

Date of Test: March 17 to 23, 2006

FCC ID: S8IWPM5

TEST REPORT
Class II Permissive Change

Report Number: 3092673LAX-001
Project Number: 3092673
March 21, 2006

Testing performed on the
Wireless Physiologic Monitoring System

Model: WPT1000, WTMXXX

to

FCC Part 95, subpart H

For
Edwards Lifesciences, LLC

Test Performed by:
Intertek
92677 La Paz Rd., Suite C
Laguna Niguel, CA 92677

Test Authorized by:
Edwards Lifesciences, LLC
One Edwards Way
Irvine, CA 92614

Prepared by: _____



Sergey Marker

Date: 3/23/06

Reviewed by: _____



Suresh Kondapalli

Date: 3/24/06

This report is for the exclusive use of Intertek's Client and is provided pursuant to the agreement between Intertek and its Client. Intertek's responsibility and liability are limited to the terms and conditions of the agreement. Intertek assumes no liability to any party, other than to the Client in accordance with the agreement, for any loss, expense or damage occasioned by the use of this report. Only the Client is authorized to copy or distribute this report and then only in its entirety. Any use of the Intertek name or one of its marks for the sale or advertisement of the tested material, product or service must first be approved in writing by Intertek. The observations and test results in this report are relevant only to the sample tested. This report by itself does not imply that the material, product, or service is or has ever been under an Intertek certification program.

Table of Contents

1.0	Introduction.....	4
2.0	Summary of Test Results.....	5
3.0	General Description	6
3.1	Product Description	6
3.2	Related Submittal(s) Grants.....	8
3.3	Test Methodology	8
3.4	Test Facility	8
4.0	System Test Configuration.....	9
4.1	Justification	9
4.2	EUT Exercising Software	9
4.3	System Test Configuration	9
4.3.1	Support Equipment	9
4.3.2	Block Diagram of Test Setup.....	10
4.4	Equipment Modification	11
4.5	Mode(s) of operation	11
5.0	Field Strength of Emission	12
5.1	Test Description (95.1115)	12
5.1.1	Test Procedure	12
5.1.2	Field Strength Calculation	12
5.1.3	Calculation of Average Factor.....	13
5.1.4	Radiated Emission Data	15
5.2	Test Description (15.109)	19
5.2.1	Test Procedure	19
5.2.2	Field Strength Calculation	19
5.2.3	Radiated Emission Data.....	20
5.2.4	Radiated Emission Data.....	22
6.0	Out of Band Emission	24
6.1	Test Description.....	24
6.2	Test Procedure.....	24
6.3	Test Results.....	24
6.4	Radiated Emission Data.....	40
7.0	Antenna Requirement	42
7.1	Test Description.....	42
7.2	Test Procedure.....	42
7.3	Test Result.....	42

8.0 Occupied Bandwidth43
8.1 Test Description.....43
8.2 Test Procedure.....43
8.3 Test Result.....43

9.0 RF Safety45
9.1 RF Exposure Evaluation.....45
9.2 Test Procedure.....45
9.3 Test Result.....45

10.0 Test Equipment.....46

Date of Test: March 17 to 23, 2006FCC ID: S8IWPMS

1.0 Introduction

This report is intended to show compliance with the FCC Part 95, Subpart H Rules.

Edwards Lifesciences made a new product, based on the certified device FCC ID: S8IWPMS. The following changes were implemented by Edwards:

Radio and RFID circuitry and driver software is the same on battery powered X units, battery powered M units, monitor powered M units, and AC adaptor powered M units. The following notes apply to all types of Lightning units.

PCB

- PCB is still same type of 6 layer construction. The layers are used for the same function as before (layer 1 components, layer 2 ground plane, layers 3 and 4 internal signals, layer 5 power plane, layer 6 components). The top and bottom layers no longer have ground plane copper pours around all the components.
- Due to a change in the shape of the printed circuit board, the part placement and trace layout of the circuitry have changed significantly.
- The same shields are used around the microprocessor and radio circuitry .

1.4GHz Radio Design

- New radio antenna is a $\frac{1}{4}$ wave monopole using circuit board ground plane. Previous version used a $\frac{1}{2}$ wave dipole antenna.
- Radio software control settings (register values) are the same.
- The interval between radio messages has been increased from 23 ms to 52 ms.
- The message length change.
- Some components are change with new layout.

134 kHz RFID Design

- The same RFID chip is used. All circuitry around the RFID chip is the same.
- RFID antenna is mounted orthogonal to the PCB rather than horizontal to it.
- RFID software control settings (modes) are the same.

No change in frequency determining and stabilizing circuitry of the device (including clock or data rates), frequency multiplication stages, basic modulator circuit, or maximum power or field strength ratings has been done. Therefore, these changes can be considered as Class II permissive change.

Date of Test: March 17 to 23, 2006

FCC ID: S8IWPM5**2.0 Summary of Test Results**

FCC RULE	DESCRIPTION OF TEST	RESULT	PAGE
95.1115 (a)(2)	Field Strength of Fundamental	Worst case: 64.3 dB(μ V/m) @ 1427.625 MHz Margin: 53.1 dB	18
95.1115 (b)(2)	Field Strength of Harmonics	Worst case: 36.8 dB(μ V/m) @ 2791.25 MHz. Margin: 17.2 dB	18
15.209	Field Strength of Fundamental RFID reader system	Worst case: 1.4 dB(μ V/m) @ 137.14 kHz Margin: 23.5 dB	Note
15.209	Field Strength of Harmonics RFID reader system	Worst case: 3.6 dB(μ V/m) @ 685.7 kHz. Margin: 7.3 dB	Note
95.1115 (b)(2)	Radiated emissions outside the band, except harmonics.	Worst case: 41.7 dB(μ V/m) @ 465.3 MHz Margin: 4.3 dB	40
15.109	Radiated Emission (receiving mode)	Worst case: 32.0 dB(μ V/m) @ 196.9 MHz Margin: 11.5 dB	20
15.203	Antenna requirement	Complies	42
15.207	Line Conducted Emissions (transmitter mode)	Worst case: 36.3 dB μ V @ 13.1 MHz Margin: 13.7 dB	Note
15.107	Line Conducted Emissions (receiver mode)	Worst case: 36.3 dB μ V @ 13.1 MHz Margin: 13.7 dB	Note
2.1049	Occupied Bandwidth	588 kHz	43
95.1115(c)	Emission Types	Complies	Note
95.1115(d)	Channel Use	Complies	Note
2.1055 95.1115(e)	Frequency Stability	Complies	Note
95.1125	RF Safety	Complies	Note

Note : The following test results from the original test report (Report Number: 3078050LAX-001, issue date: September 12, 2005) are applicable without additional testing.


EMC Department

Date of issue: September 12, 2005

Test Engineer:


Sergey Marker

Reviewing Engineer:


Suresh Kondapalli

Date of Test: March 17 to 23, 2006

FCC ID: S8IWPM5**3.0 General Description****3.1 Product Description*****EQUIPMENT UNDER TEST***

Type of equipment	Wireless Physiologic Monitoring System		
Type/Model	WPT1000 – Transducer Module (X Unit) WTMXXX – Monitor Module (M Unit)		
Technical Specifications:	Range:	15 feet (4.6m)	
	Frequency:		
	Operating Frequencies:	WMTS Bands	
		1395 – 1400 MHz,	
		1427 – 1429.5 MHz	
	Channels:	Ch.1: 1395.625 MHz	
		Ch.2: 1396.875 MHz	
		Ch.3: 1398.125 MHz	
		Ch.4: 1399.375 MHz	
		Ch.5: 1427.625 MHz	
		Ch.6: 1428.875 MHz	
	RFID Reader System:	127 - 142 kHz	
	Modulation:		
	Operating system:	FSK (Frequency Shifted Keyed)	
	RFID Reader system:	OOK (On Off Keyed)	
	Output Power:		
	Operating system:	-5dBm	
	RFID Reader System:	150 dBμA/m	
	Supply voltage, wattage:		
	X Unit:	1.5 VDC AA Alkaline battery	
	M Unit:	9 VDC, 25 mA	
		AC Adapter:	100 -240 VAC Input
			9 VDC, 1.1 A Output
	Operational environment:	Indoors, 15°C to 40°C	
	Antenna:		
		Operating System:	Vertical Antenna (permanently attached)
		RFID Reader System:	Coil integrated inside the EUT
Manufacturer	Edwards Lifesciences, LLC One Edwards Way Irvine, CA 92614		

Date of Test: March 17 to 23, 2006**FCC ID: S8IWPMS*****Tested by request of***

Mr. Don Parikh
Phone: (949) 588-7568
Fax: (949) 588-8871

Standards:

FCC Part 95 H (95.1115)
FCC Part 15 B, C (15.109 / 209)

Test Report No.

3092673LAX-001

FCC ID:

S8IWPMS

EUT Description:

The Wireless Physiological Monitoring System is a wireless device designed to be used in place of standard cable. The system communication operates using frequency bands designed for use by the Wireless Medical Telemetry Service.

The system utilized RFID link process, which operates at 127 - 142 kHz frequency band.

Date of Test: March 17 to 23, 2006FCC ID: S8IWPMS

3.2 Related Submittal(s) Grants

This report is for use with an application for certification of a low power transmitter. One transmitter is included in the application. This specific report details the emission characteristics of transmitter.

3.3 Test Methodology

Both AC mains line-conducted and radiated emission measurements were performed according to the procedures in ANSI C63.4 (2003). Radiated emission measurements were performed in 10 m Open Area Test Site. All Radiated tests were performed at an antenna to EUT distance of 3 meters, unless stated otherwise in the "**Justification Section**" of this Application.

3.4 Test Facility

The test facility was a specially designed and constructed Open Area Test Site (OATS). Test site included a metal ground plane constructed of 22-gauge sheet metal. It contained a 2.5 meter diameter turntable for floor standing equipment, and a fiber glass table measuring 1.5 x 1.5 x 0.8 meters for table top equipment. To facilitate testing, also it has heat and air conditioning systems to control environmental test conditions.

This test facility and site measurement data have been fully placed on file with the FCC, Industry of Canada and A2LA accredited.

Test Facility: Intertek ETL Semko
27611 La Paz Road, Suite C
Laguna Niguel, CA 92677

Accreditations:
FCC Registration Number: 90711
A2LA Certificate Number: 2085-01
IC Reference Number: IC 3753

Date of Test: March 17 to 23, 2006

FCC ID: S8IWPM5**4.0 System Test Configuration****4.1 Justification**

For emission testing, the equipment under test (EUT) was configured for testing in a typical fashion (as a customer would normally use it). During testing, all cables were manipulated to produce worst case emissions.

For the measurements, the EUT is attached to a cardboard box (if necessary) and placed on the wooden turntable. If the EUT attaches to peripherals, they are connected and operational (as typical as possible). The EUT is wired to transmit full power.

The signal is maximized through rotation and placement in the three orthogonal axes. The antenna height and polarization are varied during the search for maximum signal level. The antenna height is varied from 1 to 4 meters.

Radiated emissions are taken at three meters unless the signal level is too low for measurement at that distance. If necessary, a pre-amplifier is used and/or the test is conducted at a closer distance. All readings are extrapolated back to the equivalent three meter reading using inverse scaling with distance.

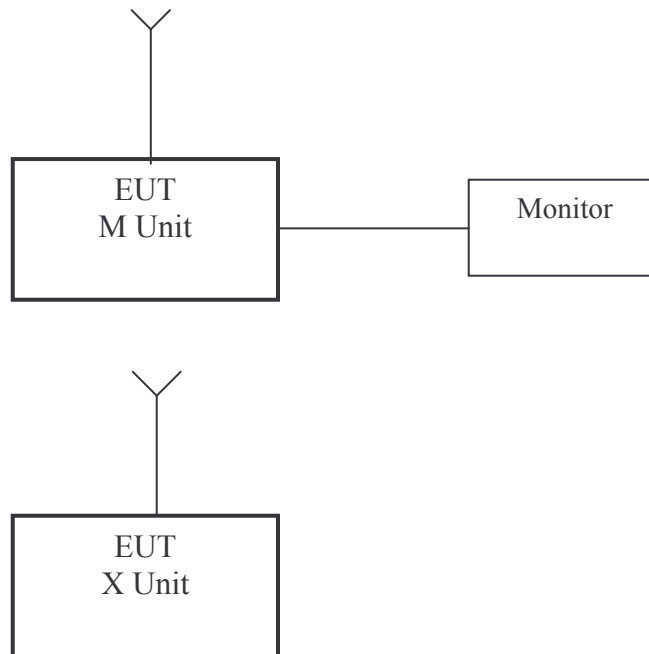
4.2 EUT Exercising Software

No software was required to exercise the EUT.

4.3 System Test Configuration**4.3.1 Support Equipment**

Support Equipment				
Equipment	Manufacturer	Model #	S/N #	FCC ID
Monitor	GE	Dash 4000	N/A	N/A

4.3.2 Block Diagram of Test Setup



S:	Shielded	U:	Unshielded	F:	With Ferrite Core
-----------	----------	-----------	------------	-----------	-------------------

Date of Test: March 17 to 23, 2006**FCC ID: S8IWPMS****4.4 Equipment Modification**

None

4.5 Mode(s) of operation

The X Unit was powered from the battery. This component transmits the transducer signal via radiofrequency to the M unit. The EUT utilizes Frequency Shift Keyed (FSK) modulation in normal operation. During the tests EUT was wired to operate at continuous transmitting mode (CW).

The M Unit was powered from the battery. This component connects to the patient monitor via IBP connection and receives the radiofrequency data transmission from X Unit. The EUT utilizes Frequency Shift Keyed (FSK) modulation in normal operation. During the tests EUT was wired to operate at continuous transmitting mode (CW).

NOTE:

Both units are transceivers utilizing the same transmitters in operation frequency range, and RFID reader system. The difference is only in control circuits.

Date of Test: March 17 to 23, 2006

FCC ID: S8IWPM5**5.0 Field Strength of Emission****5.1 Test Description**

Parameter:	FCC 95.1115(a)(2) & (b)(2)
Requirement:	FCC 95.1115(a)(2) & (b)(2)
Fundamental: 1395 – 1400 MHz	Limit 117.4 dB μ V
Harmonics: above 960 MHz	Limit 54 dB μ V
Distance:	3 m

5.1.1 Test Procedure

For the measurements, the EUT is attached to a cardboard box (if necessary) and placed on the wooden turntable which is 0.8 m above the ground plane on the open test site. If the EUT attaches to peripherals, they are connected and operational (as typical as possible). The EUT is wired to transmit full power in CW mode. Average Factor was calculated and added to the peak emission obtained in CW mode. The signal is maximized through rotation and placement in the three orthogonal axes. The antenna height and polarization are varied during the search for maximum signal level. The antenna height is varied from 1 to 4 meters. Radiated emissions are taken at three meters unless the signal level is too low for measurement at that distance. If necessary, a pre-amplifier is used and/or the test is conducted at a closer distance. All readings are extrapolated back to the equivalent three meter reading using inverse scaling with distance. Radiated emission measurements were performed from 30 MHz to the 10th harmonic of transmitter frequency. Analyzer resolution is 120 KHz for 30 to 1000 MHz, 1 MHz for >1000 MHz. This test was performed per test procedure specified in ANSI C63.4 (2003).

5.1.2 Field Strength Calculation

The field strength is calculated by adding the reading on the Spectrum Analyzer to the factors associated with antennas, cables, preamplifiers (if any) and average factors (when specified limits is in average and measurements are made with peak detectors) The basic equation with a sample calculation is as follows:

$$FS = RA + AF + CF - AG + AV$$

where FS = Field Strength in dB(μ V/m)
RA = Receiver Amplitude in dB(μ V)
CF = Cable Attenuation Factor in dB
AF = Antenna Factor in dB/m
AG = Amplifier Gain in dB
AV = Average Factor in (-dB)

Assume a receiver reading of 52.0 dB(μ V) is obtained. The antenna factor of 7.4 dB/m, cable factor of 4.6 dB and average factor of -5.1 dB are added. The amplifier gain of 27 dB is subtracted, giving a field strength of 32 dB(μ V/m).

$$\begin{array}{lll} RA = 52 \text{ dB}(\mu\text{V}) & CF = 1.6 \text{ dB} & AV = -5.1 \text{ dB} \\ AF = 7.4 \text{ dB/m} & AG = 29 \text{ dB} & FS = 52 + 7.4 + 4.6 - 27 - 5.1 = 32 \text{ dB}(\mu\text{V/m}) \end{array}$$

This value in dB(μ V/m) was converted to its corresponding level in μ V/m.

Level in μ V/m = Common Antilogarithm $\{[32 \text{ dB}(\mu\text{V/m})]/20\} = 39.8 \mu\text{V/m}$

Note: In the following table(s), the level shown on the data table includes the antenna factor, cable factor and preamplifier gain.

5.1.3 Calculation of Average Factor.

Average Factor (AV) in dB = $20 \log (\text{duty cycle})$

The specification for output field strength for frequencies above 1000 MHz according to FCC rules specify measurements with average detectors. The EUT use Frequency Shift Keyed (FSK) modulation in normal operation. During the tests EUT was wired to operate at continuous transmitting mode (CW). For field strength measurements of emission from transmitter, average factor was calculated and added to the peak emission obtained in CW mode and compared to the limit specified for average detector.

The time period over the duty cycle is measured is 55 milliseconds, or the repetition cycle, whichever is a shorter time frame. The worst case (highest percentage on) duty cycle is used for calculation.

The duty cycle is simply the On-time divided by the period:

Time period = 55 ms

Effective period of the cycle = $1.32 \text{ ms} \times 2 = 2.64 \text{ ms}$

DC = $2.64 \text{ ms} / 55 \text{ ms} = 0.048$

AV = $20 \log 0.048 = -26.4 \text{ dB}$

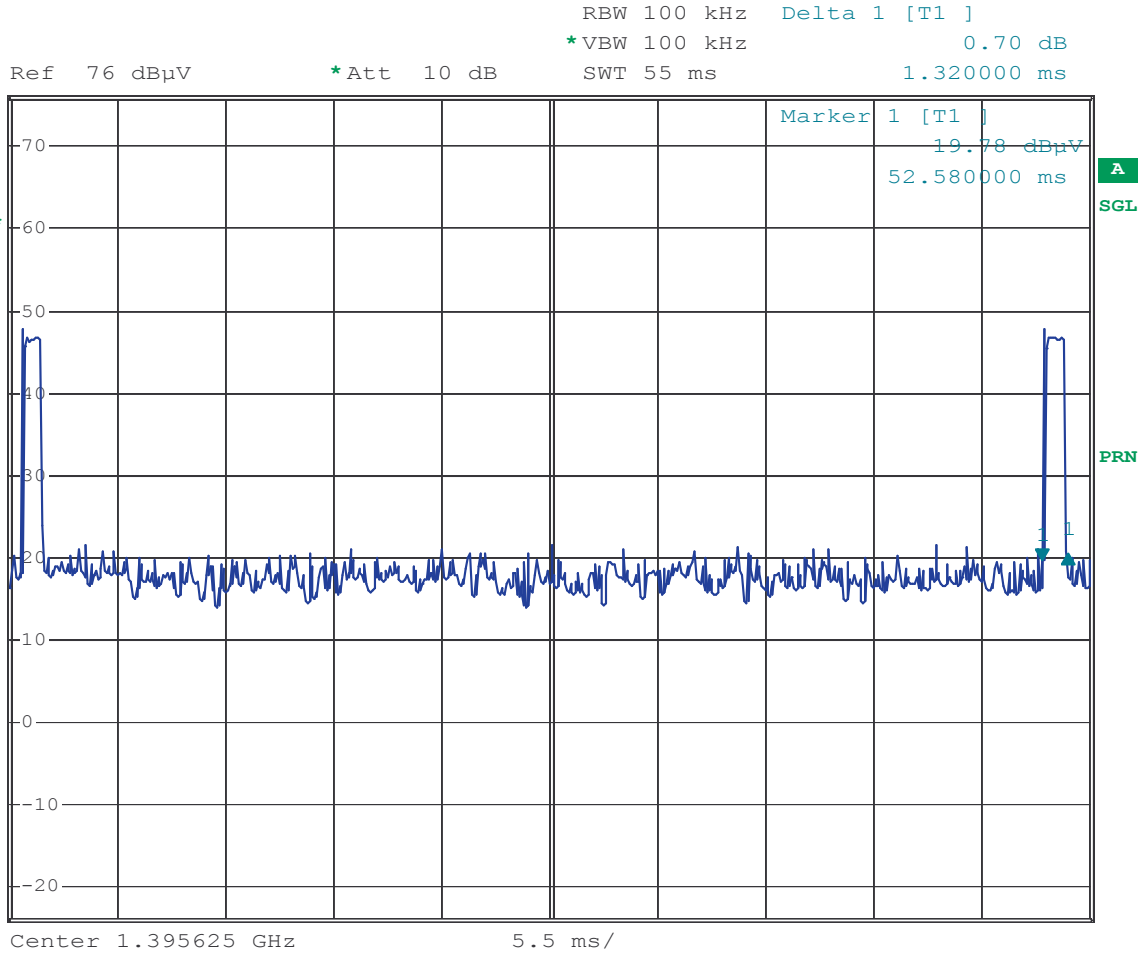
Plot on the next page shows the transmission timing over 55 ms time frame.

Date of Test: March 17 to 23, 2006

FCC ID: S8IWPM5



1 PK*
CLRWR



Comment: Duty cycle

Date: 23.MAR.2006 22:53:20

Date of Test: March 17 to 23, 2006

FCC ID: S8IWPM5

5.1.4 Radiated Emission Data**Standard:** FCC Part 95.1115(a)(2) & (b)(2)**Company:** Edwards Lifesciences, LLC**Job No.** 3092673LAX-001**Model Name:** X Unit**Test Channel:** Channel 1 & 4**Mode:** Transmitting (CW)

Measurement Uncertainty: 3.92dB

Temperature: 24°C

Relative Humidity: 49 %

NOTE:

Both units are transceivers utilizing the same transmitters/receivers in operation frequency range, and RFID reader system. The difference is only in control circuits.

Frequency	Distance	Vertical level	Horizontal level	D.C.F.	Limit	Margin
MHz	m	(dBuV/m)	(dBuV/m)	dB	(dBuV/m)	(dB)
1395.625	3.0	52.0	58.0	0.0	117.4	-59.4
2791.250	3.0	31.1	35.2	0.0	54.0	-18.8
4186.875	3.0	28.1	31.3	0.0	54.0	-22.7
5582.250	3.0	30.7	29.9	0.0	54.0	-23.3
6978.125	3.0	29.4	29.1	0.0	54.0	-24.6
8373.750	3.0	32.7	32.7	0.0	54.0	-21.3
9769.375	3.0	35.4	35.5	0.0	54.0	-18.5
11165.000	1.0	38.7	37.9	9.5	54.0	-24.8
12560.625	1.0	38.1	37.7	9.5	54.0	-25.4
13956.250	1.0	44.5	44.7	9.5	54.0	-18.8
1399.375	3.0	53.6	60.0	0.0	117.4	-57.4
2798.750	3.0	29.4	35.2	0.0	54.0	-18.8
4198.125	3.0	27.7	33.0	0.0	54.0	-21.0
5597.500	3.0	32.2	30.3	0.0	54.0	-21.7
6996.875	3.0	28.9	30.3	0.0	54.0	-23.7
8396.250	3.0	32.0	32.4	0.0	54.0	-21.6
9795.250	3.0	35.9	35.4	0.0	54.0	-18.1
11195.000	1.0	38.0	37.3	9.5	54.0	-25.5
12594.375	1.0	38.7	37.8	9.5	54.0	-24.8
13993.750	1.0	44.7	44.1	9.5	54.0	-18.8

Date of Test: March 17 to 23, 2006

FCC ID: S8IWPM5

Model Name: X Unit

Test Channel: Channel 5 & 6

Frequency	Distance	Vertical level	Horizontal level	D.C.F.	Limit	Margin
MHz	m	(dBuV/m)	(dBuV/m)	dB	(dBuV/m)	(dB)
1427.625	3.0	52.9	59.8	0.0	117.4	-57.6
2855.250	3.0	26.4	31.9	0.0	54.0	-22.1
4282.875	3.0	30.9	30.2	0.0	54.0	-23.8
5710.500	3.0	31.0	28.4	0.0	54.0	-25.6
7138.125	3.0	30.5	29.6	0.0	54.0	-24.4
8565.750	3.0	31.8	32.2	0.0	54.0	-21.8
9993.375	3.0	35.4	35.6	0.0	54.0	-18.4
11421.000	1.0	36.9	37.5	9.5	54.0	-26.0
12848.625	1.0	37.7	37.7	9.5	54.0	-25.8
14276.250	1.0	44.3	45.1	9.5	54.0	-18.4
1428.875	3.0	51.6	59.9	0.0	117.4	-57.5
2857.750	3.0	25.9	31.6	0.0	54.0	-22.4
4286.625	3.0	32.3	31.0	0.0	54.0	-23.0
5715.500	3.0	30.8	29.3	0.0	54.0	-23.2
7144.375	3.0	31.5	30.0	0.0	54.0	-22.5
8573.250	3.0	32.2	32.9	0.0	54.0	-21.1
10002.250	3.0	35.6	36.3	0.0	54.0	-17.7
11431.000	1.0	38.2	37.6	9.5	54.0	-25.3
12859.875	1.0	38.1	37.4	9.5	54.0	-25.4
14288.750	1.0	45.2	46.1	9.5	54.0	-17.4

Date of Test: March 17 to 23, 2006

FCC ID: S8IWPMS

Model Name: M Unit

Test Channel: Channel 1 & 5

Frequency	Distance	Vertical level	Horizontal level	D.C.F.	Limit	Margin
MHz	m	(dBuV/m)	(dBuV/m)	dB	(dBuV/m)	(dB)
1395.625	3.0	53.2	63.1	0.0	117.4	-54.3
2791.250	3.0	30.0	36.8	0.0	54.0	-17.2
4186.875	3.0	32.8	30.8	0.0	54.0	-21.2
5582.250	3.0	28.8	26.7	0.0	54.0	-25.2
6978.125	3.0	29.4	28.2	0.0	54.0	-24.6
8373.750	3.0	31.9	32.5	0.0	54.0	-21.5
9769.375	3.0	35.2	35.4	0.0	54.0	-18.6
11165.000	1.0	36.9	37.3	9.5	54.0	-26.2
12560.625	1.0	38.1	38.3	9.5	54.0	-25.2
13956.250	1.0	44.1	44.0	9.5	54.0	-19.4
1427.625	3.0	53.7	64.3	0.0	117.4	-53.1
2855.250	3.0	28.8	33.9	0.0	54.0	-20.1
4282.875	3.0	32.8	32.5	0.0	54.0	-21.2
5710.500	3.0	31.2	29.7	0.0	54.0	-22.8
7138.125	3.0	31.0	29.2	0.0	54.0	-23.0
8565.750	3.0	32.3	32.9	0.0	54.0	-21.7
9993.375	3.0	36.3	36.3	0.0	54.0	-17.7
11421.000	1.0	37.8	37.7	9.5	54.0	-25.7
12848.625	1.0	37.5	37.5	9.5	54.0	-26.0
14276.250	1.0	45.4	44.8	9.5	54.0	-18.7

Notes:

- The field strength shown in the table (Vertical and Horizontal levels) included Antenna factor, Cable loss, Average factor (-26.4) and Pre-amplifier Gain (if applicable).
- Negative signs (-) in Margin column signify levels below the limits.
- For frequencies below 1000 MHz the, above limits are based on quasi-peak limits.
Analyzer setting: RBW =120 KHz, VBW =300 KHz
- For frequencies above 1000 MHz the, above limits are based on average limits.
- Analyzer setting: RBW =1 MHz, VBW =1 MHz
- All other emissions not reported are below the equipment noise floor which is at least 10 dB below the limits.

Date of Test: March 17 to 23, 2006

FCC ID: S8IWPMS

g) D.C.F: Distance Correction Factor.

Test Result	FCC 95.1115 (a)(2): Passed with 53.1 dB margin at 1427.625 MHz. FCC 95.1115 (b)(2): Passed with 17.2 dB margin at 2791.75 MHz.
--------------------	---

Date of Test: March 17 to 23, 2006

FCC ID: S8IWPMS**5.2 Test Description**

Parameter:	FCC 15.109
Requirement:	FCC 15.109
30-88 MHz	40 dB μ V @ 3 m
88-216 MHz	43.5 dB μ V @ 3 m
216-960 MHz	46 dB μ V @ 3 m
Above 960 MHz	54 dB μ V @ 3 m

5.2.1 Test Procedure

See section 5.1.1.

5.2.2 Field Strength Calculation

See section 5.1.2.

Date of Test: March 17 to 23, 2006

FCC ID: S8IWPMS**5.2.3 Radiated Emission Data****Standard:** FCC Part 15.109**Company:** Edwards Lifesciences, LLC**Job No.** 3092673LAX-001**Model Name:** X Unit**Test Channel:** Channel 1**Mode:** Receiving**Distance:** 3 m

Measurement Uncertainty: 3.92dB

Temperature: 24°C

Relative Humidity: 49 %

Frequency	Detector	Vertical level	Horizontal level	D.C.F.	Limit	Margin
MHz		(dBuV/m)	(dBuV/m)	dB	(dBuV/m)	(dB)
189.4	Q-peak	18.2	27.2	0	43.5	-16.3
190.5	Q-peak	19.1	29.0	0	43.5	-14.5
195.5	Q-peak	20.3	29.5	0	43.5	-14.0
196.9	Q-peak	21.6	32.0	0	43.5	-11.5
198.1	Q-peak	21.4	31.4	0	43.5	-12.1
204.3	Q-peak	19.7	28.8	0	43.5	-14.7
225.7	Q-peak	20.5	29.2	0	46.0	-16.8

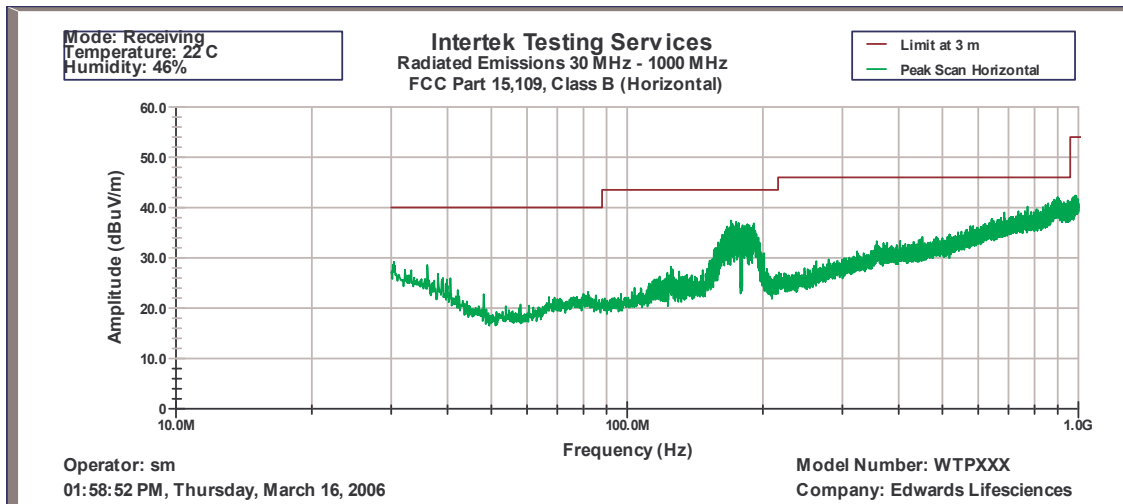
Notes:

- The field strength shown in the table (Vertical and Horizontal levels) included Antenna factor, Cable loss and Pre-amplifier Gain (if applicable).
- All emissions not reported were at least 20 dB below the limits.
- Negative signs (-) in Margin column signify levels below the limits.
- Analyzer setting: RBW \geq 1 MHz, VBW \geq 1 MHz, for freq. $>$ 1 GHz
RBW \geq 100 kHz, VBW \geq 100 kHz, for freq. $<$ 1 GHz
- D.C.F: Distance Correction Factor

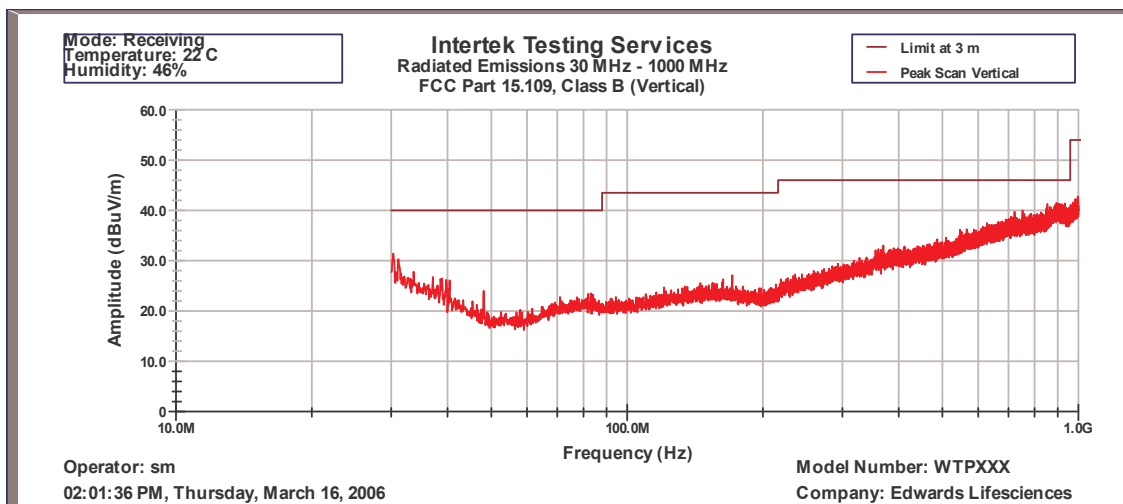
Test Result Passed with 11.5 dB margin at 196.9MHz.

Date of Test: March 17 to 23, 2006

FCC ID: S8IWPM5



Radiated Emission, X Unit, Horizontal Polarization



Radiated Emission, X Unit, Vertical Polarization

Date of Test: March 17 to 23, 2006

FCC ID: S8IWPMS

5.2.4 Radiated Emission Data**Standard:** FCC Part 15.109**Company:** Edwards Lifesciences, LLC**Job No.** 3092673LAX-001**Model Name:** M Unit**Test Channel:** Channel 1**Mode:** Receiving**Distance:** 3 m

Measurement Uncertainty: 3.92dB

Temperature: 24°C

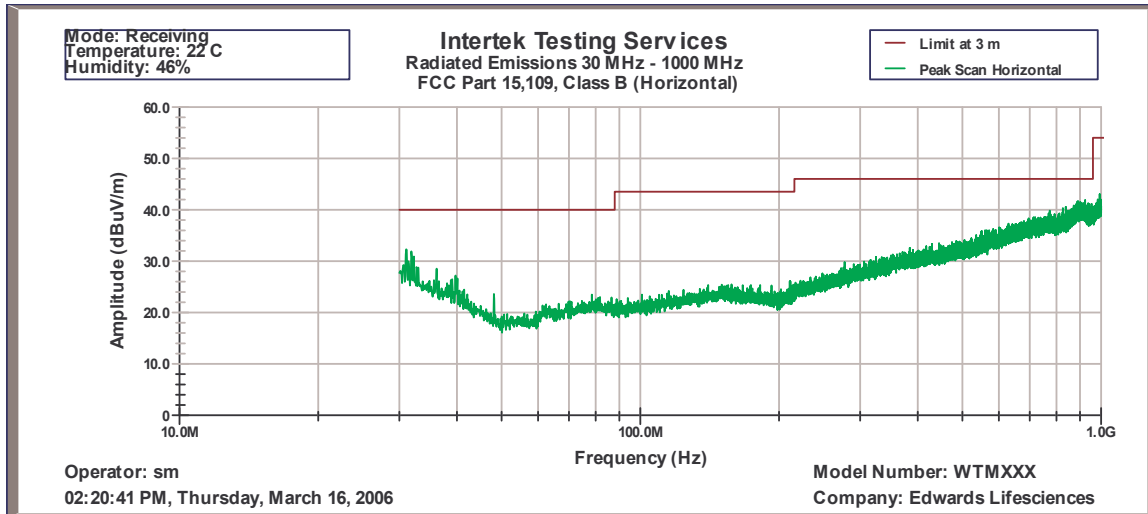
Relative Humidity: 49 %

Notes:

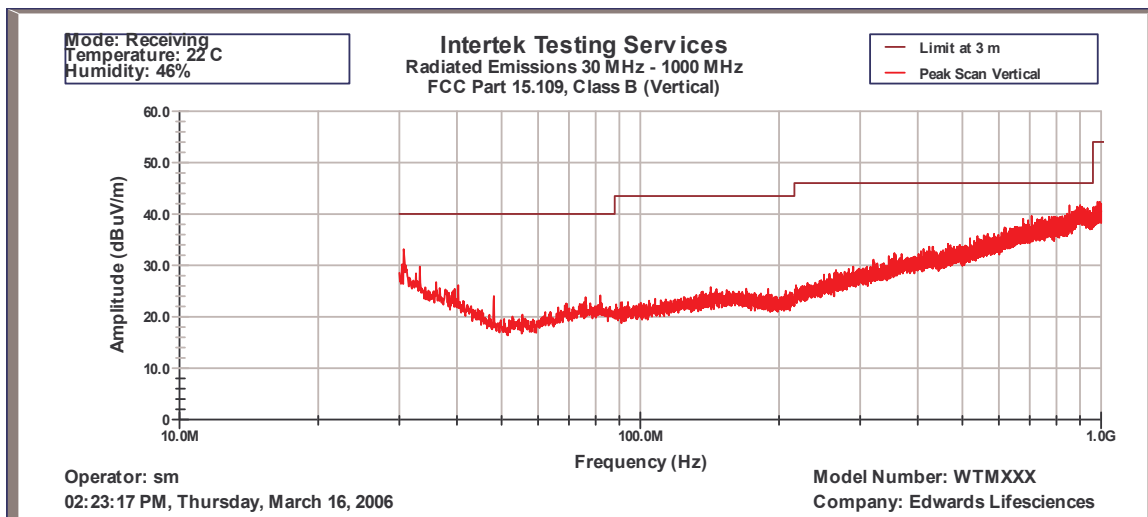
No emissions were found below the noise level of EMI receiver. See next page for peak scans

Date of Test: March 17 to 23, 2006

FCC ID: S8IWPM5



Radiated Emission, M Unit, Horizontal Polarization



Radiated Emission, M Unit, Vertical Polarization

Date of Test: March 17 to 23, 2006

FCC ID: S8IWPM5

6.0 Out of Band Emission**6.1 Test Description**

Parameter:	FCC 95.1115(b)
Requirement:	FCC 95.1115(b) & (b)(2)
below: 960 MHz	Limit 46 dB μ V
above: 960 MHz	Limit 54 dB μ V
Distance:	3 m

6.2 Test Procedure

See section 4.1.1.

6.3 Test Results

See attached plots.

The following plots show the relative spurious emission level of the X Unit in transmitting mode.

Plot #	Description
5.3.a	Plot shows peak scan emission from 30 to 1000 MHz. Plot show emissions which verified in section 5.4 for compliance to section 95.1115(b)
5.3.b	Plot shows peak measurements differential between ch.1 fundamental and frequency range from 1000 to 1400 MHz. (58-43.5=14.5 dB μ V) < 54 dB μ V
5.3.c	Plot shows peak measurements differential between ch.1 fundamental and lower edge of the frequency band (58-33.0=25 dB μ V) < 54 dB μ V
5.3.d	Plot shows peak measurements differential between ch.1 fundamental and upper edge of the frequency band (58-44.0=14 dB μ V) < 54 dB μ V
5.3.e	Plot shows peak measurements differential between ch.4 fundamental and lower edge of the frequency band (60-33.0=27 dB μ V) < 54 dB μ V
5.3.f	Plot shows peak measurements differential between ch.4 fundamental and upper edge of the frequency band (60-31.4=28.6 dB μ V) < 54 dB μ V
5.3.g	Plot shows peak measurements differential between ch.5 fundamental and lower edge of the frequency band (59.8-36.0=23.8 dB μ V) < 54 dB μ V
5.3.h	Plot shows peak measurements differential between ch.5 fundamental and upper edge of the frequency band (59.8-35.0=24.8 dB μ V) < 54 dB μ V
5.3.i	Plot shows peak measurements differential between ch.6 fundamental and lower edge of the frequency band (59.9-36.0=23.9dB μ V) < 54 dB μ V
5.3.j	Plot shows peak measurements differential between ch.6 fundamental and upper edge of the frequency band (59.9-36.0=23.9dB μ V) < 54 dB μ V
5.3.k	Plot shows peak measurements differential between ch.6 fundamental and frequency range from 1400 to 2000 MHz (59.9-39.3=20.6dB μ V) < 54 dB μ V

Date of Test: March 17 to 23, 2006**FCC ID: S8IWPMS**

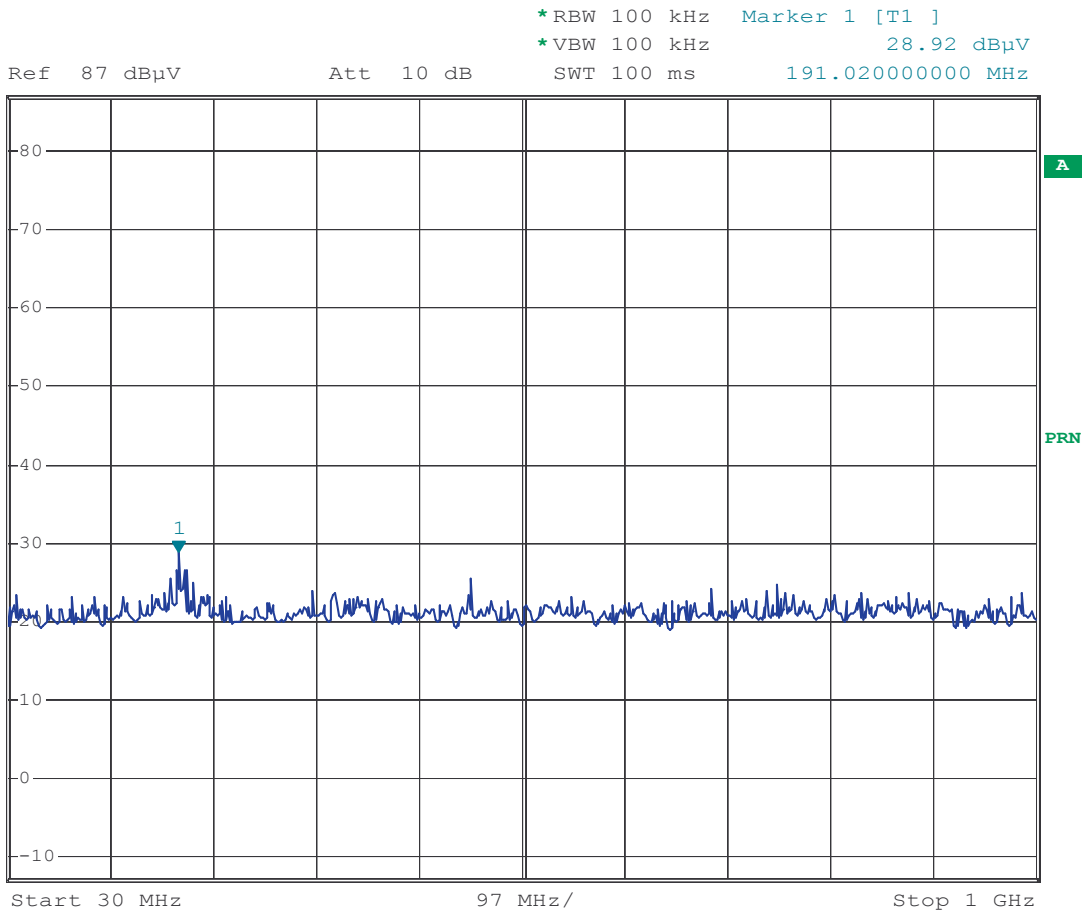
5.3.l	Plot shows spurious emission from 2000 to 4000 MHz, which verified in section 5.4 for compliance to section 95.1115(b)
5.3.m	Plot shows spurious emission from 4000 to 6000 MHz, which verified in section 5.4 for compliance to section 95.1115(b)
5.3.n	Plot shows spurious emission from 6000 to 10000 MHz, which verified in section 5.4 for compliance to section 95.1115(b)

Date of Test: March 17 to 23, 2006

FCC ID: S8IWPM5



1 PK
VIEW



Comment: Ch1-X-Unit

Date: 16.MAR.2006 23:43:10

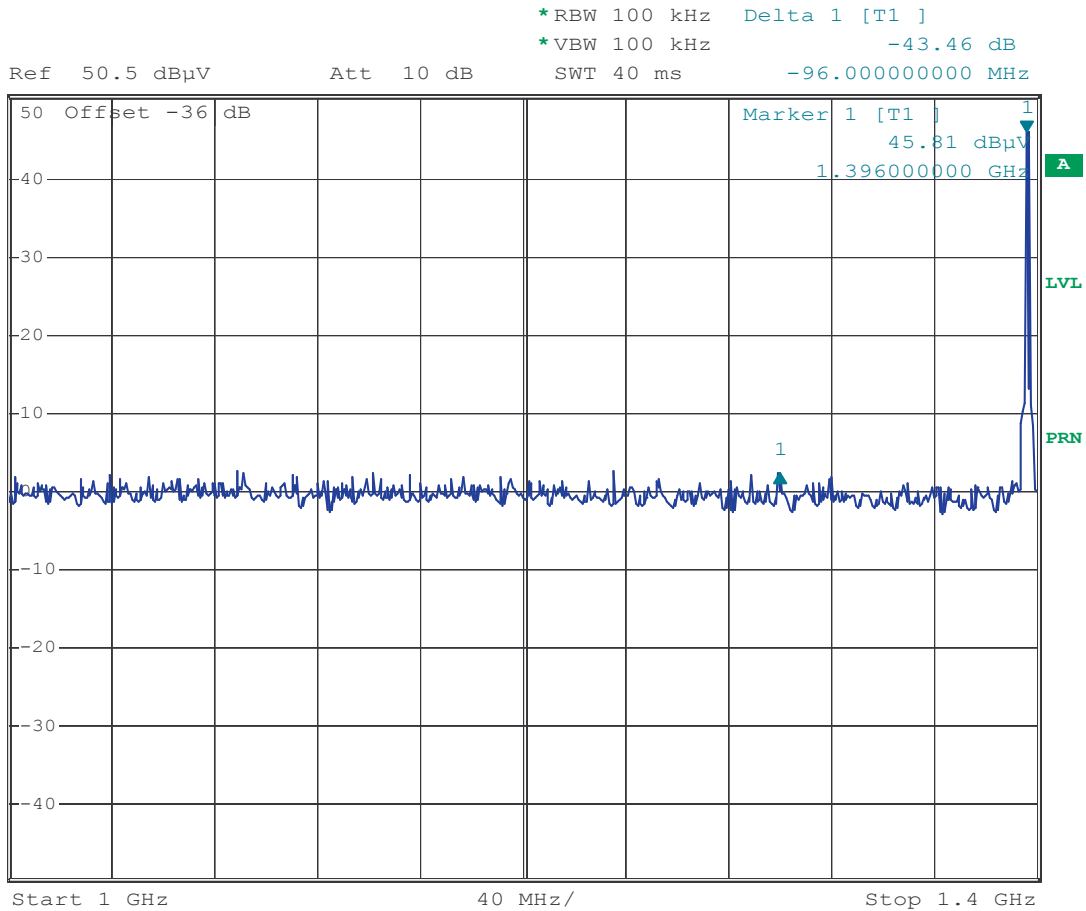
Plot 5.3.a

Date of Test: March 17 to 23, 2006

FCC ID: S8IWPM5



1 PK
VIEW



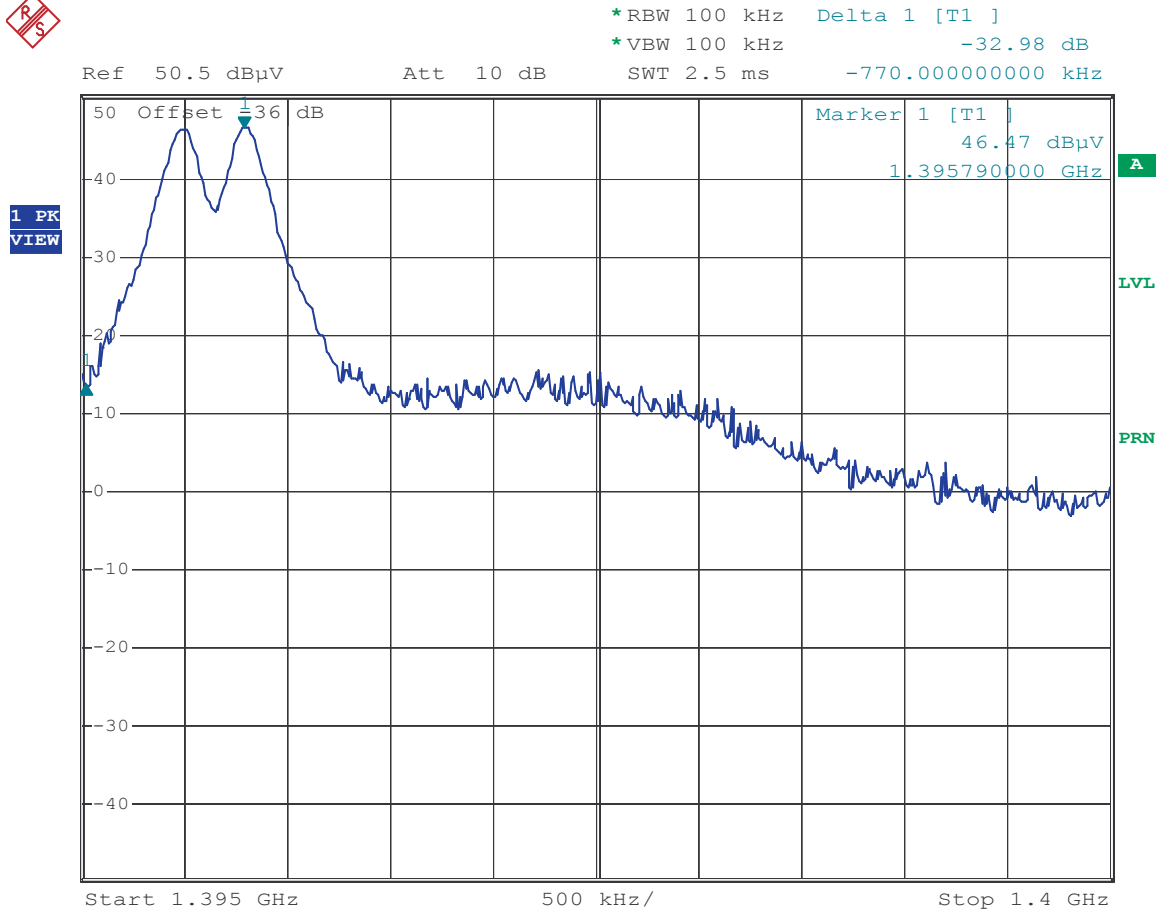
Comment: Ch1-X-Unit

Date: 17.MAR.2006 00:01:53

Plot 5.3.b

Date of Test: March 17 to 23, 2006

FCC ID: S8IWPM5



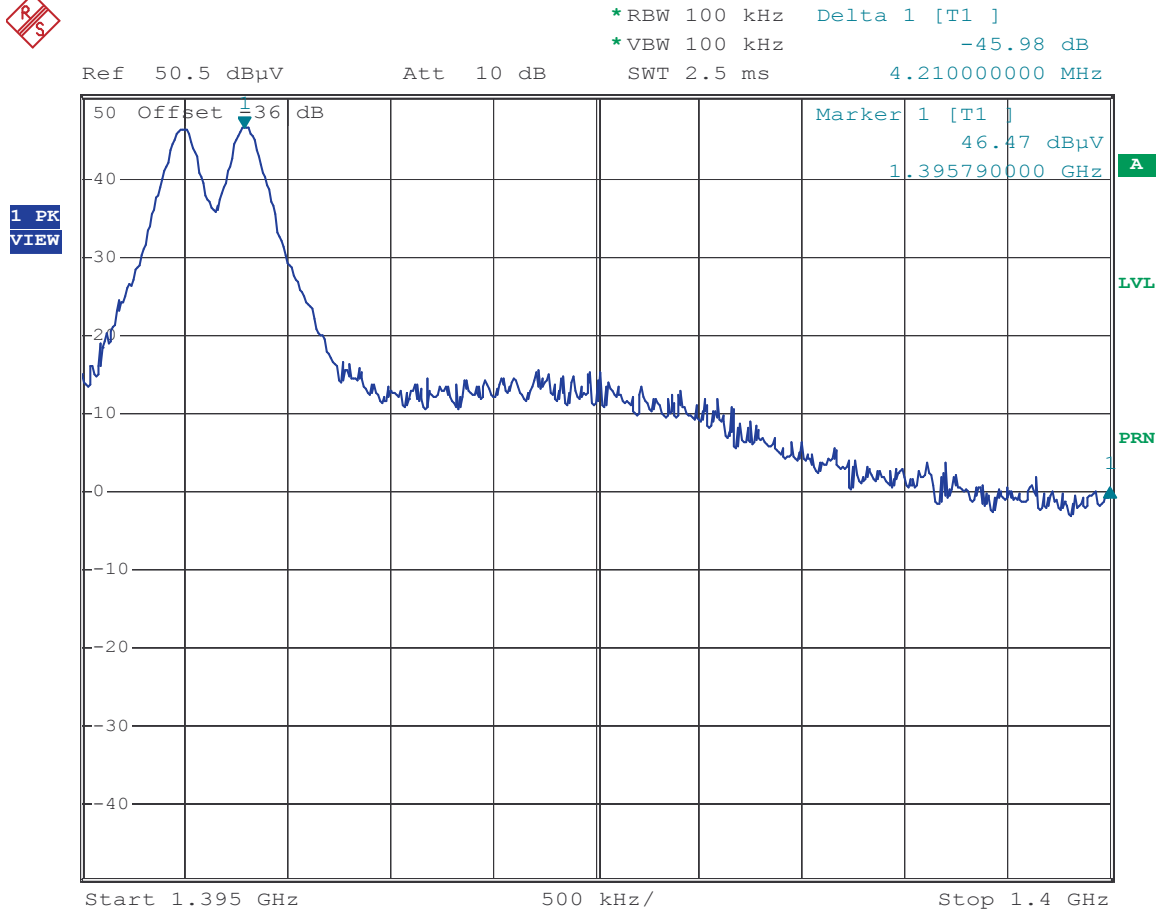
Comment: Ch4 X-Unit

Date: 17.MAR.2006 00:23:28

Plot 5.3.c

Date of Test: March 17 to 23, 2006

FCC ID: S8IWPM5



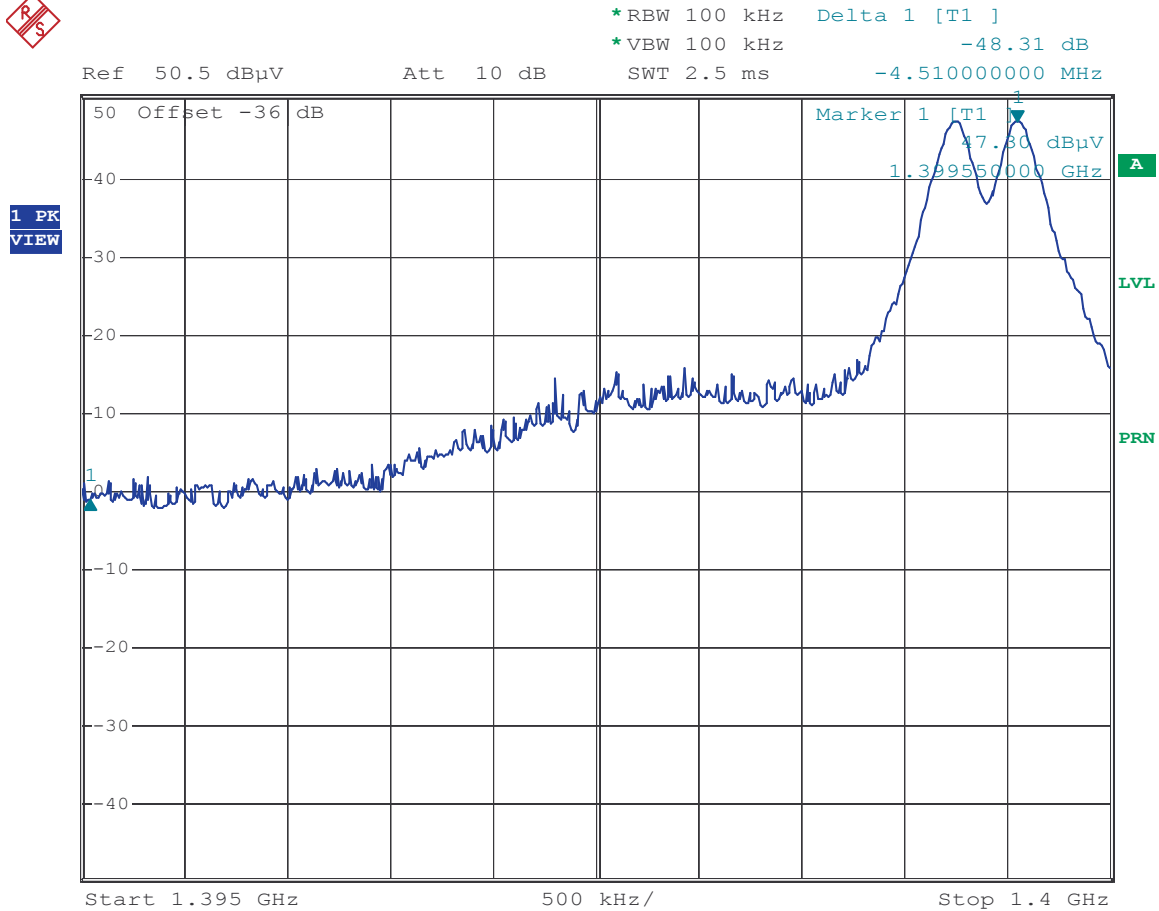
Comment: Ch4 X-Unit

Date: 17.MAR.2006 00:22:07

Plot 5.3.d

Date of Test: March 17 to 23, 2006

FCC ID: S8IWPM5



Comment: Ch4 X-Unit

Date: 17.MAR.2006 00:18:41

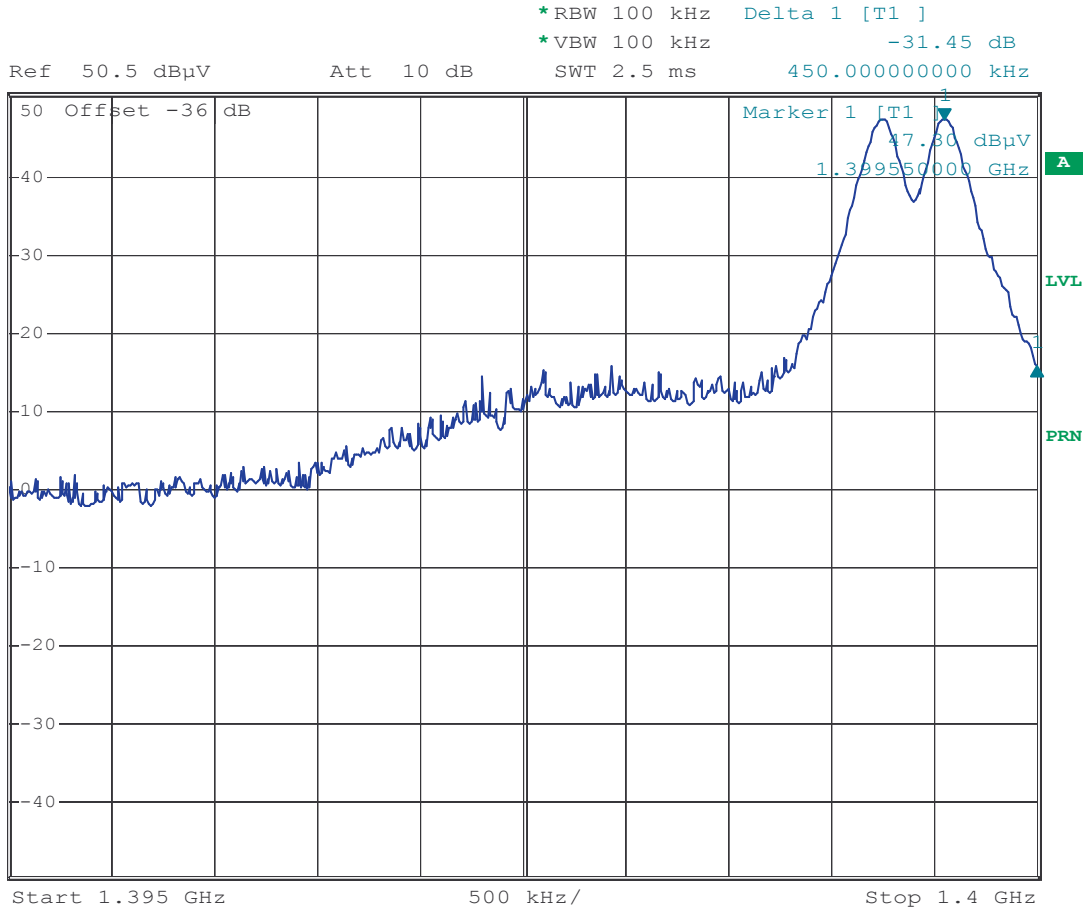
Plot 5.3.e

Date of Test: March 17 to 23, 2006

FCC ID: S8IWPM5



1 PK
VIEW



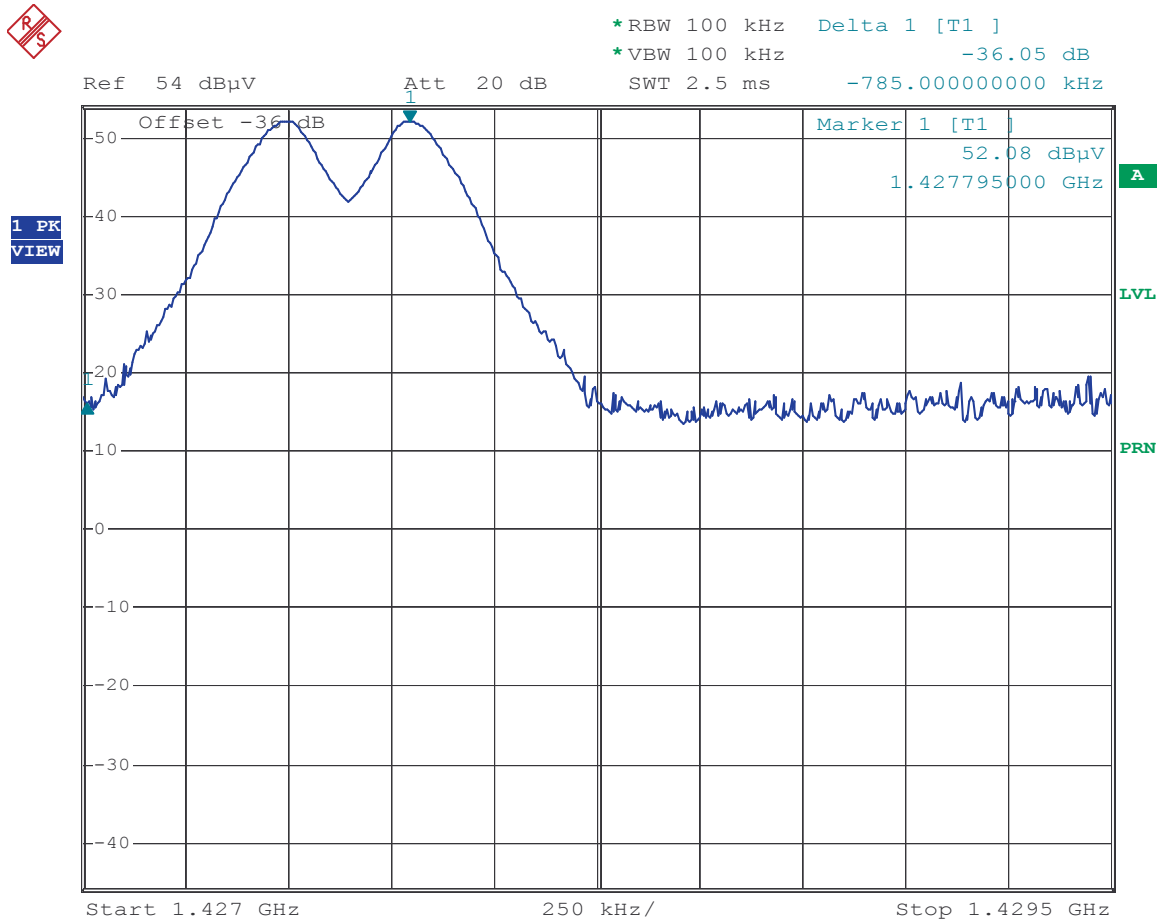
Comment: Ch4 X-Unit

Date: 17.MAR.2006 00:20:06

Plot 5.3.f

Date of Test: March 17 to 23, 2006

FCC ID: S8IWPM5

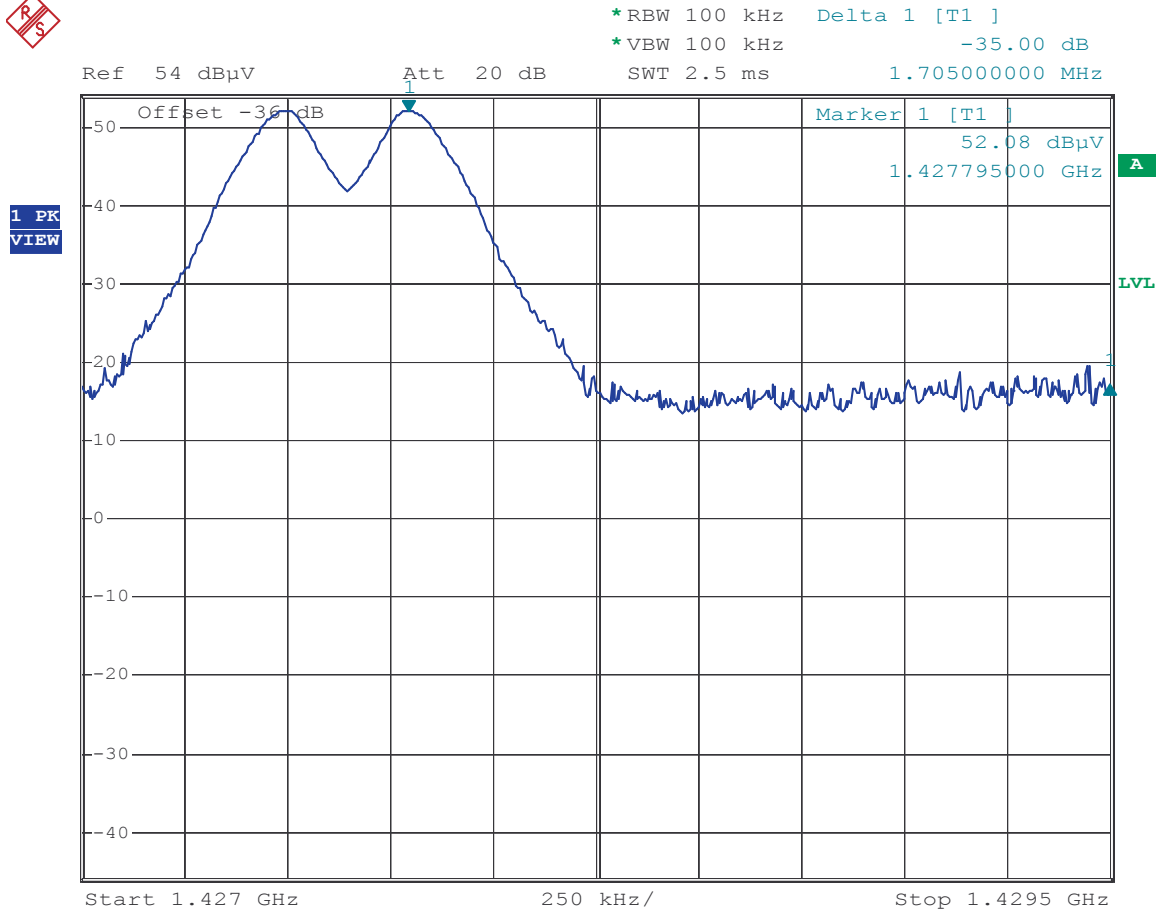


Comment: Ch5 X-Unit
 Date: 17.MAR.2006 00:26:51

Plot 5.3.g

Date of Test: March 17 to 23, 2006

FCC ID: S8IWPM5



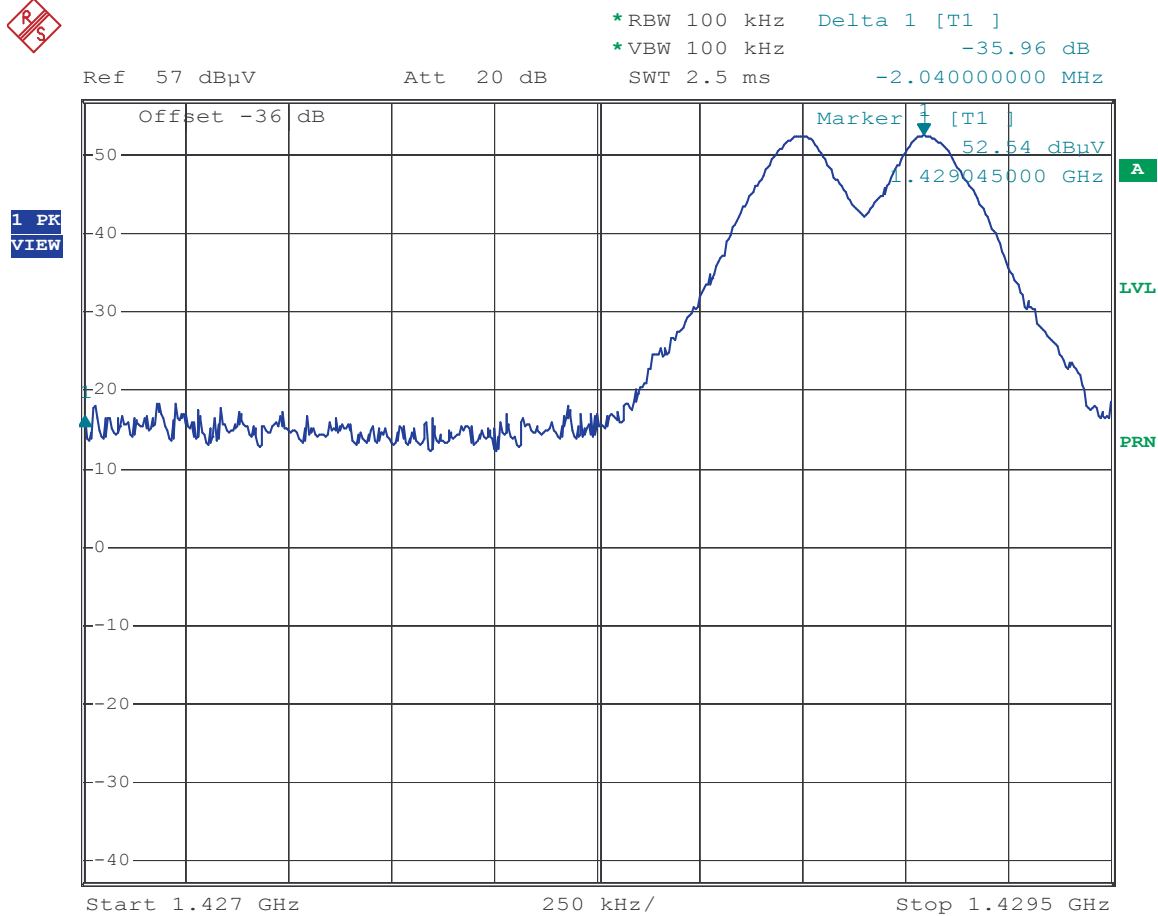
Comment: Ch5 X-Unit

Date: 17.MAR.2006 00:28:23

Plot 5.3.h

Date of Test: March 17 to 23, 2006

FCC ID: S8IWPM5



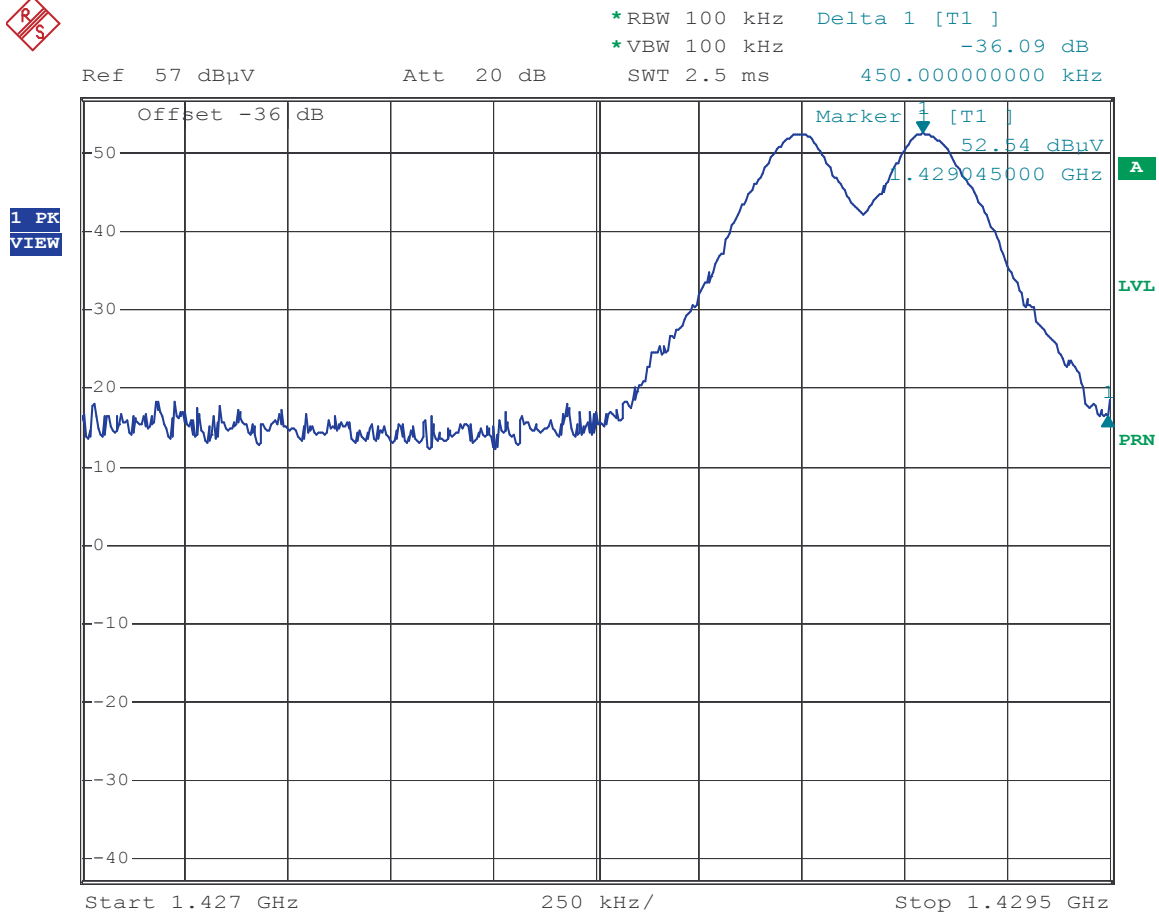
Comment: Ch6 X-Unit

Date: 17.MAR.2006 00:34:11

Plot 5.3.i

Date of Test: March 17 to 23, 2006

FCC ID: S8IWPM5



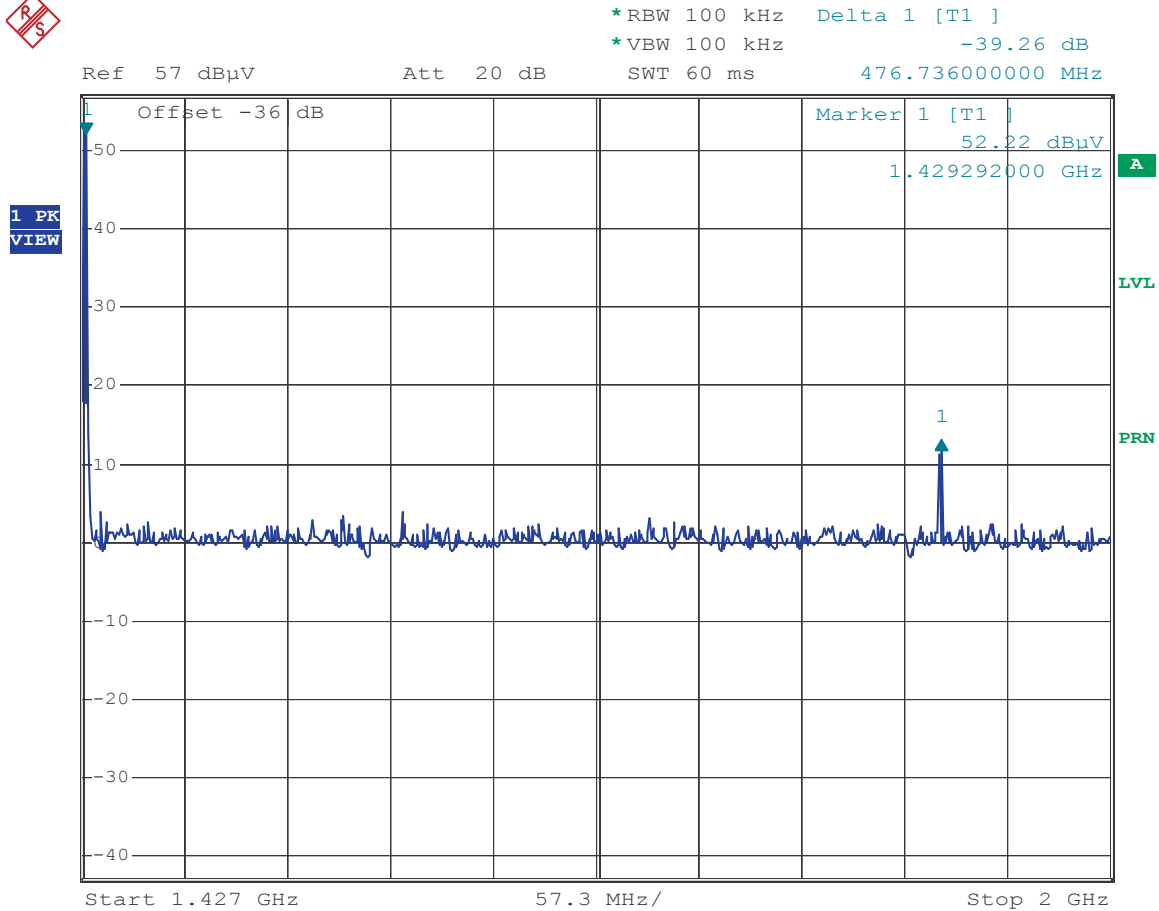
Comment: Ch6 X-Unit

Date: 17.MAR.2006 00:35:22

Plot 5.3.j

Date of Test: March 17 to 23, 2006

FCC ID: S8IWPM5



Comment: X-Unit, 1427-2000

Date: 17.MAR.2006 00:42:39

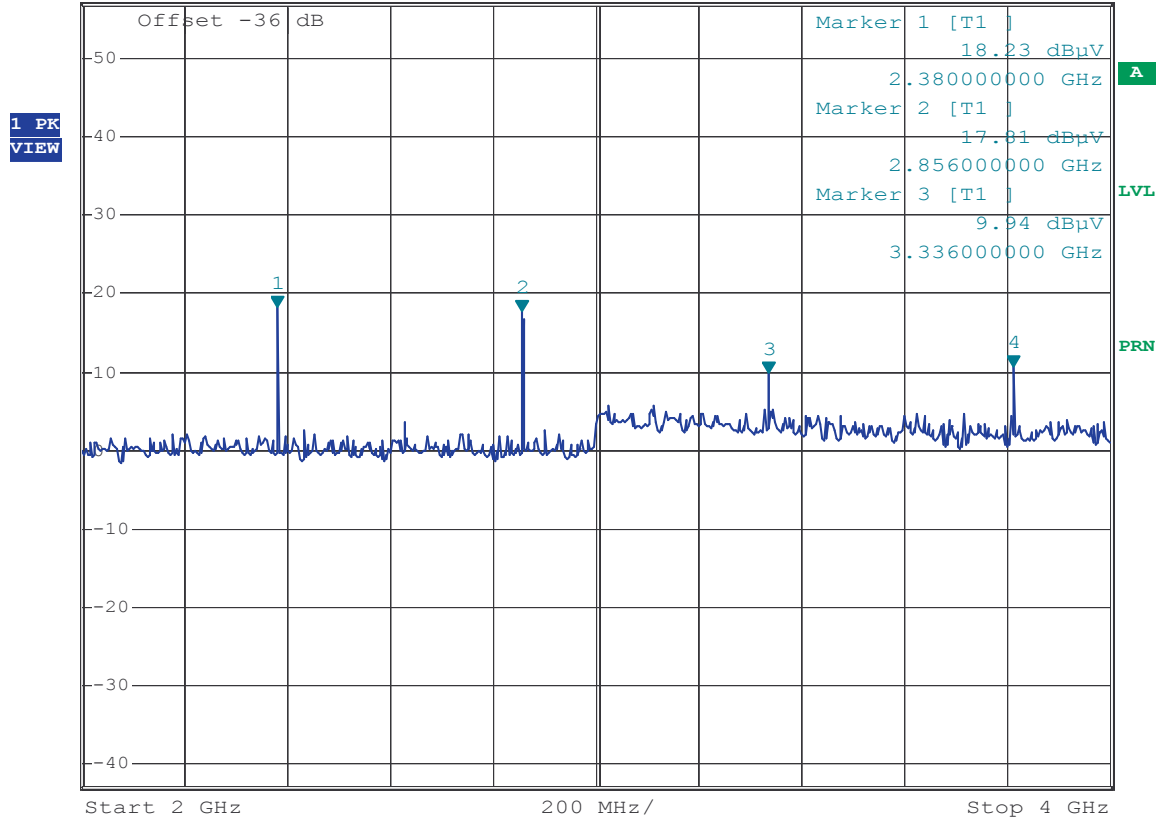
Plot 5.3.k

Date of Test: March 17 to 23, 2006

FCC ID: S8IWPM5



*RBW 100 kHz Marker 4 [T1]
 *VBW 100 kHz 10.65 dBμV
 Ref 57 dBμV Att 20 dB SWT 200 ms 3.812000000 GHz



Comment: X-Unit, 2000-4000
 Date: 17.MAR.2006 00:46:57

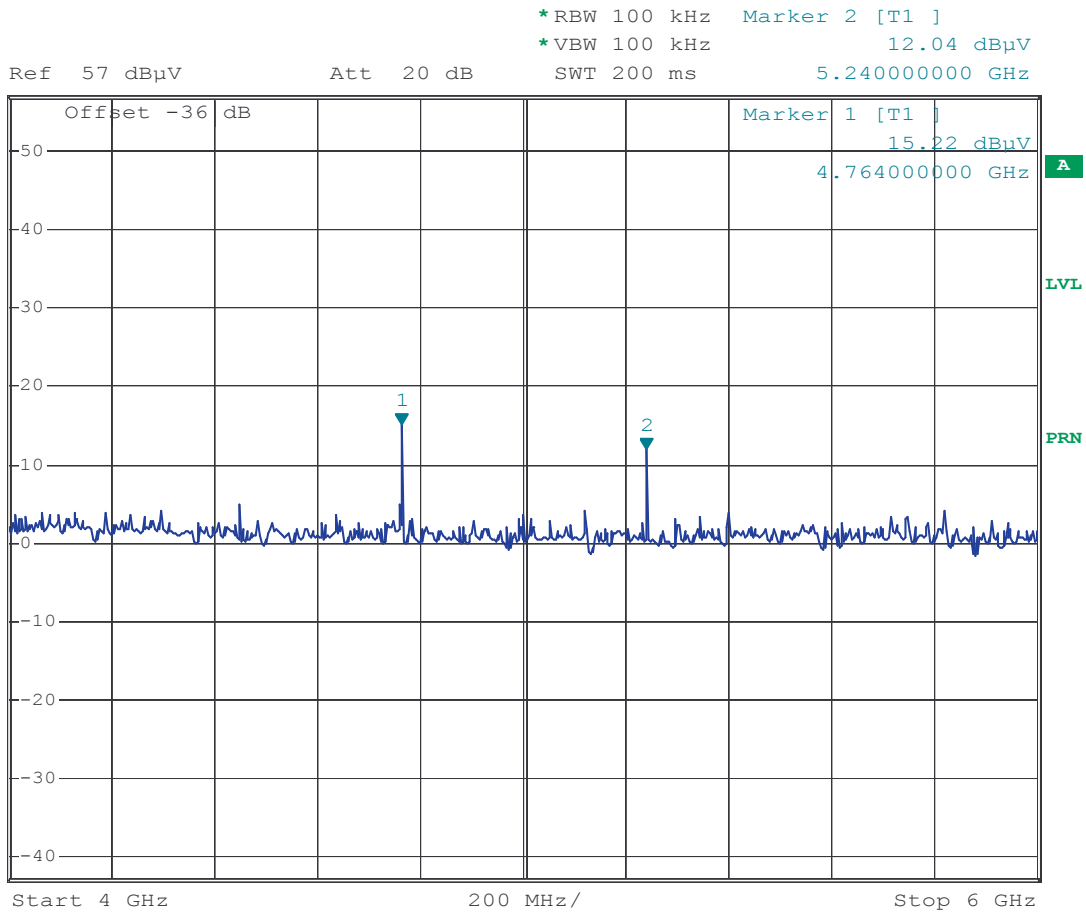
Plot 5.3.1

Date of Test: March 17 to 23, 2006

FCC ID: S8IWPM5



1 PK
VIEW



Comment: X-Unit, 4000-6000

Date: 17.MAR.2006 00:53:03

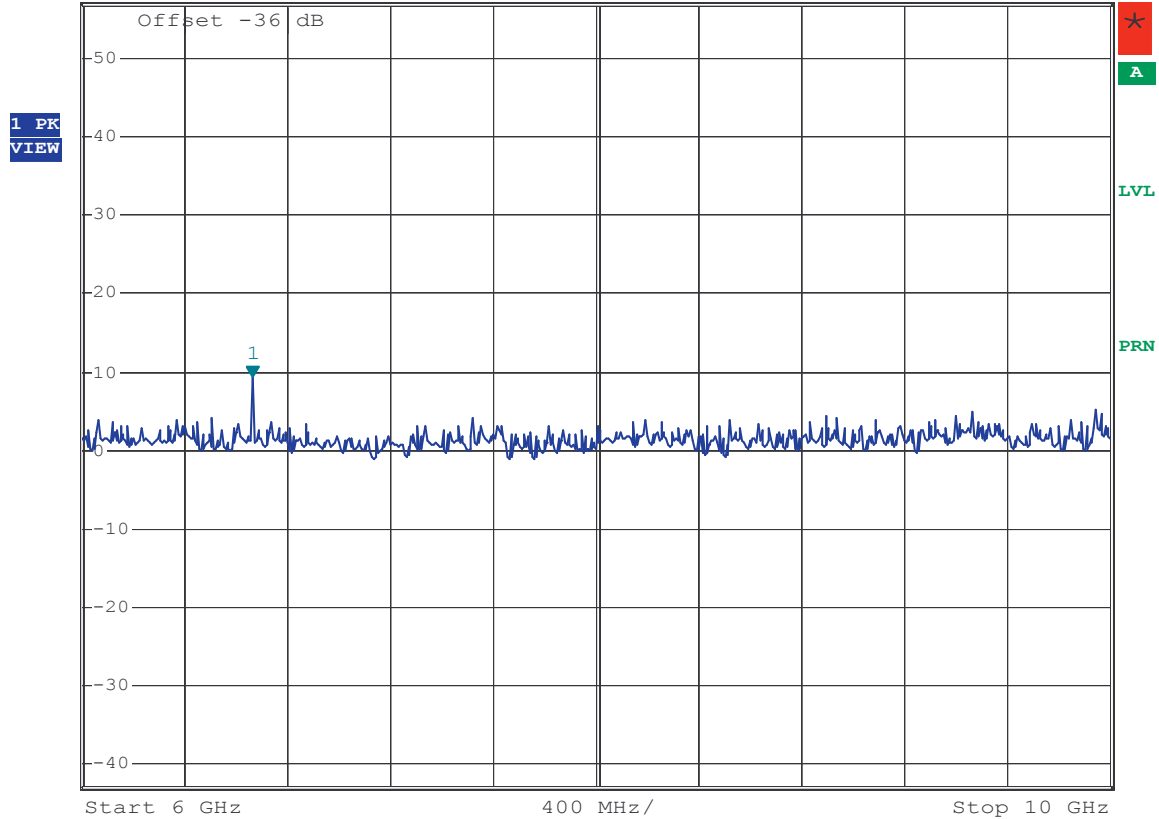
Plot 5.3.m

Date of Test: March 17 to 23, 2006

FCC ID: S8IWPM5



*RBW 100 kHz Marker 1 [T1]
 *VBW 100 kHz 9.43 dBμV
 Ref 57 dBμV Att 20 dB SWT 400 ms 6.664000000 GHz



Comment: X-Unit, 6000-10000 MHz
 Date: 17.MAR.2006 00:56:01

Plot 5.3.n

Date of Test: March 17 to 23, 2006

FCC ID: S8IWPM5

6.4 Radiated Emission Data

Standard: FCC Part 95.1115(b)
Company: Edwards Lifesciences, LLC
Job No. 3092673LAX-001
Model Name: X Unit
Mode: Transmitting

Measurement Uncertainty: 3.92dB
 Temperature: 24°C
 Relative Humidity: 49 %

Channel 1

Frequency	Vertical level	Horizontal level	D.C.F.	Limit	Margin
MHz	(dBuV/m)	(dBuV/m)	dB	(dBuV/m)	(dB)
189.4	18.2	27.2	0	43.5	-16.3
190.5	19.1	29.0	0	43.5	-14.5
195.5	20.3	29.5	0	43.5	-14.0
196.9	21.6	32.0	0	43.5	-11.5
198.1	21.4	31.4	0	43.5	-12.1
204.3	19.7	28.8	0	43.5	-14.7
225.7	20.5	29.2	0	43.5	-14.3
465.3	40.5	41.7	0	46.0	-4.3

Channel 6

Frequency	Vertical level	Horizontal level	D.C.F.	Limit	Margin
MHz	(dBuV/m)	(dBuV/m)	dB	(dBuV/m)	(dB)
1905.500	24.5	28.5	0	54.0	-25.5
2381.680	38.2	42.3	0	54.0	-11.7
3334.000	24.0	26.7	0	54.0	-27.3
3810.160	27.7	30.7	0	54.0	-23.3
4764.000	26.9	23.3	0	54.0	-27.1
5240.000	32.6	28.9	0	54.0	-21.4
6666.900	25.8	26.1	0	54.0	-27.9

Notes:

- The field strength shown in the table for frequency below 1 GHz included Antenna factor, Cable loss and Pre-amplifier Gain (if applicable).
- The field strength shown in the table for frequency above 1 GHz included Antenna factor, Cable loss, Average factor (-26.4) and Pre-amplifier Gain (if applicable).
- For frequencies below 1000 MHz the, above limits are based on quasi-peak limits.

Date of Test: March 17 to 23, 2006

FCC ID: S8IWPMS

- d) For frequencies above 1000 MHz the, above limits are based on average limits.
- e) Negative signs (-) in Margin column signify levels below the limits.
- f) Analyzer setting: $RBW \geq 1 \text{ MHz}$, $VBW \geq 1 \text{ MHz}$, for freq. $> 1 \text{ GHz}$
 $RBW \geq 100 \text{ kHz}$, $VBW \geq 100 \text{ kHz}$, for freq. $< 1 \text{ GHz}$
- g) D.C.F: Distance Correction Factor

Test Result	Passed with 4.3 dB margin at 465.3 MHz.
--------------------	--

Date of Test: March 17 to 23, 2006

FCC ID: S8IWPMS**7.0 Antenna Requirement****7.1 Test description**

Parameter:	FCC 15.203
Requirement:	FCC 15.203
Descriptions:	No antenna other than furnished by the responsible party shall be used with the device.

6.2 Test Procedure

None

6.3 Test Result

The device is considered to comply with the requirements by:

	Description
X	The transmitter uses a permanently connected antennas.
	The antenna is affixed to the EUT using a unique connector which allows for replacement of a broken antenna, but does NOT use a standard antenna jack or electrical connector.

Date of Test: March 17 to 23, 2006

FCC ID: S8IWPMS**8.0 Occupied Bandwidth****8.1 Test description**

Requirement:	FCC §2.1049
Emission Bandwidth:	20 dB

8.2 Test Procedure

The measurement antenna was positioned at distance 3 m from the transmitter.
Span = approximately 2 to 3 times of the 20 dB bandwidth, centered on the channel.
RBW \geq 1% of the 20 dB bandwidth.
The bandwidth is measured at the 20 dB RF output.

8.3 Test Results

Please see next page for the occupied bandwidth plot:

Test Result:	The Occupied Bandwidth is 588 kHz
--------------	-----------------------------------

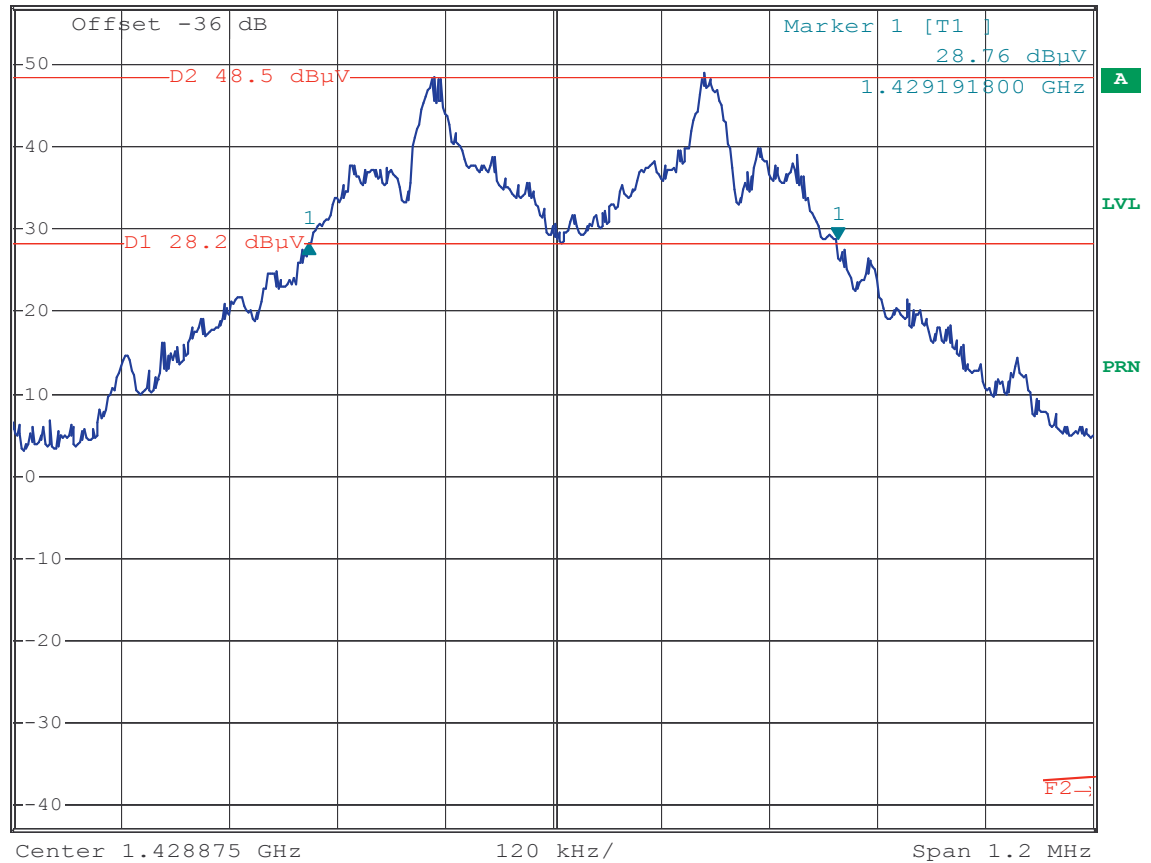
Date of Test: March 17 to 23, 2006

FCC ID: S8IWPM5



*RBW 10 kHz Delta 1 [T1]
 *VBW 10 kHz -0.57 dB
 Ref 57 dBμV Att 20 dB SWT 25 ms -588.000000000 kHz

1 PK
VIEW



Comment: X-Unit, Occupied BW
 Date: 17.MAR.2006 01:13:45

Date of Test: March 17 to 23, 2006

FCC ID: S8IWPMS

9.0 RF Safety**9.1 RF Exposure Evaluation**

Parameter:	FCC 95.1125
Requirement:	FCC 2.1093, 1.1307(b)(2)
Descriptions:	This "WMTS device can be classified as "Portable" and subject for routine environmental evaluation.

9.2 Test Procedure

None

9.3 Test Result

The device is considered to comply with the requirements by:

	Description
X	<u>Limit for general population:</u> No SAR evaluation is required for user distance < 2.5 cm: $P < 60/f(\text{GHz}) \text{ mW}$ $\text{EIRP} = E - 95.3 = 64.3 \text{ dB}\mu\text{V} - 95.3 = -31.0 \text{ dBm} \rightarrow 0.007 \text{ mW}$ $0.007 \text{ mW} < 60/1.4 = 42.8 \text{ mW}$
	<u>Conclusion:</u> No SAR evaluation is required.

Date of Test: March 17 to 23, 2006

FCC ID: S8IWPM5**10.0 TEST EQUIPMENT**

Measurement equipment used for emission compliance testing utilized the equipment on the following list:

Receivers / Spectrum Analyzers / Pre amp

DESCRIPTION	SERIAL NO.	LAST CAL DATE	CAL DUE	TICK IF USED
HP 8546A Receiver RF Section	3549A00261	11/16/05	11/16/06	X
HP 85460A RF Filter Section	3448A00265	11/16/05	11/16/06	X
Tile Software	Rev. 3.0 G	N/A	N/A	X
R & S FSP40 Spectrum Analyzer	100027	2/21/06	2/21/07	X
Agilent 8447D RF Pre Amplifier	2944A10141	1/27/06	1/27/07	X
HP 8449B RF Pre Amplifier	300801168	1/27/06	1/27/07	X

Antennas

DESCRIPTION	SERIAL NO.	LAST CAL DATE	CAL DUE	TICK IF USED
AH Systems SAS-510-4 Log Periodic	156	01/17/06	01/17/07	X
ETS Lindgren Biconical Antenna 3110B	56996	05/13/05	05/13/06	X
Com-Power AL-100 Logperiodic Antenna	16055	05/02/05	05/02/06	
ETS Lindgren 3115 Horn Antenna	00031626	03/09/06	03/09/07	X

Artificial Mains Networks/Absorbing Clamps

DESCRIPTION	SERIAL NO.	LAST CAL DATE	CAL DUE	TICK IF USED
EMCO 3825/2 25A LISN	2527	7/20/05	07/20/06	
FCC LISN 50 Amp 5 μ H	9827	02/07/05	02/07/06	