

Date of Test: September 2 to 8, 2005

FCC ID: S8IWPMS**TEST REPORT****Report Number: 3078050LAX-001****Project Number: 3078050****September 12, 2005**

Testing performed on the
Wireless Physiologic Monitoring System

Model: WPT1000, WTMXXX**to****FCC Part 95, subpart H**
FCC Part 15, subpart C**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: 9/12/05

Reviewed by: 
Suresh Kondapalli

Date: 9/16/05

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FCC ID: S8IWPMS**1.0 Summary of Test Results**

FCC RULE	DESCRIPTION OF TEST	RESULT	PAGE
95.1115 (a)(2)	Field Strength of Fundamental	Worst case: 78.4 dB(μ V/m) @ 1395.625 MHz Margin: 39.0 dB	14
95.1115 (b)(2)	Field Strength of Harmonics	Worst case: 44.9 dB(μ V/m) @ 14276.25 MHz. Margin: 9.1 dB	15
15.209	Field Strength of Fundamental RFID reader system	Worst case: 1.4 dB(μ V/m) @ 137.14 kHz Margin: 23.5 dB	19
15.209	Field Strength of Harmonics RFID reader system	Worst case: 3.6 dB(μ V/m) @ 685.7 kHz. Margin: 7.3 dB	19
95.1115 (b)(2)	Radiated emissions outside the band, except harmonics.	Worst case: 26.8 dB(μ V/m) @ 171.8 MHz Margin: 19.2 dB	41
15.109	Radiated Emission (receiving mode)	Worst case: 26.8 dB(μ V/m) @ 171.8 MHz Margin: 16.7 dB	22
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	44
15.107	Line Conducted Emissions (receiver mode)	Worst case: 36.3 dB μ V @ 13.1 MHz Margin: 13.7 dB	44
2.1049	Occupied Bandwidth	594 kHz	47
95.1115(c)	Emission Types	Complies	49
95.1115(d)	Channel Use	Complies	50
2.1055 95.1115(e)	Frequency Stability	Complies	52
95.1125	RF Safety	Complies	54

EMC Department

Date of issue: September 12, 2005

Test Engineer:


Sergey Marker

Reviewing Engineer:


Suresh Kondapalli

Date of Test: September 2 to 8, 2005

FCC ID: S8IWPMS**2.0 General Description****2.1 Product Description*****EQUIPMENT UNDER TEST***

<i>Type of equipment</i>	Wireless Physiologic Monitoring System	
<i>Type/Model</i>	WPT1000 – Transducer Module (X Unit) WTMXXX – Monitor Module (M Unit)	
Technical Specifications:	Range:	15 feet (4.6m)
	Frequency:	Operating Frequencies: WMDS 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:	FSK (Frequency Shifted Keyed) OOK (On Off Keyed)
	Operating system:	
	RFID Reader system:	
	Output Power:	
	Operating system:	-5dBm
	RFID Reader System:	150 dB μ A/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
<i>Manufacturer</i>	Edwards Lifesciences, LLC One Edwards Way Irvine, CA 92614	

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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 C (15.109/209)

Test Report No.

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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.

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2.2 Related Submittal(s) Grants

This report is for use with an application for certification as a composite device, and subject to an additional equipment authorization. Two transmitters are included in the report. This specific report details the emission characteristics of transmitters.

2.3 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.

2.4 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

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FCC ID: S8IWPMS**3.0 System Test Configuration****3.1 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.

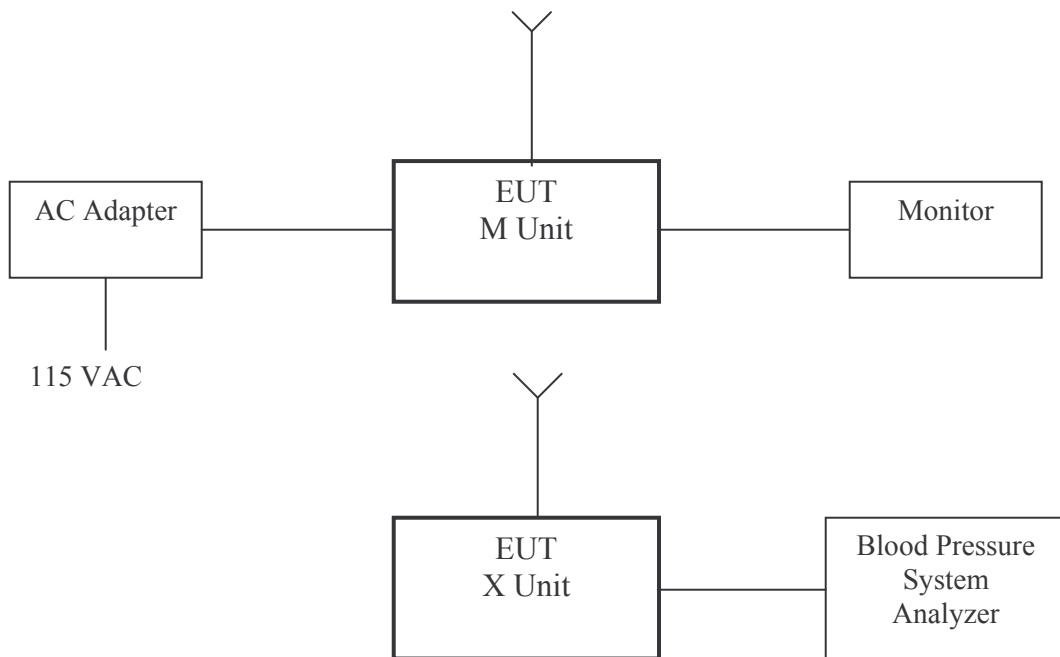
3.2 EUT Exercising Software

No software was required to exercise the EUT.

3.3 System Test Configuration**3.3.1 Support Equipment**

Support Equipment				
Equipment	Manufacturer	Model #	S/N #	FCC ID
Monitor	GE	Dash 4000	N/A	N/A
Blood Pressure System Analyzer	Bio-Tek Instruments	601	1182	N/A
AC Adapter	Ault Inc.	MW117	N/A	N/A

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FCC ID: S8IWPMS**3.3.2 Block Diagram of Test Setup**

S:	Shielded	U:	Unshielded	F:	With Ferrite Core
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3.4 Equipment Modification

None

3.5 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 9 VDC power adapter. 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.

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4.0 Field Strength of Emission

4.1 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

4.1.1 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).

4.1.2 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 -5.1dB are added. The amplifier gain of 27 dB is subtracted, giving a field strength of 32 dB(μ V/m).

$$RA = 52 \text{ dB}(\mu\text{V}) \quad CF = 1.6 \text{ dB} \quad AV = -5.1 \text{ dB}$$

$$AF = 7.4 \text{ dB/m} \quad AG = 29 \text{ dB} \quad FS = 52 + 7.4 + 4.6 - 27 - 5.1 = 32 \text{ dB}(\mu\text{V/m})$$

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

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

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

4.1.3 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 100 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 = 25 ms

Effective period of the cycle = $1.625 \text{ ms} \times 2 = 3.25 \text{ ms}$

DC = $3.25 \text{ ms}/25 \text{ ms} = 0.13$

AV = $20 \log 0.13 = -17.7 \text{ dB}$

Plot on the next page shows the transmission timing over 25 ms time frame.

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08:59:17 SEP 06, 2005

MARKER Δ
1.6250 msec
-3.03 dBACTV DET: PEAK
MEAS DET: PEAK QP AVG
MKR Δ 1.6250 msec
-3.03 dBLast Hrd
Key Menu

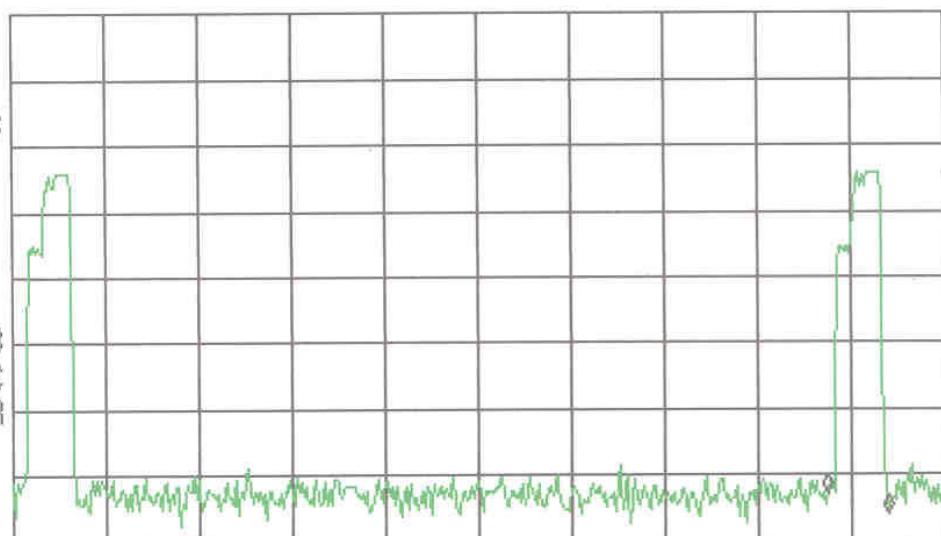
SPAN

LOG REF 00.0 dB μ V

PREAMP ON

10
dB/
ATN
10 dBVA SB
SC FC
CORRCENTER 1.395850 GHz
#IF BW 100 kHz

#AVG BW 100 kHz

SPAN 0 Hz
#SWP 25.0 msecMARKER
NORMALMARKER
 Δ MARKER
AMPTDSELECT
1 2 3 4MARKER 1
ON OFFMore
1 of 2

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FCC ID: S8IWPMS**4.1.4 Radiated Emission Data****Standard:** FCC Part 95.1115(a)(2) & (b)(2)

Measurement Uncertainty: 3.92dB

Company: Edwards Lifesciences, LLC

Temperature: 24°C

Job No. 3078050LAX-001

Relative Humidity: 49 %

Model Name: X Unit**Test Channel:** Channel 1 & 4**Mode:** Transmitting (CW)**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	71.8	78.4	0.0	117.4	-39.0
2791.250	3.0	34.2	35.7	0.0	54.0	-18.3
4186.875	3.0	32.4	32.8	0.0	54.0	-21.2
5582.250	3.0	34.4	35.3	0.0	54.0	-18.7
6978.125	3.0	37.3	37.0	0.0	54.0	-16.7
8373.750	3.0	40.8	40.4	0.0	54.0	-13.2
9769.375	3.0	42.8	43.5	0.0	54.0	-10.5
11165.000	1.0	45.6	45.8	9.5	54.0	-17.7
12560.625	1.0	45.4	45.7	9.5	54.0	-17.8
13956.250	1.0	53.0	52.6	9.5	54.0	-10.5
1399.375	3.0	72.3	78.3	0.0	117.4	-39.1
2798.750	3.0	34.1	35.3	0.0	54.0	-18.7
4198.125	3.0	32.5	32.2	0.0	54.0	-21.5
5597.500	3.0	34.6	34.8	0.0	54.0	-19.2
6996.875	3.0	37.7	37.7	0.0	54.0	-16.3
8396.250	3.0	40.4	40.2	0.0	54.0	-13.6
9795.250	3.0	43.5	43.3	0.0	54.0	-10.5
11195.000	1.0	45.6	45.8	9.5	54.0	-17.7
12594.375	1.0	45.5	44.8	9.5	54.0	-18.0
13993.750	1.0	52.7	53.1	9.5	54.0	-10.4

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FCC ID: S8IWPMS**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	71.1	76.0	0.0	117.4	-41.4
2855.250	3.0	33.8	33.7	0.0	54.0	-20.2
4282.875	3.0	32.9	32.2	0.0	54.0	-21.1
5710.500	3.0	34.7	34.5	0.0	54.0	-19.3
7138.125	3.0	37.4	37.8	0.0	54.0	-16.2
8565.750	3.0	41.3	41.2	0.0	54.0	-12.7
9993.375	3.0	43.8	43.8	0.0	54.0	-10.2
11421.000	1.0	45.0	44.9	9.5	54.0	-18.5
12848.625	1.0	45.4	45.2	9.5	54.0	-18.1
14276.250	1.0	54.4	53.8	9.5	54.0	-9.1
1428.875	3.0	71.0	75.9	0.0	117.4	-41.5
2857.750	3.0	34.9	34.1	0.0	54.0	-19.1
4286.625	3.0	32.2	32.3	0.0	54.0	-21.7
5715.500	3.0	34.9	35.1	0.0	54.0	-18.9
7144.375	3.0	37.5	37.3	0.0	54.0	-16.5
8573.250	3.0	41.3	41.4	0.0	54.0	-12.6
10002.250	3.0	44.3	43.9	0.0	54.0	-9.7
11431.000	1.0	45.1	44.6	9.5	54.0	-18.4
12859.875	1.0	45.1	45.2	9.5	54.0	-18.3
14288.750	1.0	54.3	53.6	9.5	54.0	-9.2

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FCC ID: S8IWPMS**Model Name:** M Unit**Test Channel:** Channel 1 & 5

Frequency MHz	Distance m	Vertical level (dBuV/m)	Horizontal level (dBuV/m)	D.C.F. dB	Limit (dBuV/m)	Margin (dB)
1395.625	3.0	69.0	74.0	0.0	117.4	-43.4
2791.250	3.0	33.0	33.9	0.0	54.0	-20.1
4186.875	3.0	32.7	32.1	0.0	54.0	-21.3
5582.250	3.0	34.4	34.7	0.0	54.0	-19.3
6978.125	3.0	37.4	35.6	0.0	54.0	-16.6
8373.750	3.0	40.2	39.3	0.0	54.0	-13.8
9769.375	3.0	43.5	43.3	0.0	54.0	-10.5
11165.000	1.0	45.4	45.3	9.5	54.0	-18.1
12560.625	1.0	45.6	45.2	9.5	54.0	-17.9
13956.250	1.0	53.0	52.3	9.5	54.0	-10.5
1427.625	3.0	65.5	73.5	0.0	117.4	-43.9
2855.250	3.0	37.5	35.1	0.0	54.0	-16.5
4282.875	3.0	32.9	32.6	0.0	54.0	-21.1
5710.500	3.0	35.3	35.2	0.0	54.0	-18.7
7138.125	3.0	37.8	37.5	0.0	54.0	-16.2
8565.750	3.0	41.3	40.7	0.0	54.0	-12.7
9993.375	3.0	43.8	43.9	0.0	54.0	-10.1
11421.000	1.0	44.7	45.0	9.5	54.0	-18.5
12848.625	1.0	45.8	45.3	9.5	54.0	-17.7
14276.250	1.0	53.5	53.4	9.5	54.0	-10.0

Notes:

- a) The field strength shown in the table (Vertical and Horizontal levels) included Antenna factor, Cable loss, Average factor (-17.7) and Pre-amplifier Gain (if applicable).
- b) Negative signs (-) in Margin column signify levels below the limits.
- c) For frequencies below 1000 MHz the, above limits are based on quasi-peak limits.
Analyzer setting: RBW =120 KHz, VBW =300 KHz
- d) For frequencies above 1000 MHz the, above limits are based on average limits.
- e) Analyzer setting: RBW =1 MHz, VBW =1 MHz
- f) All other emissions not reported are below the equipment noise floor which is at least 10 dB below the limits.

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

Test Result	FCC 95.1115 (a)(2): Passed with 39.0 dB margin at 1395.625 MHz. FCC 95.1115 (b)(2): Passed with 9.1 dB margin at 14276.25 MHz.
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FCC ID: S8IWPMS**4.2 Test Description**

Parameter:	FCC 15.209
Requirement:	FCC 15.209
0.009 – 0.490 MHz	2400/F (kHz) (μ V/m) @ 300 m
0.490 – 1.705 MHz	2400/F (kHz) (μ V/m) @ 30 m
1.705 – 30.0 MHz	29.5 dB μ V @ 30 m
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

4.2.1 Test Procedure

See section 4.1.1.

4.2.2 Field Strength Calculation

See section 4.1.2.

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FCC ID: S8IWPMS**4.2.3 Radiated Emission Data****Standard:** FCC Part 15.209

Measurement Uncertainty: 3.92dB

Company: Edwards Lifesciences, LLC

Temperature: 24°C

Job No. 3078050LAX-001

Relative Humidity: 49 %

Model Name: X Unit (RFID Reader System)**Test Channel:** Channel 1 & 4**Mode:** Transmitting (RFID Reader System)**Distance:** 3 m

Frequency	Detector	Distance	Vertical level	Horizontal level	D.C.F.	Limit	Margin
kHz		m	(dBuV/m)	(dBuV/m)	dB	(dBuV/m)	(dB)
137.14	Ave.	3	78.0	81.4	-80	24.9	-23.5
274.28	Ave.	3	41.7	41.2	-80	18.8	-57.1
411.42	Ave.	3	39.4	37.6	-80	15.3	-55.9
548.56	Q-peak	1	40.5	41.1	-80	12.8	-11.7
685.7	Q-peak	1	43.6	38.9	-80	10.9	-7.3
822.84	Q-peak	1	37.2	37.1	-80	9.3	-12.1
960.0	Q-peak	1	37.5	35.6	-80	8.0	-10.5
1097.12	Q-peak	1	34.2	34.2	-80	6.8	-12.6
1234.26	Q-peak	1	33.8	32.9	-80	5.8	-12.0
1371.4	Q-peak	1	32.0	31.8	-80	4.9	-12.9

Notes:

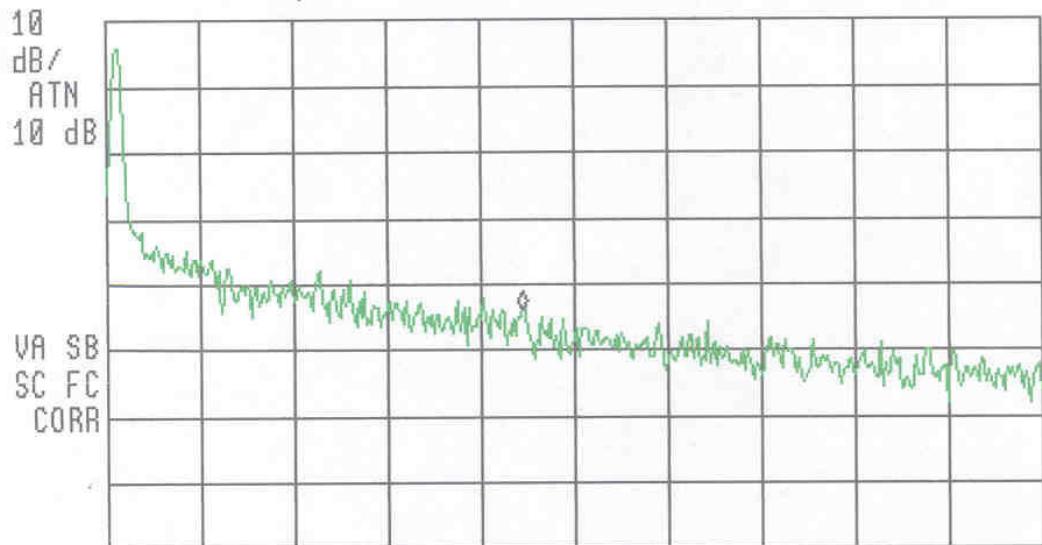
- a) The field strength shown in the table (Vertical and Horizontal levels) included Antenna factor, Cable loss and Pre-amplifier Gain (if applicable).
- b) All emissions not reported were at least 20 dB below the limits.
- c) Negative signs (-) in Margin column signify levels below the limits.
- d) Analyzer setting: $\text{RBW} \geq 1 \text{ MHz}$, $\text{VBW} \geq 1 \text{ MHz}$, for freq. $> 1 \text{ GHz}$
 $\text{RBW} \geq 100 \text{ kHz}$, $\text{VBW} \geq 100 \text{ kHz}$, for freq. $< 1 \text{ GHz}$
 $\text{RBW} \geq 1 \text{ kHz}$, $\text{VBW} \geq 1 \text{ kHz}$ for freq. $< 150 \text{ kHz}$
- e) D.C.F: Distance Correction Factor

Test Result Passed with 7.3 dB margin at 685.7 kHz.

Date of Test: September 2 to 8, 2005

FCC ID: S8IWPMS

11:46:07 SEP 07, 2005

MARKER
690 kHz
31.05 dB μ VACTV DET: PEAK
MEAS DET: PEAK QP AVG
MKR 690 kHz
31.05 dB μ VLast Hrd
Key Menu
SPANLOG REF 75.0 dB μ V10
dB/
ATN
10 dBCLEAR
WRITE AMAX
HOLD AVIEW A

BLANK A

Trace
A B CMore
1 of 3**Radiated emission peak scan for RFID reader system**

Date of Test: September 2 to 8, 2005

FCC ID: S8IWPMS**4.3 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

4.3.1 Test Procedure

See section 4.1.1.

4.3.2 Field Strength Calculation

See section 4.1.2.

Date of Test: September 2 to 8, 2005

FCC ID: S8IWPMS**4.3.3 Radiated Emission Data****Standard:** FCC Part 15.109

Measurement Uncertainty: 3.92dB

Company: Edwards Lifesciences, LLC

Temperature: 24°C

Job No. 3078050LAX-001

Relative Humidity: 49 %

Model Name: X Unit**Test Channel:** Channel 1**Mode:** Receiving**Distance:** 3 m

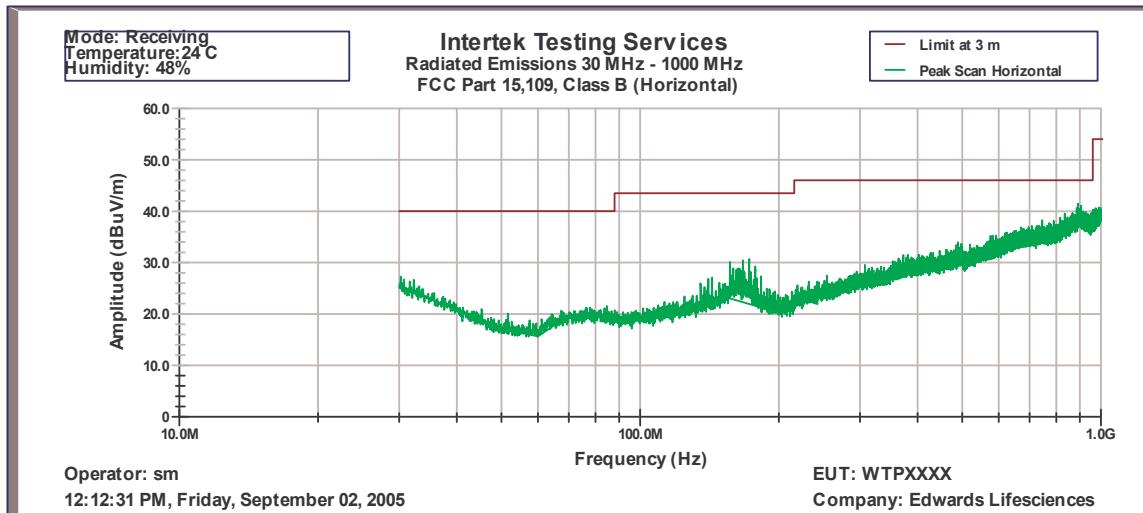
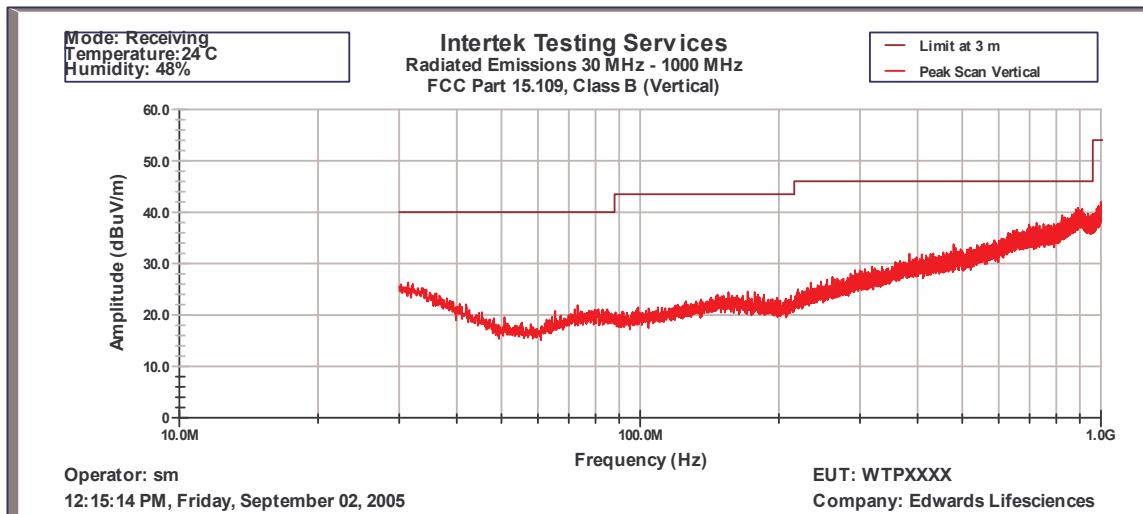
Frequency	Detector	Vertical level	Horizontal level	D.C.F.	Limit	Margin
MHz		(dBuV/m)	(dBuV/m)	dB	(dBuV/m)	(dB)
166.3	Q-peak	18.4	18.6	0	43.5	-24.9
168.0	Q-peak	19.9	22.4	0	43.5	-21.1
169.1	Q-peak	18.6	23.9	0	43.5	-19.6
171.8	Q-peak	19.4	26.8	0	43.5	-16.7
177.6	Q-peak	19.5	25.3	0	43.5	-18.2
182.9	Q-peak	19.7	26.0	0	43.5	-17.5
190.8	Q-peak	19.9	25.7	0	43.5	-17.8

Notes:

- a) The field strength shown in the table (Vertical and Horizontal levels) included Antenna factor, Cable loss and Pre-amplifier Gain (if applicable).
- e) All emissions not reported were at least 20 dB below the limits.
- f) Negative signs (-) in Margin column signify levels below the limits.
- g) Analyzer setting: $\text{RBW} \geq 1 \text{ MHz}$, $\text{VBW} \geq 1 \text{ MHz}$, for freq. $> 1 \text{ GHz}$
 $\text{RBW} \geq 100 \text{ kHz}$, $\text{VBW} \geq 100 \text{ kHz}$, for freq. $< 1 \text{ GHz}$
 $\text{RBW} \geq 1 \text{ kHz}$, $\text{VBW} \geq 1 \text{ kHz}$ for freq. $< 150 \text{ kHz}$
- e) D.C.F: Distance Correction Factor

Test Result	Passed with 16.7 dB margin at 171.8 MHz.
--------------------	---

Date of Test: September 2 to 8, 2005

FCC ID: S8IWPMS**Radiated Emission, X Unit, Horizontal Polarization****Radiated Emission, X Unit, Vertical Polarization**

Date of Test: September 2 to 8, 2005

FCC ID: S8IWPMS

4.3.4 Radiated Emission Data

Standard: FCC Part 15.109

Measurement Uncertainty: 3.92dB

Company: Edwards Lifesciences, LLC

Temperature: 24°C

Job No. 3078050LAX-001

Relative Humidity: 49 %

Model Name: M Unit

Test Channel: Channel 1

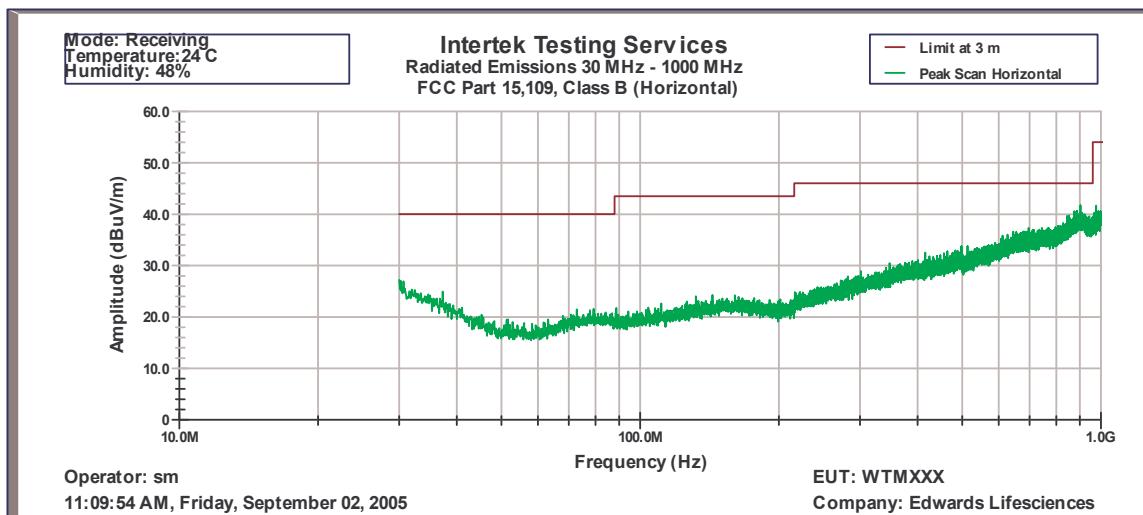
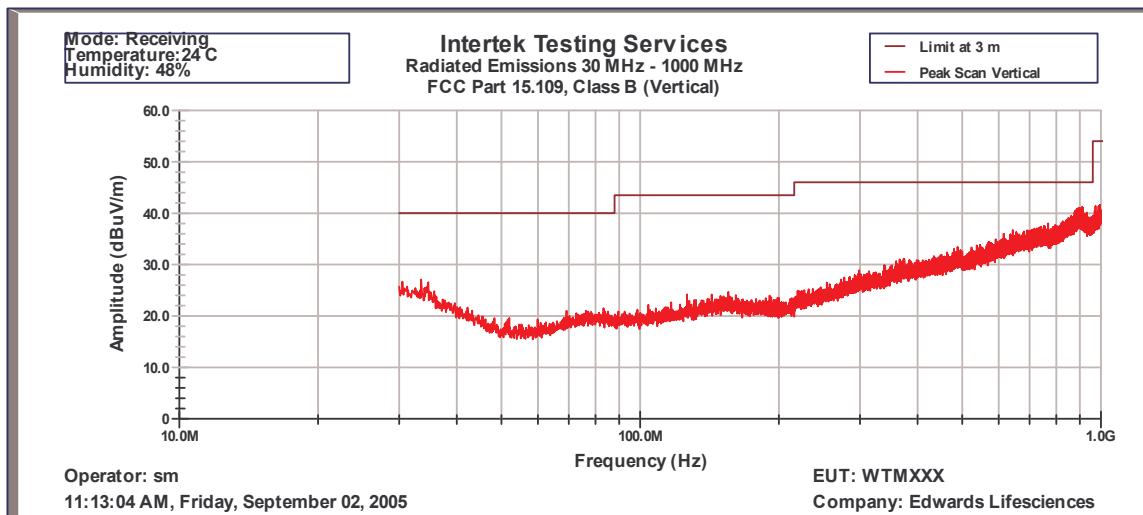
Mode: Receiving

Distance: 3 m

Notes:

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

Date of Test: September 2 to 8, 2005

FCC ID: S8IWPMS**Radiated Emission, M Unit, Horizontal Polarization****Radiated Emission, M Unit, Vertical Polarization**

Date of Test: September 2 to 8, 2005

FCC ID: S8IWPMS**5.0 Out of Band Emission****5.1 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

5.2 Test Procedure

See section 4.1.1.

5.3 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 shows emissions which verified below 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. (78.4-40.8=37.6 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 (78.4-37.1=41.3 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 (78.4-39.1=39.3 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 (78.3-46.7=31.6 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 (78.3-39.1=39.2 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 (76-39.5=36.5 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 (76-39.7=36.3 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 (75.9-38.3=38.8 dB 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 (75.9-37.6=38.3 dB 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 (75.9-42.5=33.4 dB μ V) < 54 dB μ V

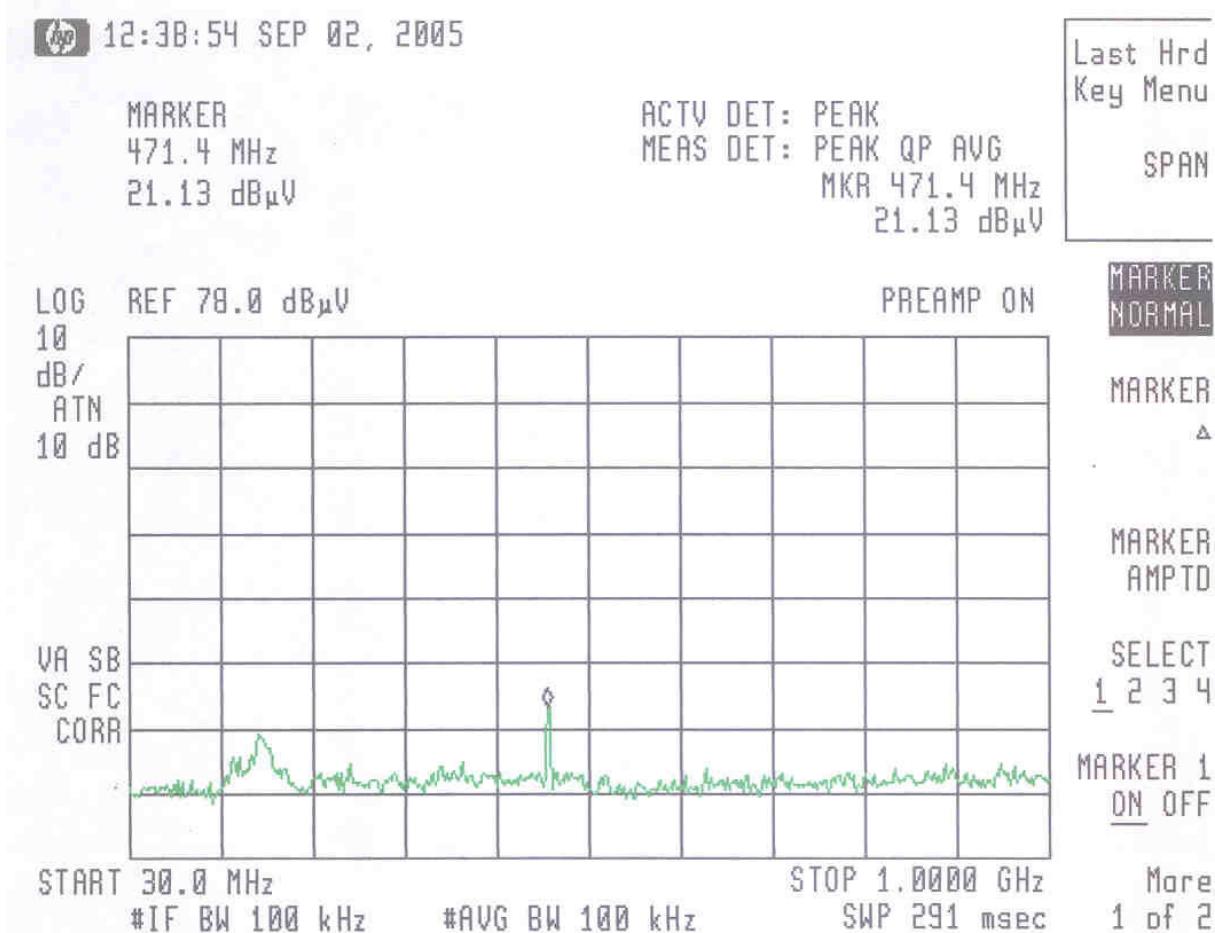
Date of Test: September 2 to 8, 2005

FCC ID: S8IWPMS

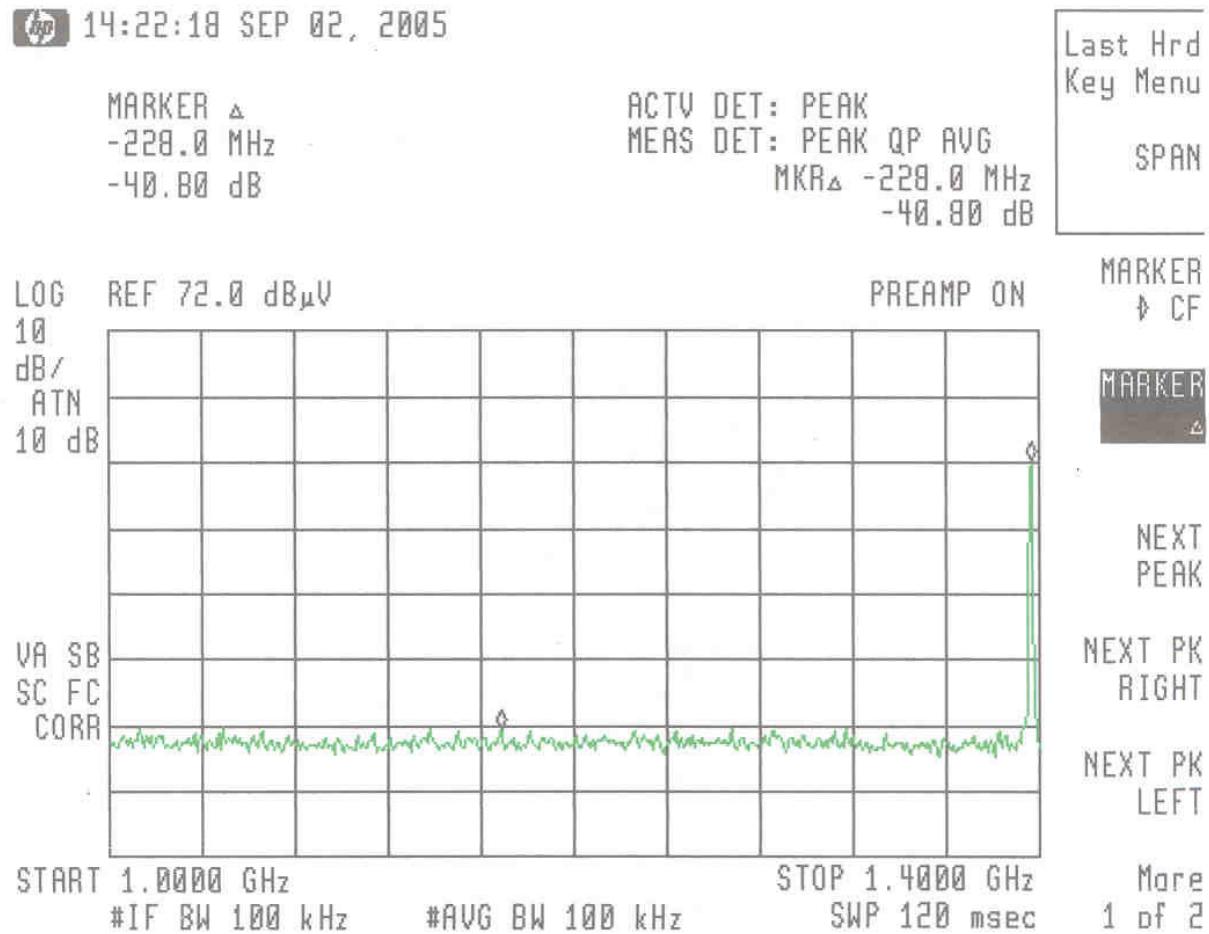
5.3.l	Plot shows no spurious emission from 2000 to 4000 MHz.
5.3.m	Plot shows no spurious emission from 4000 to 6500 MHz.

Note 1: There are no emissions, except harmonics, observed above frequency 2000 MHz. All spurious emissions outside the frequency bands 1395 – 1400 and 1427 – 1431.5 MHz are attenuated below the limits in reference of level of fundamental.

Date of Test: September 2 to 8, 2005

FCC ID: S8IWPMS

Date of Test: September 2 to 8, 2005

FCC ID: S8IWPMS**Plot 5.3.b**

Date of Test: September 2 to 8, 2005

FCC ID: S8IWPMS

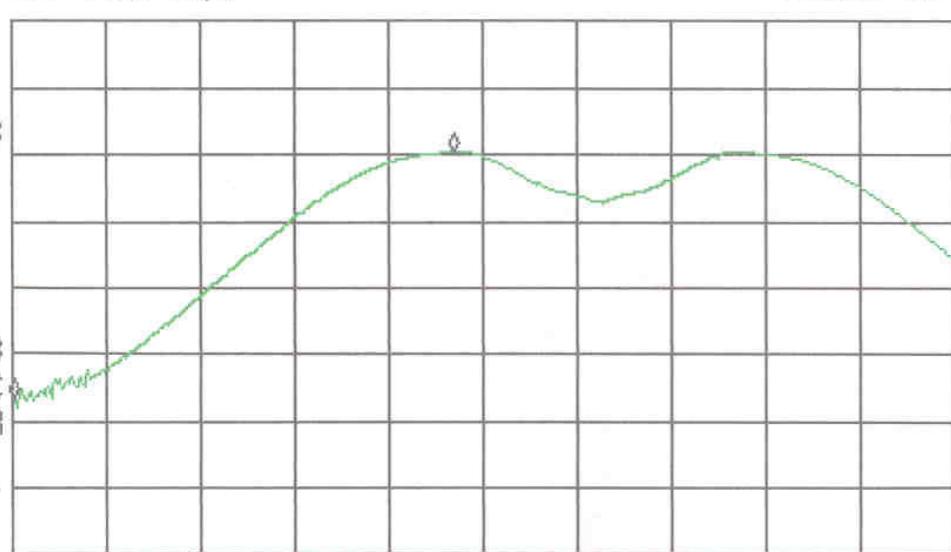
14:19:22 SEP 02, 2005

MARKER Δ
-468 kHz
-37.05 dBACTV DET: PEAK
MEAS DET: PEAK QP AVG
MKR Δ -468 kHz
-37.05 dBLast Hrd
Key Menu
SPANLOG REF 72.0 dB μ V

PREAMP ON

10
dB/
ATN
10 dBVA SB
SC FC
CORRSTART 1.395000 GHz
#IF BW 100 kHz

#AVG BW 100 kHz

STOP 1.396000 GHz
SWP 20.0 msecMARKER
▼ CFMARKER
 Δ NEXT
PEAKNEXT PK
RIGHTNEXT PK
LEFTMore
1 of 2**Plot 5.3.c**

Date of Test: September 2 to 8, 2005

FCC ID: S8IWPMS

14:26:52 SEP 02, 2005

MARKER Δ
775 kHz
-39.06 dBACTV DET: PEAK
MEAS DET: PEAK QP AVG
MKR Δ 775 kHz
-39.06 dBLast Hrd
Key Menu
SPANLOG REF 72.0 dB μ V

PREAMP ON

10

dB/

ATN

10 dB

VA SB

SC FC

CORR

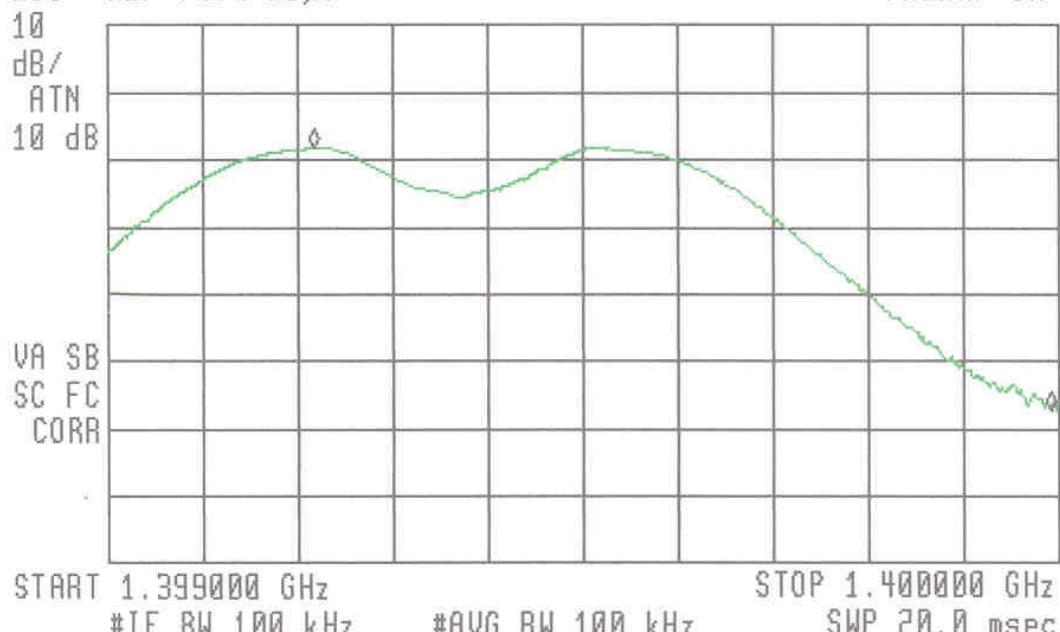
START 1.399000 GHz

#IF BW 100 kHz

#AVG BW 100 kHz

STOP 1.400000 GHz

SWP 20.0 msec

MARKER
NORMALMARKER
 Δ MARKER
AMPTDSELECT
1 2 3 4MARKER 1
ON OFFMore
1 of 2**Plot 5.3.d**

Date of Test: September 2 to 8, 2005

FCC ID: S8IWPMS

14:28:30 SEP 02, 2005

MARKER Δ
-4.213 MHz
-46.71 dBACTV DET: PEAK
MEAS DET: PEAK QP AVG
MKR Δ -4.213 MHz
-46.71 dBLast Hrd
Key Menu

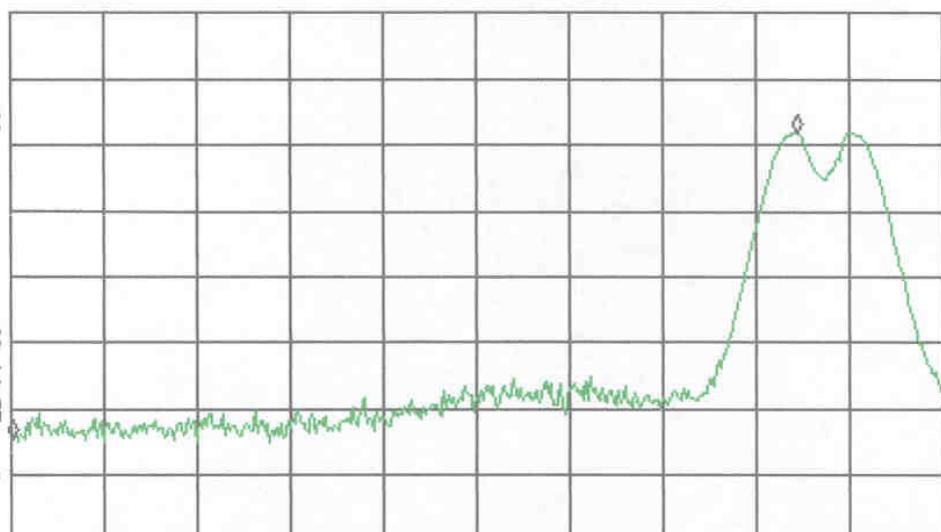
SPAN

LOG REF 72.0 dB μ V

PREAMP ON

10
dB/
ATM
10 dBVA SB
SC FC
CORRSTART 1.395000 GHz
#IF BW 100 kHz

#AVG BW 100 kHz

STOP 1.400000 GHz
SWP 20.0 msecMARKER
NORMALMARKER
 Δ MARKER
AMPTDSELECT
1 2 3 4MARKER 1
ON OFFMore
1 of 2

Plot 5.3.e

Date of Test: September 2 to 8, 2005

FCC ID: S8IWPMS

14:26:52 SEP 02, 2005

MARKER Δ
775 kHz
-39.06 dBACTV DET: PEAK
MEAS DET: PEAK QP AVG
MKR Δ 775 kHz
-39.06 dBLast Hrd
Key Menu
SPANLOG REF 72.0 dB μ V

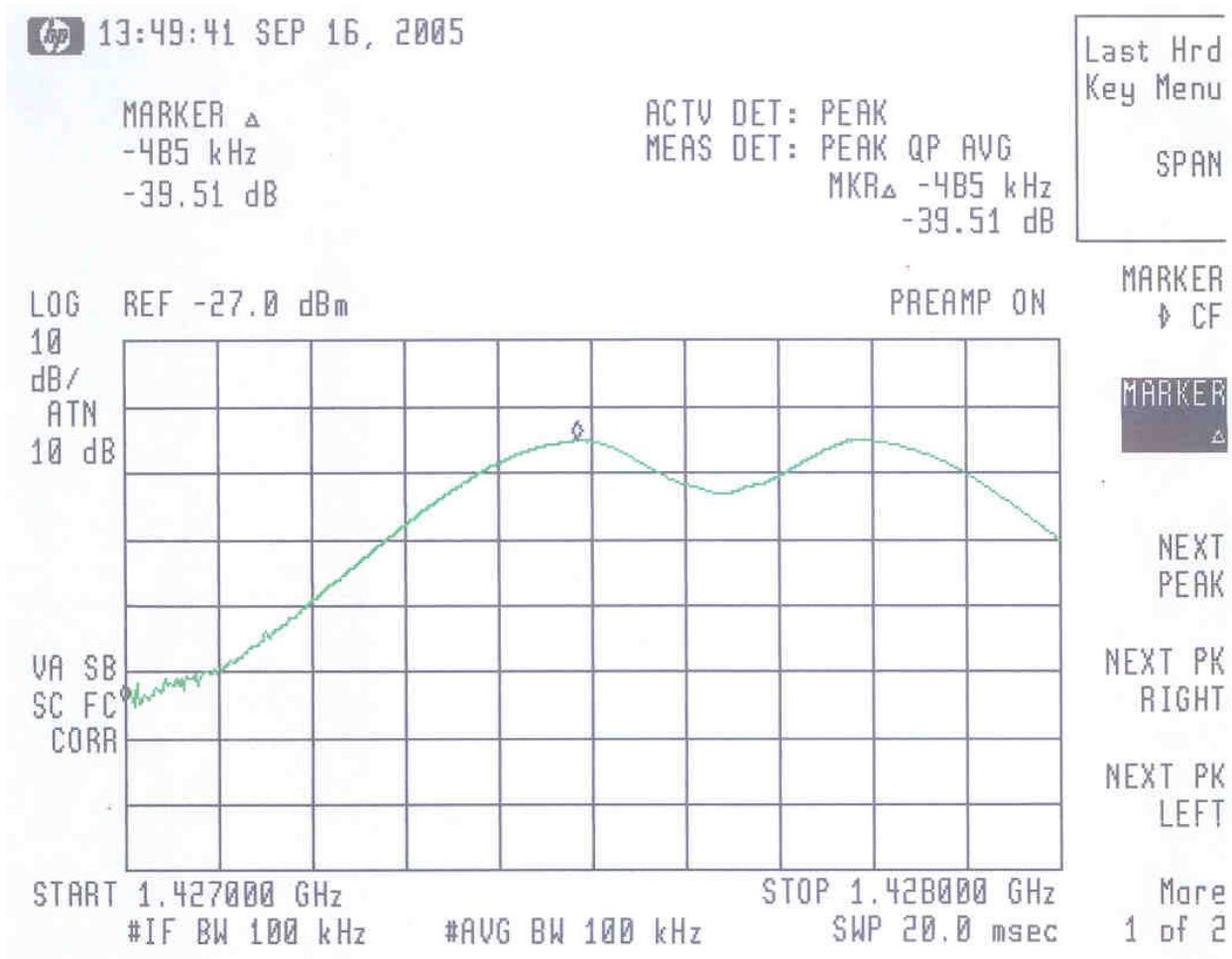
PREAMP ON

10
dB/
ATN
10 dBVA SB
SC FC
CORRSTART 1.399000 GHz
#IF BW 100 kHz

#AVG BW 100 kHz

STOP 1.400000 GHz
SWP 20.0 msecMARKER
NORMALMARKER
 Δ MARKER
AMPTDSELECT
1 2 3 4MARKER 1
ON OFFMore
1 of 2**Plot 5.3.f**

Date of Test: September 2 to 8, 2005

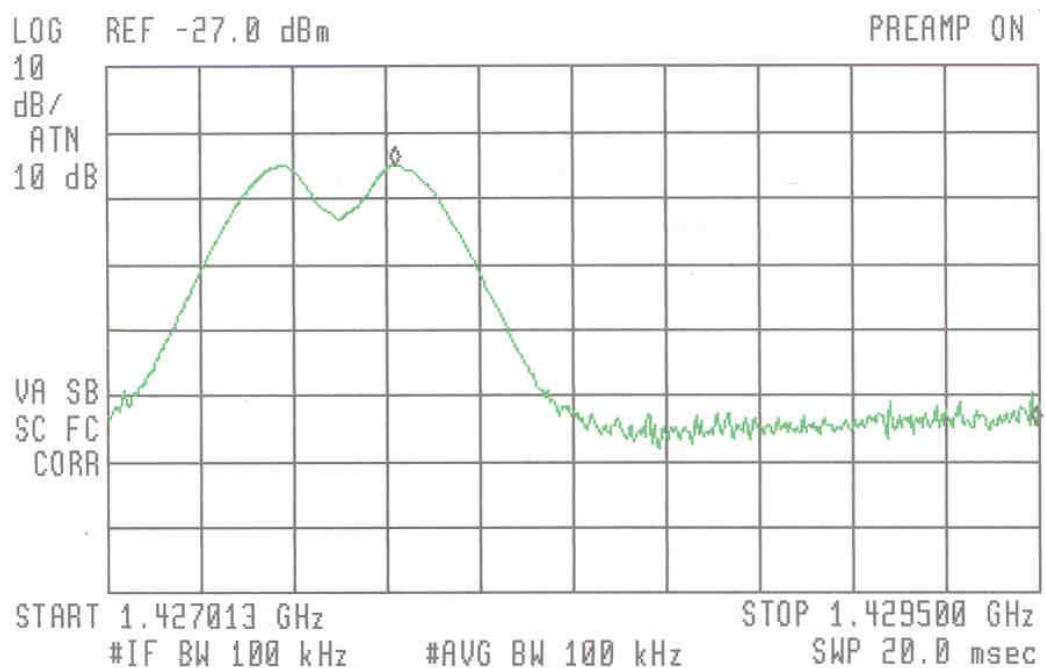
FCC ID: S8IWPMS

Plot 5.3.g

Date of Test: September 2 to 8, 2005

FCC ID: S8IWPMS**hp 13:52:24 SEP 16, 2005**MARKER Δ
1.710 MHz
-39.65 dBACTV DET: PEAK
MEAS DET: PEAK QP AVG
MKR Δ 1.710 MHz
-39.65 dBLast Hrd
Key Menu

SPAN

MARKER Δ CFMARKER Δ

NEXT PEAK

NEXT PK RIGHT

NEXT PK LEFT

More
1 of 2**Plot 5.3.h**

Date of Test: September 2 to 8, 2005

FCC ID: S8IWPMS

13:41:49 SEP 16, 2005

MARKER Δ
-1.731 MHz
-39.06 dBACTV DET: PEAK
MEAS DET: PEAK QP AVG
MKR Δ -1.731 MHz
-39.06 dBLast Hrd
Key Menu

SPAN

LOG REF -27.0 dBm

PREAMP ON

10
dB/
ATN
10 dBVA SB
SC FC
CORRSTART 1.427000 GHz
#IF BW 100 kHz

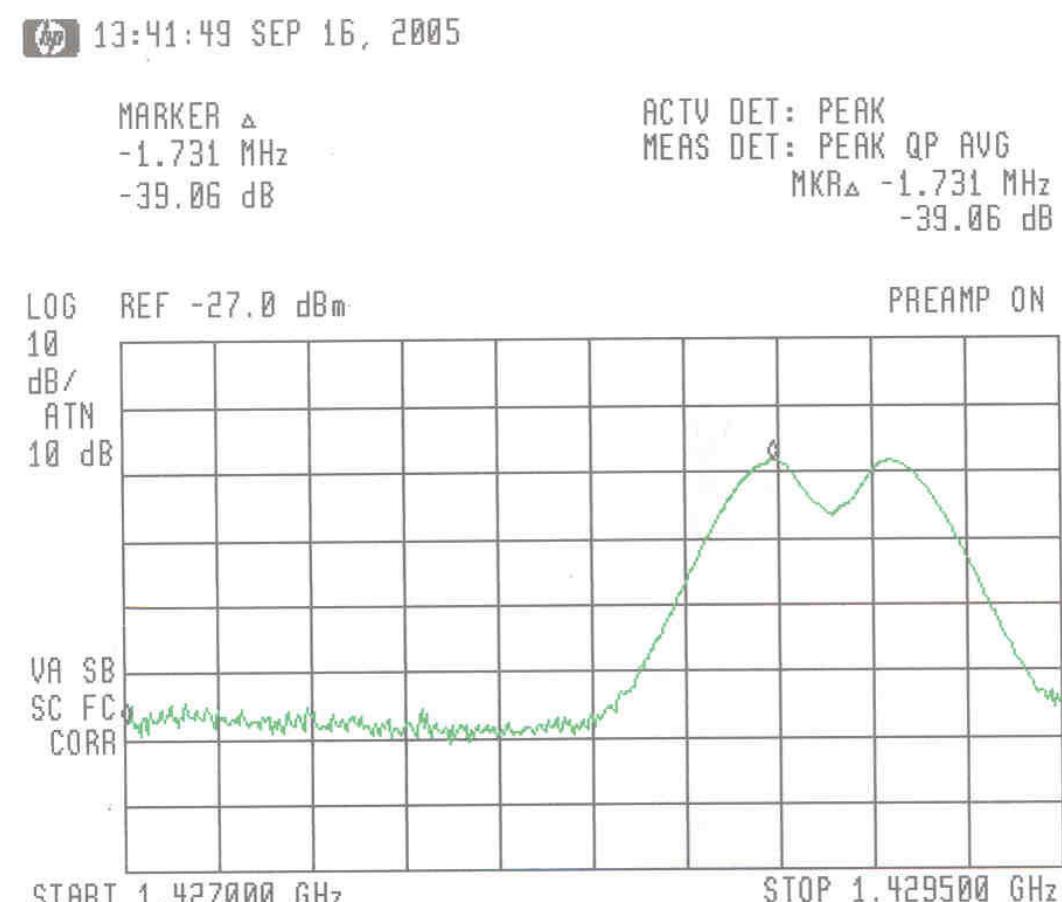
#AVG BW 100 kHz

STOP 1.429500 GHz
SWP 20.0 msec

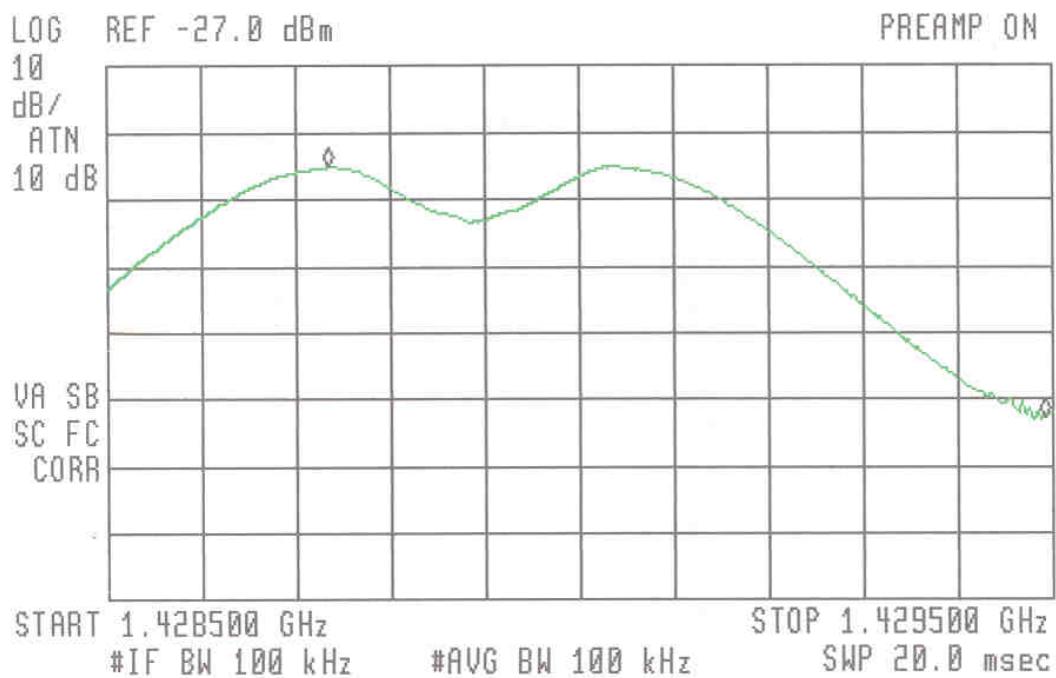
Plot 5.3.i

MARKER
CF

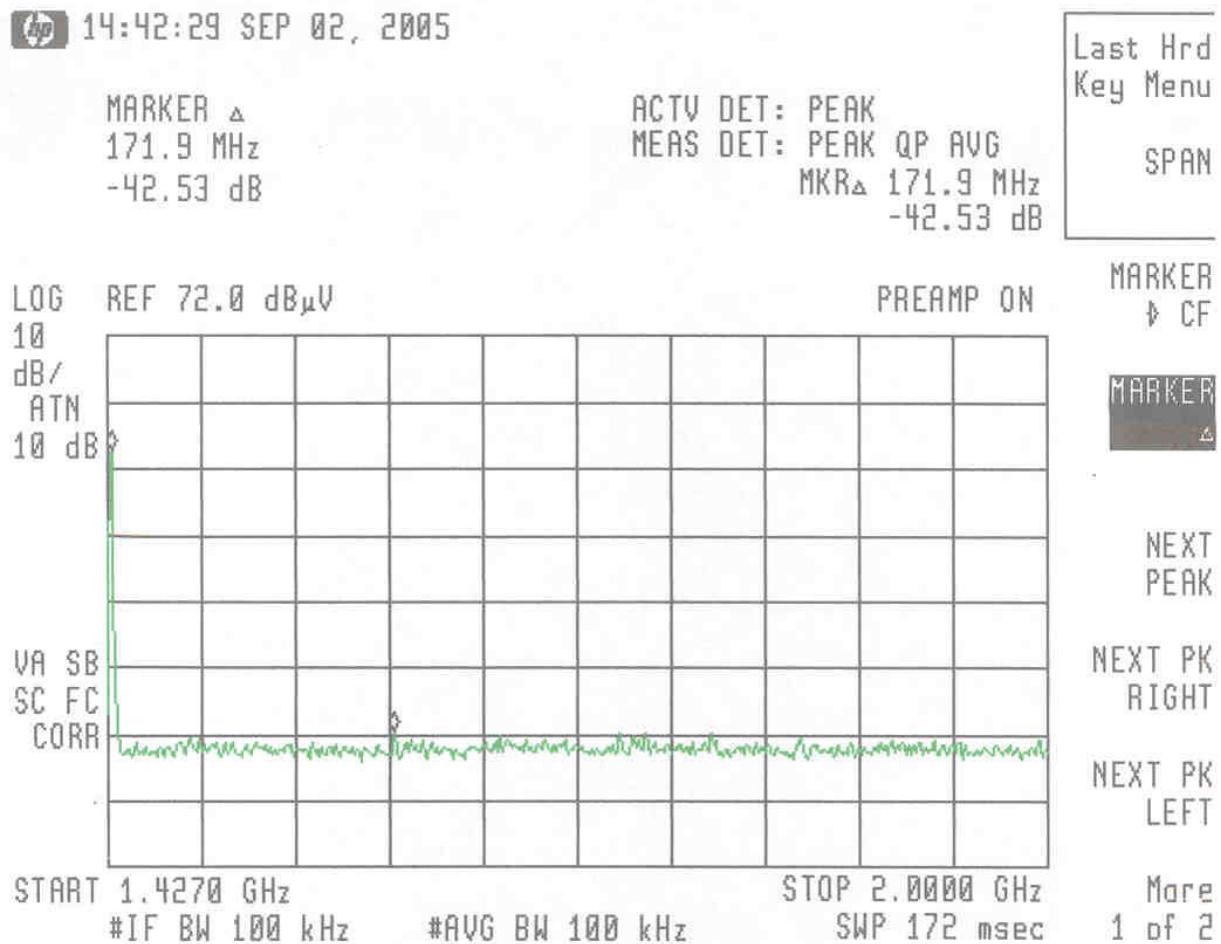
MARKER

NEXT
PEAKNEXT PK
RIGHTNEXT PK
LEFTMore
1 of 2

Date of Test: September 2 to 8, 2005

FCC ID: S8IWPMS**hp 13:47:56 SEP 16, 2005**MARKER Δ
758 kHz
-37.64 dBACTV DET: PEAK
MEAS DET: PEAK QP AVG
MKR Δ 758 kHz
-37.64 dBLast Hrd
Key Menu
SPANMARKER
 Δ CFMARKER
 Δ NEXT
PEAKNEXT PK
RIGHTNEXT PK
LEFTMore
1 of 2**Plot 5.3.j**

Date of Test: September 2 to 8, 2005

FCC ID: S8IWPMS**Plot 5.3.k**

Date of Test: September 2 to 8, 2005

FCC ID: S8IWPMS

14:45:27 SEP 02, 2005

MARKER
2.866 GHz
12.83 dB μ VACTV DET: PEAK
MEAS DET: PEAK QP AVG
MKR 2.866 GHz
12.83 dB μ VLast Hrd
Key Menu
SPANLOG REF 72.0 dB μ V

PREAMP ON

10

dB/
ATN

10 dB

VA SB
SC FC
CORR

START 2.000 GHz

#IF BW 100 kHz

#AVG BW 100 kHz

STOP 4.000 GHz

SWP 600 msec

MARKER
▼ CFMARKER
△NEXT
PEAKNEXT PK
RIGHTNEXT PK
LEFTMore
1 of 2**Plot 5.3.1**

Date of Test: September 2 to 8, 2005

FCC ID: S8IWPMS 14:46:37 SEP 02, 2005STOP
6.500 GHzACTV DET: PEAK
MEAS DET: PEAK QP AVG
MKR 5.575 GHz
9.6B dB μ VLast Hrd
Key Menu
SPANLOG REF 72.0 dB μ V

PREAMP ON

10

dB/
ATN

10 dB

VA SB
SC FC
CORR

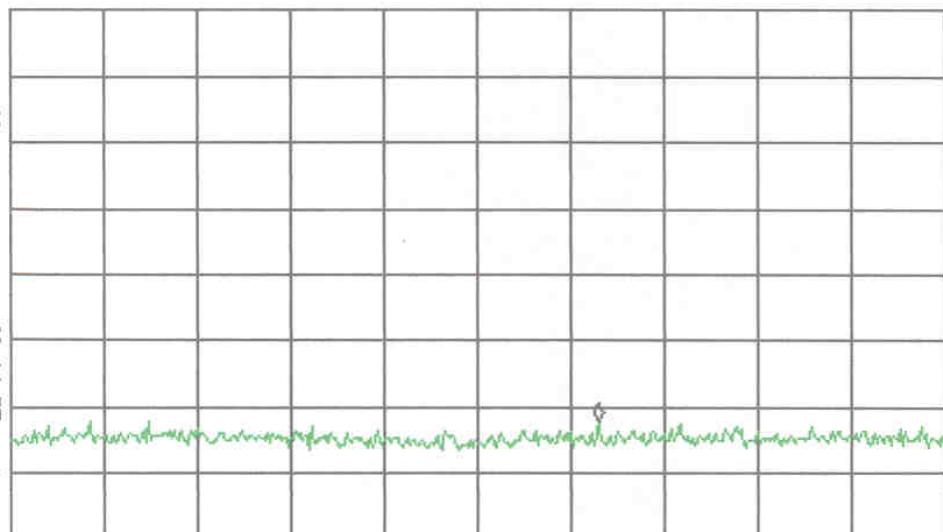
START 4.000 GHz

#IF BW 100 kHz

#AVG BW 100 kHz

STOP 6.500 GHz

SWP 750 msec

MARKER
↓ CFMARKER
△NEXT
PEAKNEXT PK
RIGHTNEXT PK
LEFTMore
1 of 2**Plot 5.3.m**

Date of Test: September 2 to 8, 2005

FCC ID: S8IWPMS**5.4 Radiated Emission Data****Standard:** FCC Part 95.1115(b)

Measurement Uncertainty: 3.92dB

Company: Edwards Lifesciences, LLC

Temperature: 24°C

Job No. 3078050LAX-001

Relative Humidity: 49 %

Model Name: X Unit**Test Channel:** Channel 1**Mode:** Transmitting

Frequency	Detector	Vertical level	Horizontal level	D.C.F.	Limit	Margin
MHz		(dBuV/m)	(dBuV/m)	dB	(dBuV/m)	(dB)
166.3	Q-peak	18.4	18.6	0	46.0	-27.4
168.0	Q-peak	19.9	22.4	0	46.0	-23.6
169.1	Q-peak	18.6	23.9	0	46.0	-22.1
171.8	Q-peak	19.4	26.8	0	46.0	-19.2
177.6	Q-peak	19.5	25.3	0	46.0	-20.7
182.9	Q-peak	19.7	26.0	0	46.0	-20.0
190.8	Q-peak	19.9	25.7	0	46.0	-20.3
471.7	Q-peak	21.5	20.5	0	46.0	-24.5

Notes:

- a) The field strength shown in the table (Vertical and Horizontal levels) included Antenna factor, Cable loss and Pre-amplifier Gain (if applicable).
- h) All emissions not reported were at least 20 dB below the limits.
- i) Negative signs (-) in Margin column signify levels below the limits.
- j) Analyzer setting: $\text{RBW} \geq 1 \text{ MHz}$, $\text{VBW} \geq 1 \text{ MHz}$, for freq. $> 1 \text{ GHz}$
 $\text{RBW} \geq 100 \text{ kHz}$, $\text{VBW} \geq 100 \text{ kHz}$, for freq. $< 1 \text{ GHz}$
 $\text{RBW} \geq 1 \text{ kHz}$, $\text{VBW} \geq 1 \text{ kHz}$ for freq. $< 150 \text{ kHz}$
- e) D.C.F: Distance Correction Factor

Test Result	Passed with 19.2 dB margin at 171.8 MHz.
--------------------	---

Date of Test: September 2 to 8, 2005

FCC ID: S8IWPMS**6.0 Antenna Requirement****6.1 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: September 2 to 8, 2005

FCC ID: S8IWPMS**7.0 Line Conducted Emission****7.1 Test Description**

Parameter:	FCC 15.107, 15.207	
Requirement:	FCC 15.107, class B; 15.207	
Frequency (MHz)	QP Limits (dB μ V)	AVG Limits (dB μ V)
0.15 to 0.50	66 to 56	56 to 46
0.50 to 5	56	46
5 to 30	60	50

7.2 Test Procedure

All conducted voltage measurements were made on each current-carrying conductor at the plug end of the EUT power cord or calibrated extension by the use of mating plugs and receptacles on the EUT and LISN/AMN if used. Equipment was tested with power cords that were normally used or that have electrical and shielding characteristics that were the same as those cords normally used. For those measurements using a LISN/AMN, the $50\ \Omega$ measuring port was terminated by a $50\ \Omega$ receiver or a $50\ \Omega$ resistive load. Hence all $50\ \Omega$ measuring ports of the LISN/AMN were terminated by $50\ \Omega$.

If a screened room or chamber was used, the EUT was placed 40 cm from a conductive wall, with the wall at the lead of the EUT. If the test was being performed on an OATS or sheltered site, the vertical ground plane was placed 40 cm away from the rear of the EUT.

The excess length of the lead between the EUT and the LISN/AMN receptacle (or mains outlet where a LISN/AMN cannot be used) was folded back and forth at the center of the lead to form a bundle not exceeding 40 cm in length. If the EUT does not have a flexible power lead, then it was placed at a distance of 80 cm from the LISN/AMN (or mains outlet where a LISN/AMN cannot be used) and connected to it by a lead or appropriate connection no longer than 1 m. Measurements were made at the LISN/AMN end of this lead or connection

Conducted emission measurements were performed according to the procedures in ANSI C63.4 (2003)

Date of Test: September 2 to 8, 2005

FCC ID: S8IWPMS**7.3 Line Conducted Emission Data****Standard:** FCC part 15.107, Class B / 15.207

Measurement Uncertainty: 1.94dB

Company: Edwards Lifesciences, LLC

Temperature: 24°C

Job No. 3078050LAX-001

Relative Humidity: 49 %

Model Name: M Unit**Tested by:** Sergey Marker**Mode:** Receiving / Transmitting

Measurements made on selected frequencies from neutral conductor are given below:

Frequency	AV	AV Limit	Q. Peak	QP Limit	Margin
MHz	(dB μ V)				
0.199	16.8	53.7	31.4	63.7	-32.3
0.6	25.7	46	29.7	56	-20.3
4.4	28.8	46	30.5	56	-17.2
13.1	26.4	50	37.7	60	-22.3
14.8	35.7	50	36.4	60	-14.3
15.5	34.7	50	35.3	60	-15.3

Measurements made on selected frequencies from line conductor are given below:

Frequency	AV	AV Limit	Q. Peak	QP Limit	Margin
MHz	(dB μ V)				
0.199	16.7	53.7	31.7	63.7	-32
0.6	25.6	46	30.2	56	-20.4
4.4	28.6	46	30.2	56	-17.4
13.1	36.3	50	37.5	60	-13.7
14.8	35.8	50	36.5	60	-14.2
15.5	34.8	50	35.5	60	-15.2

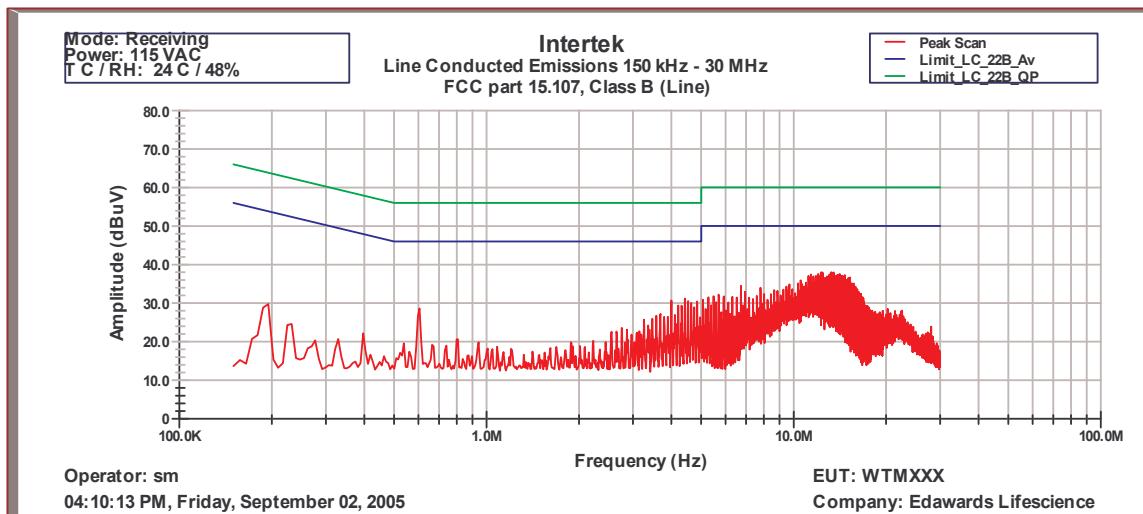
- Note 1: a) A complete scan from 0.15 - 30 MHz was made.
b) Analyzer setting: RBW = 9 kHz, VBW = 30 kHz
c) Detector mode: Quasi-peak and Average.
d) All other measurements were more than 10 dB below the limit lines.
e) Numbers with a minus sign in margin column are below the limit.

The next two pages are the peak scan made on line and neutral conductors

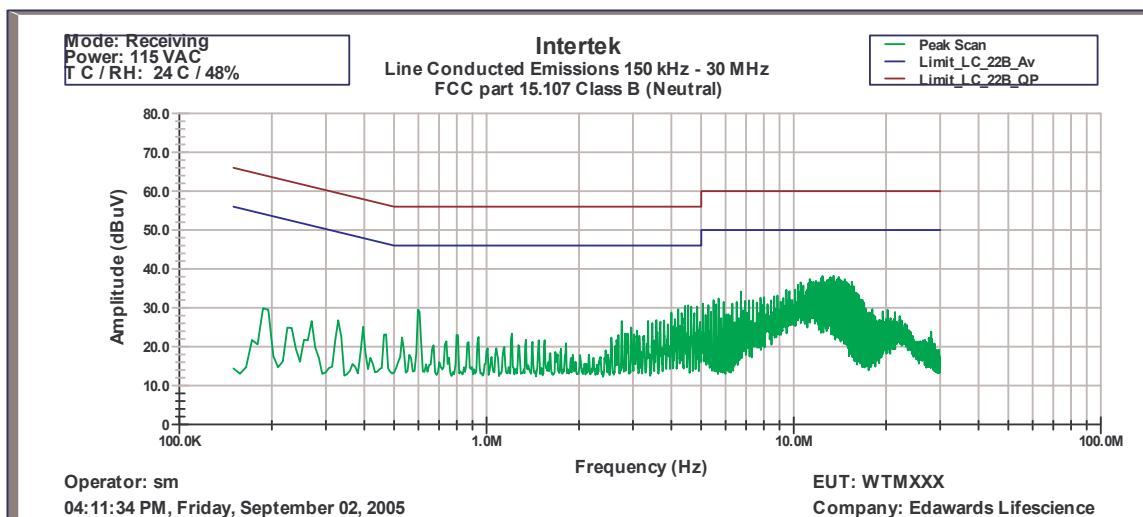
Test Result	Passed with margin 13.7 dB at 13.1 MHz
--------------------	---

Date of Test: September 2 to 8, 2005

FCC ID: S8IWPMS



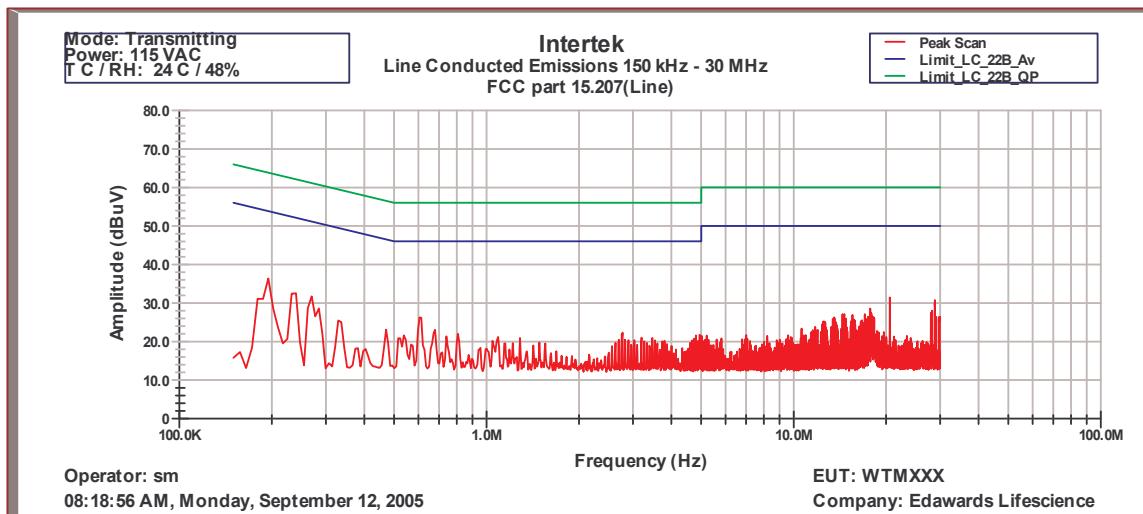
Conducted emission, Receiving mode, Line conductor



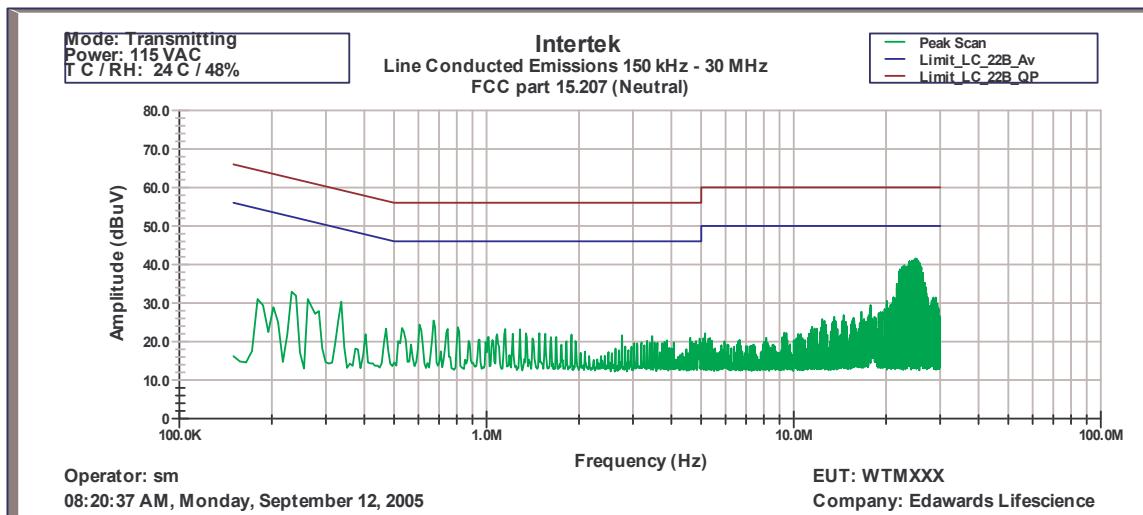
Conducted emission, Receiving mode, Neutral conductor

Date of Test: September 2 to 8, 2005

FCC ID: S8IWPMS



Conducted emission, Transmitting mode, Line conductor



Conducted emission, Transmitting mode, Neutral conductor

Date of Test: September 2 to 8, 2005

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 594 kHz
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Date of Test: September 2 to 8, 2005

FCC ID: S8IWPMS

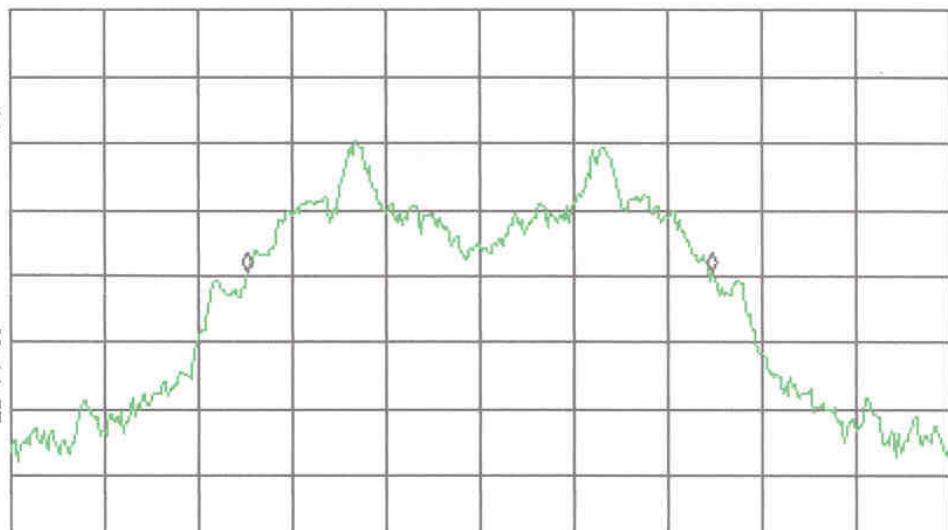
14:57:10 SEP 02, 2005

MARKER A
594 kHz
-.19 dBACTV DET: PEAK
MEAS DET: PEAK QP AVG
MKRA 594 kHz
-.19 dBLast Hrd
Key Menu
SPANLOG REF 72.0 dB μ V

PREAMP ON

10
dB/
ATN
10 dBVA SB
SC FC
CORRCENTER 1.428B75 GHz
#IF BW 10 kHz

#AVG BW 10 kHz

SPAN 1.200 MHz
SWP 36.0 msecMARKER
NORMALMARKER
AMARKER
AMPTDSELECT
1 2 3 4MARKER 1
ON OFFMore
1 of 2

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FCC ID: S8IWPMS**9.0 Emission Types****9.1 Test Description**

Parameter:	FCC 95.1115(c)
Requirement:	FCC 95.1115(c)
Descriptions:	Any emission type is accepted except for video and voice. Waveforms such as electrocardiograms (ECGs) are not considered video. Operation may be under manual or automatic control, and on continuous basis.

9.2 Test Procedure

None

9.3 Test Result

The device is considered to comply with the requirements by:

	Description
X	This device transmits data only.

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FCC ID: S8IWPMS**10.0 Channel Use****10.1 Test Description**

Parameter:	FCC 95.1115(d)
Requirement:	FCC 95.1115(d)
Descriptions:	Within the 1395 -1400 MHz and 1427 – 1431.5 MHz WMTS device may operate on any channels – none are specified.

10.2 Test Procedure

None

10.3 Test Result

The device is considered to comply with the requirements by:

	Description
X	Avoids harmful interference to other WMTS devices. Channels use is shared and cannot be assigned exclusively use by any one entity.

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11.0 Frequency Stability

11.1 Test description

Requirement:	FCC § 2.1055, § 95.1115(e)
Frequency Tolerance:	Within 0.004% (40ppm)

11.2 Test Procedure

The ppm frequency error of the transmitter was calculated by:

$$ppm\ error = \left(\frac{MCF}{ACF} - 1 \right) \cdot 10^6$$

Where MCF is the Measured Carrier Frequency in MHz
ACF is the Assigned Carrier Frequency in MHz

11.2.1 Frequency Stability vs. Temperature

For X Unit:

The equipment under the test was connected to an external DC power supply and the RF output was connected to a frequency counter via feedthrough attenuators. The EUT was placed inside the temperature chamber.

The temperature stability was measured with variation of ambient temperature as follows:

- From -30°C to +50°C with intervals of 10°C
- After the temperature stabilized for approximately 20 minutes, the frequency of the output signal was recorded from the counter.

11.2.2 Frequency Stability vs. Voltage

For M Unit with AC power adapter:

At room temperature (25 ± 5 °C), an external variable AC power supply was connected to the EUT. The frequency of the transmitter was measured for 115%, 100% and 85% of the nominal operating input voltage.

For M Unit with 9 VDC power pack:

At room temperature (25 ± 5 °C), an external variable DC power supply was connected to the EUT. The frequency of the transmitter was measured for 9 VDC and 4 VDC.

For X Unit with 1.5 VDC battery:

At room temperature (25 ± 5 °C), an external variable DC power supply was connected to the EUT. The frequency of the transmitter was measured for 1.5 VDC and 1.0 VDC.

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FCC ID: S8IWPMS**11.3 Test Results**

X Unit:

Frequency Stability vs Temperature		
ACF (MHz):	1395.625	Limit: 40 ppm
Temperature, C	MCF (MHz)	PPM Error
50	1395.64083	11.34258845
40	1395.63922	10.18898343
30	1395.63813	9.407971339
20	1395.63783	9.193013883
10	1395.63662	8.326018809
0	1395.63489	7.086430811
-10	1395.63141	4.592924317
-20	1395.62655	1.110613524
-30	1395.616	-6.44872369

M Unit with AC adapter:

Frequency Stability vs Voltage			
ACF (MHz): 1395.625			Limit: 40 ppm
%	Voltage	MCF (MHz)	PPM Error
115	138.00	1395.626	0.72
100	120.00	1395.6264	1.00
85	102.00	1395.62618	0.85

M Unit with 9 VDC battery pack:

Frequency Stability vs Voltage			
ACF (MHz): 1395.625			Limit: 40 ppm
%	Voltage	MCF (MHz)	PPM Error
	9 VDC	1395.6264	1.00
	4 VDC	1395.6261	0.79

X Unit with 1.5 VDC battery:

Frequency Stability vs Voltage			
ACF (MHz): 1395.625			Limit: 40 ppm
%	Voltage	MCF (MHz)	PPM Error
	1.5 VDC	1395.63783	9.19
	1.0 VDC	1395.63745	8.92

Note: 40 ppm (60) kHz frequency change would not shift emission outside the band of operation and sideband emission would not exceed specified limits. See margins in section 5.0

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FCC ID: S8IWPMS**12.0 RF Safety****12.1 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.

12.1.1 Test Procedure

None

12.1.2 Test Result

The device is considered to comply with the requirements by:

	Description
X	<i>Limit for general population:</i> No SAR evaluation is required for user distance < 2.5 cm: $P < 60/f(\text{GHz}) \text{ mW}$ $EIRP = E - 95.3 = 78.4 \text{ dB}\mu\text{V} - 95.3 = -16.9 \text{ dBm} \rightarrow 0.02 \text{ mW}$ $0.02 \text{ mW} < 60/1.4 = 42.8 \text{ mW}$
	<i>Conclusion:</i> No SAR evaluation is required.

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13.0 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	11/16/04	11/16/05	X
HP 85460A RF Filter Section	3448A00265	11/16/04	11/16/05	X
Tile Software	Rev. 3.0 G	N/A	N/A	X
R & S FSP40 Spectrum Analyzer	100027	2/21/05	2/21/06	X
Agilent 8447D RF Pre Amplifier	2944A10141	1/27/05	1/27/06	X
HP 8449B RF Pre Amplifier	300801168	1/27/05	1/27/06	X

Antennas

DESCRIPTION	SERIAL NO.	LAST CAL DATE	CAL DUE	TICK IF USED
Electro-metrics LPA-25 Log Periodic	1077	08/27/05	08/27/06	
Comp Power Biconical Antenna AB 900	15299	03/22/05	03/22/06	X
Com-Power AL-100 Logperiodic Antenna	16055	05/02/05	05/02/06	X
ETS Lindgren 3115 Horn Antenna	00031626	03/09/05	03/09/06	X
Chase Bilog Antenna CBL6112	2040	11/23/04	11/23/05	

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	7/20/06	X
FCC LISN 50 Amp 5 μ H	9827	02/07/05	02/07/06	