

APPLICANT

X-10 (USA), Inc.
19823, 58th Place S.
Kent, WA 98032

MANUFACTURER

X-10 Electronics (Shenzhen) Co. Ltd.
X-10 Building, Labour Industrial District
Xixiang Town, Baoan County,
Shenzhen, China

TEST SPECIFICATION: FCC Rules and Regulations Part 15, Subpart C, Para. 15.231

TEST PROCEDURE: ANSI C63.4:2001

TEST SAMPLE DESCRIPTION

BRANDNAME: ATI Technologies Model Number: OR14A

TYPE: Pulsed Transmitter

POWER REQUIREMENTS: 2 "AAA" Batteries

FREQUENCY OF OPERATION: 433.92 MHz

TESTS PERFORMED

Para. 15.231(b),	Radiated Emissions, Fundamental and Harmonics
Para. 15.231(b),	Radiated Emissions, Spurious Case
Para. 15.35,	Duty Cycle Determination
Para. 15.231(c),	Occupied Bandwidth

REPORT OF MEASUREMENTS

Applicant:	X-10 (USA), Inc.
Brand Name:	ATI Technologies
Device:	Pulsed Transmitter
FCC ID:	B4SOR14A
Power Requirements:	2 "AAA" Batteries
Applicable Rule Section:	Part 15, Subpart C, Section 15.231

**Retlif Testing Laboratories**

Test Report No. R-10506-1
FCC ID: B4SOR14A

REPORT OF MEASUREMENTS (continued)

TEST RESULTS

- 15.231 (a): This device is used as a remote control transmitter.
- 15.231 (a)(1) & 15.231(a)(2): The transmitter is manually operated and ceases transmission within 5 seconds after deactivation.
- 15.231 (a)(3): The transmitter does not perform periodic transmissions.
- 15.231 (b): The fundamental field strength did not exceed 11,000 $\mu\text{V/M}$ (Average) at a test distance of 3 meters. In addition, the requirements of section 15.35 for averaging pulsed emissions and for limiting peak emissions were met.
- The field strength of harmonic and spurious emissions did not exceed 1,100 $\mu\text{V/M}$ (AVERAGE).

DETERMINATION OF FIELD STRENGTH LIMITS

The field strength limits shown below are found in Section 15.231.

Frequency			Limit		
F1	=	260	3750	=	L1
Fo	=	433.92			Lo
F2	=	470	12500	=	L2



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Test Report No. R-10506-1
FCC ID: B4SOR14A

REPORT OF MEASUREMENTS (continued)

The formula below was utilized to determine the limits:

$$\text{Limit} = L1 + [(F0-F1)(L2-L1)/(F2-F1)]$$

Solving yields:

Fundamental Limit = 11,000 μ V/M (AVERAGE) @ 3 Meters

Harmonic Limit = 1,100 μ V/M (AVERAGE) @ 3 Meters

DUTY CYCLE DETERMINATION

The unit's RF output was directly coupled to the input of the spectrum analyzer. The analyzer was set for a frequency span of 0Hz. The sweep time was then adjusted in order to display one full pulse train. The transmitter on time was then summed and compared to the time for one full cycle in order to obtain the duty cycle.

Transmitter On Time = 15 milliseconds (maximum)

Transmitter Cycle Time = 45.25 milliseconds

Transmitter Duty Cycle = 33.1 %

See separate e-file for plots named dutycycle.pdf for additional information.



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SPECTRUM ANALYZER DESENSITIZATION CONSIDERATIONS

Due to the nature of the emissions being measured, care was taken to ensure that the resolution bandwidth of the spectrum analyzer was adequate to provide accurate measurements. The following formula was utilized:

Setting pulse desensitization equal to zero and utilizing the minimum observed pulse width of 650 μ s yields a minimum required bandwidth of 1,026 Hz. FCC specified bandwidths of 100kHz and 1MHz were utilized below and above 1GHz, respectively.

GENERAL NOTES

1. All readings were taken utilizing a peak detector function at a test distance of 3 meters.
2. The duty cycle was applied to the peak readings in order to determine the average value of the emissions.
3. The frequency range was scanned from 30 MHz to 4.33 GHz. All emissions not reported were more than 20 dB below the specified limit.



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Test Report No. R-10506-1
FCC ID: B4SOR14A

EQUIPMENT LIST

FCC Part 15, Subpart C Paragraph; 15.231

EN	Type	Manufacturer	Description	Model No.	Cal Date	Due
067	Open Area Test Site	Retlif	3 Meter	RNY	10/1/2003	10/1/2006
128	Double Ridged Guide	Electro-Mechanics	1 GHz - 18 GHz	3105	6/21/2004	6/21/2005
133	Broadband Pre-Amplifier	Electro-Metrics	10 kHz - 1 GHz, 26dB	BPA-1000	6/12/2004	6/12/2005
206B	6.0 dB Attenuator	Texscan	0 - 1.0 GHz	FP-50 - 6 dB	6/12/2004	6/12/2005
523	Biconilog	Electro-Mechanics	26 - 2000 MHz	3142B	9/8/2003	9/8/2004
543	Preamplifier	Hewlett Packard	1.0 GHz - 26.5 GHz	8449B	7/27/2004	7/27/2005
896	EMI Test Receiver	Rohde & Schwarz	20 Hz - 40 GHz	ESIB40	7/24/2003	8/24/2004



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Test Report No. R-10506-1
FCC ID: B4SOR14A

FCC 15.231(b)
RADIATED EMISSIONS, FUNDAMENTAL & SPURIOUS CASE
(See separate e-file named Refundharm & REspur.pdf)



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Test Report No. R-10506-1
FCC ID: B4SOR14A

FCC 15.231(c)
OCCUPIED BANDWIDTH
(See separate e-file named occbw.pdf)



Retlif Testing Laboratories

Test Report No. R-10506-1
FCC ID: B4SOR14A

FCC 15.231(c)

DUTY CYCLE

(See separate e-file named dutycycle.pdf)



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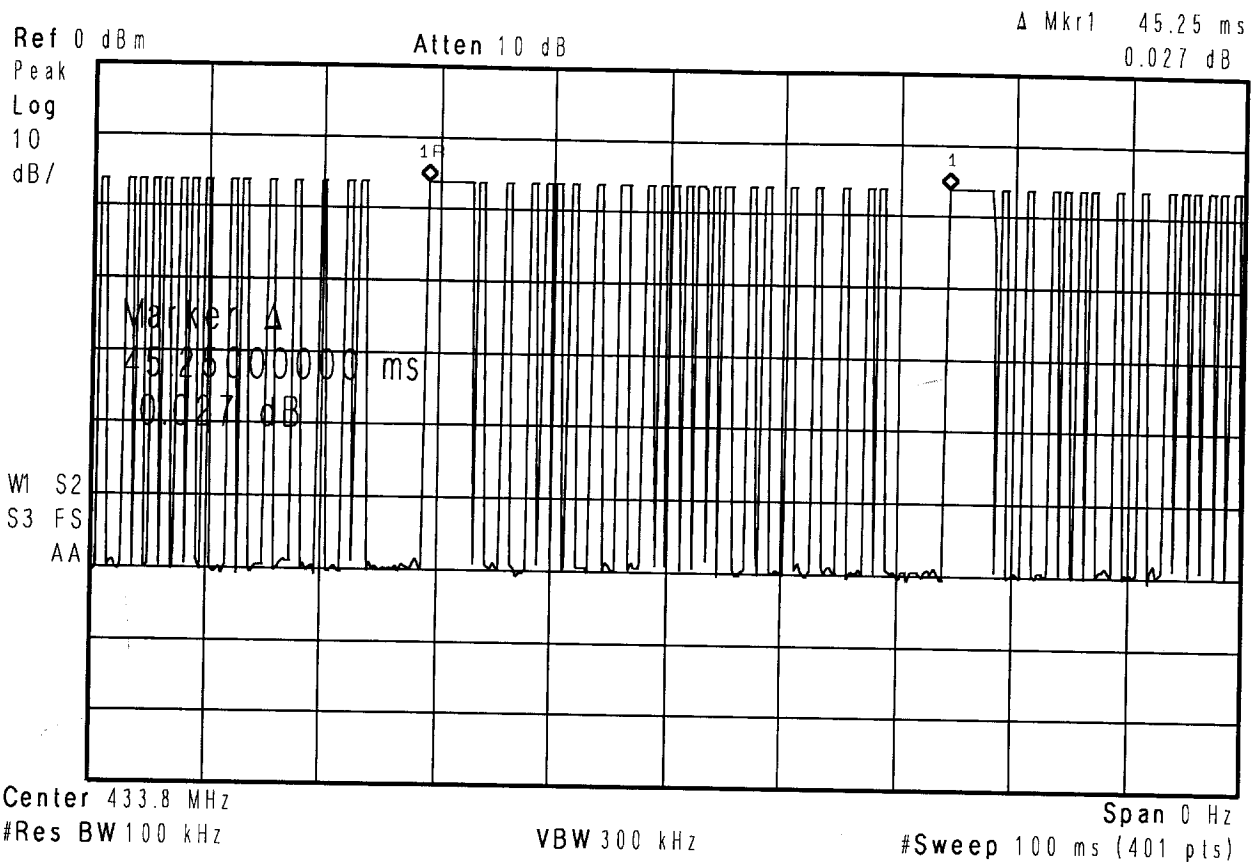
Test Report No. R-10506-1
FCC ID: B4SOR14A

Test Setup Photograph



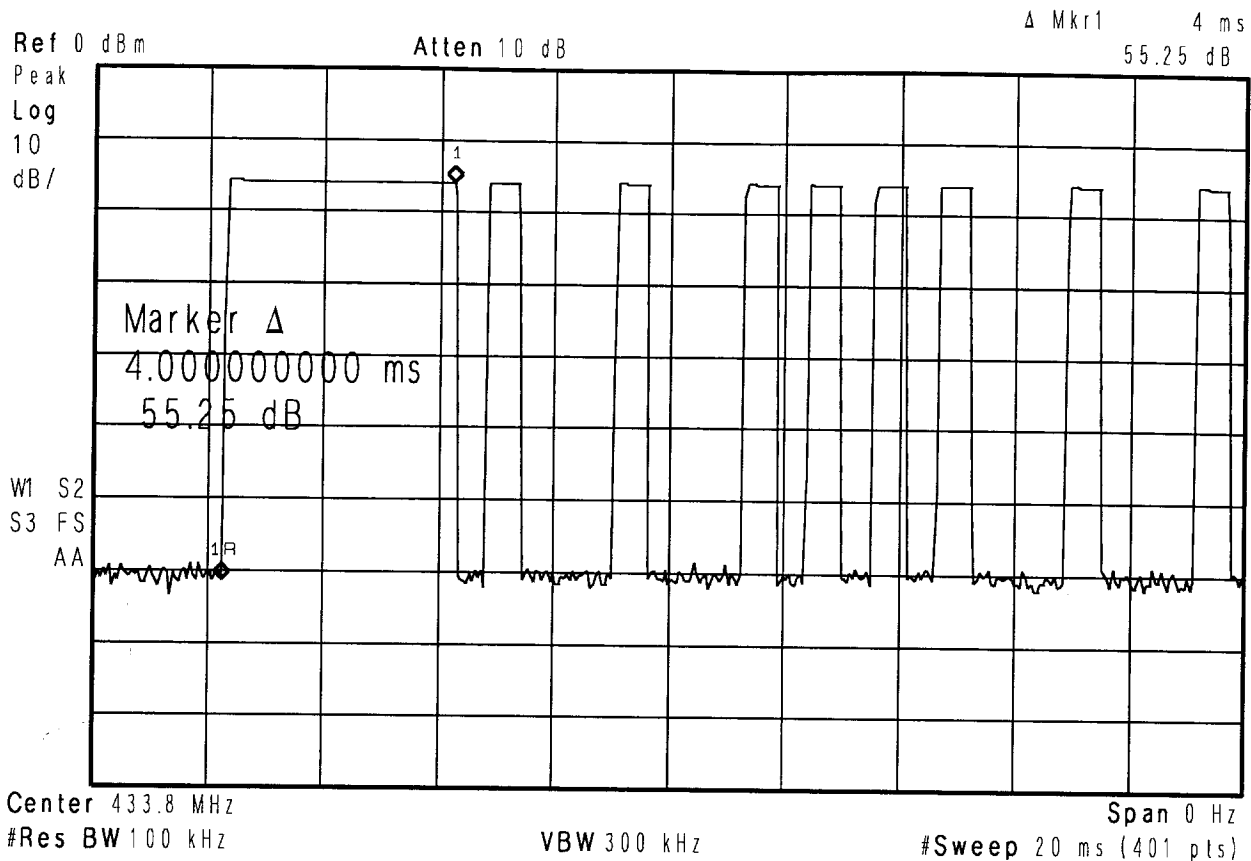
Retlif Testing Laboratories

Test Report No. R-10506-1
FCC ID: B4SOR14A



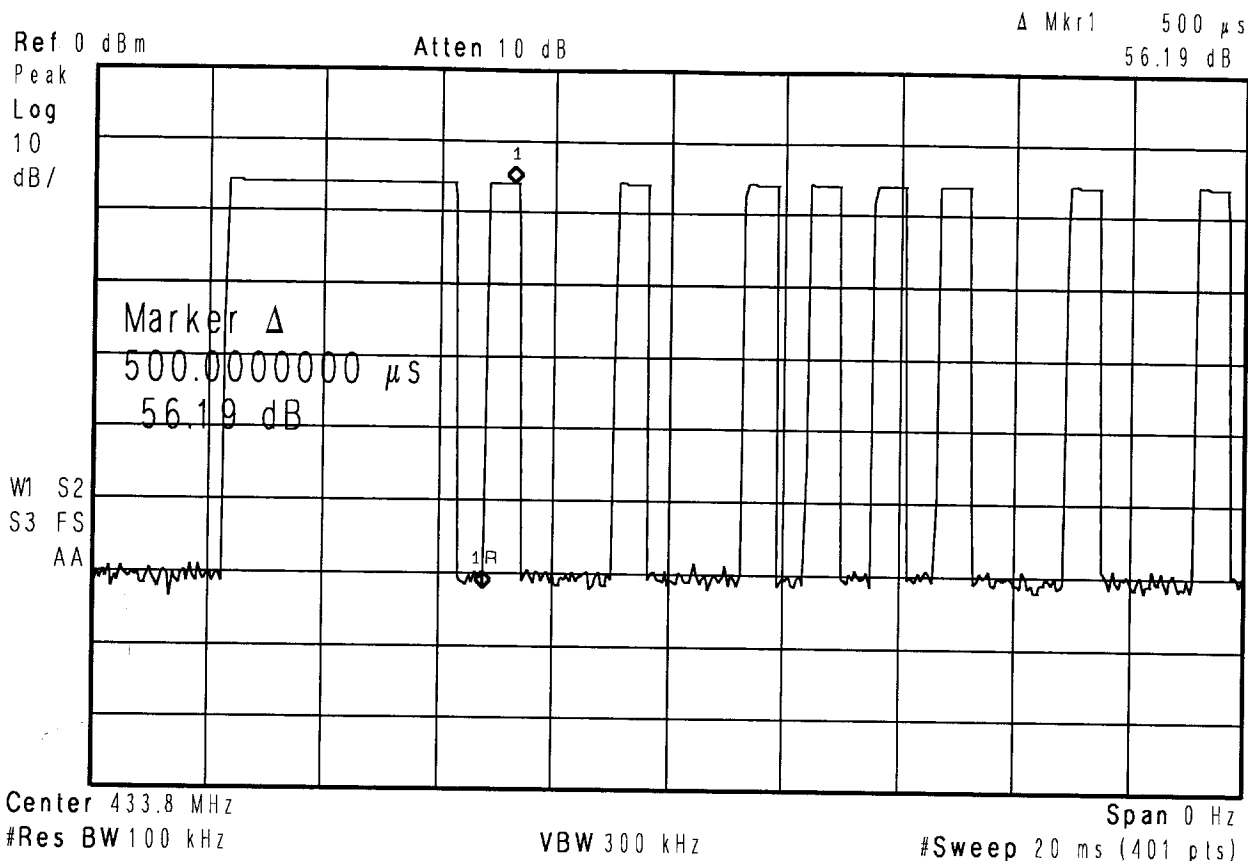
RETLIF TESTING LABORATORIES

Test Method	FCC Part 15, Subpart C, Paragraph 6.5, Pulsed Operation		
Customer	X10(USA), Inc	Job No.	R-10506-1
Test Sample	433.92 Pulsed Rf Transmitter		
Model No.	OR14A, PN: 5000026900	Serial No.	FCC ID: B4SOR14A
Test Specification	47 CFR, Part 15	Paragraph	15.35
Operating Mode	Continuously transmitting 433.92 MHz pulsed RF.		
Technician	T. Schneider	Date	July 29, 2004
Lead Tested	N/A		
Notes	Cycle Time Measurement=45.25 mSec, Duty Cycle=(4 + [22*0.5])/45.25= 0.331= 33.1%, Duty Cycle Factor= -9.5 dB		



RETLIF TESTING LABORATORIES

Test Method	FCC Part 15, Subpart C, Paragraph 6.5, Pulsed Operation		
Customer	X10(USA), Inc	Job No.	R-10506-1
Test Sample	433.92 Pulsed Rf Transmitter		
Model No.	OR14A, PN: 5000026900	Serial No.	FCC ID: B4SOR14A
Test Specification	47 CFR, Part 15	Paragraph	15.35
Operating Mode	Continuously transmitting 433.92 MHz pulsed RF.		
Technician	T. Schneider	Date	July 29, 2004
Lead Tested	N/A		
Notes	Large Pulse Measurement=4.0 mSec, Duty Cycle=(4 + [22*0.5])/45.25= 0.331= 33.1%, Duty Cycle Factor= -9.5 dB		



RETLIF TESTING LABORATORIES

Test Method	FCC Part 15, Subpart C, Paragraph 6.5, Pulsed Operation		
Customer	X10(USA), Inc	Job No.	R-10506-1
Test Sample	433.92 Pulsed Rf Transmitter		
Model No.	OR14A, PN: 5000026900	Serial No.	FCC ID: B4SOR14A
Test Specification	47 CFR, Part 15	Paragraph	15.35
Operating Mode	Continuously transmitting 433.92 MHz pulsed RF.		
Technician	T. Schneider	Date	July 29, 2004
Lead Tested	N/A		
Notes	22 Small Pulses Measurement=22 x 0.5 mSec, Duty Cycle=(4 + [22*0.5])/45.25= 0.331= 33.1%, Duty Cycle Factor= -9.5 dB		

Test Method:	FCC Part 15 Subpart C Radiated Emissions, Fundamental & Harmonic Emissions						
Customer:	X-10 (USA), Inc.				Job No.	R-10506-1	
Test Sample:	433.92 MHz Pulsed RF Transmitter				Paragraph:	15.231 (b)	
Model No.:	OR14A				FCC ID:	B4SOR14A	
Operating Mode:	Continuously Transmitting a pulsed 433.92 MHz Signal						
Technician:	D. Lerner				Date:	August 10, 2004	
Notes:	Test Distance: 3 Meters Detector: Peak, unless otherwise specified				Temperature: 22.0°C Humidity: 58%		
Frequency	Antenna Pol./Height	EUT Orientation	Meter Reading	Correction Factor	Corrected Reading	Converted Reading	Peak Limit
MHz	(V/H)/Meters	X / Y / Z	dBuV	dB	dBuV/m	uV/m	uV/m
433.92	H/1.0	X	81.2	1.0	82.2	12882.5	109,967
	H/1.0	Y	85.7	1.0	86.7	21627.2	
	H/1.0	Z	73.2	1.0	74.2	5128.6	
	V/1.0	X	81.4	1.0	82.4	13182.6	
	V/2.5	Y	79.8	1.0	80.8	10964.8	
433.92	V/1.5	Z	85.0	1.0	86	19952.6	109,967
867.84	H/1.0	X	37.5	9.2	46.7	216.3	10,996.7
	H/1.0	Y	38.5	9.2	47.7	242.7	
	H/1.0	Z	30.2	9.2	39.4	93.3	
	V/1.0	X	30.7	9.5	40.2	102.3	
	V/1.0	Y	33.0	9.5	42.5	133.4	
867.84	V/1.0	Z	34.0	9.5	43.5	149.6	10,996.7
1301.76	H/1.2	X	47.5	-0.6	46.9	221.3	5,000
	H/1.7	Y	45.2	-0.6	44.6	169.8	
	H/1.1	Z	50.1	-0.6	49.5	298.5	
	V/1.0	X	48.6	-1.5	47.1	226.5	
	V/1.0	Y	51.4	-1.5	49.9	312.6	
1301.76	V/1.0	Z	47.2	-1.5	45.7	192.8	5,000
1735.68	H/1.0	X	45.5	4.4	49.9	312.6	10,996.7
	H/1.0	Y	43.8	4.4	48.2	257.0	
	H/1.0	Z	46.6	4.4	51	354.8	
	V/1.2	X	45.3	2.8	48.1	254.1	
	V/1.0	Y	47.9	2.8	50.7	342.8	
1735.68	V/1.0	Z	48.7	2.8	51.5	375.8	10,996.7
2169.60	H/1.0	X	48.8	-2.9	45.9	197.2	10,996.7
	H/1.0	Y	47.6	-2.9	44.7	171.8	
	H/1.0	Z	54.4	-2.9	51.5	375.8	
	V/1.0	X	47.0	-2.9	44.1	160.3	
	V/1.0	Y	53.0	-2.9	50.1	319.9	
2169.60	V/1.0	Z	48.0	-2.9	45.1	179.9	10,996.7
	The frequency range was scanned from 30 MHz to 4.3392 GHz.						
	All emissions not recorded were more than 10 dB below the specified limit.						
	Emissions from the EUT do not exceed the specified limits.						
	*=Noise Floor Measurements (minimum system sensitivity).						



Retlif Testing Laboratories

Retlif Job Number R-10506-1

Test Method:	FCC Part 15 Subpart C Radiated Emissions, Fundamental & Harmonic Emissions						
Customer:	X-10 (USA), Inc.				Job No.	R-10506-1	
Test Sample:	433.92 MHz Pulsed RF Transmitter				Paragraph:	15.231 (b)	
Model No.:	OR14A				FCC ID:	B4SOR14A	
Operating Mode:	Continuously Transmitting a pulsed 433.92 MHz Signal						
Technician:	D Lerner				Date:	August 10, 2004	
Notes:	Test Distance: 3 Meters				Temperature: 22.0°C		Humidity: 58%
	Detector: Peak, unless otherwise specified						
Frequency	Antenna Pol./Height	EUT Orientation	Meter Reading	Correction Factor	Corrected Reading	Converted Reading	Peak Limit
MHz	(V/H)-Meters	X / Y / Z	dBuV	dB	dBuV/m	uV/m	uV/m
2603.52	H/1.3	X	45.0	-7.3	37.7	*76.7	10,996.7
	H/1.0	Y	46.1	-7.3	38.8	*87.1	
	H/1.6	Z	48.9	-7.3	41.6	*120.2	
	V/1.0	X	43.6	-7.3	36.3	*65.3	
	V/1.4	Y	43.8	-7.3	36.5	*66.8	
2603.52	V/1.0	Z	45.6	-7.3	38.3	*82.2	10,996.7
3037.44	H/1.0	X	42.6	-7.7	34.9	*55.6	10,996.7
	H/1.0	Y	42.6	-7.7	34.9	*55.6	
	H/1.0	Z	42.6	-7.7	34.9	*55.6	
	V/1.0	X	42.6	-7.7	34.9	*55.6	
	V/1.0	Y	42.6	-7.7	34.9	*55.6	
3037.44	V/1.0	Z	42.6	-7.7	34.9	*55.6	10,996.7
3471.36	H/1.0	X	42.6	-8.7	33.9	*49.5	10,996.7
	H/1.0	Y	42.6	-8.7	33.9	*49.5	
	H/1.0	Z	42.6	-8.7	33.9	*49.5	
	V/1.0	X	42.6	-8.7	33.9	*49.5	
	V/1.0	Y	42.6	-8.7	33.9	*49.5	
3471.36	V/1.0	Z	42.6	-8.7	33.9	*49.5	10,996.7
3905.28	H/1.0	X	42.6	-12.1	30.5	*33.5	5,000
	H/1.0	Y	42.6	-12.1	30.5	*33.5	
	H/1.0	Z	42.6	-12.1	30.5	*33.5	
	V/1.0	X	42.6	-12.1	30.5	*33.5	
	V/1.0	Y	42.6	-12.1	30.5	*33.5	
3905.28	V/1.0	Z	42.6	-12.1	30.5	*33.5	5,000
4339.20	H/1.0	X	42.6	-13.4	29.2	*28.8	5,000
	H/1.0	Y	42.6	-13.4	29.2	*28.8	
	H/1.0	Z	42.6	-13.4	29.2	*28.8	
	V/1.0	X	42.6	-13.4	29.2	*28.8	
	V/1.0	Y	42.6	-13.4	29.2	*28.8	
4339.20	V/1.0	Z	42.6	-13.4	29.2	*28.8	5,000
	The frequency range was scanned from 30 MHz to 4.3392 GHz.						
	All emissions not recorded were more than 10 dB below the specified limit.						
	Emissions from the EUT do not exceed the specified limits.						
	*=Noise Floor Measurements (minimum system sensitivity).						



Retlif Testing Laboratories

Retlif Job Number R-10506-1

Test Method:		FCC Part 15 Subpart C Radiated Emissions, Fundamental & Harmonic Emissions					
Customer:		X-10 (USA), Inc.			Job No.		R-10506-1
Test Sample:		433.92 MHz Pulsed RF Transmitter			Paragraph:		15.231 (b)
Model No.:		OR14A			FCC ID:		B4SOR14A
Operating Mode:		Continuously Transmitting a pulsed 433.92 MHz Signal					
Technician:		D. Lerner			Date:		August 10, 2004
Notes:		Test Distance: 3 Meters			Duty Cycle: 33.1 %		
		Detector: Peak, unless otherwise specified			Duty Cycle Correction: -9.6 dB		
Frequency	Antenna Pol./Height	EUT Orientation	Peak Reading	Correction Factor	Corrected Reading	Converted Reading	Avg. Limit
MHz	(V/H)-Meters	X / Y / Z	dBuV	dB	dBuV/m	uV/m	uV/m
433.92	H/1.0	X	82.2	-9.6	72.6	4265.8	10,996.7
	H/1.0	Y	86.7	-9.6	77.1	7161.4	
	H/1.0	Z	74.2	-9.6	64.6	1698.2	
	V/1.0	X	82.4	-9.6	72.8	4365.2	
	V/2.5	Y	80.8	-9.6	71.2	3630.8	
433.92	V/1.5	Z	86.0	-9.6	76.4	6606.9	10,996.7
867.84	H/1.0	X	46.7	-9.6	37.1	71.60	1,099.7
	H/1.0	Y	47.7	-9.6	38.1	80.40	
	H/1.0	Z	39.4	-9.6	29.8	30.90	
	V/1.0	X	40.2	-9.6	30.6	33.90	
	V/1.0	Y	42.5	-9.6	32.9	44.20	
867.84	V/1.0	Z	43.5	-9.6	33.9	49.50	1,099.7
1301.76	H/1.2	X	46.9	-9.6	37.3	73.30	500
	H/1.7	Y	44.6	-9.6	35.0	56.20	
	H/1.1	Z	49.5	-9.6	39.9	98.90	
	V/1.0	X	47.1	-9.6	37.5	75.00	
	V/1.0	Y	49.9	-9.6	40.3	103.5	
1301.76	V/1.0	Z	45.7	-9.6	36.1	63.80	500
1735.68	H/1.0	X	49.9	-9.6	40.3	103.5	1,099.7
	H/1.0	Y	48.2	-9.6	38.6	85.10	
	H/1.0	Z	51.0	-9.6	41.4	117.5	
	V/1.2	X	48.1	-9.6	38.5	84.10	
	V/1.0	Y	50.7	-9.6	41.1	113.5	
1735.68	V/1.0	Z	51.5	-9.6	41.9	124.5	1,099.7
2169.60	H/1.0	X	45.9	-9.6	36.3	65.30	1,099.7
	H/1.0	Y	44.7	-9.6	35.1	56.90	
	H/1.0	Z	51.5	-9.6	41.9	124.5	
	V/1.0	X	44.1	-9.6	34.5	53.10	
	V/1.0	Y	50.1	-9.6	40.5	105.9	
2169.60	V/1.0	Z	45.1	-9.6	35.5	59.60	1,099.7
The frequency range was scanned from 30 MHz to 4.3392 GHz.							
All emissions not recorded were more than 10 dB below the specified limit.							
Emissions from the EUT do not exceed the specified limits.							
*=Noise Floor Measurements (minimum system sensitivity).							



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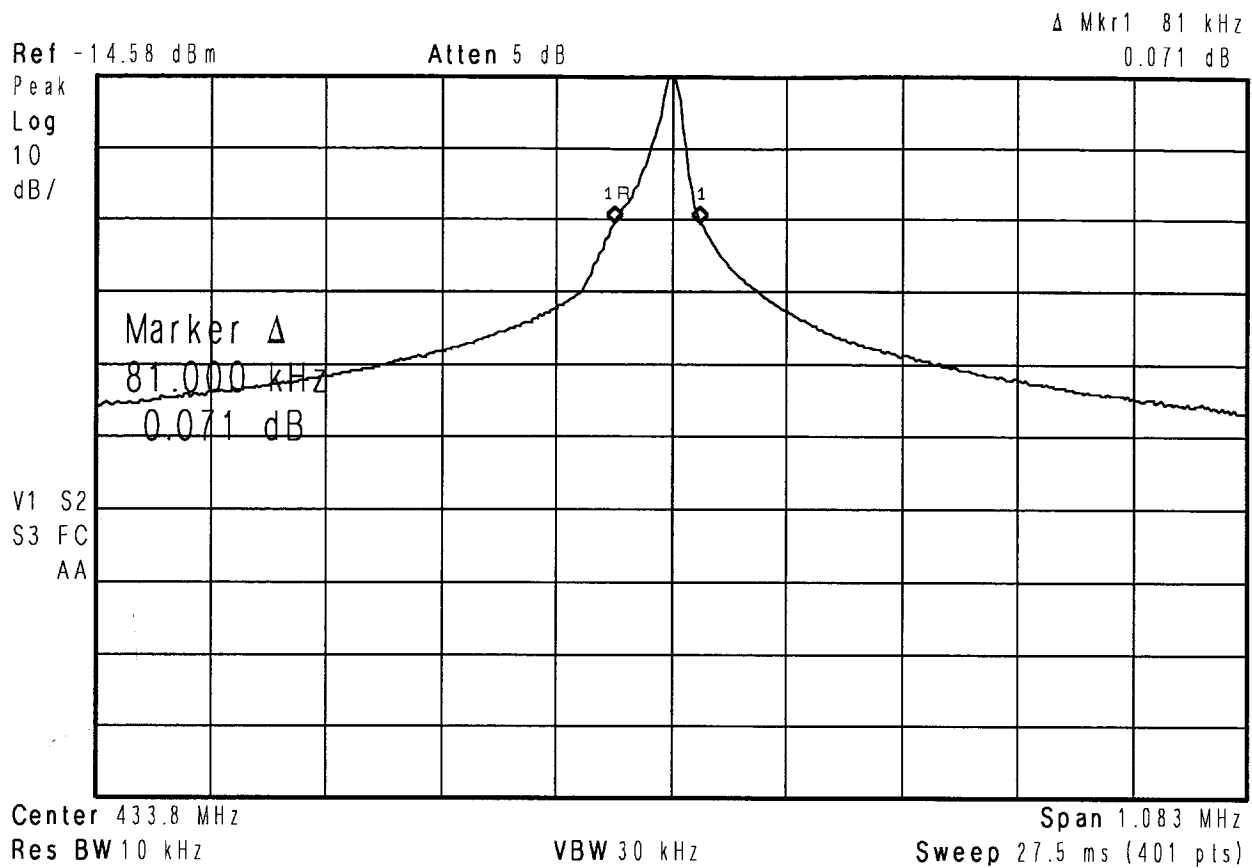
Retlif Job Number R-10506-1

Test Method:	FCC Part 15 Subpart C Radiated Emissions, Fundamental & Harmonic Emissions						
Customer:	X-10 (USA), Inc.				Job No.	R-10506-1	
Test Sample:	433.92 MHz Pulsed RF Transmitter				Paragraph:	15.231 (b)	
Model No.:	OR14A				FCC ID:	B4SOR14A	
Operating Mode:	Continuously Transmitting a pulsed 433.92 MHz Signal						
Technician:	D. Lerner				Date:	August 10, 2004	
Notes:	Test Distance: 3 Meters				Duty Cycle: 33.1 %		
	Detector: Peak, unless otherwise specified				Duty Cycle Correction: -9.6 dB		
Frequency	Antenna Pol./Height	EUT Orientation	Peak Reading	Correction Factor	Corrected Reading	Converted Reading	Avg. Limit
MHz	(V/H)-Meters	X / Y / Z	dBuV	dB	dBuV/m	uV/m	uV/m
2603.52	H/1.3	X	37.7	-9.6	28.1	25.4	1,099.7
	H/1.0	Y	38.8	-9.6	29.2	28.8	
	H/1.6	Z	41.6	-9.6	32.0	39.8	
	V/1.0	X	36.3	-9.6	26.7	21.6	
	V/1.4	Y	36.5	-9.6	26.9	22.1	
2603.52	V/1.0	Z	38.3	-9.6	28.7	27.2	1,099.7
3037.44	H/1.0	X	34.9	-9.6	25.3	18.4	1,099.7
	H/1.0	Y	34.9	-9.6	25.3	18.4	
	H/1.0	Z	34.9	-9.6	25.3	18.4	
	V/1.0	X	34.9	-9.6	25.3	18.4	
	V/1.0	Y	34.9	-9.6	25.3	18.4	
3037.44	V/1.0	Z	34.9	-9.6	25.3	18.4	1,099.7
3471.36	H/1.0	X	33.9	-9.6	24.3	16.4	1,099.7
	H/1.0	Y	33.9	-9.6	24.3	16.4	
	H/1.0	Z	33.9	-9.6	24.3	16.4	
	V/1.0	X	33.9	-9.6	24.3	16.4	
	V/1.0	Y	33.9	-9.6	24.3	16.4	
3471.36	V/1.0	Z	33.9	-9.6	24.3	16.4	1,099.7
3905.28	H/1.0	X	30.5	-9.6	20.9	11.1	500
	H/1.0	Y	30.5	-9.6	20.9	11.1	
	H/1.0	Z	30.5	-9.6	20.9	11.1	
	V/1.0	X	30.5	-9.6	20.9	11.1	
	V/1.0	Y	30.5	-9.6	20.9	11.1	
3905.28	V/1.0	Z	30.5	-9.6	20.9	11.1	500
4339.20	H/1.0	X	29.2	-9.6	19.6	9.5	500
	H/1.0	Y	29.2	-9.6	19.6	9.5	
	H/1.0	Z	29.2	-9.6	19.6	9.5	
	V/1.0	X	29.2	-9.6	19.6	9.5	
	V/1.0	Y	29.2	-9.6	19.6	9.5	
4339.20	V/1.0	Z	29.2	-9.6	19.6	9.5	500
	The frequency range was scanned from 30 MHz to 4.3392 GHz.						
	All emissions not recorded were more than 10 dB below the specified limit.						
	Emissions from the EUT do not exceed the specified limits.						
	*=Noise Floor Measurements (minimum system sensitivity).						



Retlif Testing Laboratories

Retlif Job Number R-10506-1



RETLIF TESTING LABORATORIES

Test Method	FCC Part 15, Subpart C, Paragraph 15.231(c), Occupied Bandwidth		
Customer	X10(USA), Inc	Job No.	R-10506-1
Test Sample	433.92 Pulsed Rf Transmitter		
Model No.	OR14A, PN: 5000026900	Serial No.	FCC ID: B4SOR14A
Test Specification	47 CFR, FCC Part 15	Paragraph	15.231(c)
Operating Mode	Continuously transmitting 433.92 MHz pulsed RF.		
Technician	T. Schneider	Date	July 29, 2004
Lead Tested	N/A		
Notes	Bandwidth does not exceed 0.25% of center Frequency (1.08 MHz) at 20 dB down points		