.98	-4.98
V	8127.72	19.40	DC<10%**	5.04	38.30	33.74	29.00	53.98	-24.98
V	9029.22	44.70	Peak	7.44	40.25	34.40	57.99	73.98	-15.99
V	9028.95	33.16	Vid Avg*	7.44	40.25	34.40	46.45	53.98	-7.53
V	9028.95	13.16	DC<10%**	7.44	40.25	34.40	26.45	53.98	-27.53

* Video average measurement; RBW=1 MHz, VBW=10 Hz

** **Calculated "duty cycle" < 10%**
Maximum allowed correction factor (20 dB) subtracted from video average reading.
Duty cycle correction factor = 20 log (dwell time[4.5 ms]/100 ms) = -26.93 dB

RADIATED EMISSIONS TEST DATA

Test Location : Compatible Electronics
Customer : Todd Elliott
Manufacturer : Valhalla Wireless
EUT name : 902-928 MHz FHSS Transceiver
Model : VikingX
Serial # : 003054
Specification : FCC Part 15, Section 15.205, 15.209, 15.247
Distance correction factor (20 * log(test/spec)) : 0
Test Mode : Transmit Mode, Low Channel

Page : 1/1
Date : 4/9/2010
Time : 5:32:17 PM
Lab : J
Test Distance : 3 Meters

Qualification Data; Frequency Range: 1 GHz to 10 GHz (restricted bands)
Tested by: Scott McCutchan
Tempurate: 16 degrees C; Humidity: 30%; Barometric Pressure: 102.0 kPa

Pol	Freq. MHz	Reading dBuV	Meas. Type	Cable Loss dB	Antenna factor dB	Amplifier gain dB	Corr'd rdg = R dBuV/m	Limit = L dBuV/m	Delta R-L dB
H	2708.82	57.30	Peak	2.74	28.98	35.82	53.20	73.98	-20.78
H	2708.73	52.50	Vid Avg*	2.74	28.98	35.82	48.40	53.98	-5.58
H	2708.73	32.50	DC<10%**	2.74	28.98	35.82	28.40	53.98	-25.58
H	3611.60	67.40	Peak	3.02	30.88	35.60	65.70	73.98	-8.28
H	3611.69	62.96	Vid Avg*	3.02	30.88	35.60	61.26	53.98	7.28
H	3611.69	42.96	DC<10%**	3.02	30.88	35.60	41.26	53.98	-12.72
H	4514.70	63.70	Peak	3.60	31.23	35.34	63.19	73.98	-10.79
H	4514.58	57.91	Vid Avg*	3.60	31.23	35.34	57.40	53.98	3.42
H	4514.58	37.90	DC<10%**	3.60	31.23	35.34	37.39	53.98	-16.59
H	5417.58	58.00	Peak	3.28	32.45	35.27	58.46	73.98	-15.52
H	5417.56	51.83	Vid Avg*	3.28	32.45	35.27	52.29	53.98	-1.69
H	5417.56	31.83	DC<10%**	3.28	32.45	35.27	32.29	53.98	-21.69
H	8127.54	49.00	Peak	5.04	38.30	33.74	58.60	73.98	-15.38
H	8127.53	40.24	Vid Avg*	5.04	38.30	33.74	49.84	53.98	-4.14
H	8127.53	20.24	DC<10%**	5.04	38.30	33.74	29.84	53.98	-24.14
H	9030.48	47.90	Peak	7.44	40.24	34.40	61.18	73.98	-12.80
H	9030.48	38.42	Vid Avg*	7.44	40.25	34.40	51.71	53.98	-2.27
H	9030.48	18.42	DC<10%**	7.44	40.25	34.40	31.71	53.98	-22.27

* Video average measurement; RBW=1 MHz, VBW=10 Hz

** **Calculated "duty cycle" < 10%**
Maximum allowed correction factor (20 dB) subtracted from video average reading.
Duty cycle correction factor = 20 log (dwell time[4.5 ms]/100 ms) = -26.93 dB

RADIATED EMISSIONS TEST DATA

Test Location : Compatible Electronics
Customer : Todd Elliott
Manufacturer : Valhalla Wireless
EUT name : 902-928 MHz FHSS Transceiver
Model : VikingX
Serial # : 003054
Specification : FCC Part 15, Section 15.205, 15.209, 15.247
Distance correction factor (20 * log(test/spec)) : 0
Test Mode : Transmit Mode, Middle Channel

Page : 1/1
Date : 4/9/2010
Time : 6:53:50 PM
Lab : J
Test Distance : 3 Meters

Qualification Data; Frequency Range: 1 GHz to 10 GHz (restricted bands)
Tested by: Scott McCutchan
Tempurate: 16 degrees C; Humidity: 30%; Barometric Pressure: 102.0 kPa

Pol	Freq. MHz	Reading dBuV	Meas. Type	Cable Loss dB	Antenna factor dB	Amplifier gain dB	Corr'd rdg = R dBuV/m	Limit = L dBuV/m	Delta R-L dB
V	2743.39	65.10	Peak	2.79	29.06	35.81	61.14	73.98	-12.84
V	2743.61	60.94	Vid Avg*	2.79	29.06	35.81	56.98	53.98	3.00
V	2743.61	40.94	DC<10%**	2.79	29.06	35.81	36.98	53.98	-17.00
V	3657.73	62.20	Peak	3.03	30.87	35.59	60.51	73.98	-13.47
V	3657.73	58.02	Vid Avg*	3.03	30.87	35.59	56.33	53.98	2.35
V	3657.73	38.02	DC<10%**	3.03	30.87	35.59	36.33	53.98	-17.65
V	4572.15	60.70	Peak	3.62	31.35	35.31	60.36	73.98	-13.62
V	4572.64	55.83	Vid Avg*	3.62	31.35	35.31	55.49	53.98	1.51
V	4572.64	35.83	DC<10%**	3.62	31.35	35.31	35.49	53.98	-18.49
H	2743.85	58.90	Peak	2.79	29.06	35.81	54.94	73.98	-19.04
H	2743.65	55.24	Vid Avg*	2.79	29.06	35.81	51.28	53.98	-2.70
H	2743.65	35.24	DC<10%**	2.79	29.06	35.81	31.28	53.98	-22.70
H	3658.78	66.40	Peak	3.03	30.87	35.59	64.71	73.98	-9.27
H	3658.16	60.86	Vid Avg*	3.03	30.87	35.59	59.17	53.98	5.19
H	3658.16	40.86	DC<10%**	3.03	30.87	35.59	39.17	53.98	-14.81
H	4573.06	65.30	Peak	3.62	31.35	35.31	64.96	73.98	-9.02
H	4572.87	60.28	Vid Avg*	3.62	31.35	35.31	59.94	53.98	5.96
H	4572.87	40.28	DC<10%**	3.62	31.35	35.31	39.94	53.98	-14.04
H	9146.24	47.40	Peak	7.20	40.03	34.54	60.09	73.98	-13.89
H	9146.10	37.41	Vid Avg*	7.20	40.03	34.54	50.10	53.98	-3.88
H	9146.10	17.41	DC<10%**	7.20	40.03	34.54	30.10	53.98	-23.88

* Video average measurement; RBW=1 MHz, VBW=10 Hz
** **Calculated "duty cycle" < 10%**
Maximum allowed correction factor (20 dB) subtracted from video average reading.
Duty cycle correction factor = 20 log (dwell time[4.5 ms]/100 ms) = -26.93 dB

RADIATED EMISSIONS TEST DATA

Test Location : Compatible Electronics
Customer : Todd Elliott
Manufacturer : Valhalla Wireless
EUT name : 902-928 MHz FHSS Transceiver
Model : VikingX
Serial # : 003054
Specification : FCC Part 15, Section 15.205, 15.209, 15.247
Distance correction factor (20 * log(test/spec)) : 0
Test Mode : Transmit Mode, High Channel

Page : 1/1
Date : 4/9/2010
Time : 7:13:18 PM
Lab : J
Test Distance : 3 Meters

Qualification Data; Frequency Range: 1 GHz to 10 GHz (restricted bands)
Tested by: Scott McCutchan
Tempurate: 16 degrees C; Humidity: 30%; Barometric Pressure: 102.0 kPa

Pol	Freq. MHz	Reading dBuV	Meas. Type	Cable Loss dB	Antenna factor dB	Amplifier gain dB	Corr'd rdg = R dBuV/m	Limit = L dBuV/m	Delta R-L dB
V	2779.36	61.00	Peak	2.81	29.14	35.80	57.15	73.98	-16.83
V	2779.62	57.18	Vid Avg*	2.81	29.14	35.80	53.33	53.98	-0.65
V	2779.62	37.18	DC<10%**	2.81	29.14	35.80	33.33	53.98	-20.65
V	3705.78	71.00	Peak	3.04	30.86	35.59	69.31	73.98	-4.67
V	3706.34	66.85	Vid Avg*	3.04	30.86	35.59	65.16	53.98	11.18
V	3706.34	46.85	DC<10%**	3.04	30.86	35.59	45.16	53.98	-8.82
V	4633.14	55.60	Peak	3.63	31.48	35.28	55.43	73.98	-18.55
V	4633.14	50.04	Vid Avg*	3.63	31.48	35.28	49.87	53.98	-4.11
V	4633.14	30.04	DC<10%**	3.63	31.48	35.28	29.87	53.98	-24.11
H	2779.73	61.50	Peak	2.81	29.14	35.80	57.65	73.98	-16.33
H	2779.73	58.26	Vid Avg*	2.81	29.14	35.80	54.41	53.98	0.43
H	2779.73	38.26	DC<10%**	2.81	29.14	35.80	34.41	53.98	-19.57
H	3705.82	71.60	Peak	3.04	30.86	35.59	69.91	73.98	-4.07
H	3706.37	66.65	Vid Avg*	3.04	30.86	35.59	64.96	53.98	10.98
H	3706.37	46.65	DC<10%**	3.04	30.86	35.59	44.96	53.98	-9.02
H	4632.50	54.40	Peak	3.63	31.48	35.28	54.23	73.98	-19.75
H	4632.99	49.05	Vid Avg*	3.63	31.48	35.28	48.88	53.98	-5.10
H	4632.99	29.05	DC<10%**	3.63	31.48	35.28	28.88	53.98	-25.10

* Video average measurement; RBW=1 MHz, VBW=10 Hz

** **Calculated "duty cycle" < 10%**
Maximum allowed correction factor (20 dB) subtracted from video average reading.
Duty cycle correction factor = 20 log (dwell time[4.5 ms]/100 ms) = -26.93 dB

RADIATED EMISSIONS TEST DATA

Test Location :	Compatible Electronics	**Page :**	1/1
Customer :	Todd Elliott	**Date :**	4/9/2010
Manufacturer :	Valhalla Wireless	**Time :**	3:02:57 PM
EUT name :	902-928 MHz FHSS Transceiver	**Lab :**	J
Model :	VikingX	**Test Distance :**	3 Meters
Serial # :	003054		
Specification :	FCC Part 15, Section 15.109		
Distance correction factor (20 * log(test/spec)) :			0
Test Mode :	Receive Mode (lowest, middle and highest channels tested)		

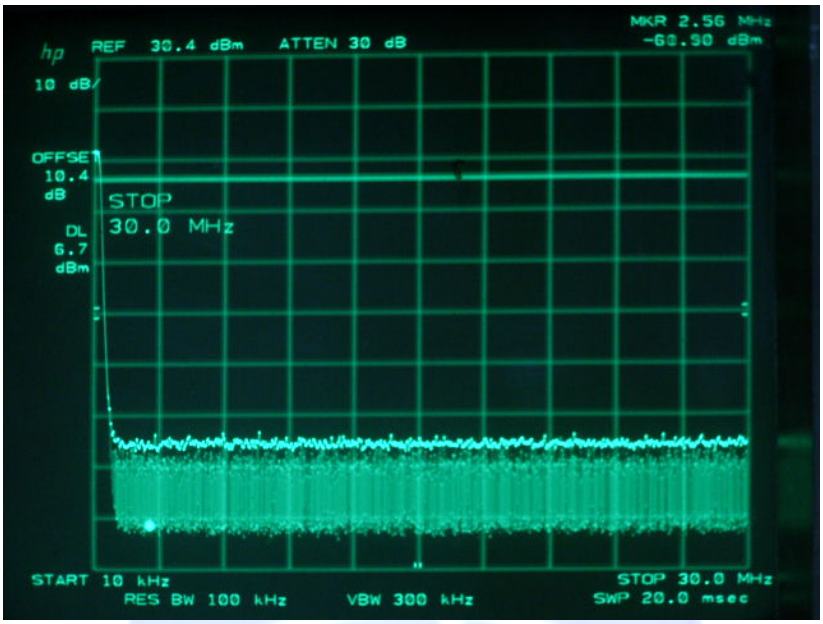
Qualification Data; Frequency Range: 1 GHz to 5 GHz
Tested by: Scott McCutchan
Tempurate:17 degrees C;Humidity: 47%; Barometric Pressure: 102.2 kPa

Pol	Freq.	Reading	Meas. Type	Cable Loss	Antenna factor	Amplifier gain	Corr'd rdg = R	Limit = L	Delta R-L
	MHz	dBuV		dB	dB	dB	dBuV/m	dBuV/m	dB

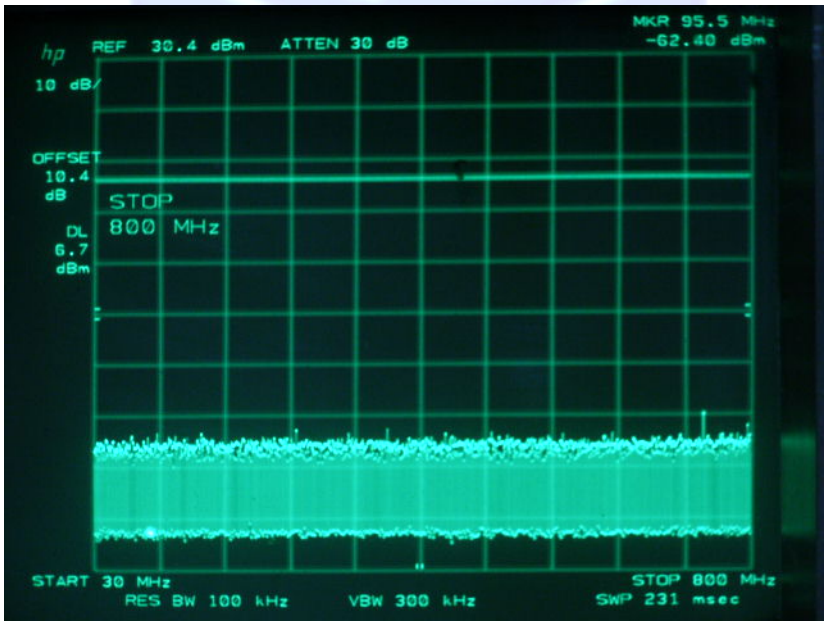
No Emissions found for the receive mode or digital electronics.

RF CONDUCTED ANTENNA TEST

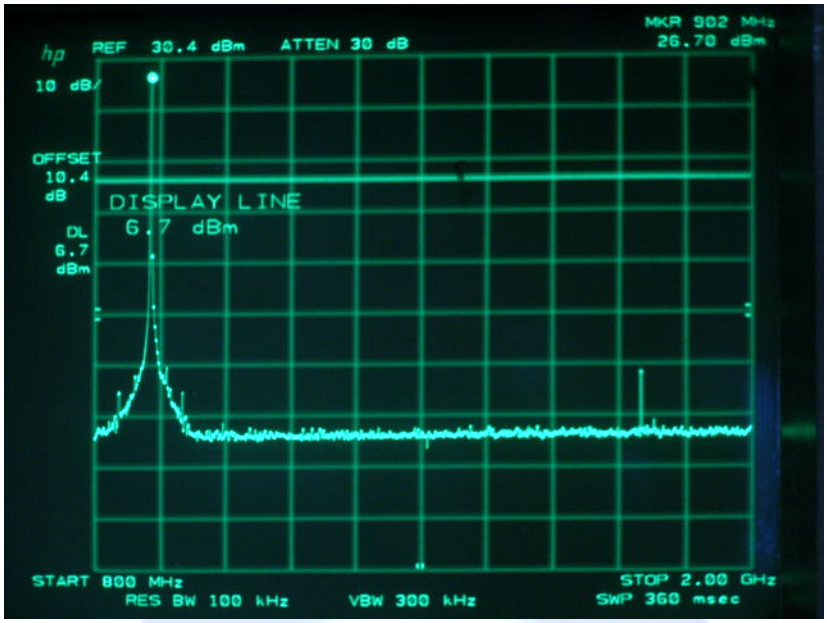
DATA SHEETS



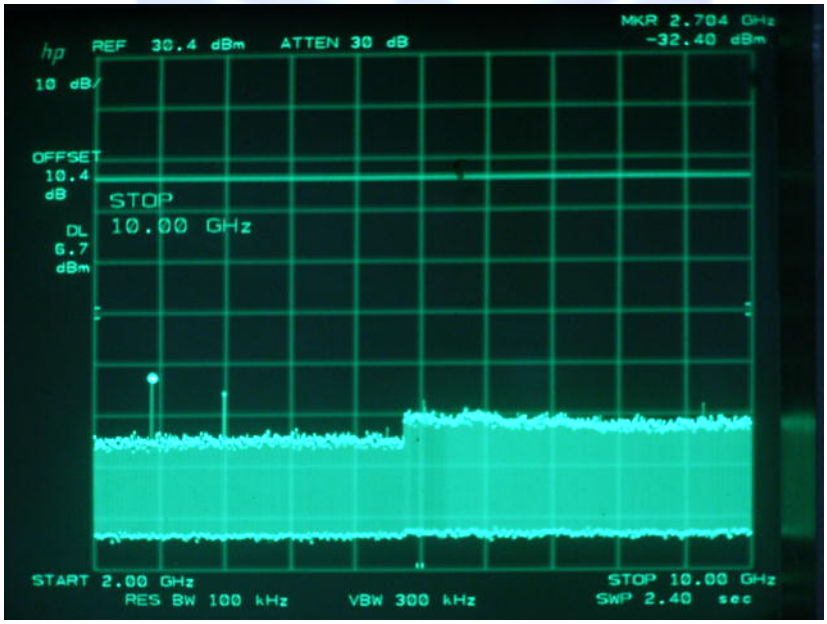
SPURIOUS RF CONDUCTED EMISSIONS
LOW CHANNEL – 10 kHz to 30 MHz – 2-17-2010



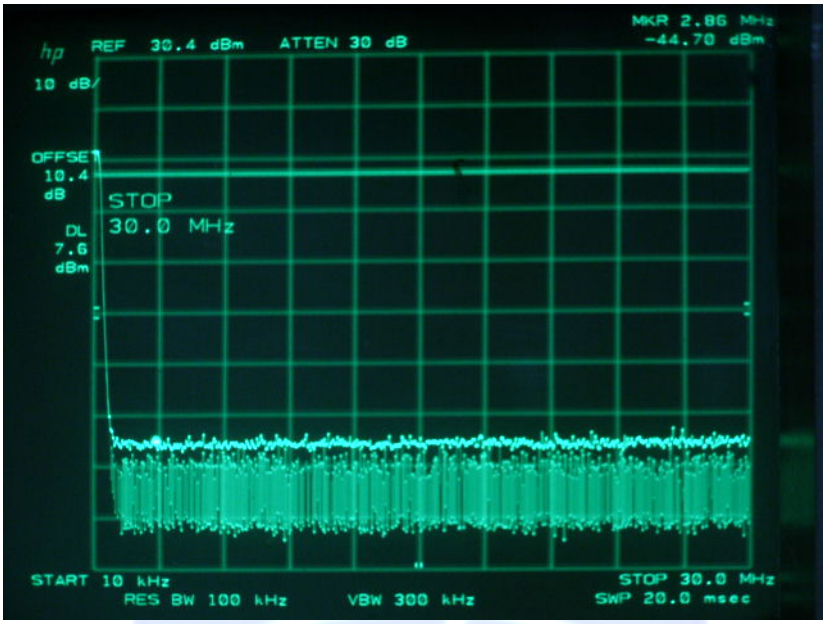
SPURIOUS RF CONDUCTED EMISSIONS
LOW CHANNEL – 30 MHz to 800 MHz – 2-17-2010



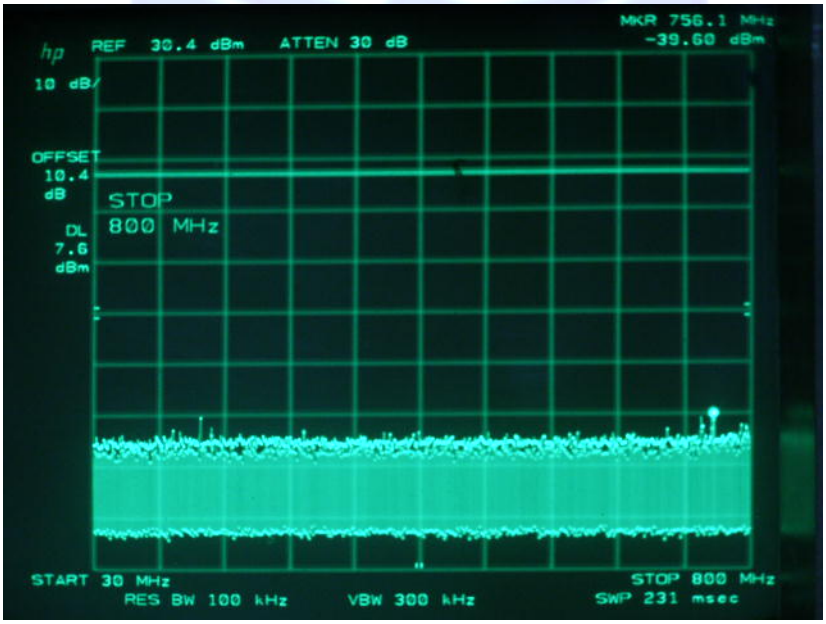
SPURIOUS RF CONDUCTED EMISSIONS
LOW CHANNEL – 800 MHz to 2 GHz – 2-17-2010



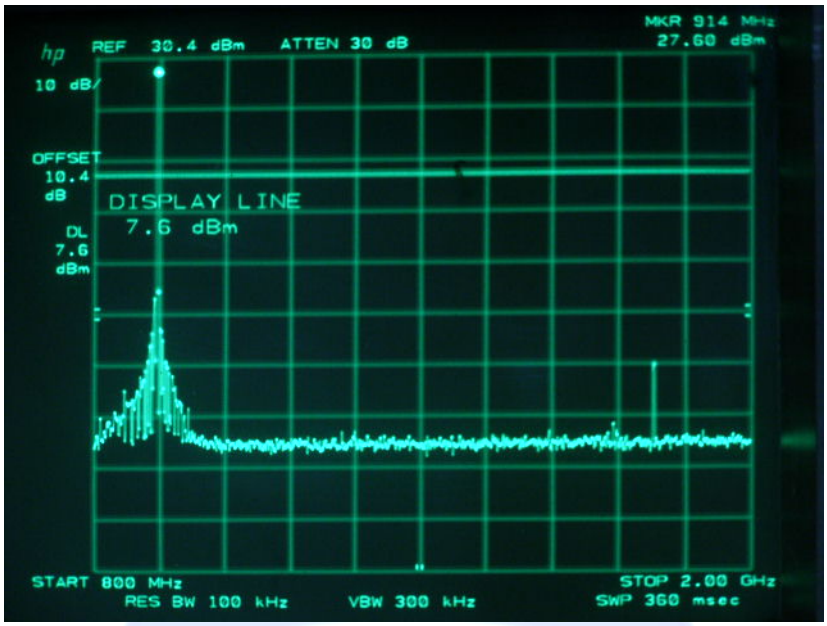
SPURIOUS RF CONDUCTED EMISSIONS
LOW CHANNEL – 2 GHz to 10 GHz – 2-17-2010



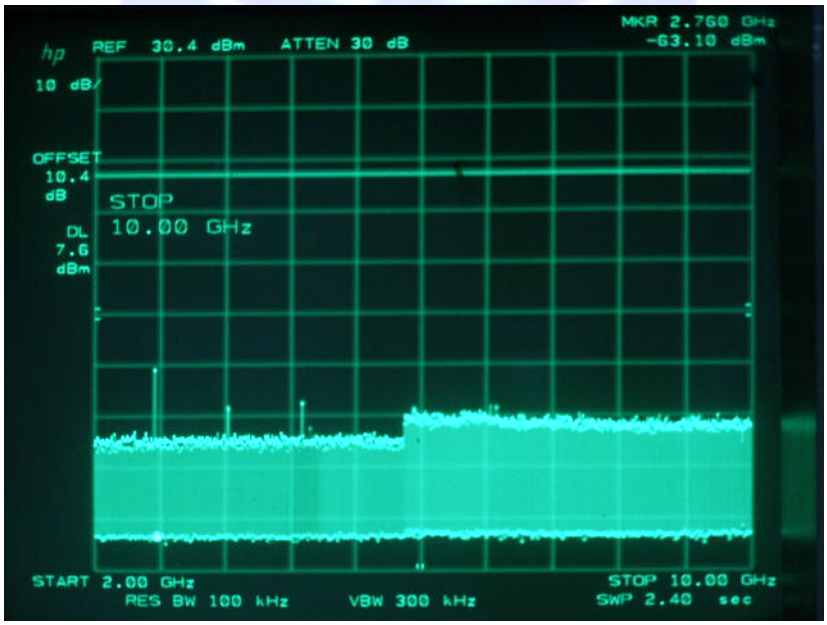
SPURIOUS RF CONDUCTED EMISSIONS
MIDDLE CHANNEL – 10 kHz to 30 MHz – 2-17-2010



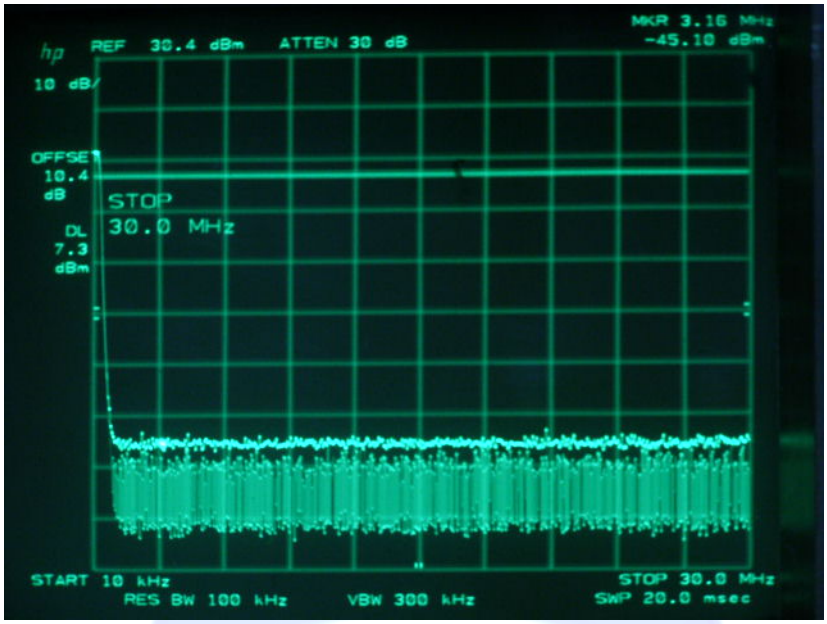
SPURIOUS RF CONDUCTED EMISSIONS
MIDDLE CHANNEL – 30 MHz to 800 MHz – 2-17-2010



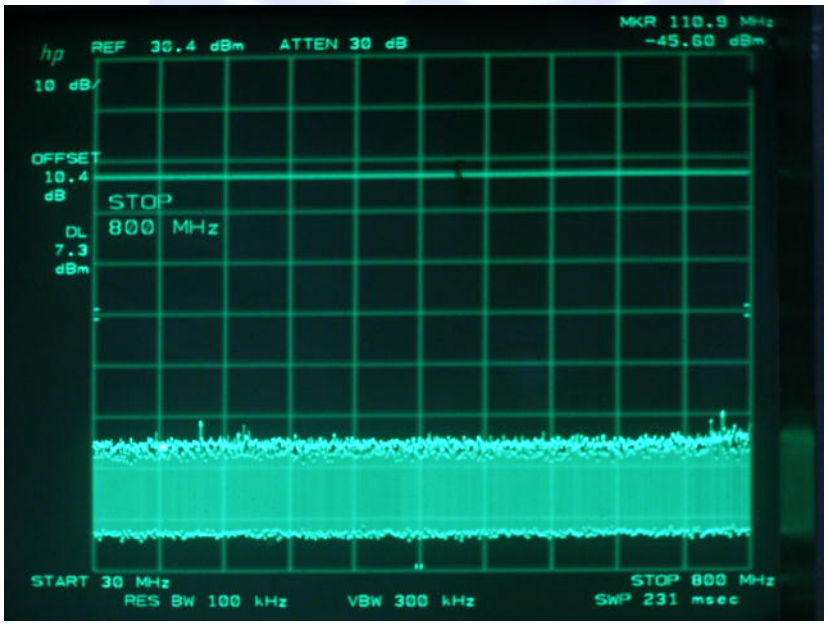
SPURIOUS RF CONDUCTED EMISSIONS
MIDDLE CHANNEL – 800 MHz to 2 GHz – 2-17-2010



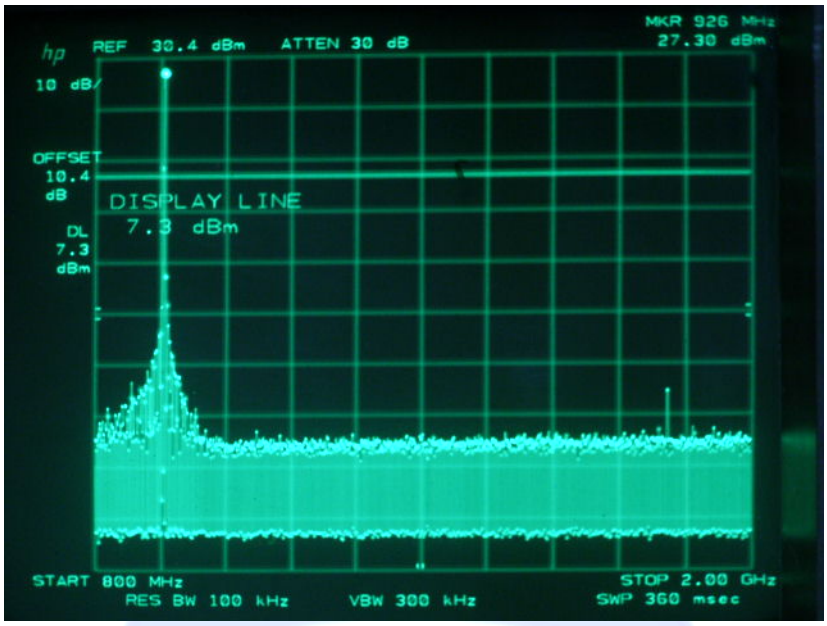
SPURIOUS RF CONDUCTED EMISSIONS
MIDDLE CHANNEL – 2 GHz to 10 GHz – 2-17-2010



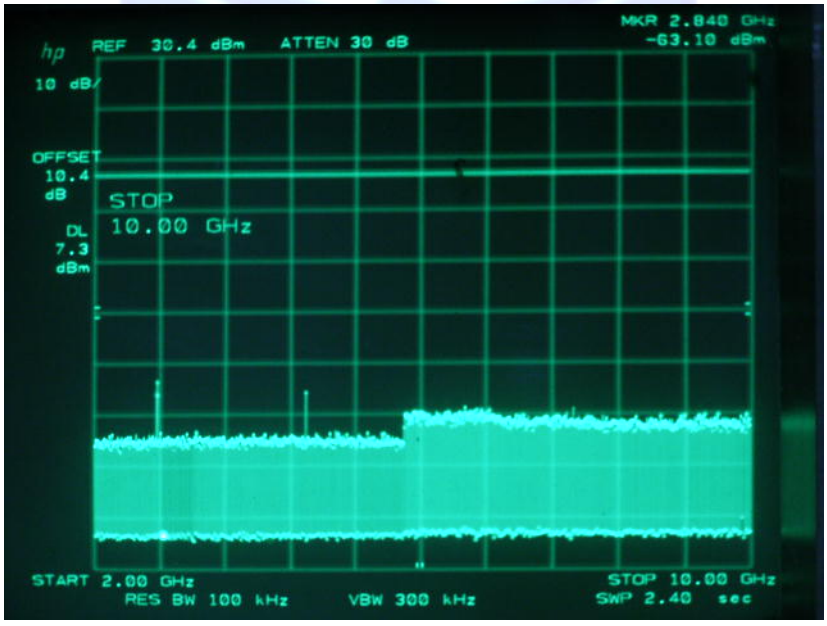
SPURIOUS RF CONDUCTED EMISSIONS
HIGH CHANNEL – 10 kHz to 30 MHz – 2-17-2010



SPURIOUS RF CONDUCTED EMISSIONS
HIGH CHANNEL – 30 MHz to 800 MHz – 2-17-2010



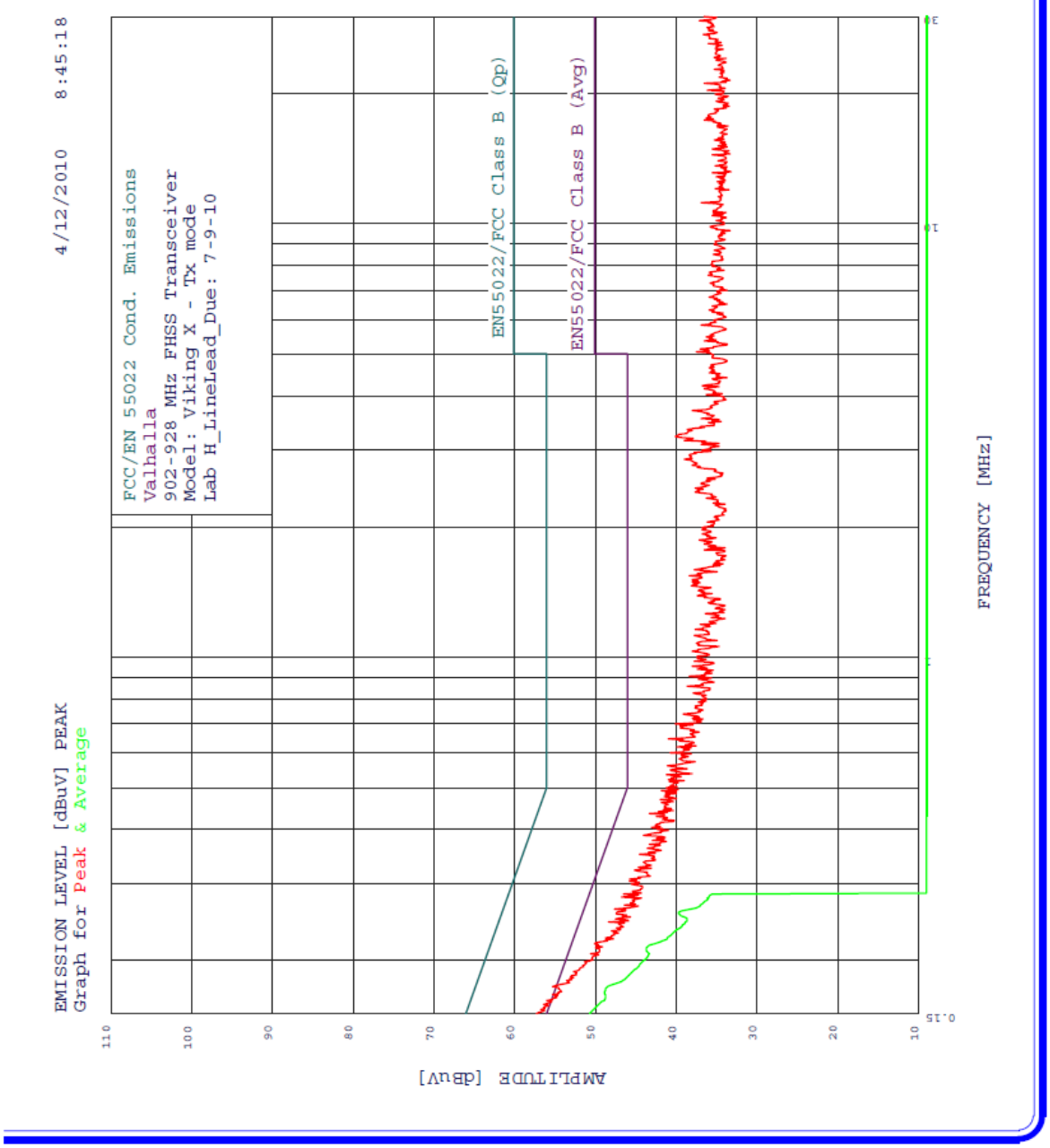
SPURIOUS RF CONDUCTED EMISSIONS
HIGH CHANNEL – 800 MHz to 2 GHz – 2-17-2010



SPURIOUS RF CONDUCTED EMISSIONS
HIGH CHANNEL – 2 GHz to 10 GHz – 2-17-2010

CONDUCTED EMISSIONS

DATA SHEETS


4/12/2010 8:45:18
FCC/EN 55022 Cond. Emissions
Valhalla
902-928 MHz FHSS Transceiver
Model: Viking X - Tx mode
Lab H_LineLead_Due: 7-9-10
EN55022/FCC Class B (Qp)
EN55022/FCC Class B (Avg)
EMISSION LEVEL [dBuV] PEAK
Graph for Peak & Average
AMPLITUDE [dBuV]
FREQUENCY [MHz]
110
100
90
80
70
60
50
40
30
20
10
0.15

page 1/1

COMPATIBLE ELECTRONICS

4/12/2010 8:45:18

Valhalla
902-928 MHz FHSS Transceiver
Model: Viking X - Tx mode
Black Lead - 115 VAC
TEST ENGINEER :_____
Scott McCutchan

30 highest peaks above -50.00 dB of EN55022/FCC Class B (Avg) limit line
Peak criteria : 1.00 dB, Curve : Peak

Peak#	Freq(MHz)	Amp(dBuV)	Limit(dB)	Delta(dB)	
1	0.173	55.19	54.81	0.38	*
2	0.244	48.30	51.95	-3.65	*
3	0.262	47.59	51.38	-3.78	*
4	0.435	43.26	47.15	-3.89	
5	0.387	44.07	48.12	-4.05	
6	0.279	46.69	50.85	-4.16	*
7	0.255	47.40	51.60	-4.20	*
8	0.283	46.49	50.72	-4.22	*
9	0.492	41.85	46.14	-4.29	*
10	0.248	47.50	51.82	-4.32	
11	0.304	45.79	50.14	-4.36	
12	0.350	44.48	48.95	-4.48	
13	0.322	45.18	49.66	-4.48	
14	0.469	41.96	46.53	-4.58	
15	0.299	45.49	50.28	-4.79	
16	0.404	42.97	47.77	-4.80	
17	0.267	46.39	51.20	-4.80	*
18	0.500	41.15	46.01	-4.86	
19	0.535	41.14	46.00	-4.86	
20	0.440	42.16	47.06	-4.90	
21	0.461	41.76	46.67	-4.91	
22	0.428	42.36	47.28	-4.92	
23	0.327	44.58	49.53	-4.94	
24	0.476	41.45	46.40	-4.95	
25	0.561	41.04	46.00	-4.96	
26	0.486	41.25	46.23	-4.98	
27	0.521	40.95	46.00	-5.05	
28	0.648	40.92	46.00	-5.08	
29	0.288	45.39	50.58	-5.19	
30	0.362	43.48	48.69	-5.22	

* see average readings

page 1/1

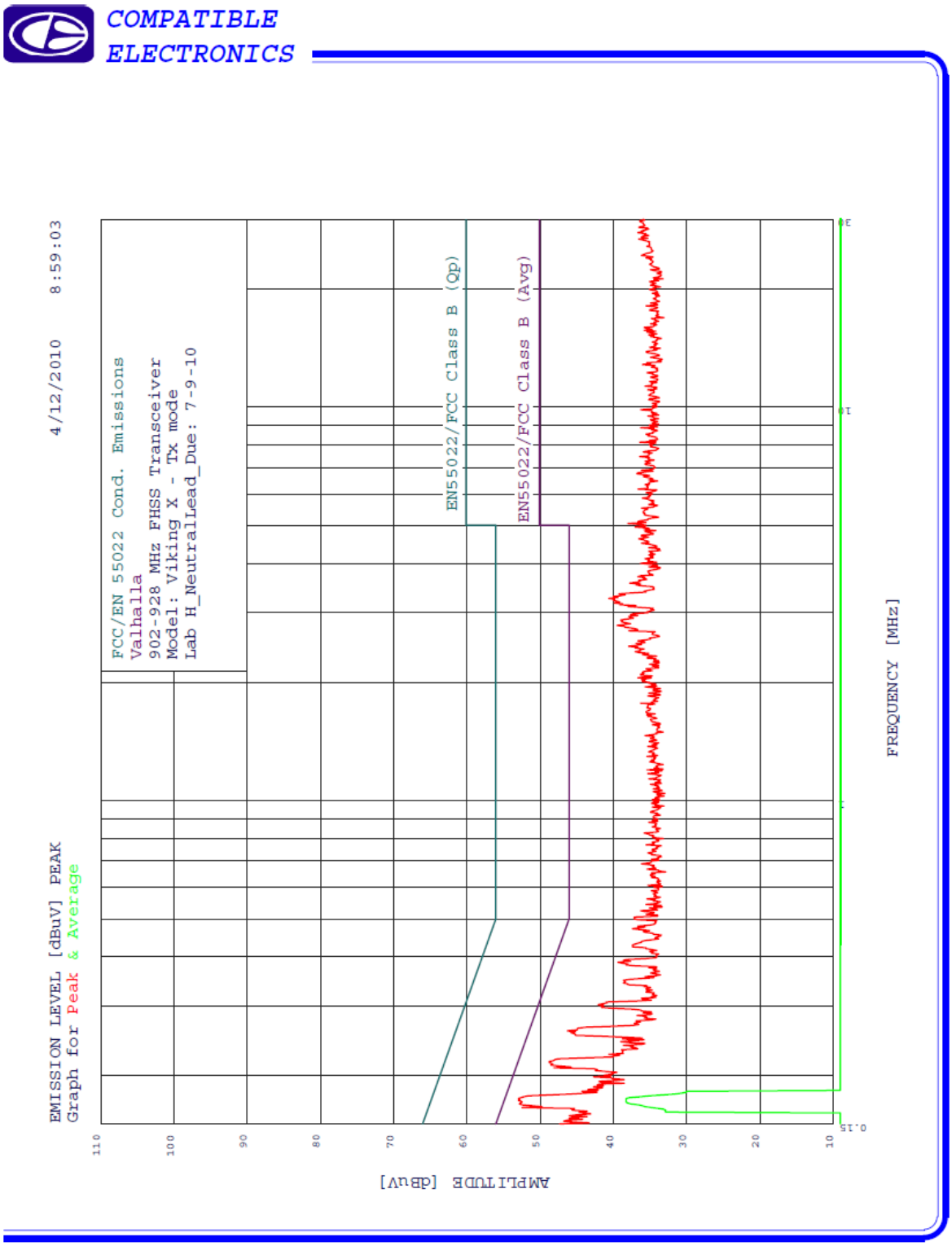
COMPATIBLE ELECTRONICS 4/12/2010 8:45:18

Valhalla
902-928 MHz FHSS Transceiver
Model: Viking X - Tx mode
Black Lead - 115 VAC
TEST ENGINEER :_____
Scott McCutchan

---

4 highest peaks above -50.00 dB of EN55022/FCC Class B (Avg) limit line
Peak criteria : 0.10 dB, Curve : Average

Peak#	Freq(MHz)	Amp(dBuV)	Limit(dB)	Delta(dB)
1	0.150	50.67	56.00	-5.33
2	0.168	48.84	55.07	-6.23
3	0.210	43.65	53.23	-9.57
4	0.256	39.69	51.55	-11.87


COMPATIBLE
ELECTRONICS
4/12/2010 8:59:03
FCC/EN 55022 Cond. Emissions
Valhalla
902-928 MHz FHSS Transceiver
Model: Viking X - Tx mode
Lab H_NeutralLead_Due: 7-9-10
EN55022/FCC Class B (Qp)
EN55022/FCC Class B (Avg)
EMISSION LEVEL [dBuV] PEAK
Graph for Peak & Average
AMPLITUDE [dBuV]
FREQUENCY [MHz]
110
100
90
80
70
60
50
40
30
20
10
0.15

page 1/1

COMPATIBLE ELECTRONICS

4/12/2010 8:59:03

Valhalla
902-928 MHz FHSS Transceiver
Model: Viking X - Tx mode
White Lead - 115 VAC
TEST ENGINEER :_____
Scott McCutchan

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31 highest peaks above -50.00 dB of EN55022/FCC Class B (Avg) limit line
Peak criteria : 1.00 dB, Curve : Peak

Peak#	Freq(MHz)	Amp(dBuV)	Limit(dB)	Delta(dB)	
1	0.174	52.89	54.77	-1.87	*
2	0.165	52.39	55.20	-2.81	*
3	0.215	48.70	53.00	-4.30	
4	0.208	48.10	53.27	-5.16	
5	0.259	46.29	51.47	-5.17	
6	3.260	40.58	46.00	-5.42	
7	2.781	39.48	46.00	-6.52	
8	2.870	38.98	46.00	-7.02	
9	3.107	37.98	46.00	-8.02	
10	0.302	42.09	50.19	-8.10	
11	2.462	37.88	46.00	-8.12	
12	2.693	37.88	46.00	-8.12	
13	3.565	37.78	46.00	-8.22	
14	0.150	47.28	56.00	-8.72	
15	0.387	39.37	48.12	-8.75	
16	0.500	37.15	46.01	-8.86	
17	2.384	36.98	46.00	-9.02	
18	4.954	36.96	46.00	-9.04	
19	0.152	46.78	55.86	-9.08	
20	0.471	37.35	46.49	-9.14	
21	2.055	36.58	46.00	-9.42	
22	3.702	36.58	46.00	-9.42	
23	4.624	36.47	46.00	-9.53	
24	0.157	45.99	55.60	-9.61	
25	2.077	36.28	46.00	-9.72	
26	4.008	36.28	46.00	-9.72	
27	0.155	45.98	55.73	-9.75	
28	0.524	36.24	46.00	-9.76	
29	1.763	36.23	46.00	-9.77	
30	0.690	36.11	46.00	-9.89	
31	2.023	36.08	46.00	-9.92	

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* see average readings

COMPATIBLE ELECTRONICS

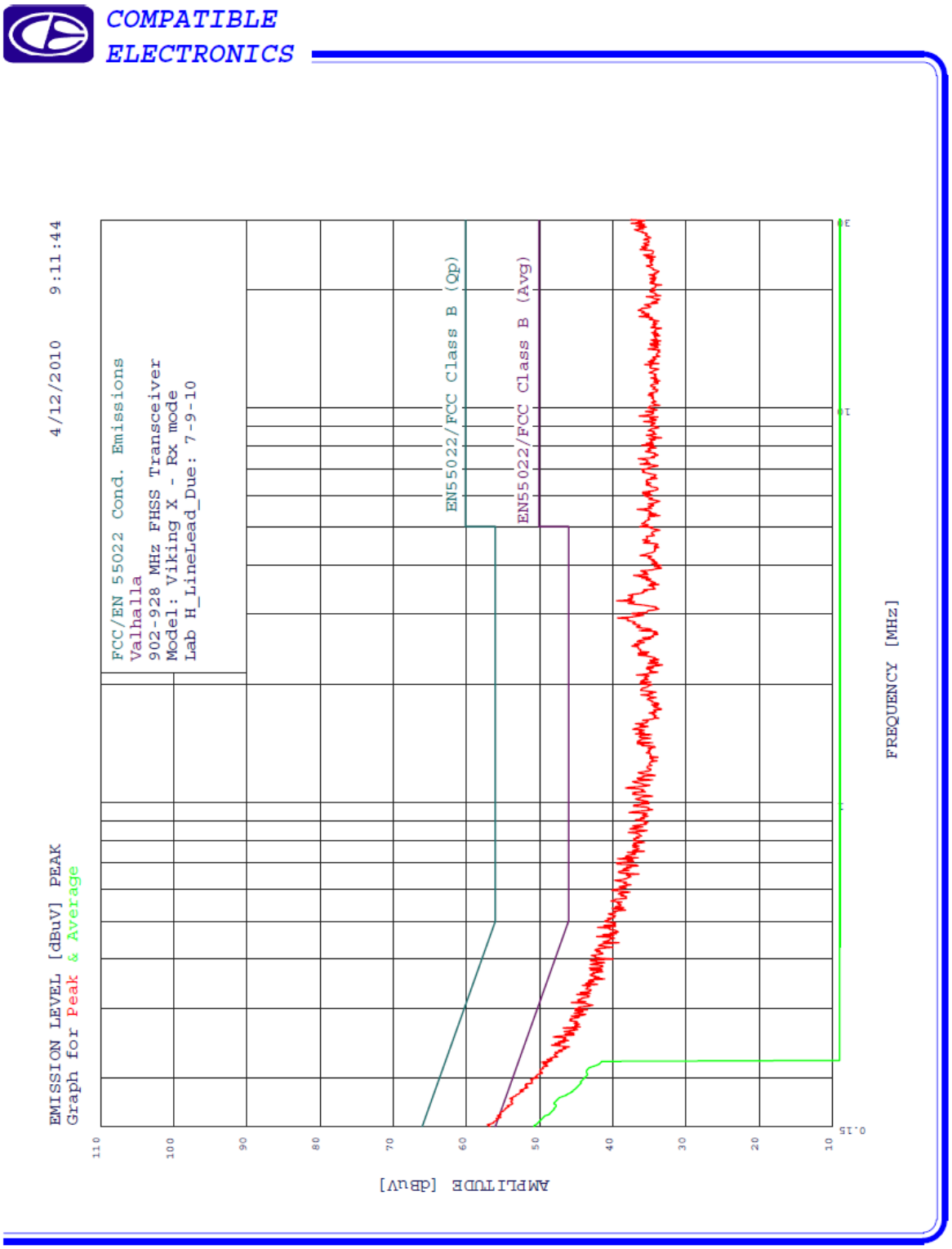
4/12/2010 8:59:03

Valhalla
902-928 MHz FHSS Transceiver
Model: Viking X - Tx mode
White Lead - 115 VAC
TEST ENGINEER :_____
Scott McCutchan

---

3 highest peaks above -50.00 dB of EN55022/FCC Class B (Avg) limit line
Peak criteria : 0.10 dB, Curve : Average

Peak#	Freq(MHz)	Amp(dBuV)	Limit(dB)	Delta(dB)
1	0.171	38.25	54.90	-16.65
2	0.162	32.88	55.38	-22.50
3	0.150	0.00	56.00	-56.00


COMPATIBLE
ELECTRONICS
4/12/2010 9:11:44
FCC/EN 55022 Cond. Emissions
Valhalla
902-928 MHz FHSS Transceiver
Model: Viking X - Rx mode
Lab H_LineLead_Due: 7-9-10
EN55022/FCC Class B (Qp)
EN55022/FCC Class B (Avg)
EMISSION LEVEL [dBuV] PEAK
Graph for Peak & Average
FREQUENCY [MHz]
AMPLITUDE [dBuV]
110
100
90
80
70
60
50
40
30
20
10
0.15

COMPATIBLE ELECTRONICS

4/12/2010 9:11:44

Valhalla
902-928 MHz FHSS Transceiver
Model: Viking X - Rx mode
Black Lead - 115 VAC
TEST ENGINEER :_____
Scott McCutchan

31 highest peaks above -50.00 dB of EN55022/FCC Class B (Avg) limit line
Peak criteria : 1.00 dB, Curve : Peak

Peak#	Freq(MHz)	Amp(dBuV)	Limit(dB)	Delta(dB)
1	0.150	56.68	56.00	0.68 *
2	0.254	48.10	51.64	-3.54
3	0.242	48.30	52.04	-3.74
4	0.481	42.05	46.32	-4.26
5	0.310	45.59	49.97	-4.38
6	0.267	46.69	51.20	-4.50
7	0.457	42.16	46.76	-4.60
8	0.325	44.88	49.57	-4.69
9	0.262	46.59	51.38	-4.78
10	0.409	42.87	47.68	-4.81
11	0.398	42.97	47.90	-4.93
12	0.343	44.18	49.13	-4.96
13	0.500	41.05	46.01	-4.96
14	0.279	45.89	50.85	-4.96
15	0.258	46.50	51.51	-5.01
16	0.286	45.59	50.63	-5.04
17	0.387	43.07	48.12	-5.05
18	0.315	44.78	49.84	-5.05
19	0.421	42.36	47.42	-5.05
20	0.486	41.15	46.23	-5.08
21	0.329	44.38	49.48	-5.10
22	0.379	43.17	48.29	-5.12
23	0.299	45.09	50.28	-5.19
24	0.433	41.96	47.19	-5.23
25	0.296	45.09	50.36	-5.28
26	0.291	45.19	50.49	-5.31
27	0.461	41.36	46.67	-5.31
28	0.347	43.68	49.04	-5.37
29	0.375	42.97	48.38	-5.41
30	0.365	43.08	48.61	-5.53
31	0.442	41.26	47.02	-5.76

* see average readings

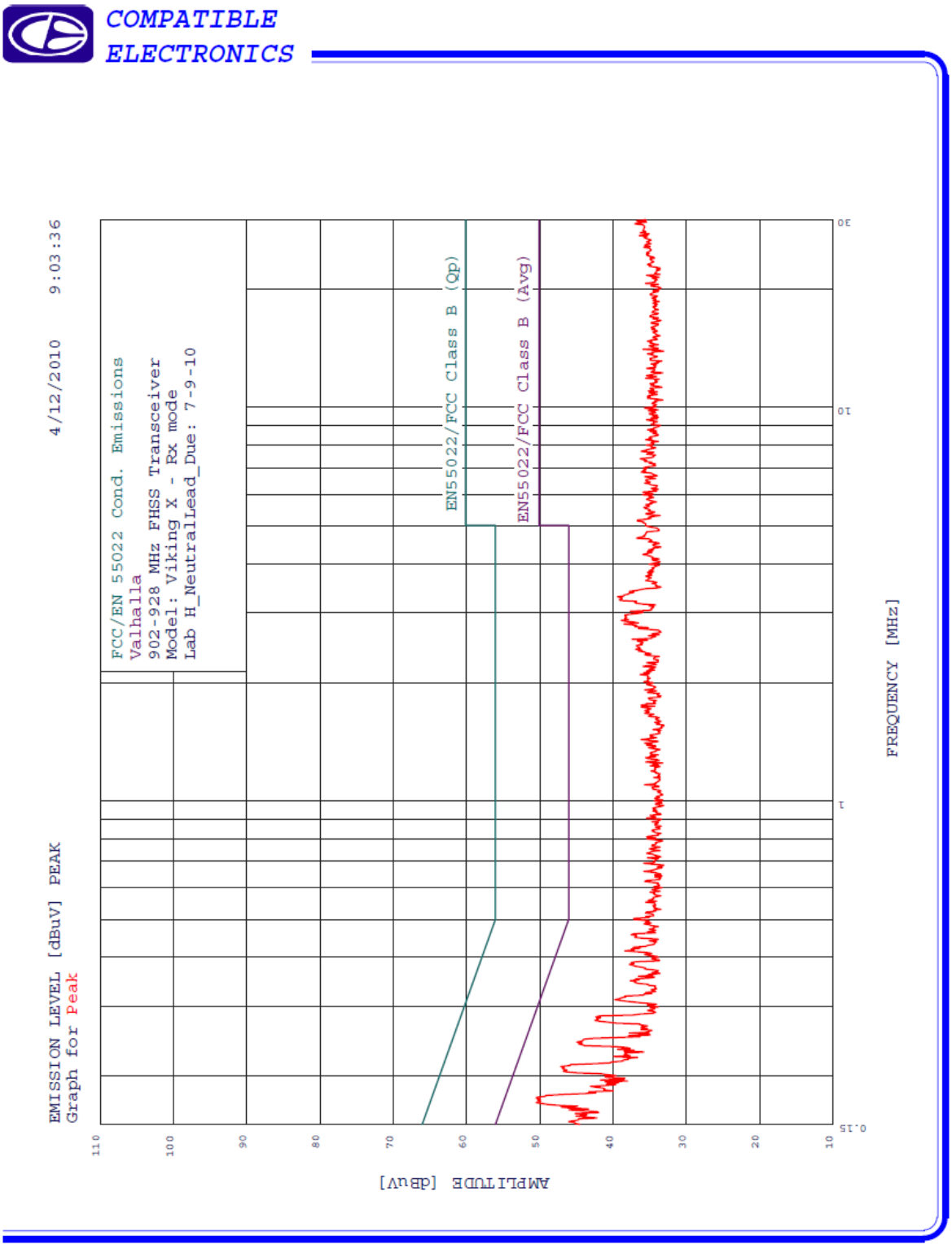
page 1/1

COMPATIBLE ELECTRONICS 4/12/2010 9:11:44

Valhalla
902-928 MHz FHSS Transceiver
Model: Viking X - Rx mode
Black Lead - 115 VAC
TEST ENGINEER :_____
Scott McCutchan

3 highest peaks above -50.00 dB of EN55022/FCC Class B (Avg) limit line
Peak criteria : 0.10 dB, Curve : Average

Peak#	Freq(MHz)	Amp(dBuV)	Limit(dB)	Delta(dB)
1	0.150	50.68	56.00	-5.32
2	0.171	47.92	54.90	-6.97
3	0.195	44.39	53.84	-9.45


COMPATIBLE
ELECTRONICS
4/12/2010 9:03:36
FCC/EN 55022 Cond. Emissions
Valhalla
902-928 MHz FHSS Transceiver
Model: Viking X - Rx mode
Lab H_NeutralLead_Due: 7-9-10
EN55022/FCC Class B (Qp)
EN55022/FCC Class B (Avg)
EMISSION LEVEL [dBuV] PEAK
Graph for Peak
AMPLITUDE [dBuV]
FREQUENCY [MHz]
110
100
90
80
70
60
50
40
30
20
10
30
10
1
0.15

COMPATIBLE ELECTRONICS

4/12/2010 9:03:36

Valhalla
902-928 MHz FHSS Transceiver
Model: Viking X - Rx mode
White Lead - 115 VAC
TEST ENGINEER :_____
Scott McCutchan

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31 highest peaks above -50.00 dB of EN55022/FCC Class B (Avg) limit line
Peak criteria : 1.00 dB, Curve : Peak

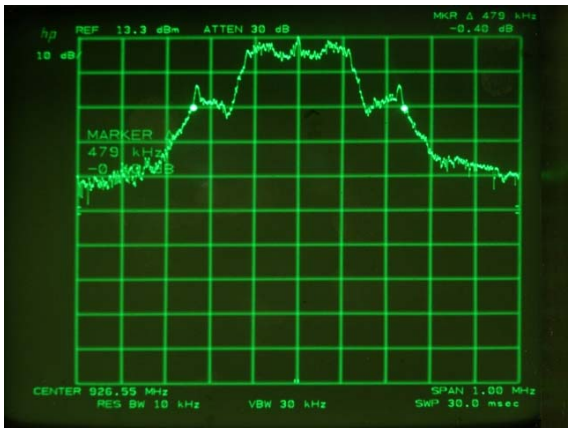
Peak#	Freq(MHz)	Amp(dBuV)	Limit(dB)	Delta(dB)
1	0.170	50.49	54.94	-4.45
2	0.211	47.10	53.18	-6.08
3	3.294	39.28	46.00	-6.72
4	0.243	44.90	52.00	-7.10
5	2.870	38.78	46.00	-7.22
6	2.811	38.48	46.00	-7.52
7	0.166	46.99	55.16	-8.17
8	3.027	37.58	46.00	-8.42
9	0.276	42.39	50.94	-8.55
10	2.568	37.38	46.00	-8.62
11	0.500	37.15	46.01	-8.86
12	2.423	36.88	46.00	-9.12
13	0.415	38.36	47.55	-9.18
14	4.648	36.77	46.00	-9.23
15	0.457	37.46	46.76	-9.30
16	0.163	45.99	55.29	-9.30
17	2.736	36.48	46.00	-9.52
18	2.089	36.28	46.00	-9.72
19	1.745	36.12	46.00	-9.88
20	0.152	45.98	55.86	-9.88
21	1.726	36.12	46.00	-9.88
22	1.434	36.05	46.00	-9.95
23	2.190	35.88	46.00	-10.12
24	4.227	35.87	46.00	-10.13
25	0.312	39.68	49.92	-10.24
26	0.662	35.72	46.00	-10.28
27	0.694	35.71	46.00	-10.29
28	1.100	35.67	46.00	-10.33
29	1.404	35.64	46.00	-10.36
30	0.624	35.62	46.00	-10.38
31	0.150	44.48	56.00	-11.52

-20 dB BANDWIDTH

DATA SHEETS

-20 dB Bandwidth – LOW CHANNEL – 3-3-2010

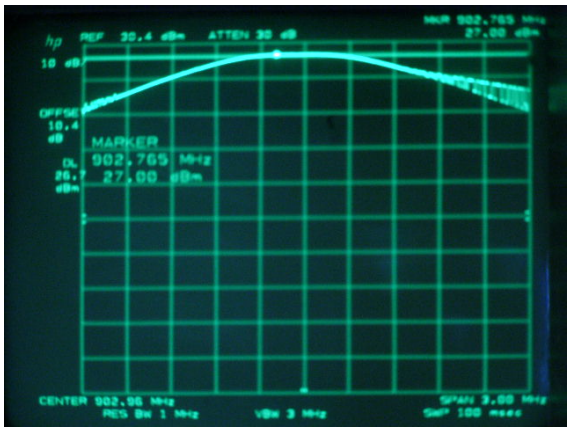
-20 dB Bandwidth – MIDDLE CHANNEL – 4-9-2010



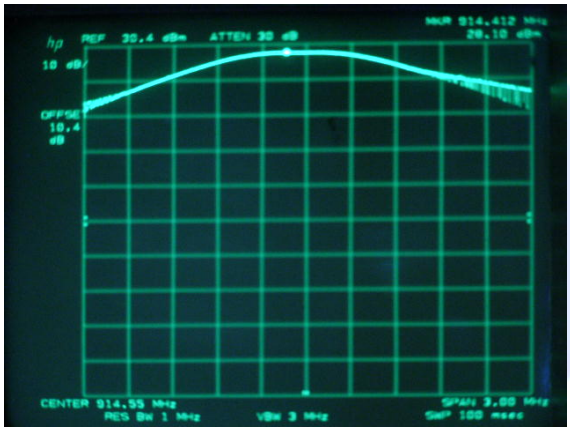
-20 dB Bandwidth – HIGH CHANNEL – 3-3-2010

PEAK POWER OUTPUT

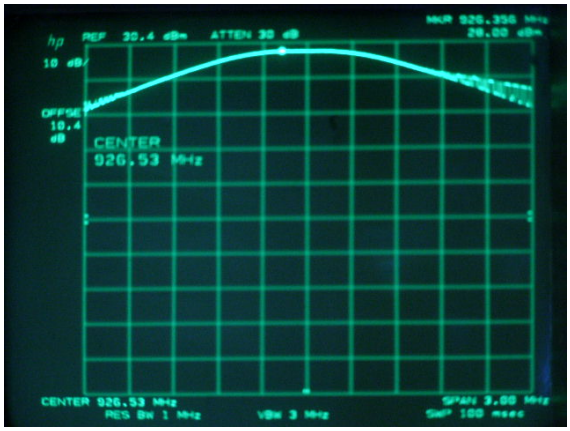
DATA SHEETS



Peak Power Output – LOW CHANNEL – 2-17-2010



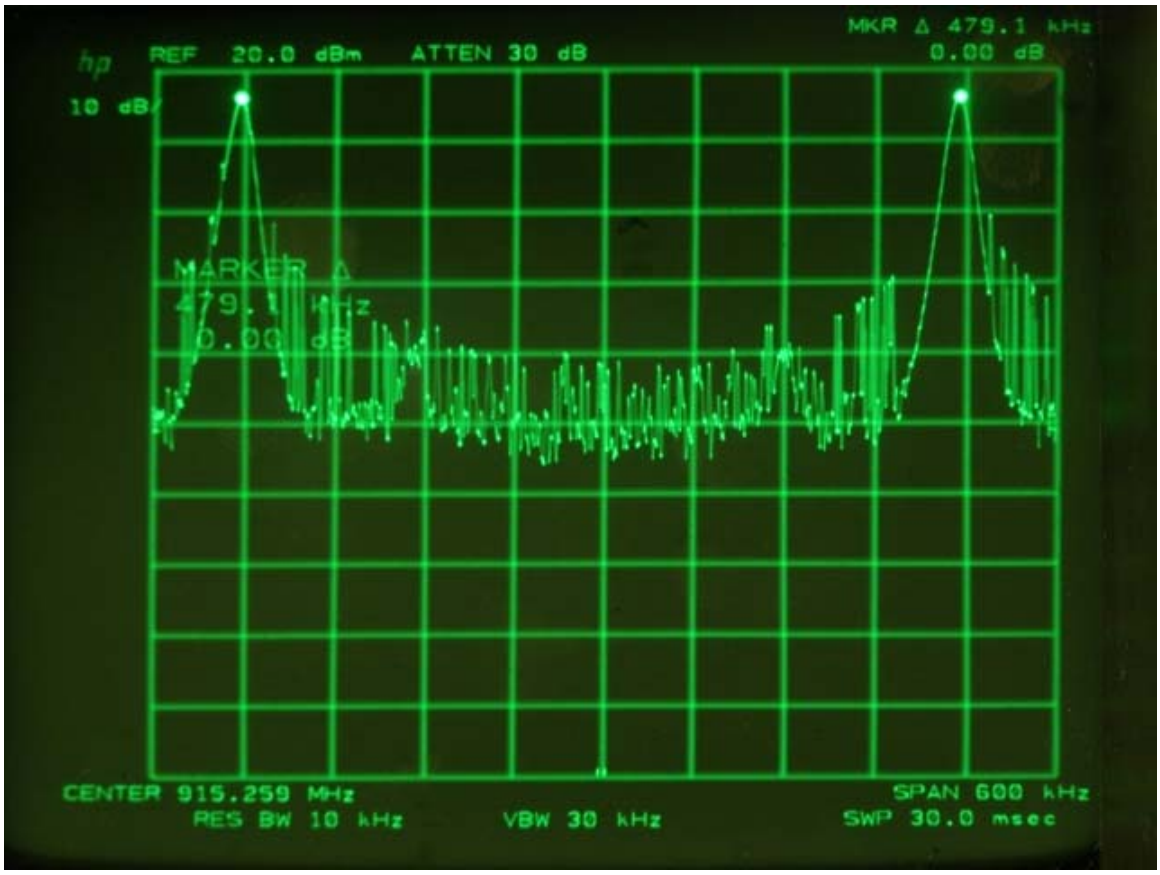
Peak Power Output – MIDDLE CHANNEL – 2-17-2010



Peak Power Output – HIGH CHANNEL – 2-17-2010

CARRIER FREQUENCY SEPARATION

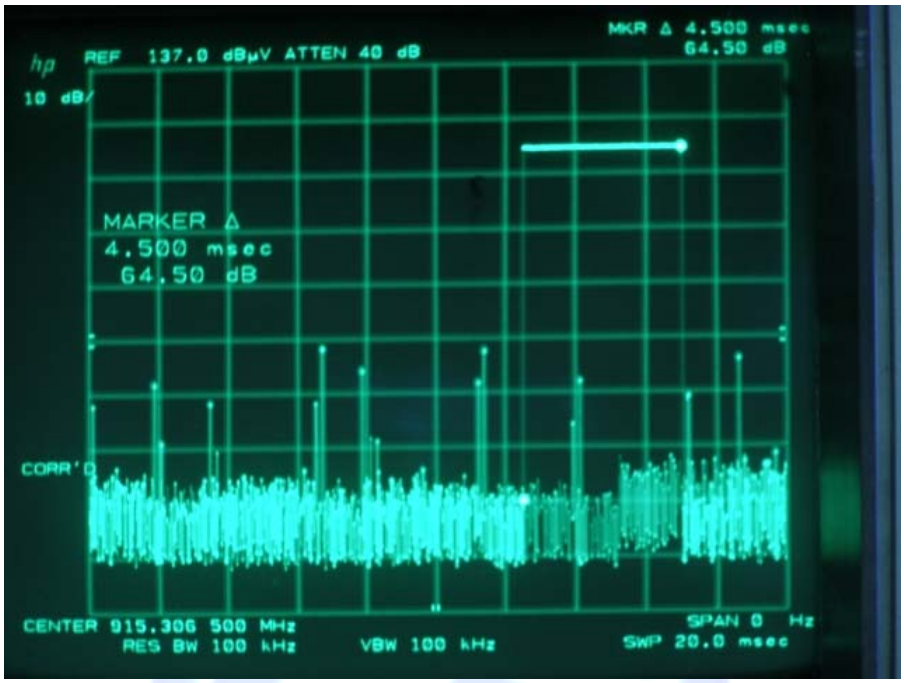
DATA SHEET



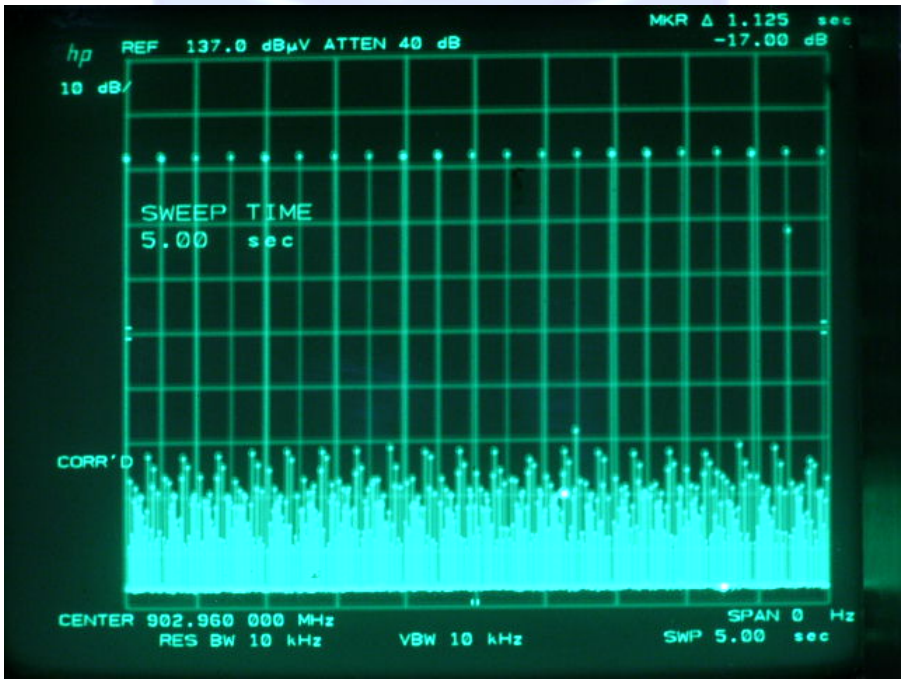
Carrier Frequency Separation – 3-3-2010

AVERAGE TIME OF OCCUPANCY

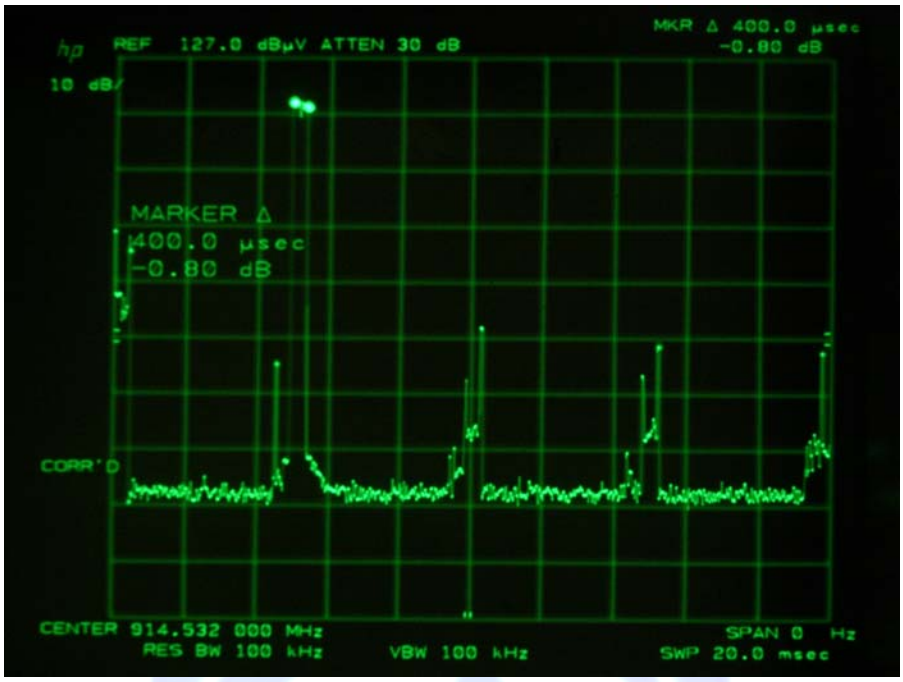
DATA SHEETS



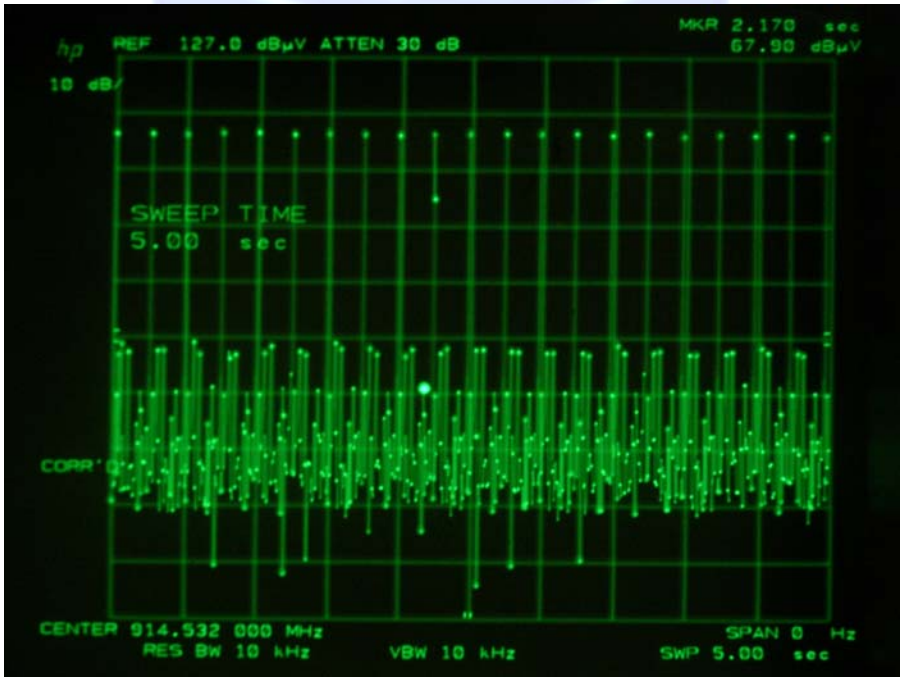
Dwell time per hopping channel (test mode) – 2-17-2010



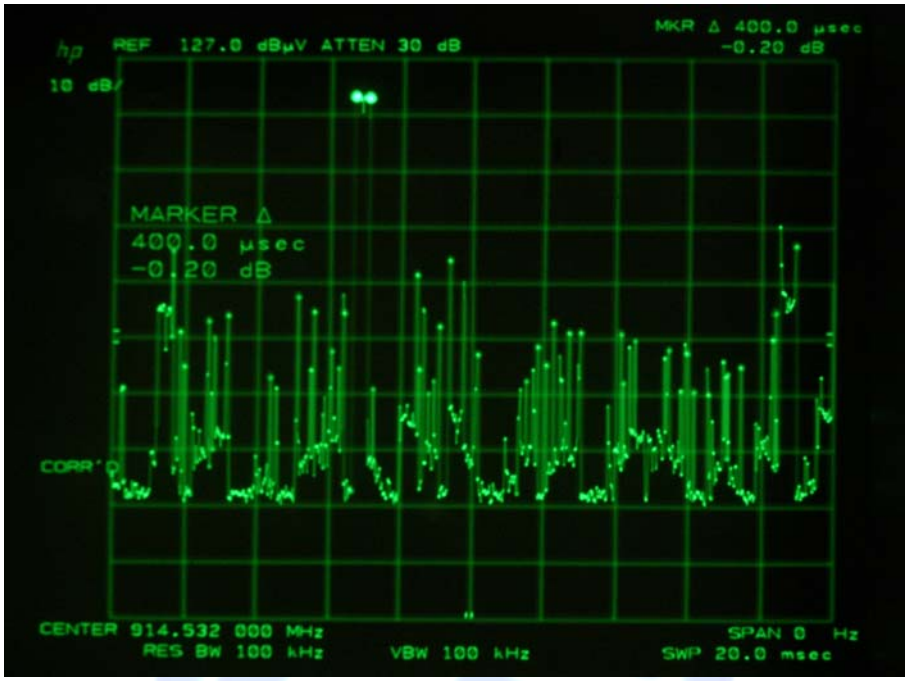
Number of channel hops in 5 seconds (test mode) – 2-17-2010



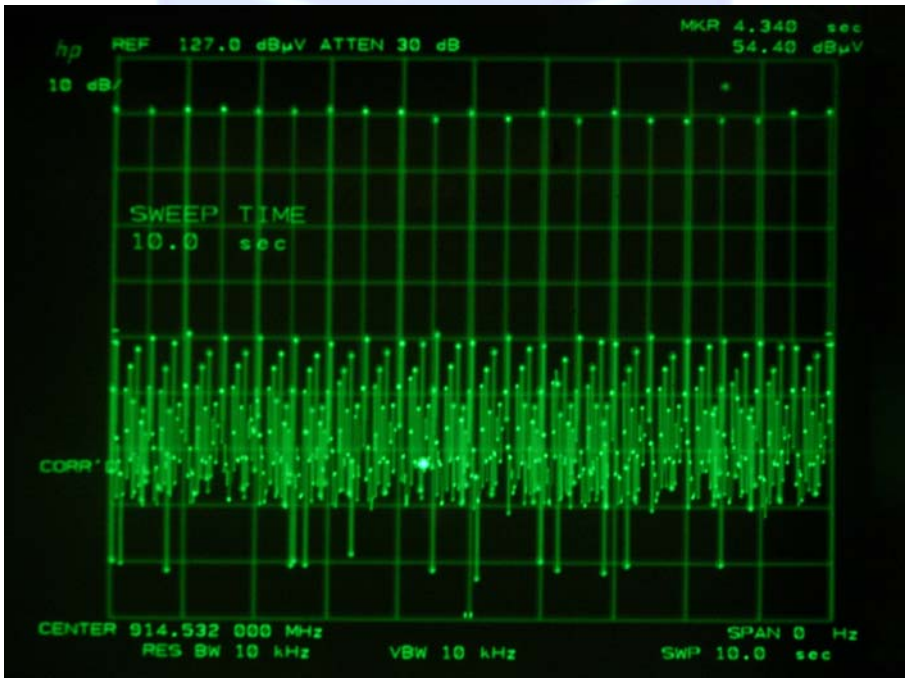
Dwell time per hopping channel (master mode) – 4-15-10



Number of channel hops in 5 seconds (master mode) – 2-17-2010



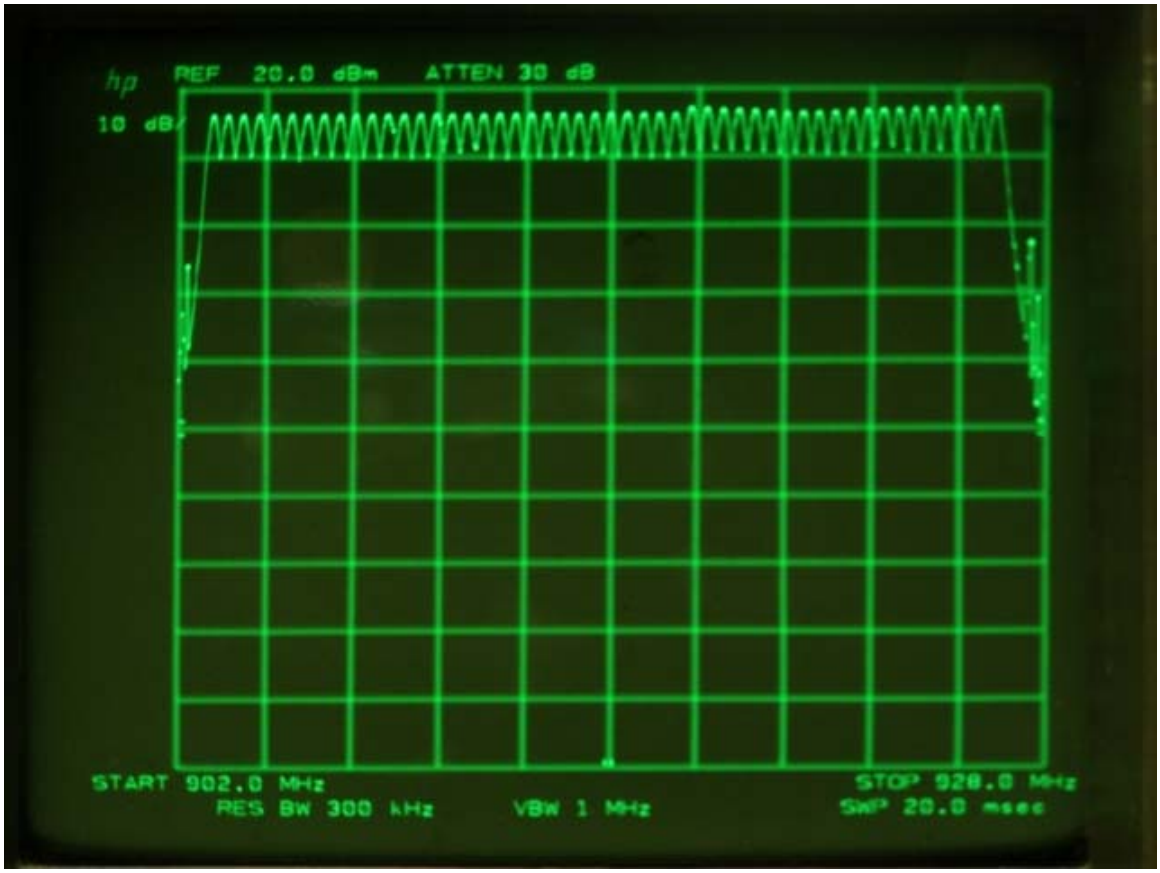
Dwell time per hopping channel (repeater mode) – 4-15-2010



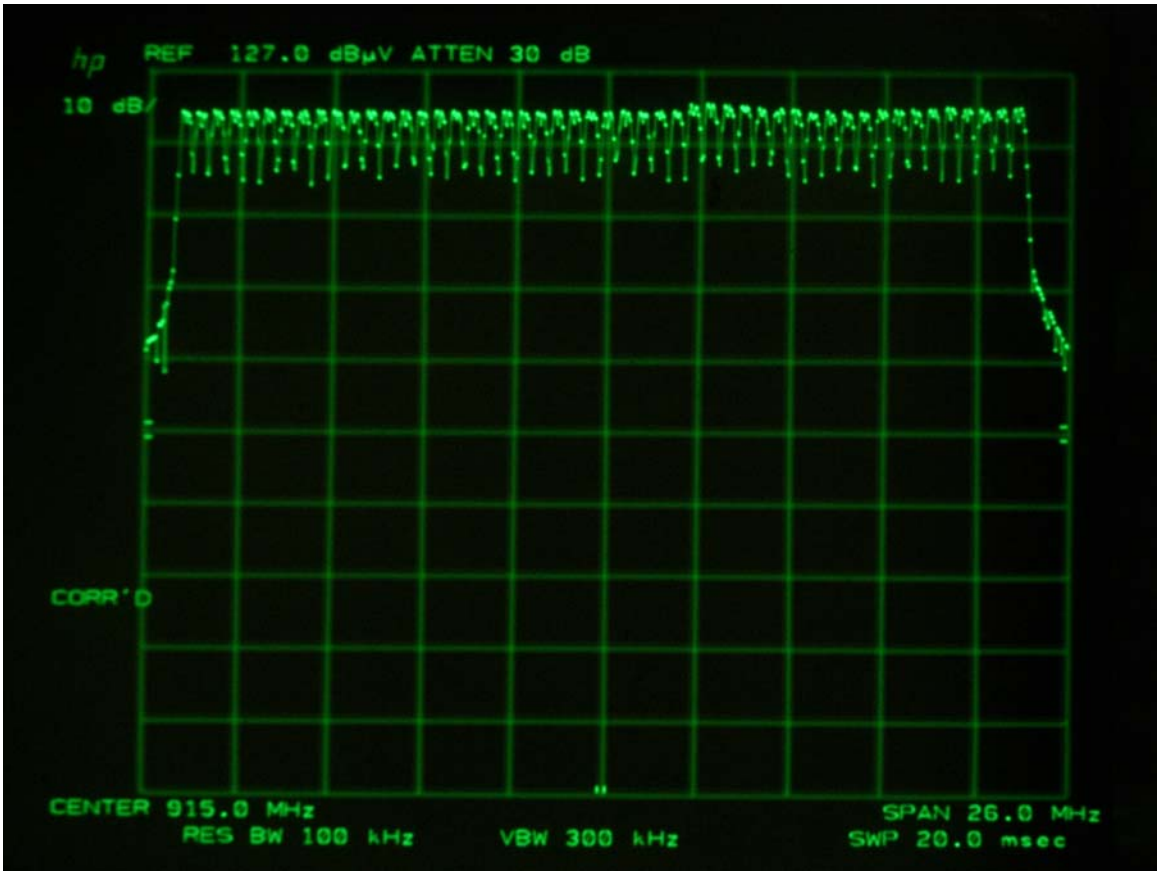
Number of channel hops in 10 seconds (repeater mode) – 4-15-2010

NUMBER OF HOPPING FREQUENCIES

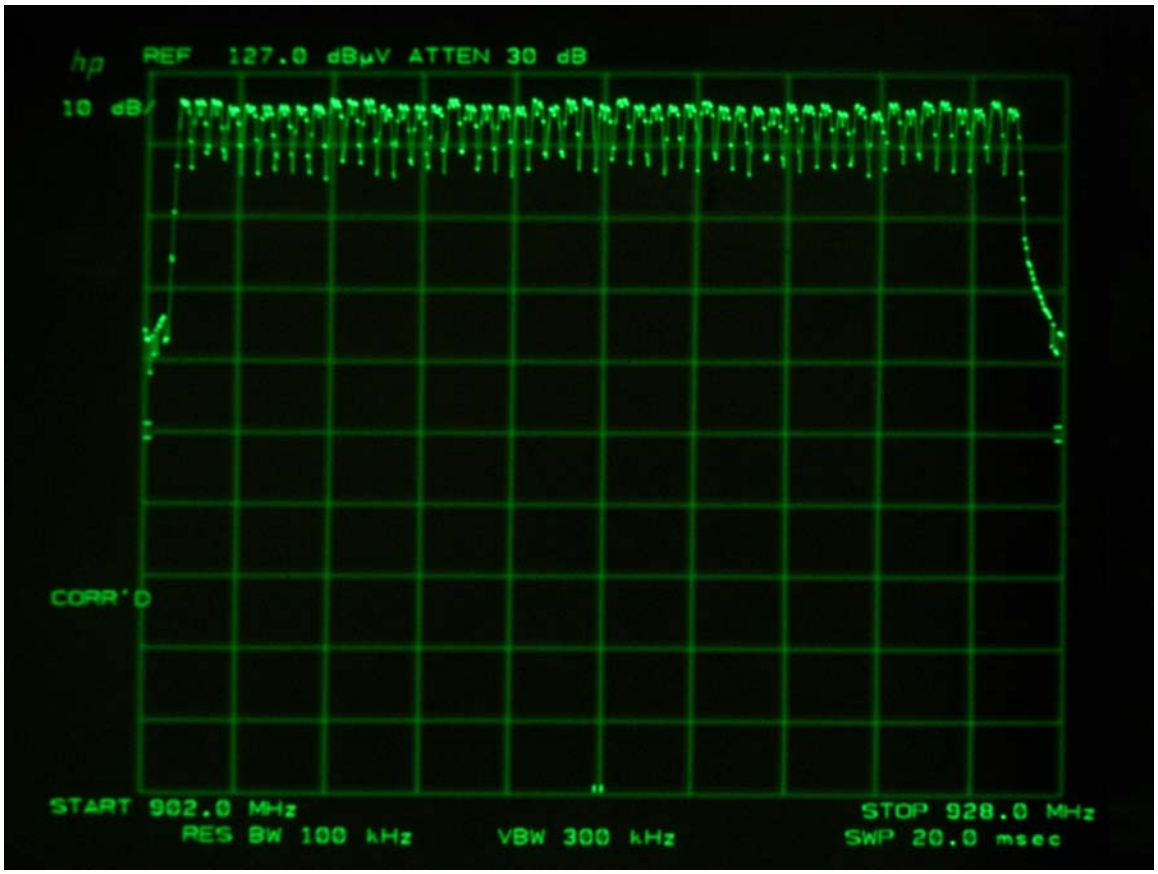
DATA SHEETS



Number of Hopping Channels (test mode) – 3-3-2010



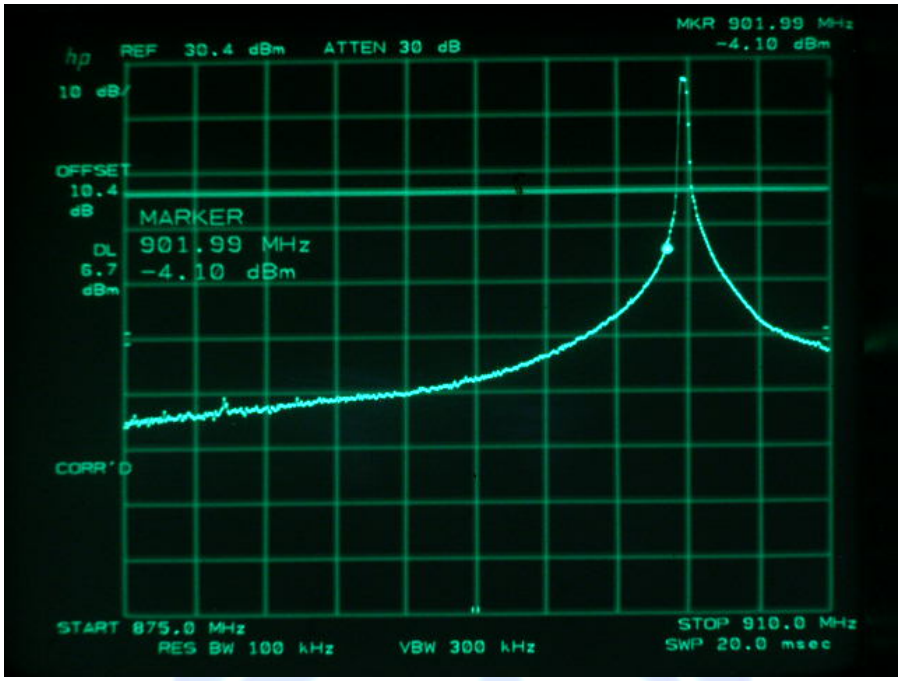
Number of Hopping Channels (master mode) – 4-15-2010



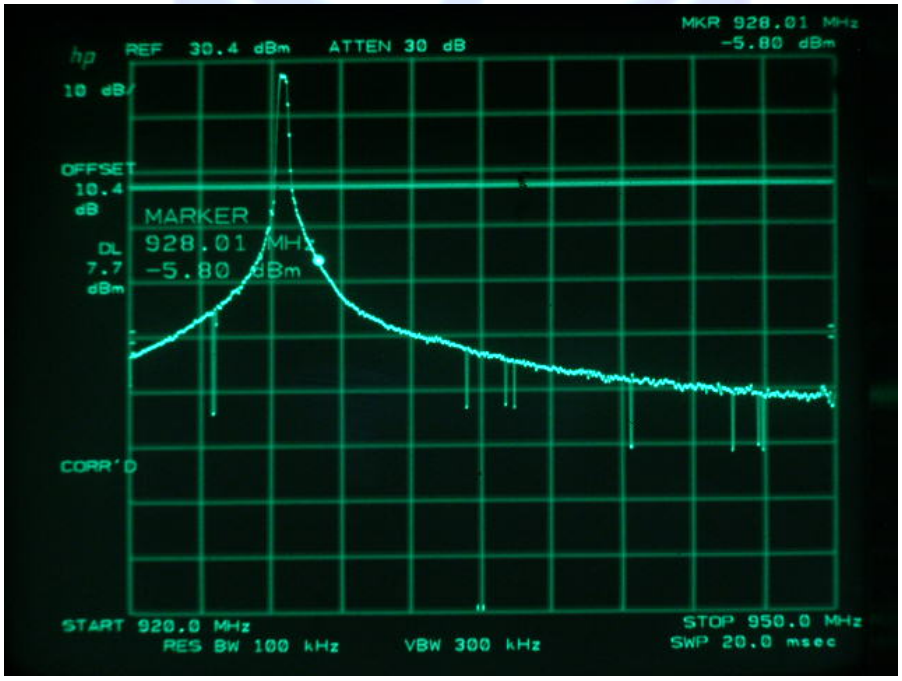
Number of Hopping Channels (repeater mode) – 4-15-2010

BAND EDGES

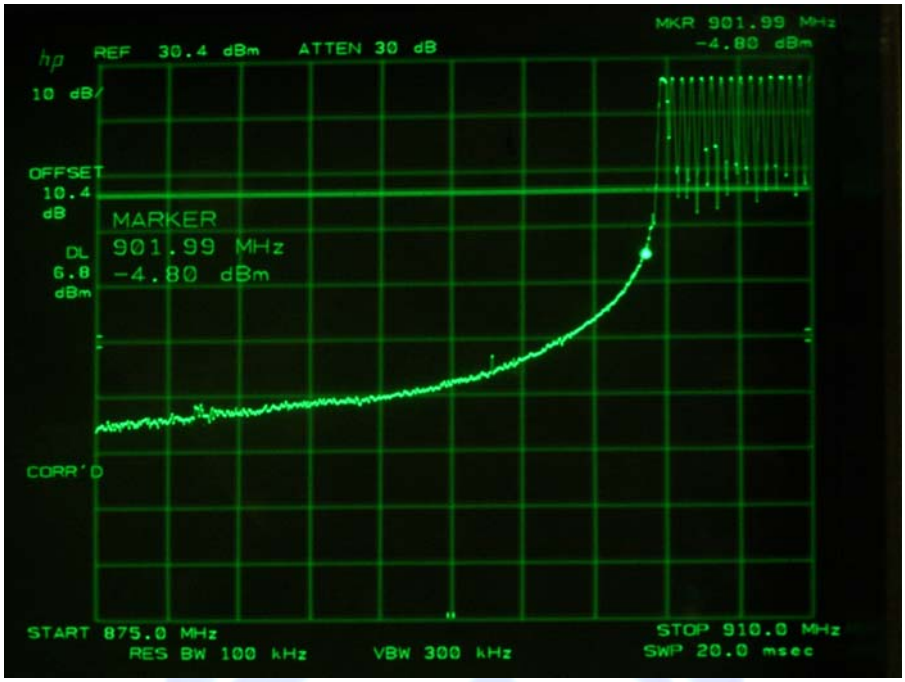
DATA SHEETS



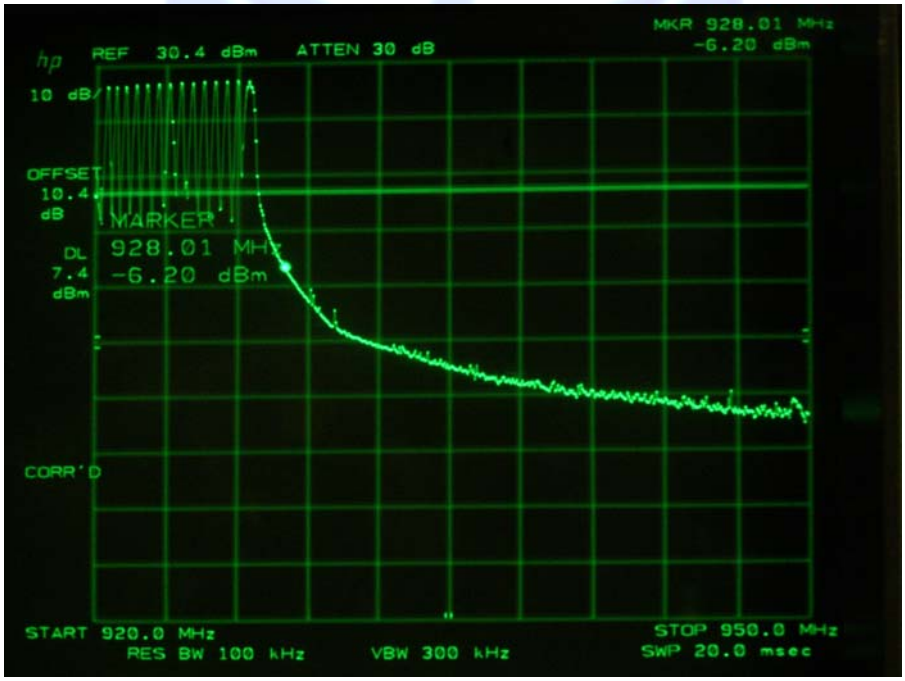
Band-edge of low channel (hopping mode halted) at 902 MHz – 2-17-2010



Band-edge of high channel (hopping mode halted) at 928 MHz – 2-17-2010



Band-edge of low channel (hopping mode enabled) at 902 MHz – 4-13-2010



Band-edge of high channel (hopping mode enabled) at 928 MHz – 4-13-2010