Emissions Test Report

EUT Name: Handheld Interrogator

EUT Model: PI900

FCC ID: G8JHHI03

FCC Title 47, Part 15, SubpartC, RSS-210 Issue 7

Prepared for:

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Report/Issue Date: 02 January 2007
Report Number: 30762512.001

Statement of Compliance

Manufacturer:	Elster Integrated Solutions, LLC 208 South Rogers Lane Raleigh, NC 27610 919 250-5700
Requester / Applicant:	John Casaer
Name of Equipment:	Handheld Interrogator
Operation Frequency Range	902.8 MHz to 927.6
Type of Equipment:	Intentional Radiator
Application of Regulations:	FCC Title 47, Part 15, SubpartC, RSS-210 Issue 7
Test Dates:	02 November 2006 to 28 November 2007

Guidance Documents:

Emissions: FCC 47 CFR Part 15, RSS-210 Issue 7

Test Methods:

Emissions: ANSI C63.4:2003

The electromagnetic compatibility test and documented data described in this report has been performed and recorded by TUV Rheinland of North America, in accordance with the standards and procedures listed herein. As the responsible authorized agent of the EMC laboratory, I hereby declare that a sample of one, of the equipment described above, has been shown to be compliant with the EMC requirements of the stated regulations and standards based on these results. If any special accessories and/or modifications were required for compliance, they are listed in the Executive Summary of this report.

This report must not be used to claim product endorsement by NVLAP or any agency of the U.S. Government. This report contains data that are not covered by NVLAP accreditation. This report shall not be reproduced except in full, without the written authorization of the laboratory.

Chris Eckert	14 December 2007	Michael Moranha	14 December 2007
Test Engineer	Date	NVLAP Signatory	Date

NVLAP	FCC	Industry Canada
200094-0	90552 and 100881	IC3755

200094-0

1 Executive Summary

1.1 Scope

This report is intended to document the status of conformance with the requirements of the FCC Title 47, Part 15, SubpartC, RSS-210 Issue 7 based on the results of testing performed on *02 November* 2006 through *28* November 2007 on the *Handheld Interrogator* Model No. *PI900* manufactured by Elster Integrated Solutions, LLC. This report only applies to the specific samples tested under the stated test conditions. It is the responsibility of the manufacturer to assure that additional production units of this model are manufactured with identical or EMI equivalent electrical and mechanical components. This report is further intended to document changes and modifications to the EUT throughout its life cycle. All documentation will be included as a supplement.

1.2 Purpose

Testing was performed to evaluate the EMC performance of the EUT in accordance with the applicable requirements, procedures, and criteria defined in the application of regulations and application of standards listed in this report.

1.3 Summary of Test Results

Table 1 - Summary of Test Results

Test	Test Method(s)	Test Parameters	Measurement	Result
Channel Separation	FCC Part 15.247(a)(1) RSS-210, Annex 8, Section A8.1 (2)	Minimum of 25 kHz or 20 dB bandwidth	401.3 kHz	**compliant**
Pseudorandom Hopping Algorithm	RSS-210, Annex 8, Section A8.1			**compliant**
Time of Occupancy	FCC Part 15.247(a)(1)(i) RSS-210, Annex 8, Section A8.1 (3)	=<0.4 sec in 10 sec.	0.202 sec in 10sec	**compliant**
Occupied Bandwidth	FCC Part 15.247(a)(1)(i) RSS-210, Annex 8, Section A8.1 (3)	=<500kHz	332.5 kHz	**compliant**
Peak Output Power	FCC Part 15.247(b)(2) RSS-210, Annex 8, Section A8.4 (1)	0.25 Watts	0.211 Watts	**compliant**
Spurious Emissions	FCC Part 15.247(C) RSS-210, Annex 8, Section A8.5	Table FCC Part 15.209	48.51dBuV/m @ 3meters Average	**compliant**
Frequency Hopping Spread Spectrum Systems	FCC Part 15.247(g) RSS-210, Annex 8, Section A8.1			**compliant**
Incorporation of Intelligence	FCC Part 15.247(h) RSS-210, Annex 8, Section A8.1			**compliant**
Conducted Emissions	FCC Part 15.207	Table FCC Part 15.207	Not Tested. Unit does not operate in charge mode	**N/A**

1.4 Special Accessories

No special accessories were necessary in order to achieve compliance.

1.5 Equipment Modifications

No modifications were found to be necessary in order to achieve compliance.

2 Laboratory Information

2.1 Accreditations & Endorsements

2.1.1 US Federal Communications Commission

TUV Rheinland of North America at the 762 Park Ave. Youngsville, N.C 27596 address is accredited by the commission for performing testing services for the general public on a fee basis. This laboratory test facilities have been fully described in reports submitted to and accepted by the FCC (Registration No 90552 and 100881). The laboratory scope of accreditation includes: Title 47 CFR Part 15, 18, and 90. The accreditation is updated every 3 years.

2.1.2 NIST / NVLAP

TUV Rheinland of North America is accredited by the National Voluntary Laboratory Accreditation Program, which is administered under the auspices of the National Institute of Standards and Technology. The laboratory has been assessed and accredited in accordance with ISO Guide 25 and ISO 9002 (Lab code 200094-0). The scope of laboratory accreditation includes emission and immunity testing. The accreditation is updated annually.

2.1.3 Canada – Industry Canada

Registration No. IC3755

2.1.4 Japan - VCCI

The Voluntary Control Council for Interference by Information Technology Equipment (VCCI) is a group that consists of Information Technology Equipment (ITE) manufacturers and EMC test laboratories. The purpose of the Council is to take voluntary control measures against electromagnetic interference from Information Technology Equipment, and thereby contribute to the development of a socially beneficial and responsible state of affairs in the realm of Information Technology Equipment in Japan. TUV Rheinland of North America at the 762 Park Ave. Youngsville, N.C 27596 address has been assessed and approved in accordance with the Regulations for Voluntary Control Measures. (Registration No. R-1174 and C-1236).

2.1.5 Acceptance By Mutual Recognition Arrangement

The United States has an established agreement with specific countries under the Asia Pacific Laboratory Accreditation Corporation (APLAC) Mutual Recognition Arrangement. Under this agreement, all TUV Rheinland of North America at the 762 Park Ave. Youngsville, N.C 27596 address test results and test reports within the scope of the laboratory NIST / NVLAP accreditation will be accepted by each member country.

2.2 Test Facilities

All of the test facilities are located at 762 Park Ave., Youngsville, North Carolina 27596, USA.

2.2.1 Emission Test Facility

The Open Area Test Site and AC Line Conducted measurement facility used to collect the radiated and conducted data has been constructed in accordance with ANSI C63.7:1992. The site has been measured in accordance with and verified to comply with the theoretical normalized site attenuation requirements of ANSI C63.4:2005, at a test distance of 3 and 10 meters. This site has been described in reports dated May 12, 1997, submitted to the FCC, and accepted by letter dated June 25, 1997 (31040/SIT 1300F2). The site is listed with the FCC and accredited by NVLAP (code 200094-0). The 5m semi-anechoic chamber used to collect the radiated data has been verified to comply with the theoretical normalized site attenuation requirements of ANSI C63.4:2005, at a test distance of 3 meters. A report detailing this site can be obtained from TUV Rheinland of North America.

2.2.2 Immunity Test Facility

ESD, EFT, Surge, PQF: These tests are performed in an environmentally controlled room with a 3.7m x 3.7m x 3.175mm thick aluminum floor connected to PE ground. For ESD testing, tabletop equipment is placed on an insulated mat with a surface resistivity of 10^9 Ohms/square on a 1.6m x 0.8m x 0.8m high non-conductive table with a 3.175mm aluminum top (Horizontal Coupling Plane). The HCP is connected to the main ground plane via a low impedance ground strap through two 470 kΩ resistors. The Vertical Coupling Plane consists of an aluminum plate 50cm x 50cm x 3.175mm thick. The VCP is connected to the main ground plane via a low impedance ground strap through two 470 kΩ resistors. For each of the other tests, the HCP is removed.

RF Field Immunity testing is performed in a 7.3m x 3.7m x 3.2m anechoic chamber.

RF Conducted and Magnetic Field Immunity testing is performed on a 4.9m x 3.7m x 3.175mm thick aluminum ground plane which is connected to one end of the anechoic chamber.

All test areas allow a minimum distance of 1 meter from the EUT to walls or conducting objects.

2.3 Measurement Uncertainty

Two types of measurement uncertainty are expressed in this report, per *ISO Guide To The Expression Of Uncertainty In Measurement*, 1st addition, 1995.

The Combined Standard Uncertainty is the standard uncertainty of the result of a measurement when that result is obtained from the values of a number of other quantities, equal to the positive square root of a sum of terms, the terms being the variances or co-variances of these other quantities weighted according to how the measurement result varies with changes in these quantities. The term standard uncertainty is the result of a measurement expressed as a standard deviation.

The Expanded Uncertainty defines an interval about the result of a measurement that may be expected to encompass a large fraction of the distribution of values that could reasonably be attributed to the measurand. The fraction may be viewed as the coverage probability or level of confidence of the interval.

The test system for conducted emissions is defined as the LISN, spectrum analyzer, coaxial cables, and pads. The test system for radiated emissions is defined as the antenna, spectrum analyzer, pre-amplifier, coaxial cables, and pads. The conducted test system has a combined standard uncertainty of ± 1.2 dB. The radiated test system has a combined standard uncertainty of ± 1.6 dB. The expanded uncertainty at a level of 95% confidence is obtained by multiplying the combined standard uncertainty by a coverage factor of 2. Compliance criteria are not based on measurement uncertainty.

2.4 Calibration Traceability

All measurement instrumentation is traceable to the National Institute of Standards and Technology (NIST). Measurement method complies with ANSI/NCSL Z540-1-1994 and ISO Guide 25.

3 Product Information

3.1 Product Description

The EUT is a PCMCIA Transceiver Card for utilies meter reading.

3.2 Equipment Configuration

The justification of the equipment configuration is given in the EUT Operational Description. The EUT was tested as described in the EUT Operational Description and was configured and operated in a manner consistent with its intended use. The EUT was connected to rated power and allowed to warm up to normal operating conditions. The placement of the EUT system components was guided by the test standard and selected to represent typical installation conditions.

In the case of an EUT that can operate in more than one configuration, preliminary testing was performed to determine the configuration that produced maximum radiation.

The final configuration was selected to produce worse case radiation and place the EUT in the most susceptible state.

4 Emissions

Testing was performed in accordance with 47 CFR Part 15, ANSI C63.4:2003, RSS-210 Issue 7. These test methods are listed under the laboratory's NVLAP Scope of Accreditation. This test measures the levels emanating from the EUT, thus evaluating the potential for the EUT to cause radio frequency interference to other electronic devices.

4.1 Channel Separation Part 15.247(a)(1)

Frequency hopping Systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater.

Bandwidth = 332.5 kHz

Channel Separation = 401.3 kHz

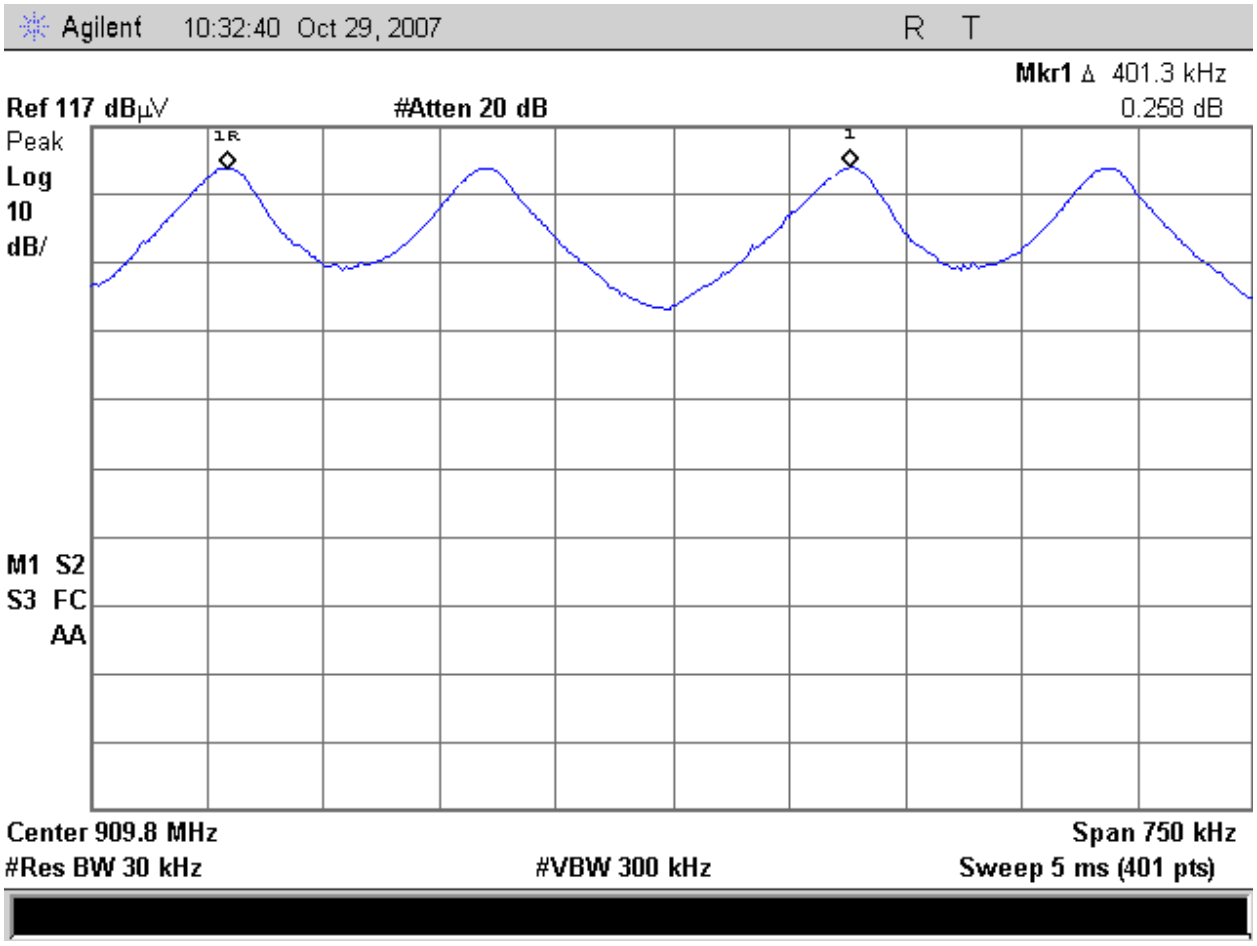


Figure 1: Channel Separation

4.2 Pseudorandom Hopping Algorithm FCC Part 15.247(a)(1)

The channel bandwidth for this system is greater than 250 kHz. Therefore the system must use at least 25 channels that are selected at the system hopping rate, from a pseudorandomly ordered list of hopping frequencies. Each frequency must be used equally on average by each transmitter. The system receivers shall have input bandwidths that match the hopping channel bandwidths of their transmitters and shall shift frequencies in synchronization with the transmitted signals.

In constant transmit mode, the Hand Held Interrogator sends a packet every 97.3 ms with a delay of 8 to 16 ms between packets. Each packet is sent on the next channel determined by the pseudo-random hop table below. The EUT always distributes its transmissions across all 25 channels, and does not re-use a channel again until a transmission has occurred on each of the other 24 channels.

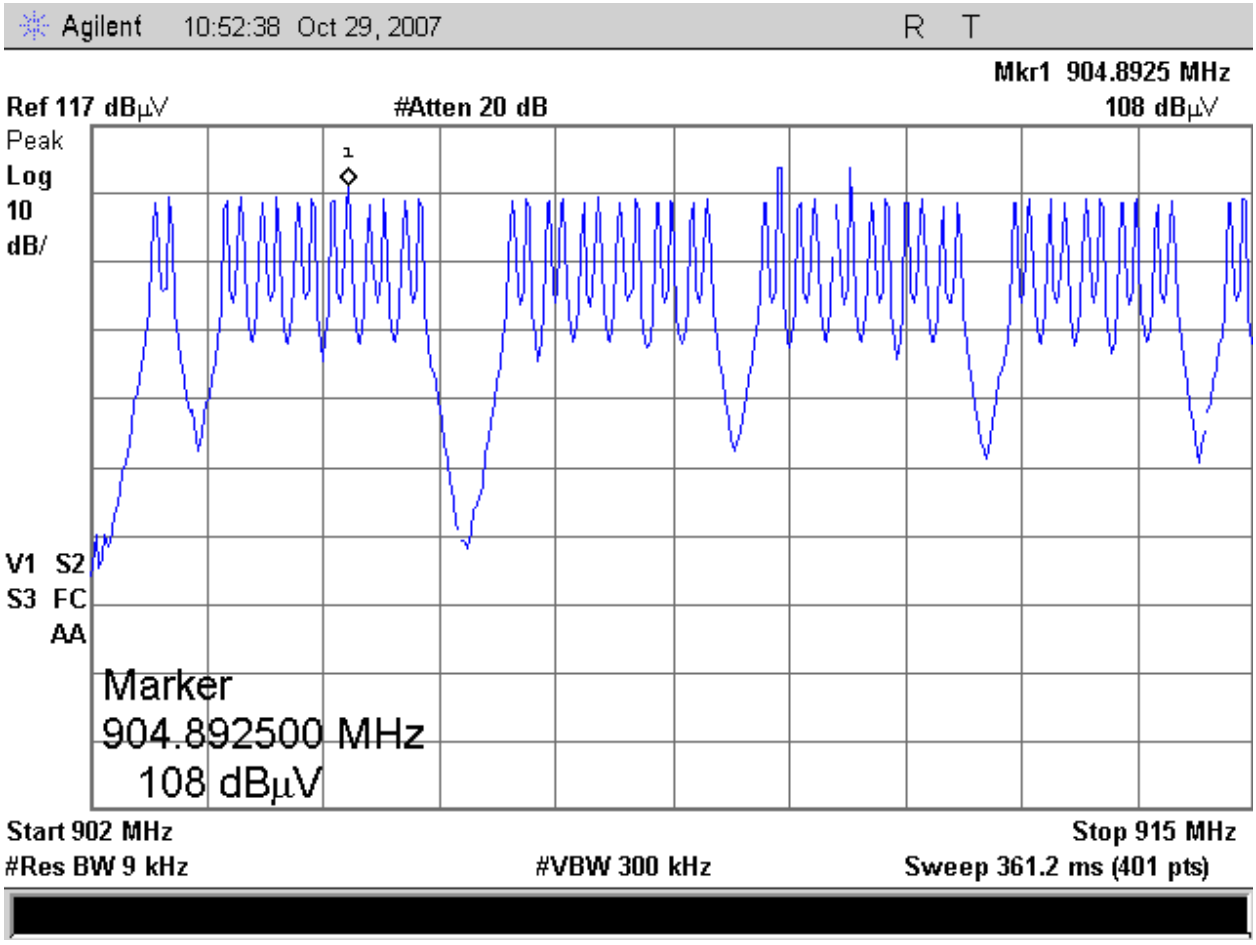


Figure 2: Plot of hopping Channels 902-916 MHz

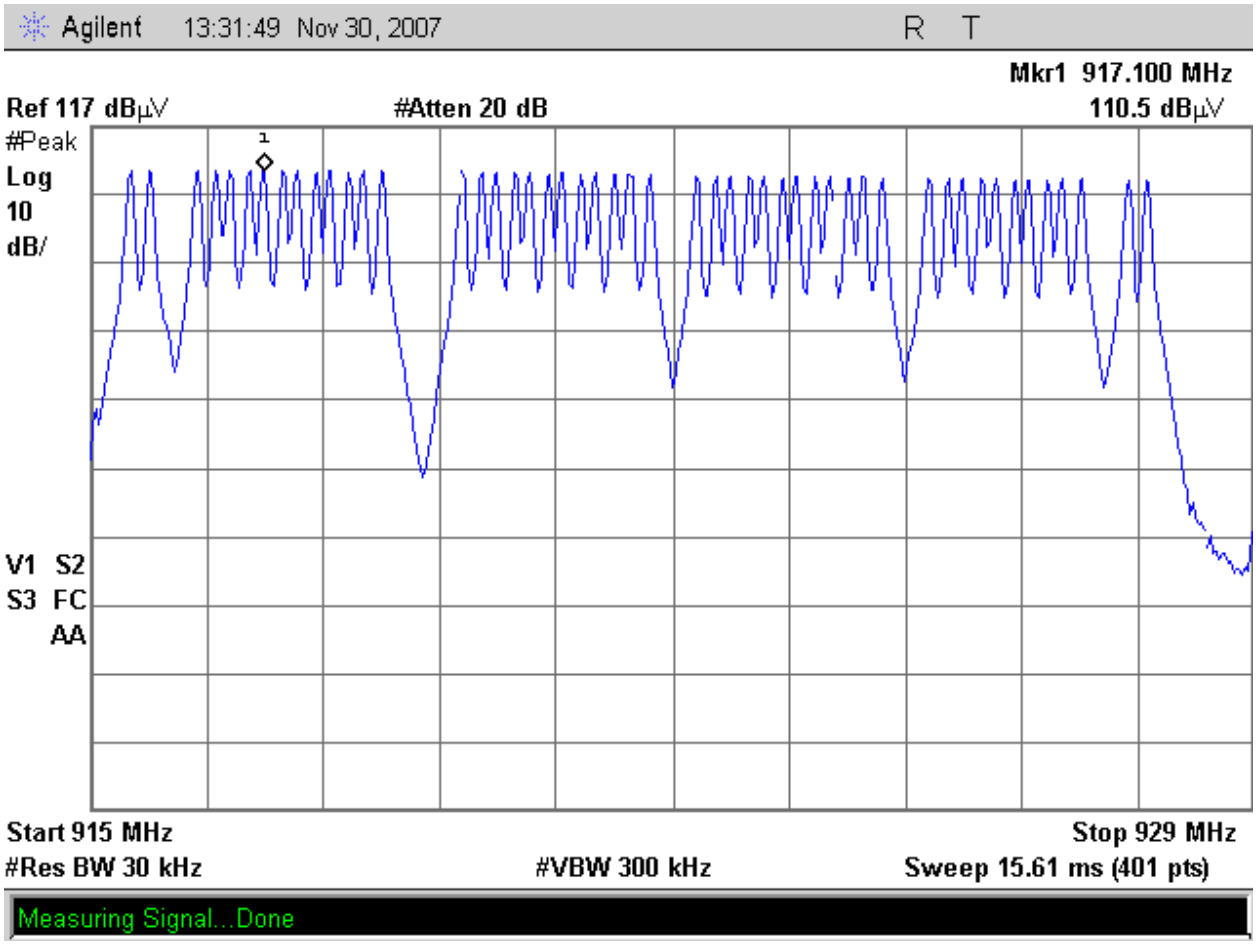


Figure 3: Plot of hopping Channels 915-929 MHz

Time of Occupancy FCC Part 15.247(a)(1)(i)

Frequency Band (MHz)	20 dB Bandwidth	Number of Hopping Channels	Average Time of Occupancy
902.8-914.8	=>250 kHz	25	=<0.4 sec. In 10 sec.

The spectrum analyzer was set as follows:

RBW=120 kHz

VBW=300 kHz

Span=0Hz

LOG dB/div.= 10dB

Sweep = 10 Sec.

Trigger Video

The occupancy time was measured as above. There were 2 hops at .101 seconds per hop for any 10 sec. Period. Time of occupancy equals number of hops multiplied by the duration of one hop.

Time of Occupancy = 0.202 seconds in any 10 second period.

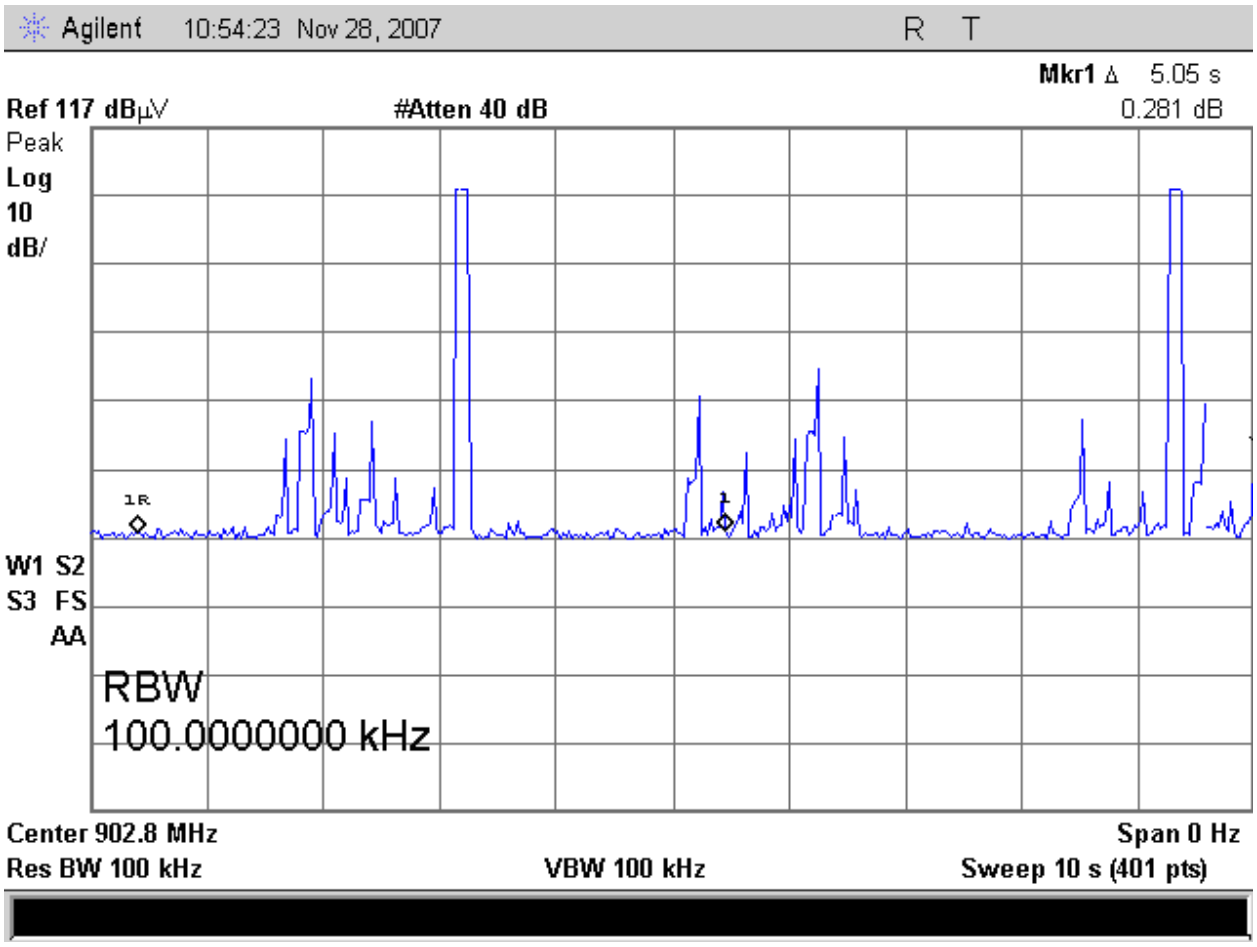


Figure 4: 10 second sweep of 902.8 MHz

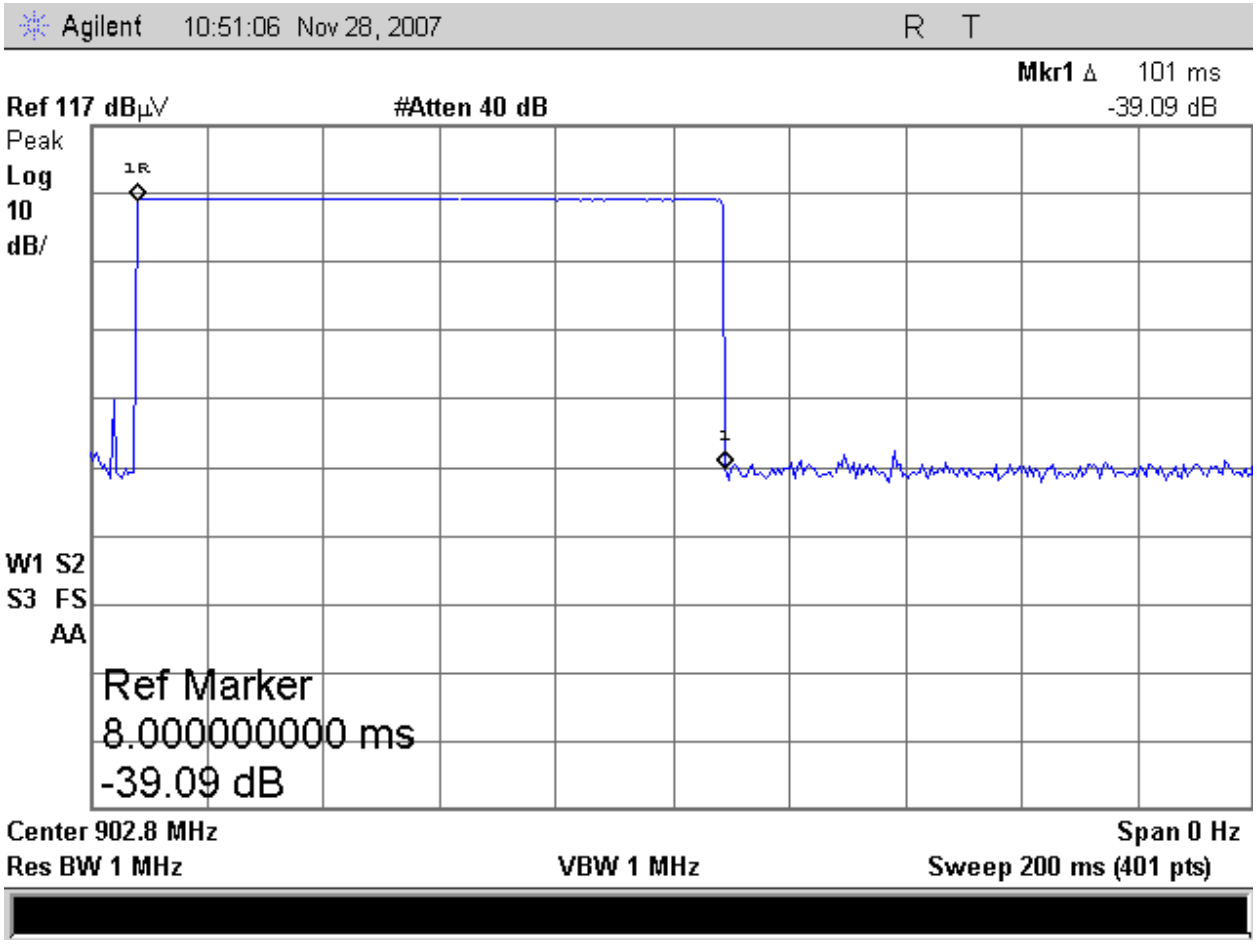


Figure 5: Measurement of 1 hop at 902.8 MHz

4.3 Occupied Bandwidth FCC Part 15.247(a)(1)(i)

The maximum allowed 20 dB bandwidth of the hopping channel is 500 kHz.

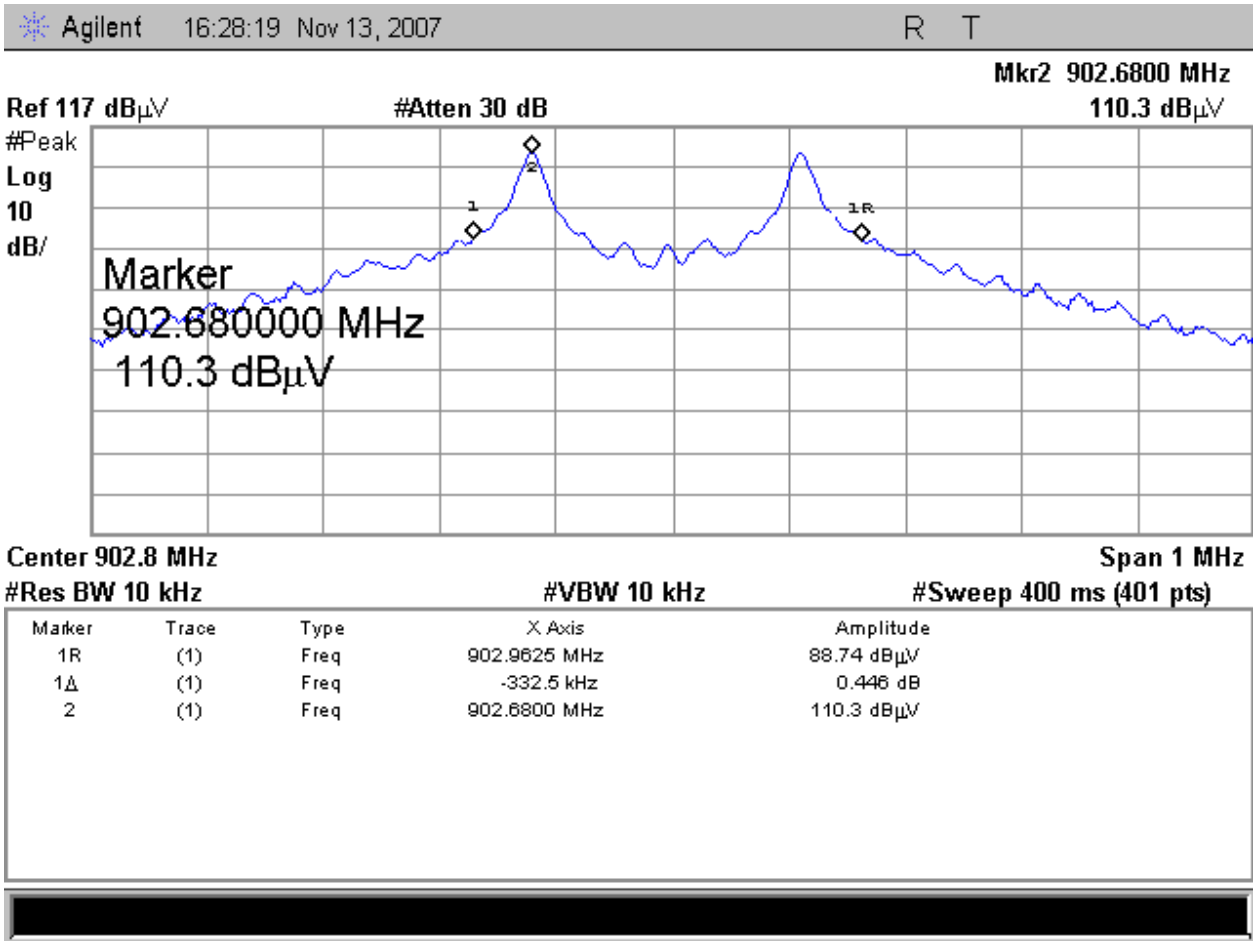


Figure 6: (902.8 MHz) Occupied Bandwidth

***BW = 332.5 kHz**

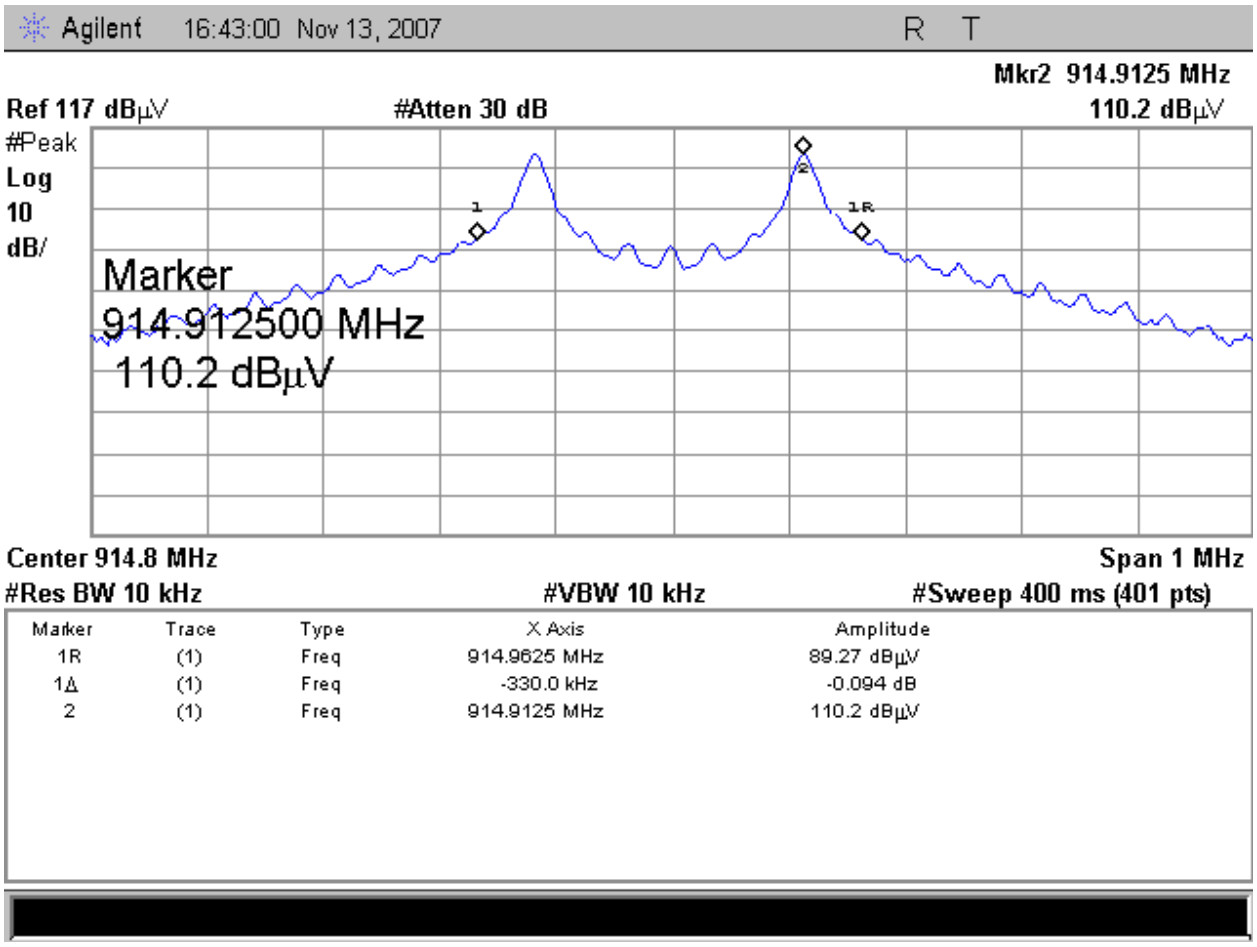


Figure 7: (914.8 MHz) Occupied Bandwidth

***BW = 330.0 kHz**

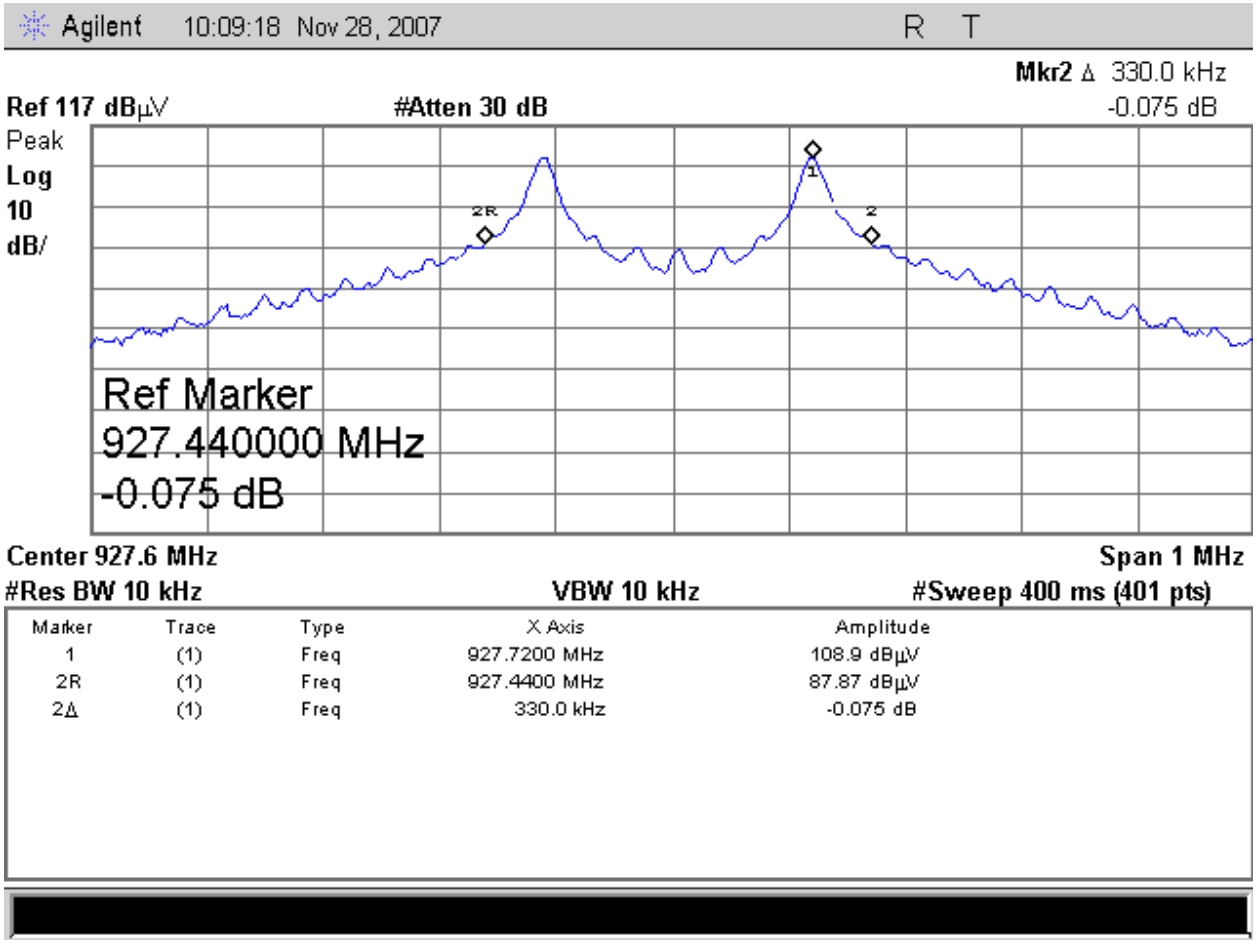


Figure 8: (927.6 MHz) Occupied Bandwidth

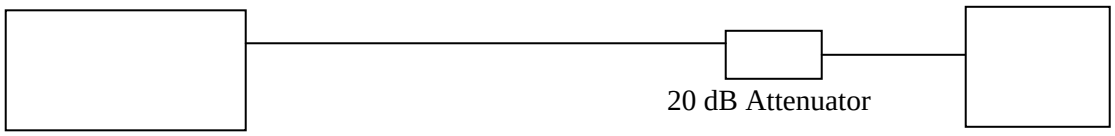
***BW = 330.0 kHz**

Peak Output Power FCC Part 15.247(b)(2)

The maximum peak output power of the intentional radiator shall not exceed 0.25 watts for systems employing less than 50 hopping channels, but at least 25 hopping channels. (Conducted Measurement)

The peak output power was measured at the lowest transmit frequency, the middle transmit frequency, and at the highest transmit frequency. The measurement was made using a direct connection between the RF output of the EUT and the spectrum analyzer. After the measurement was made the cable loss and the attenuator was added to the measurement. The spectrum analyzer's resolution bandwidth was greater than the 20dB bandwidth of the modulated carrier and the video bandwidth was equal to the resolution bandwidth.

Test Setup



Peak Power Output

902.8 MHz = 0.211 Watts

914.8 MHz = 0.201 Watts

926.7 MHz = 0.148 Watts

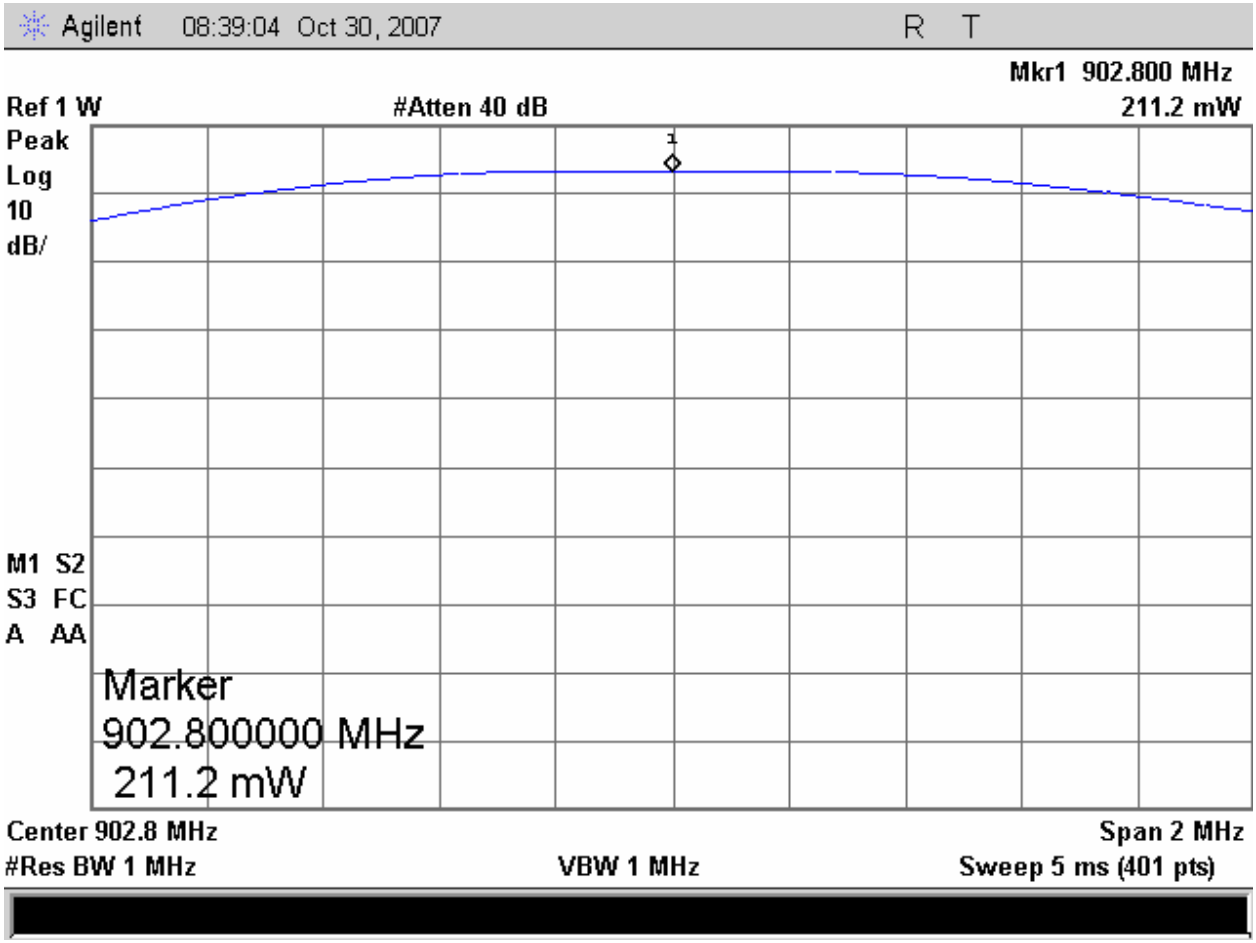


Figure 9: (902.8 MHz) Peak Output Power

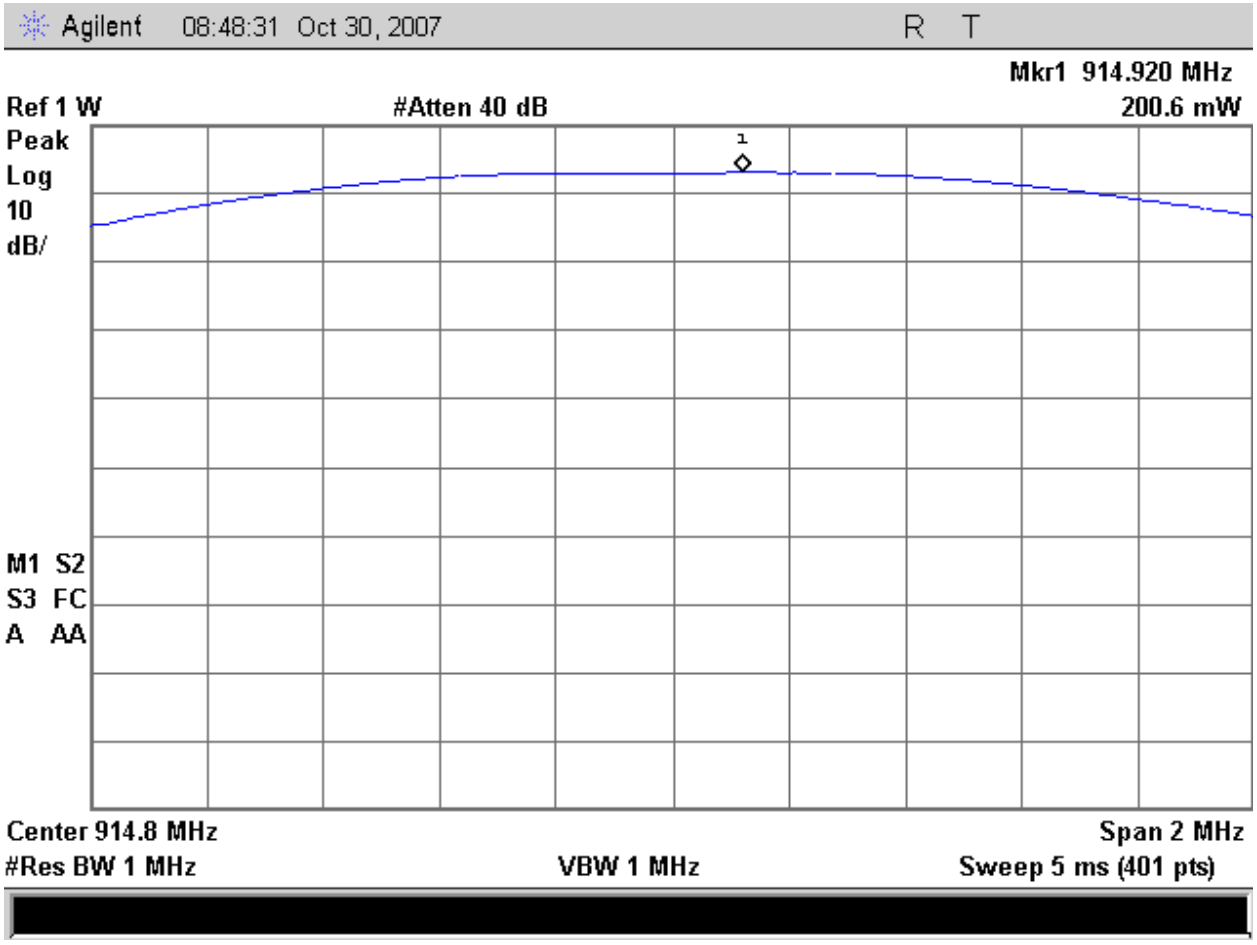


Figure 10: (914.8 MHz) Peak Output Power

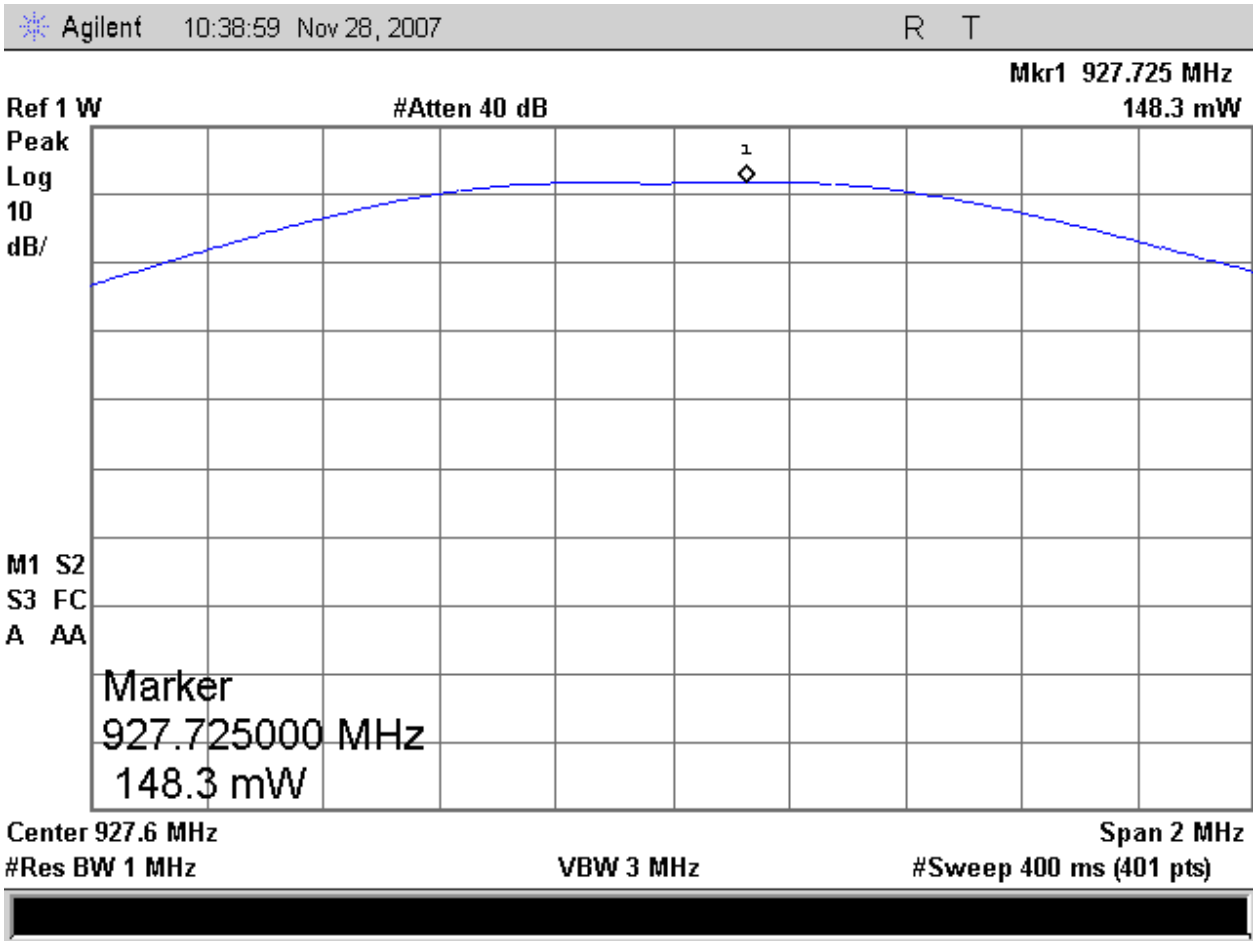


Figure 11: (927.6 MHz) Peak Output Power

Antenna Gain

If peak power output was performed using the conducted method then the antenna gain will be stated.

The measurement was performed with out modulation. The transmitter under test was placed on a non-conductive table 80cm above the ground plane. The spectrum analyzer was tuned to the transmitter carrier frequency and the turntable was rotated 360 degrees about the vertical axis until the highest maximum signal was received. Then the receive antenna was raised and lowered 1 to 4 meters until the maximum signal was detected. Then the substitution dipole antenna and signal generator replaced the transmitter under test and both the receive and substitution antenna were placed in the vertical polarization. The input signal to the substitution antenna was adjusted to the maximum signal received from the transmitter. The receive antenna was then raised and lowered to ensure the maximum signal was still received. The cable to the dipole was then removed and attached to a calibrated power meter to record the power level and added to the substitution antenna gain to obtain the EIRP level. Then the steps above were repeated for the horizontal polarization. The gain of the EUT antenna is the difference between the measured RF power at the RF port and the measured EIRP.

4.3.1.1 Results

Emission Freq (MHz)	ANT Polar (H/V)	ANT Pos (m)	Table Pos (deg)	Raw Value (dBuV)	Sig. Gen Reading (dBm)	Cable loss dB	Substitution Ant Gain dBi	Radiated Power Level (dBm)	Conducted Power (dBm)	Gain Margin (dBi)
902.8	H	1.00	154	110.72	7	2.29	6.2	10.91	23.24	-12.33
902.8	V	2.17	68	113.41	12.6	2.29	7.2	17.51	23.24	-5.73
914.8	H	1.27	160	109.89	6.2	2.31	6.2	10.09	23.02	-12.93
914.8	V	2.19	66	113.80	13.5	2.31	7.3	18.49	23.02	-4.53
927.6	H	1.12	148	110.15	9.2	2.33	6.5	13.37	21.71	-8.34
927.6	V	1.01	0	115.30	15.8	2.33	7.3	20.77	21.71	-0.94

Internal Antenna

Freq.	Peak (dBi)
(GHz)	
0.902 – 0.928	-0.94

5 Emissions

5.1 Spurious Emissions FCC Part 15.247(c)

5.1.1 Test Methodology

5.1.1.1 Preliminary Test

A test program that controls instrumentation and data logging was used to automate the preliminary RF emission test procedure. The frequency range of interest was divided into sub-ranges to yield a frequency resolution of approximately 300 kHz and provide a reading at each frequency for each 6° of turntable rotation. For each frequency sub-range the turntable was rotated 360° while peak emission data was recorded and plotted over the frequency range of interest in horizontal and vertical antenna polarization's.

Preliminary emission profile testing was performed inside the anechoic chamber. The EUT was placed on a 1.0m x 1.5m non-conductive table 80cm above the floor. The EUT was positioned as shown in the setup photographs. The receiving antenna was placed at a distance of 3m at a fixed height of 1m. Measurement equipment was located outside of the chamber. A video camera was placed inside the chamber to view the EUT.

5.1.1.2 Final Test

For each frequency measured, the peak emission was maximized by manipulating the receiving antenna from 1 to 4 meters above the ground plane and placing it at the position that produced the maximum signal strength reading. The turntable was then rotated through 360° while observing the peak signal and placing the EUT at the position that produced maximum radiation.

Final testing was performed on an NSA compliant test site. The EUT was placed on a 1.0m x 1.5m non-conductive table 80cm above the ground plane. The placement of EUT and cables were the same as for preliminary testing and is shown in the setup photographs.

5.1.1.3 Deviations

There were no deviations from this test methodology.

5.1.2 Test Results

As originally tested, the EUT was found to be compliant to the requirements of the test standard(s).

5.1.2.1 Radiated Emissions Outside the Frequency Band

In any 100kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of desired power, based on radiated measurements.

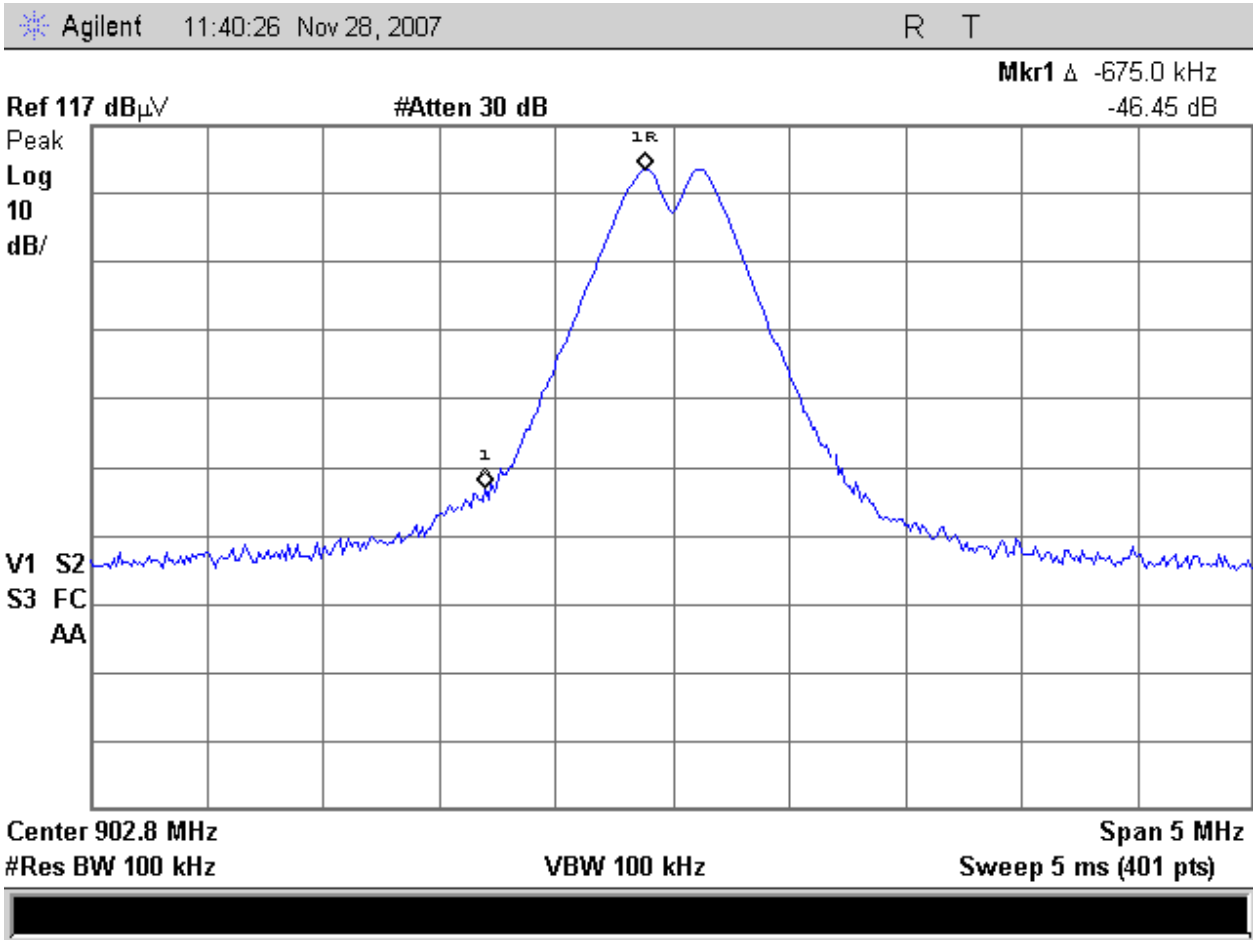


Figure 12: Lower Band Edge Measurement

Note: The delta marker "1" was placed at 902 MHz and is at a level 46.45 dB below the peak. This satisfies the requirement that the emissions at the band edge must be 20 dB below the peak.

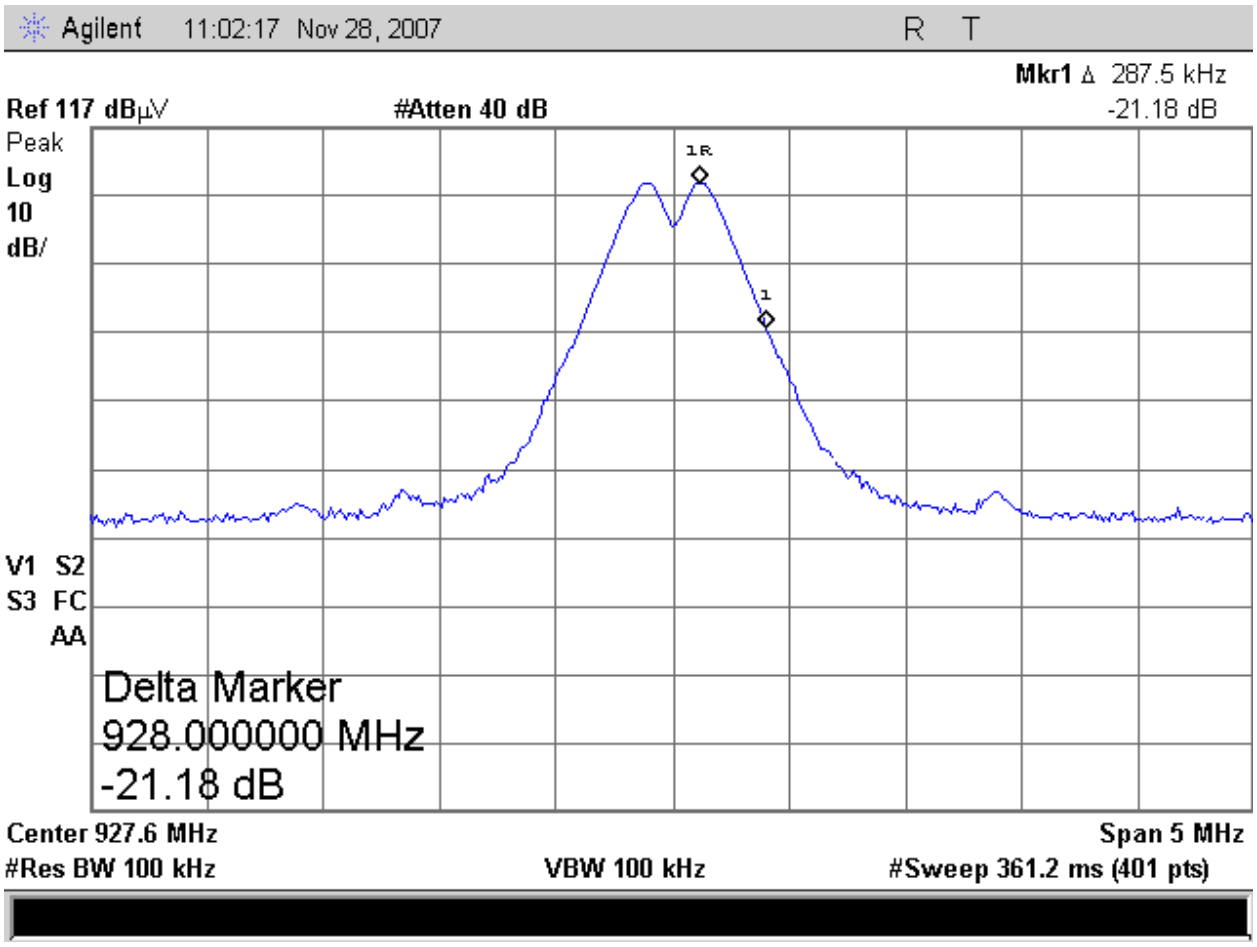


Figure 13: Upper Band Edge Measurement

SOP 1 Radiated Emissions, 15.247c

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EUT Name	Handheld Interrogator	**Date**	07 November, 2007
EUT Model	PI900	**Temp / Hum in**	73.4 deg F / 28% rh
EUT Serial	G07 672 721	**Temp / Hum out**	N/A
Standard	FCC 47 CFR Part 15, RSS-210 Issue 7	**Line AC / Freq.**	Battery Powered
Deg/sweep	12	**RBW / VBW**	1 MHz/1MHz
Dist/Ant Used	3 meters / 3115 above 1 GHz	**Performed by**	Chris Eckert
Configuration			

Emission Freq (MHz)	ANT Polar (H/V)	ANT Pos (m)	Table Pos (deg)	FIM Value (dBuV)	Amp Gain (dB)	Cable Loss (dB)	ANT Factor (dB/m)	E-Field Value (dBuV/m)	Spec Limit (dBuV/m)	Spec Margin (dBuV/m)
902.80	H	1.00	154	83.79	0.00	3.33	23.60	110.72	N/A	
1805.60	**H**	**1.08**	**179**	**41.51**	**35.88**	**6.80**	**26.63**	**39.06**	**90.72**	**-51.66**
2708.40	**H**	**1.31**	**220**	**44.13**	**36.06**	**8.62**	**29.12**	**45.81**	**90.72**	**-44.91**
3611.20	**H**	**1.02**	**0**	**30.32**	**35.39**	**9.77**	**31.47**	**36.17**	**90.72**	**-54.55**
4514.00	**H**	**1.00**	**331**	**33.93**	**35.85**	**9.70**	**32.18**	**39.95**	**90.72**	**-50.77**
5416.80	**H**	**1.02**	**0**	**40.32**	**35.22**	**11.09**	**33.90**	**50.10**	**90.72**	**-40.62**
6319.60	**H**	**1.02**	**0**	**34.15**	**34.62**	**11.98**	**34.43**	**45.95**	**90.72**	**-44.77**
7222.40	**H**	**1.02**	**0**	**29.59**	**35.38**	**14.39**	**35.93**	**44.52**	**90.72**	**-46.20**
8125.40	**H**	**1.02**	**0**	**29.59**	**35.80**	**17.09**	**36.99**	**47.87**	**90.72**	**-42.85**
9028.00	**H**	**1.02**	**0**	**30.06**	**35.90**	**18.30**	**37.94**	**50.40**	**90.72**	**-40.32**
902.80	V	2.17	68	87.38	0.00	3.33	22.70	113.41	N/A	
1805.60	**V**	**1.01**	**4**	**42.77**	**35.88**	**6.80**	**26.59**	**40.29**	**93.41**	**-53.12**
2708.40	**V**	**1.20**	**183**	**46.98**	**36.06**	**8.62**	**29.11**	**48.65**	**93.41**	**-44.76**
3611.20	**V**	**1.46**	**285**	**39.34**	**35.39**	**9.77**	**31.39**	**45.11**	**93.41**	**-48.30**
4514.00	**V**	**1.34**	**221**	**37.54**	**35.85**	**9.70**	**32.17**	**43.55**	**93.41**	**-49.86**
5416.80	**V**	**1.02**	**183**	**40.46**	**35.22**	**11.09**	**33.89**	**50.23**	**93.41**	**-43.18**
6319.60	**V**	**1.02**	**0**	**41.36**	**34.62**	**11.98**	**34.36**	**53.09**	**93.41**	**-40.32**
7222.40	**V**	**1.02**	**0**	**38.57**	**35.38**	**14.39**	**35.80**	**53.37**	**93.41**	**-40.04**
8125.40	**V**	**1.02**	**0**	**38.57**	**35.80**	**17.09**	**36.97**	**56.84**	**93.41**	**-36.57**
9028.00	**V**	**1.84**	**337**	**39.09**	**35.90**	**18.30**	**37.86**	**59.34**	**93.41**	**-34.07**

Spec Margin = E-Field Value - Limit, E-Field Value = FIM Value - Amp Gain + Cable Loss + ANT Factor ± Uncertainty

Combined Standard Uncertainty $u_c(y)$ = ± 1.6dB Expanded Uncertainty $U = ku_c(y)$ k = 2 for 95% confidence

Notes:

The bandwidth for these measurements was higher than 100 kHz. However, the peak spurious emissions still met the requirements of 15.247(c), even when measured the 1 MHz bandwidth.

SOP 1 Radiated Emissions

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EUT Name	Handheld Interrogator	**Date**	07 November, 2007
EUT Model	PI900	**Temp / Hum in**	73.4 deg F / 28% rh
EUT Serial	G07 672 721	**Temp / Hum out**	N/A
Standard	FCC 47 CFR Part 15, RSS-210 Issue 7	**Line AC / Freq.**	Battery Powered
Deg/sweep	12	**RBW / VBW**	1 MHz/1MHz
Dist/Ant Used	3 meters / 3115 above 1 GHz	**Performed by**	Chris Eckert
Configuration			

Emission Freq (MHz)	ANT Polar (H/V)	ANT Pos (m)	Table Pos (deg)	FIM Value (dBuV)	Amp Gain (dB)	Cable Loss (dB)	ANT Factor (dB/m)	E-Field Value (dBuV/m)	Spec Limit (dBuV/m)	Spec Margin (dBuV/m)
914.80	H	1.27	160	82.82	0.00	3.37	23.70	109.89	N/A	
1829.60	**H**	**1.53**	**197**	**45.17**	**35.89**	**6.90**	**26.73**	**42.91**	**89.89**	**-46.98**
2744.40	**H**	**1.04**	**214**	**43.56**	**36.23**	**8.57**	**29.24**	**45.15**	**89.89**	**-44.74**
3659.20	**H**	**1.11**	**83**	**38.84**	**35.59**	**10.07**	**31.59**	**44.9**	**89.89**	**-44.99**
4574.00	**H**	**1.09**	**330**	**42.67**	**35.79**	**10.00**	**32.31**	**49.19**	**89.89**	**-40.70**
5488.80	**H**	**1.00**	**0**	**41.24**	**35.16**	**10.76**	**34.03**	**50.87**	**89.89**	**-39.02**
6403.60	**H**	**1.02**	**0**	**42.29**	**34.27**	**13.01**	**34.47**	**55.5**	**89.89**	**-34.39**
7318.40	**H**	**1.02**	**0**	**39.09**	**35.34**	**14.27**	**36.16**	**54.18**	**89.89**	**-35.71**
8233.20	**H**	**1.02**	**0**	**38.57**	**35.77**	**17.56**	**37.11**	**57.47**	**89.89**	**-32.42**
9148.00	**H**	**1.30**	**340**	**40.71**	**35.81**	**18.61**	**38.01**	**61.52**	**89.89**	**-28.37**
914.80	V	2.19	66	87.60	0.00	3.37	22.80	113.77	NA	
1829.60	**V**	**1.63**	**269**	**43.16**	**35.89**	**6.90**	**26.73**	**40.90**	**93.77**	**-52.87**
2744.40	**V**	**1.02**	**183**	**42.77**	**36.23**	**8.57**	**29.24**	**44.36**	**93.77**	**-49.41**
3659.20	**V**	**1.47**	**326**	**39.09**	**35.59**	**10.07**	**31.52**	**45.09**	**93.77**	**-48.68**
4574.00	**V**	**1.33**	**284**	**41.36**	**35.79**	**10.00**	**32.30**	**47.88**	**93.77**	**-45.89**
5488.80	**V**	**1.02**	**0**	**40.84**	**35.16**	**10.76**	**34.00**	**50.44**	**93.77**	**-43.33**
6403.60	**V**	**1.01**	**0**	**41.63**	**34.27**	**13.01**	**34.39**	**54.76**	**93.77**	**-39.01**
7318.40	**V**	**1.02**	**0**	**39.25**	**35.34**	**14.27**	**36.05**	**54.23**	**93.77**	**-39.54**
8233.20	**V**	**1.01**	**0**	**38.99**	**35.77**	**17.56**	**37.10**	**57.88**	**93.77**	**-35.89**
9148.00	**V**	**1.42**	**339**	**40.71**	**35.81**	**18.61**	**37.93**	**61.44**	**93.77**	**-32.33**

Spec Margin = E-Field Value - Limit, E-Field Value = FIM Value - Amp Gain + Cable Loss + ANT Factor ± Uncertainty

Combined Standard Uncertainty $u_c(y)$ = ± 1.6dB Expanded Uncertainty $U = ku_c(y)$ k = 2 for 95% confidence

Notes:

The bandwidth for these measurements was higher than 100 kHz. However, the peak spurious emissions still met the requirements of 15.247(c), even when measured the 1 MHz bandwidth.

SOP 1 Radiated Emissions

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EUT Name	Handheld Interrogator	**Date**	28 November, 2007
EUT Model	PI900	**Temp / Hum in**	70.6 deg F / 31% rh
EUT Serial	G07 672 721	**Temp / Hum out**	N/A
Standard	FCC 47 CFR Part 15, RSS-210 Issue 7	**Line AC / Freq.**	Battery Powered
Deg/sweep	12	**RBW / VBW**	1 MHz/1MHz
Dist/Ant Used	3 meters / 3115 above 1 GHz	**Performed by**	Chris Eckert
Configuration			

Emission Freq (MHz)	ANT Polar (H/V)	ANT Pos (m)	Table Pos (deg)	FIM Value (dBuV)	Amp Gain (dB)	Cable Loss (dB)	ANT Factor (dB/m)	E-Field Value (dBuV/m)	Spec Limit (dBuV/m)	Spec Margin (dBuV/m)
927.60	H	1.01	0	84.05	0.00	3.25	22.85	110.15		
1855.20	**H**	**1.09**	**181**	**55.19**	**35.98**	**7.62**	**26.84**	**53.67**	**90.15**	**-36.48**
2782.80	**H**	**1.02**	**0**	**48.28**	**36.60**	**9.33**	**29.37**	**50.39**	**90.15**	**-39.76**
3710.40	**H**	**1.02**	**0**	**47.15**	**35.46**	**10.97**	**31.72**	**54.38**	**90.15**	**-35.77**
4638.00	**H**	**1.01**	**0**	**48.08**	**35.76**	**13.01**	**32.43**	**57.77**	**90.15**	**-32.38**
5565.60	**H**	**1.04**	**2**	**47.44**	**35.19**	**13.37**	**34.08**	**59.7**	**90.15**	**-30.45**
6493.20	**H**	**1.18**	**22**	**47.97**	**34.58**	**13.75**	**34.52**	**61.65**	**90.15**	**-28.50**
7420.80	**H**	**1.22**	**135**	**47.82**	**35.32**	**17.04**	**36.40**	**65.94**	**90.15**	**-24.21**
8348.40	**H**	**1.02**	**293**	**47.48**	**35.71**	**17.36**	**37.24**	**66.37**	**90.15**	**-23.78**
9276.00	**H**	**1.00**	**347**	**47.68**	**35.81**	**18.19**	**38.08**	**68.14**	**90.15**	**-22.01**
927.60	V	1.12	148	87.98	0.00	3.25	23.85	115.30		
1855.20	**V**	**1.13**	**140**	**54.27**	**35.98**	**7.62**	**26.80**	**52.70**	**95.3**	**-42.60**
2782.80	**V**	**1.02**	**0**	**48.18**	**36.60**	**9.33**	**29.37**	**50.28**	**95.3**	**-45.02**
3710.40	**V**	**1.02**	**0**	**48.18**	**35.46**	**10.97**	**31.66**	**55.35**	**95.3**	**-39.95**
4638.00	**V**	**1.34**	**343**	**48.72**	**35.76**	**13.01**	**32.44**	**58.42**	**95.3**	**-36.88**
5565.60	**V**	**1.02**	**141**	**47.21**	**35.19**	**13.37**	**34.05**	**59.45**	**95.3**	**-35.85**
6493.20	**V**	**1.01**	**280**	**48.09**	**34.58**	**13.75**	**34.42**	**61.68**	**95.3**	**-33.62**
7420.80	**V**	**1.01**	**0**	**48.89**	**35.32**	**17.04**	**36.31**	**66.91**	**95.3**	**-28.39**
8348.40	**V**	**1.02**	**242**	**48.66**	**35.71**	**17.36**	**37.23**	**67.54**	**95.3**	**-27.76**
9276.00	**V**	**1.02**	**151**	**47.96**	**35.81**	**18.19**	**38.00**	**68.34**	**95.3**	**-26.96**

Spec Margin = E-Field Value - Limit, E-Field Value = FIM Value - Amp Gain + Cable Loss + ANT Factor ± Uncertainty

Combined Standard Uncertainty $u_c(y)$ = ± 1.6dB Expanded Uncertainty $U = ku_c(y)$ k = 2 for 95% confidence

Notes:

The bandwidth for these measurements was higher than 100 kHz. However, the peak spurious emissions still met the requirements of 15.247(c), even when measured the 1 MHz bandwidth.

5.1.2.2 Restricted band measurements

Radiated emissions which fall in the restricted bands, as defined in 15.205(a), must also comply with the radiated emission limits specified in 15.209(a) (see 15.205(c)).

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EUT Name	Handheld Interrogator	**Date**	07 November, 2007
EUT Model	PI900	**Temp / Hum in**	73.4 deg F / 28% rh
EUT Serial	255-0000373648	**Temp / Hum out**	N/A
Standard	FCC 47 CFR Part 15, RSS-210 Issue 7	**Line AC / Freq.**	Battery Powered
Deg/sweep		**RBW / VBW**	1 MHz/1MHz
Dist/Ant Used	3 meters 1Ghz -10GHz	**Performed by**	Chris Eckert
Configuration	902.8 MHz Spurious Emissions with internal antenna		

Emission Freq (MHz)	ANT Polar (H/V)	ANT Pos (m)	Table Pos (deg)	FIM Value (dBuV)	Amp Gain (dB)	Cable Loss (dB)	ANT Factor (dB/m)	E-Field Value (dBuV/m)	Spec Limit (dBuV/m)	Spec Margin (dB)
Peak										
2708.40	H	1.31	220	44.13	36.06	8.62	29.12	45.81	74.00	-28.19
3611.20	H	1.02	0	30.32	35.39	9.77	31.47	36.17	74.00	-37.83
4514.00	H	1.00	331	33.93	35.85	9.70	32.18	39.95	74.00	-34.05
5416.80	H	1.02	0	40.32	35.22	11.09	33.90	50.10	74.00	-23.90
8125.40	H	1.02	0	29.59	35.80	17.09	36.99	47.87	74.00	-26.13
9028.00	H	1.02	0	30.06	35.90	18.30	37.94	50.40	74.00	-23.60
Average										
2708.40	H	1.31	220	35.39	36.06	8.62	29.12	37.07	54.00	-16.93
3611.20	H	1.02	0	16.77	35.39	9.77	31.47	22.62	54.00	-31.38
4514.00	H	1.00	331	22.51	35.85	9.70	32.18	28.53	54.00	-25.47
5416.80	H	1.02	0	26.93	35.22	11.09	33.90	36.71	54.00	-17.29
8125.40	H	1.00	0	24.83	35.80	17.09	36.99	43.11	54.00	-10.89
9028.00	H	1.02	0	16.63	35.90	18.30	37.94	36.97	54.00	-17.03

Spec Margin = E-Field Value - Limit, E-Field Value = FIM Value - Amp Gain + Cable Loss + ANT Factor $\pm$ Uncertainty

Combined Standard Uncertainty $u_c(y) = \pm 1.6$dB Expanded Uncertainty $U = ku_c(y)$ $k = 2$ for 95% confidence

Notes: RBW/VBW = 1MHz/1MHz For frequencies between 1GHz and 10 GHz

Note: Peak measurements were made to document compliance with 15.247(c) and compliance with 15.35b. In addition, average measurements were made to document compliance with 15.205(b) for spurious emissions falling in the restricted bands.

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EUT Name	Handheld Interrogator	**Date**	07 November, 2007
EUT Model	PI900	**Temp / Hum in**	73.4 deg F / 28% rh
EUT Serial	255-0000373648	**Temp / Hum out**	N/A
Standard	FCC 47 CFR Part 15, RSS-210 Issue 7	**Line AC / Freq.**	Battery Powered
Deg/sweep		**RBW / VBW**	1 MHz/1MHz
Dist/Ant Used	3 meters 1Ghz -10GHz	**Performed by**	Chris Eckert
Configuration	902.8 MHz Spurious Emissions with internal antenna		

Emission Freq (MHz)	ANT Polar (H/V)	ANT Pos (m)	Table Pos (deg)	FIM Value (dBuV)	Amp Gain (dB)	Cable Loss (dB)	ANT Factor (dB/m)	E-Field Value (dBuV/m)	Spec Limit (dBuV/m)	Spec Margin (dB)
Peak										
2708.40	V	1.20	183	46.98	36.06	8.62	29.11	48.65	74.00	-25.35
3611.20	V	1.46	285	39.34	35.39	9.77	31.39	45.11	74.00	-28.89
4514.00	V	1.34	221	37.54	35.85	9.70	32.17	43.55	74.00	-30.45
5416.80	V	1.02	183	40.46	35.22	11.09	33.89	50.23	74.00	-23.77
8125.40	V	1.02	0	38.57	35.80	17.09	36.97	56.84	74.00	-17.16
9028.00	V	1.84	337	39.09	35.90	18.30	37.86	59.34	74.00	-14.66
Average										
2708.40	V	1.20	183	36.10	36.06	8.62	29.11	37.77	54.00	-16.23
3611.20	V	1.46	285	27.72	35.39	9.77	31.39	33.49	54.00	-20.51
4514.00	V	1.34	221	24.38	35.85	9.70	32.17	30.39	54.00	-23.61
5416.80	V	1.02	183	26.91	35.22	11.09	33.89	36.68	54.00	-17.32
8125.40	V	1.00	0	24.85	35.80	17.09	36.97	43.12	54.00	-10.88
9028.00	V	1.84	337	26.26	35.90	18.30	37.86	46.51	54.00	-7.49

Spec Margin = E-Field Value - Limit, E-Field Value = FIM Value - Amp Gain + Cable Loss + ANT Factor ± Uncertainty

Combined Standard Uncertainty $u_c(y)$ = ± 1.6dB Expanded Uncertainty $U = ku_c(y)$ k = 2 for 95% confidence

Notes: RBW/VBW = 1MHz/1MHz For frequencies between 1GHz and 10 GHz

Note: Peak measurements were made to document compliance with 15.247(c) and compliance with 15.35b. In addition, average measurements were made to document compliance with 15.205(b) for spurious emissions falling in the restricted bands.

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EUT Name	Handheld Interrogator	**Date**	07 November, 2007
EUT Model	PI900	**Temp / Hum in**	73.4 deg F / 28% rh
EUT Serial	255-0000373648	**Temp / Hum out**	N/A
Standard	FCC 47 CFR Part 15, RSS-210 Issue 7	**Line AC / Freq.**	Battery Powered
Deg/sweep		**RBW / VBW**	1 MHz/1MHz
Dist/Ant Used	3 meters 1Ghz -10GHz	**Performed by**	Chris Eckert
Configuration	914.8 MHz Spurious Emissions with internal antenna		

Emission Freq (MHz)	ANT Polar (H/V)	ANT Pos (m)	Table Pos (deg)	FIM Value (dBuV)	Amp Gain (dB)	Cable Loss (dB)	ANT Factor (dB/m)	E-Field Value (dBuV/m)	Spec Limit (dBuV/m)	Spec Margin (dB)
Peak										
2744.40	H	1.04	214	43.56	36.23	8.57	29.24	45.15	74.00	-28.85
3659.20	H	1.11	83	38.84	35.59	10.07	31.59	44.90	74.00	-29.10
4574.00	H	1.09	330	42.67	35.79	10.00	32.31	49.19	74.00	-24.81
7318.40	H	1.02	0	39.09	35.34	14.27	36.16	54.18	74.00	-19.82
8233.20	H	1.02	0	38.57	35.77	17.56	37.11	57.47	74.00	-16.53
9148.00	H	1.30	340	40.71	35.81	18.61	38.01	61.52	74.00	-12.48
Average										
2744.40	H	1.04	214	33.97	36.23	8.57	29.24	35.56	54.00	-18.44
3659.20	H	1.11	83	26.32	35.59	10.07	31.59	32.38	54.00	-21.62
4574.00	H	1.09	330	30.34	35.79	10.00	32.31	36.86	54.00	-17.14
7318.40	H	1.02	0	25.91	35.34	14.27	36.16	41.00	54.00	-13.00
8233.20	H	1.02	0	25.39	35.77	17.56	37.11	44.29	54.00	-9.71
9148.00	H	1.30	340	27.46	35.81	18.61	38.01	48.27	54.00	-5.73

Spec Margin = E-Field Value - Limit, E-Field Value = FIM Value - Amp Gain + Cable Loss + ANT Factor ± Uncertainty

Combined Standard Uncertainty $u_c(y)$ = ± 1.6dB Expanded Uncertainty $U = ku_c(y)$ k = 2 for 95% confidence

Notes: RBW/VBW = 1MHz/1MHz For frequencies between 1GHz and 10 GHz

Note: Peak measurements were made to document compliance with 15.247(c) and compliance with 15.35b. In addition, average measurements were made to document compliance with 15.205(b) for spurious emissions falling in the restricted bands.

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EUT Name	Handheld Interrogator	**Date**	07 November, 2007
EUT Model	PI900	**Temp / Hum in**	73.4 deg F / 28% rh
EUT Serial	255-0000373648	**Temp / Hum out**	N/A
Standard	FCC 47 CFR Part 15, RSS-210 Issue 7	**Line AC / Freq.**	Battery Powered
Deg/sweep		**RBW / VBW**	1 MHz/1MHz
Dist/Ant Used	3 meters 1Ghz -10GHz	**Performed by**	Chris Eckert
Configuration	914.8 MHz Spurious Emissions with internal antenna		

Emission Freq (MHz)	ANT Polar (H/V)	ANT Pos (m)	Table Pos (deg)	FIM Value (dBuV)	Amp Gain (dB)	Cable Loss (dB)	ANT Factor (dB/m)	E-Field Value (dBuV/m)	Spec Limit (dBuV/m)	Spec Margin (dB)
Peak										
2744.40	V	1.02	183	42.77	36.23	8.57	29.24	44.36	74.00	-29.64
3659.20	V	1.47	326	39.09	35.59	10.07	31.52	45.09	74.00	-28.91
4574.00	V	1.33	284	41.36	35.79	10.00	32.30	47.88	74.00	-26.12
5488.80	V	1.02	0	40.84	35.16	10.76	34.00	50.44	74.00	-23.56
7318.40	V	1.02	0	39.25	35.34	14.27	36.05	54.23	74.00	-19.77
8233.20	V	1.01	0	38.99	35.77	17.56	37.10	57.88	74.00	-16.12
9148.00	V	1.42	339	40.71	35.81	18.61	37.93	61.44	74.00	-12.56
Average										
2744.40	V	1.02	183	32.66	36.23	8.57	29.24	34.25	54.00	-19.75
3659.20	V	1.47	326	27.83	35.59	10.07	31.52	33.83	54.00	-20.17
4574.00	V	1.33	284	29.51	35.79	10.00	32.30	36.03	54.00	-17.97
7318.40	V	1.02	0	25.94	35.34	14.27	36.05	40.92	54.00	-13.08
8233.20	V	1.01	0	25.39	35.77	17.56	37.10	44.28	54.00	-9.72
9148.00	V	1.42	339	27.78	35.81	18.61	37.93	48.51	54.00	-5.49

Spec Margin = E-Field Value - Limit, E-Field Value = FIM Value - Amp Gain + Cable Loss + ANT Factor ± Uncertainty

Combined Standard Uncertainty $u_c(y)$ = ± 1.6dB Expanded Uncertainty $U = ku_c(y)$ k = 2 for 95% confidence

Notes: RBW/VBW = 1MHz/1MHz For frequencies between 1GHz and 10 GHz

Note: Peak measurements were made to document compliance with 15.247(c) and compliance with 15.35b. In addition, average measurements were made to document compliance with 15.205(b) for spurious emissions falling in the restricted bands.

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EUT Name	Handheld Interrogator	**Date**	28 November, 2007
EUT Model	PI900	**Temp / Hum in**	70.6 deg F / 31% rh
EUT Serial	255-0000373648	**Temp / Hum out**	N/A
Standard	FCC 47 CFR Part 15, RSS-210 Issue 7	**Line AC / Freq.**	Battery Powered
Deg/sweep		**RBW / VBW**	1 MHz/1MHz
Dist/Ant Used	3 meters 1Ghz -10GHz	**Performed by**	Chris Eckert
Configuration	927.6 MHz Spurious Emissions with internal antenna		

Emission Freq (MHz)	ANT Polar (H/V)	ANT Pos (m)	Table Pos (deg)	FIM Value (dBuV)	Amp Gain (dB)	Cable Loss (dB)	ANT Factor (dB/m)	E-Field Value (dBuV/m)	Spec Limit (dBuV/m)	Spec Margin (dB)
Peak										
2782.80	H	1.02	0	48.28	36.60	9.33	29.37	50.39	74.00	-23.61
3710.40	H	1.02	0	47.15	35.46	10.97	31.72	54.38	74.00	-19.62
4638.00	H	1.01	0	48.04	35.76	13.01	32.43	57.73	74.00	-16.27
7420.80	H	1.22	135	47.82	35.32	17.04	36.40	65.94	74.00	-8.06
8348.40	H	1.02	293	47.48	35.37	14.32	36.05	53.73	74.00	-20.27
Average										
2782.80	H	1.02	0	26.59	36.60	9.33	29.37	28.70	54.00	-25.30
3710.40	H	1.02	0	25.68	35.46	10.97	31.72	32.91	54.00	-21.09
4638.00	H	1.87	176	27.47	35.76	13.01	32.43	37.16	54.00	-16.84
7420.80	H	1.22	135	23.67	35.32	17.04	36.40	41.79	54.00	-12.21
8348.40	H	1.02	293	23.17	35.71	17.36	37.24	42.06	54.00	-11.94

Spec Margin = E-Field Value - Limit, E-Field Value = FIM Value - Amp Gain + Cable Loss + ANT Factor ± Uncertainty

Combined Standard Uncertainty $u_c(y)$ = ± 1.6dB Expanded Uncertainty $U = ku_c(y)$ k = 2 for 95% confidence

Notes: RBW/VBW = 1MHz/1MHz For frequencies between 1GHz and 10 GHz

Note: Peak measurements were made to document compliance with 15.247(c) and compliance with 15.35b. In addition, average measurements were made to document compliance with 15.205(b) for spurious emissions falling in the restricted bands.

SOP 1 Radiated Emissions

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EUT Name	Handheld Interrogator	**Date**	28 November, 2007
EUT Model	PI900	**Temp / Hum in**	70.6 deg F / 31% rh
EUT Serial	255-0000373648	**Temp / Hum out**	N/A
Standard	FCC 47 CFR Part 15, RSS-210 Issue 7	**Line AC / Freq.**	Battery Powered
Deg/sweep		**RBW / VBW**	1 MHz/1MHz
Dist/Ant Used	3 meters 1Ghz -10GHz	**Performed by**	Chris Eckert
Configuration	927.6 MHz Spurious Emissions with internal antenna		

Emission Freq (MHz)	ANT Polar (H/V)	ANT Pos (m)	Table Pos (deg)	FIM Value (dBuV)	Amp Gain (dB)	Cable Loss (dB)	ANT Factor (dB/m)	E-Field Value (dBuV/m)	Spec Limit (dBuV/m)	Spec Margin (dB)
Peak										
2782.80	V	1.02	0	48.18	36.60	9.33	29.37	50.28	74	-23.72
3710.40	V	1.02	0	48.18	35.46	10.97	31.66	55.35	74	-18.65
4638.00	V	1.34	343	48.72	35.76	13.01	32.44	58.42	74	-15.58
7420.80	V	1.01	0	48.89	35.32	17.04	36.31	66.91	74	-7.09
8348.40	V	1.02	242	48.66	35.71	17.36	37.23	67.54	74	-6.46
Average										
2782.80	V	1.02	0	27.73	36.60	9.33	29.37	29.83	54.00	-24.17
3710.40	V	1.02	0	24.79	35.46	10.97	31.66	31.96	54.00	-22.04
4638.00	V	1.34	343	29.78	35.76	13.01	32.44	39.48	54.00	-14.52
7420.80	V	1.01	0	23.67	35.32	17.04	36.31	41.69	54.00	-12.31
8348.40	V	1.00	0	23.17	35.71	17.36	37.23	42.05	54.00	-11.95

Spec Margin = E-Field Value - Limit, E-Field Value = FIM Value - Amp Gain + Cable Loss + ANT Factor ± Uncertainty

Combined Standard Uncertainty $u_c(y)$ = ± 1.6dB Expanded Uncertainty $U = ku_c(y)$ k = 2 for 95% confidence

Notes: RBW/VBW = 1MHz/1MHz For frequencies between 1GHz and 10 GHz

Note: Peak measurements were made to document compliance with 15.247(c) and compliance with 15.35b. In addition, average measurements were made to document compliance with 15.205(b) for spurious emissions falling in the restricted bands.

5.2 Frequency Hopping Spread Spectrum Systems FCC Part 15.247(g)

Frequency hopping spread spectrum systems are not required to employ all available hopping channels during each transmission. However, the system, consisting of both the transmitter and the receiver, must be designed to comply with all of the regulations in this section should the transmitter be presented with a continuous data (or information) stream. In addition, a system employing short transmission bursts must comply with the definition of a frequency hopping system and must distribute its transmissions over the minimum number of hopping channels specified in this section.

The required signal bandwidth is approximately 312 kHz and the average time of occupancy on any frequency is less than 0.4 seconds within any 10 second period. In the worst case burst transmit mode, the PI900 would send sixteen 100msec packets with approximately 10 msec delay between packets, followed by 1,750 msec of off time to yield a 50% duty cycle. Thus, in any 10 second interval, a maximum of packets sent will be 48 with 23 channels being used twice and 2 channels only being used once. The maximum dwell time on any one channel is approximately 200 msec which is less than the 400 msec occupancy requirement. The EUT always distributes its transmissions across all 25 channels, and does not re-use a channel again until a transmission has occurred on each of the other 24 channels.

5.3 Incorporation of Intelligence within a Frequency Hopping Spread Spectrum System FCC Part 15.247(h)

The incorporation of intelligence within a frequency hopping spread spectrum system that permits the system to recognize other users within the spectrum band so that it individually and independently chooses and adapts its hopsets to avoid hopping on occupied channels is permitted. The coordination of frequency hopping systems in any other manner for the express purpose of avoiding the simultaneous occupancy of individual hopping frequencies by multiple transmitters is not permitted.

The EUT does not attempt to recognize other users or interferers within the spectrum band and then attempt to select which channels to use. The EUT always distributes its transmissions across the same 25 channels. A channel is not re-used until a transmission has occurred on each of the other 24 channels.

6 Test Equipment Use List

Equipment	Manufacturer	Model #	Serial/Inst #	Last Cal dd/mm/yy	Next Cal dd/mm/yy
SOP 1 - Radiated Emissions (5 Meter Chamber)					
Amplifier, preamp	Agilent Technologies	8449B	3008A01480	10-Oct-2007	10-Oct-2008
Amplifier, preamp	Hewlett Packard	8447D	2944A10139	08-Oct-2007	08-Oct-2008
Ant. BiconiLog	EMCO	3142	1006	2-May-2006	2-May2008
Antenna Horn 1-18GHz	EMCO	3115	2236	25-Jan-2007	25-Jan-2009
Ant. BiconiLog	Chase	CBL6140A	1108	16-May-2006	16-May-2008
Receiver, EMI	Rohde & Schwarz	ESIB40	100043	12-Jul-2007	12-Jul-2008
Spectrum Analyzer	Agilent Tec.	E7405A	US39440161	29-Jun-2007	29-Jun-2008
Cable, Coax	Andrew	FSJ1-50A	036	14-Mar-2007	14-Mar-2008
Cable, Coax	Andrew	FSJ1-50A	030	1-Nov-2007	1-Nov-2008

* Calibration of equipment past due for re-calibration will be performed expeditiously. If any equipment is found to be out of tolerance at that time, affected customers will be notified accordingly.

7 Secondary Test Equipment Use List

The following test equipment was used during additional testing

Equipment	Manufacturer	Model #	Serial/Inst #	Last Cal dd/mm/yy	Next Cal dd/mm/yy
SOP 1 - Radiated Emissions (5 Meter Chamber)					
Spectrum Analyzer	Agilent Tec.	E7405A	US39440157	19-Apr-07	19-Apr-08
Cable, Coax	Andrew	FSJ1-50A	036	14-Mar-07	14-Mar-08
Cable, Coax	Andrew	FSJ1-50A	030	24-Jan-2007	24-Jan-2008
Cable, Coax	Andrew	FSJ1-50A	045	24-Jan-07	24-Jan-08
Ant. BiconiLog	Chase	CBL6140A	1108	16-May-2006	16-May-2008
DBL Ridge Horn ANT	EMCO	3115	2236	25-Jan-07	25-Jan-09