APPLICANT	MANUFACTURER
X-10 (USA), Inc. 91 Ruckman Road Closter, NJ 07624-0420	X-10 Electronics Shenzhen Co. Ltd. X-10 Building Labour Industrial District Shenzhen, Xixiang, Bao An Guang Dong, China, 518102

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

TEST PROCEDURE: ANSI C63.4:1992

TEST SAMPLE DESCRIPTION

BRANDNAME: X-10 (USA), Inc. MODEL: XC14A

TYPE: Pulsed Transmitter

POWER REQUIREMENTS: 12 VDC derived from an AC Adapter

FREQUENCY OF OPERATION: 310 MHz

TESTS PERFORMED

Para. 15.207(a), Conducted Emissions

Para. 15.231(a), Radiated Emissions, Fundamental and Harmonics

Para. 15.231(b), Radiated Emissions, Spurious Case

Para. 15.231(c), Occupied Bandwidth

REPORT OF MEASUREMENTS

Applicant:	X-10 (USA), Inc.
Device:	Pulsed Transmitter
FCC ID:	B4SXC14A
Power Requirements:	12 VDC derived from an AC Adapter
Applicable Rule Section:	Part 15, Subpart C, Section 15.231

TEST RESULTS

15.207(a):	The radio frequency voltage that was conducted back on to the AC power line on any frequency/frequencies within the bandwidth of 450kHz to 30MHz did not exceed 250 microvolts.
15.231 (a):	This device is used as a Passive Infrared Sensor which sends a remote control signal to a remote chime when motion is detected.
15.231 (a)(1) & 15.231(a)(2):	The transmitter is automatically 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 5833 µV/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 583 µV/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

The formula below was utilized to determine the limits:

Limit = L1 + [(Fo-F1)(L2-L1)/(F2-F1)]

Solving yields:

Fundamental Limit = 5833 µV/M (AVERAGE) @ 3 Meters

Harmonic Limit = 583 µV/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.(See plots for additional information)

Transmitter On Time	=	31.34 milliseconds (maximum- worst case in 100 ms)
Transmitter Cycle Time	=	> 100 milliseconds (107 msec)
Transmitter Duty Cycle	=	31.34 %

CALCULATION:

1 Large Pulse	=	9.333 milliseconds
33 x 667 µs (small pulse)	=	22.001 milliseconds
9.333 + 22.001	=	31.34 milliseconds
Duty Cycle	=	31.34 %
Correction Factor = 20 log(0.248)	=	-10.1

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 20µs yields a minimum required bandwidth of 33.3 kHz. 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. All measurements were made with 12 VDC being derived from an AC Adapter.

4. The frequency range was scanned from 30 MHz to 3.1 GHz. All emissions not reported were more than 20 dB below the specified limit.

EQUIPMENT LIST

Radiated Emissions, 30MHz-25GHz

EN	Type	Manufacturer	Description	Model No.	Cal Date	Due Date
067	Open Area Test Site	Retlif	3 Meter	RNY	09/20/2000	09/20/2003
128C	Double Ridge Guide	Eaton Corporation	1 GHz - 18 GHz	96001	09/18/2000	09/18/2001
129E	High Gain Horn Antenna	Microlab/FXR	18 GHz - 26.5 GHz	K638A	09/18/2000	09/18/2001
133	Broadband Pre-Amplifier	Electro-Metrics	10 kHz - 1 GHz, 26dB	BPA-1000	06/13/2000	06/13/2001
206B	6.0 dB Attenuator	Texscan	0 - 1.0 GHz	FP-50 - 6 dB	06/13/2000	06/13/2001
523	Biconilog	Electro-Mechanics	26 - 2000 MHz	3142B	06/08/2000	06/08/2001
543	Preamplifier	Hewlett Packard	1.0 GHz - 26.5 GHz	8449B	06/16/1999	06/16/2001
712	EMI Test Receiver	Rohde & Schwarz	20 Hz - 26.5 GHz	ESI26	03/01/2000	03/01/2001

Conducted Emissions, 450kHz-30MHz

EN	Type	Manufacturer	Description	Model No.	Cal Date	Due Date
078	LISN	Solar Electronics	10 kHz - 30 MHz	8028-50-TS24BNC	04/27/2000	04/27/2001
091	Shielded Enclosure	Retlif	10 kHz - 1 GHz	Room 6	07/21/2000	07/21/2001
141A	Graphics Plotter	Hewlett Packard	N/A	7470A	03/08/2000	03/08/2001
202	Transient Limiter	Hewlett Packard	.009 MHz - 200 MHz	11947A	07/24/2000	07/24/2001
513	LISN	Solar Electronics	10 kHz - 30 MHz	8028-50-TS24BNC	04/27/2000	04/27/2001
R089	Spectrum Analyzer	Hewlett Packard	30 Hz - 2.9 GHz	8560E	09/16/1999	09/16/2001

FCC 15.207(a)

Conducted Emissions

Please refer to separate electronic file named cedata.pdf

FCC 15.231(b)

RADIATED EMISSIONS, FUNDAMENTAL & SPURIOUS CASE

See separate e-file attachment named RE fundharm.doc and REspur.doc

FCC 15.231(c)

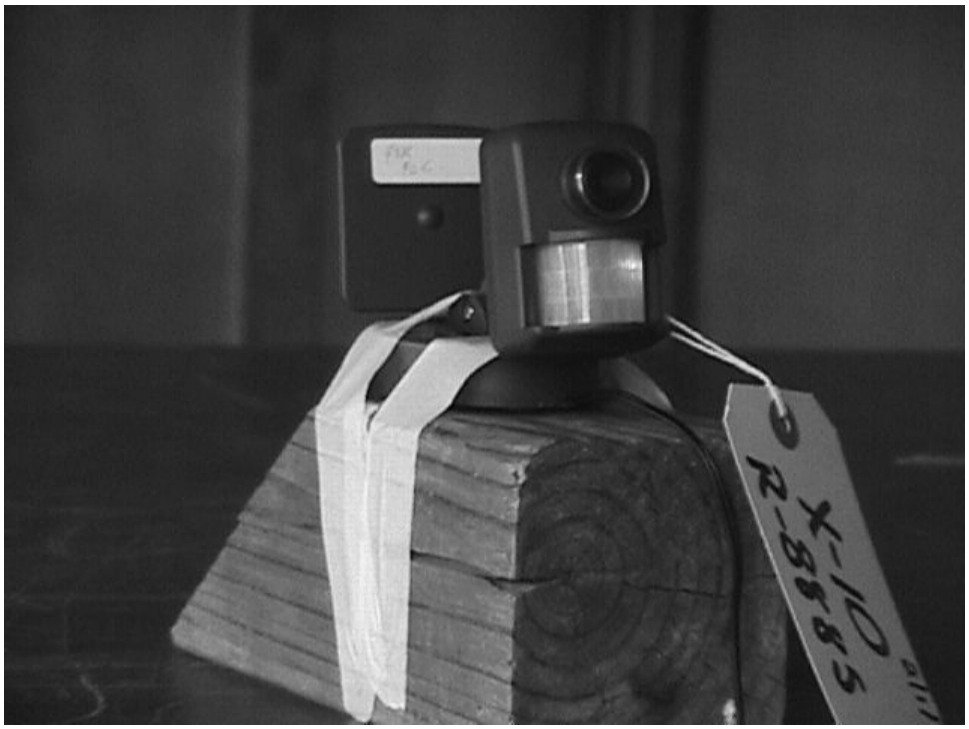
OCCUPIED BANDWIDTH

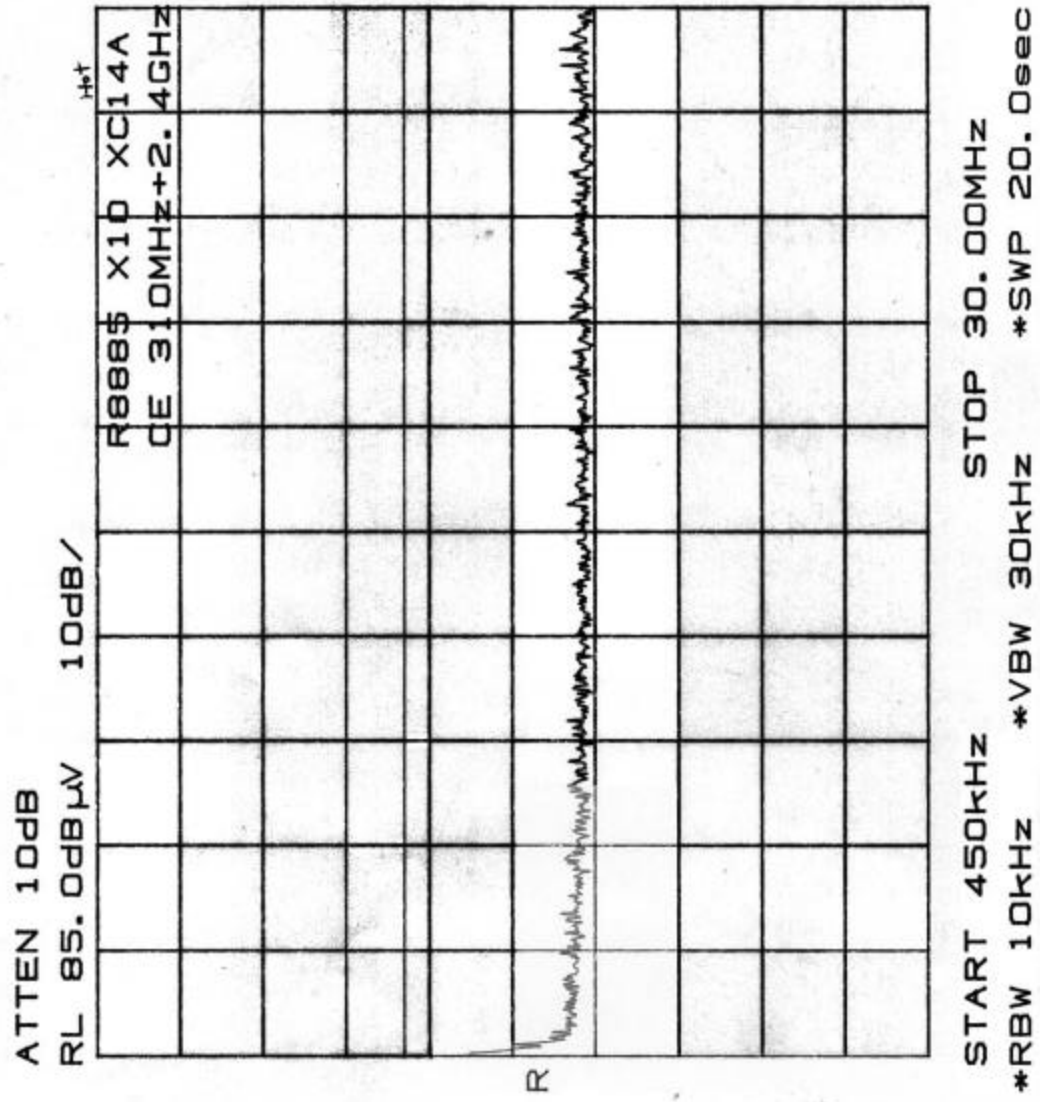
Please refer to separate electronic file named Occbw.pdf

FCC 15.231(c)

DUTY CYCLE

Please refer to separate electronic file named Dutycycle.pdf

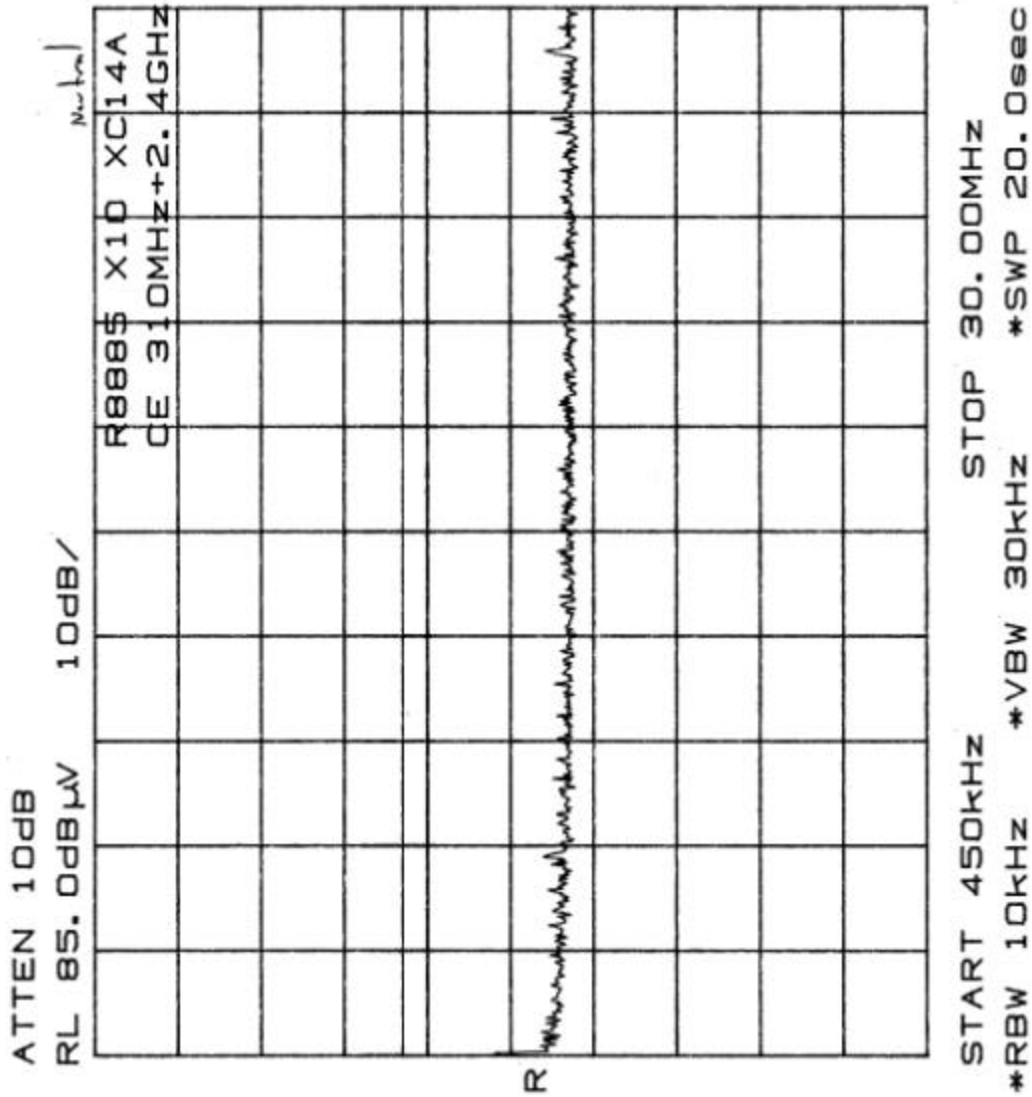

X-10
R-8885



Customer:	X-10 (USA)
Test Sample:	310MHz and 2.4GHz Transmitter
Model No.:	XC14A FCC ID.:B4SXC14A
Test Method:	FCC15.207(a) Conducted Emissions, 450kHz-30MHz
Notes:	Lead-HOT Detector=Peak 310MHz AND 2.4GHz Transmitters both active.
Date: February 9, 2001	Tech: Peter Lananna Sheet 1 of 2

Retlif Testing Laboratories

Report No. R-8885-1A



Customer:	X-10 (USA)
Test Sample:	310MHz and 2.4GHz Transmitter
Model No.:	XC14A FCC ID:B45XC14A
Test Method:	FCC15.207(a) Conducted Emissions, 450KHz-30MHz
Notes:	Lead-NEUTRAL Detector=Peak 310MHz AND 2.4GHz Transmitters both active.
Date: February 9, 2001	Tech: Peter Lananna Sheet 2 of 2

Retlif Testing Laboratories

Report No. R-8885-1A

Test Method:	FCC Part 15 Subpart C Radiated Emissions, Fundamental & Harmonic Emissions		
Customer:	X-10 (USA)	**Job No.**	R-8885-1a
Test Sample:	310MHz Transmitter	**Paragraph:**	15.231
Model No.:	XC14A	**FCC ID:**	B4SXC14A
Operating Mode:	Continuously Transmitting a 310 MHz Signal		
Technician:	Peter Lananna	**Date:**	February 8, 2001

Notes: Test Distance: 3 Meters
Detector: Peak, Unless otherwise specified

Test Freq.	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
310	H/1.0	X	68.0	-4.0	64.0	1584.9	58330
|	H/1.0	Y	69.5	-4.0	65.5	1883.6	|
|	H/2.0	Z	70.7	-4.0	66.7	2162.7	|
|	V/1.8	X	72.0	-4.0	68.0	2511.9	|
|	V/1.0	Y	67.5	-4.0	63.5	1496.2	|
310	V/1.0	Z	68.5	-4.0	64.5	1678.8	58330
620	H / 1.0	X	37.7	3.2	40.9	110.9	5833
|	H / 1.3	Y	36.7	3.2	39.9	98.9	|
|	H / 1.3	Z	37.5	3.2	40.7	108.4	|
|	V / 3.0	X	38.0	3.2	41.2	114.8	|
|	V / 1.0	Y	41.7	3.2	44.9	175.8	|
620	V / 2.5	Z	39.0	3.2	42.2	128.8	5833
930	H / 1.0	X	32.0	7.4	39.4	93.3*	5833
|	H / 1.0	Y	32.0	7.4	39.4	93.3*	|
|	H / 1.0	Z	32.0	7.4	39.4	93.3*	|
|	V / 1.0	X	32.0	7.4	39.4	93.3*	|
|	V / 1.0	Y	32.0	7.4	39.4	93.3*	|
930	V / 1.0	Z	32.0	7.4	39.4	93.3*	5833
1240	H / 1.3	X	40.0	-5.6	34.4	52.5*	5000
|	H / 1.3	Y	40.0	-5.6	34.4	52.5*	|
|	H / 1.3	Z	40.0	-5.6	34.4	52.5*	|
|	V / 1.3	X	40.0	-5.6	34.4	52.5*	|
|	V / 1.3	Y	40.0	-5.6	34.4	52.5*	|
1240	V / 1.5	Z	40.0	-5.6	34.4	52.5*	5000
1550	H / 1.0	X	40.0	-4.4	35.6	60.3*	5000
|	H / 1.0	Y	40.0	-4.4	35.6	60.3*	|
|	H / 1.0	Z	40.0	-4.4	35.6	60.3*	|
|	V / 1.0	X	40.0	-4.4	35.6	60.3*	|
|	V / 1.0	Y	40.0	-4.4	35.6	60.3*	|
1550	V / 1.0	Z	40.0	-4.4	35.6	60.3*	5000

The frequency range was scanned from 30 MHz to 3.1GHz. 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-8885-1a

Test Method:	FCC Part 15 Subpart C Radiated Emissions, Fundamental & Harmonic Emissions		
Customer:	X-10 (USA)	**Job No.**	R-8885-1a
Test Sample:	310MHz Transmitter	**Paragraph:**	15.231
Model No.:	XC14A	**FCC ID:**	B4SXC14A
Operating Mode:	Continuously Transmitting a 310 MHz Signal		
Technician:	Peter Lananna	**Date:**	February 8, 2001

Notes: Test Distance: 3 Meters
Detector: Peak, unless otherwise specified

Test Freq.	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
1860	H / 1.0	X	40.0	-2.4	37.6	75.9*	5833
|	H / 1.0	Y	40.0	-2.4	37.6	75.9*	|
|	H / 1.0	Z	40.0	-2.4	37.6	75.9*	|
|	V / 1.0	X	40.0	-2.4	37.6	75.9*	|
|	V / 1.0	Y	40.0	-2.4	37.6	75.9*	|
1860	V / 1.0	Z	40.0	-2.4	37.6	75.9*	5833
2170	H / 1.0	X	40.0	-1.3	38.7	86.1*	5833
|	H / 1.0	Y	40.0	-1.3	38.7	86.1*	|
|	H / 1.0	Z	40.0	-1.3	38.7	86.1*	|
|	V / 1.0	X	40.0	-1.3	38.7	86.1*	|
|	V / 1.0	Y	40.0	-1.3	38.7	86.1*	|
2170	V / 1.0	Z	40.0	-1.3	38.7	86.1*	5833
2480	H / 1.0	X	40.0	-0.1	39.9	98.9*	5833
|	H / 1.0	Y	40.0	-0.1	39.9	98.9*	|
|	H / 1.0	Z	40.0	-0.1	39.9	98.9*	|
|	V / 1.0	X	40.0	-0.1	39.9	98.9*	|
|	V / 1.0	Y	40.0	-0.1	39.9	98.9*	|
2480	V / 1.0	Z	40.0	-0.1	39.9	98.9*	5833
2790	H / 1.0	X	40.0	1.5	41.5	118.9*	5000
|	H / 1.0	Y	40.0	1.5	41.5	118.9*	|
|	H / 1.0	Z	40.0	1.5	41.5	118.9*	|
|	V / 1.0	X	40.0	1.5	41.5	118.9*	|
|	V / 1.0	Y	40.0	1.5	41.5	118.9*	|
2790	V / 1.0	Z	40.0	1.5	41.5	118.9*	5000
3100	H / 1.0	X	40.0	3.5	43.5	149.6*	5833
|	H / 1.0	Y	40.0	3.5	43.5	149.6*	|
|	H / 1.0	Z	40.0	3.5	43.5	149.6*	|
|	V / 1.0	X	40.0	3.5	43.5	149.6*	|
|	V / 1.0	Y	40.0	3.5	43.5	149.6*	|
3100	V / 1.0	Z	40.0	3.5	43.5	149.6*	5833

The frequency range was scanned from 30 MHz to 3.1 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-8885-1a

Test Method:	FCC Part 15 Subpart C Radiated Emissions, Fundamental & Harmonic Emissions		
Customer:	X-10 (USA)	**Job No.**	R-8885-1a
Test Sample:	310MHz Transmitter	**Paragraph:**	15.231
Model No.:	XC14A	**FCC ID:**	B4SXC14A
Operating Mode:	Continuously Transmitting a 310 MHz Signal		
Technician:	Peter Lananna	**Date:**	February 8, 2001

Notes: Test Distance: 3 Meters — Duty Cycle: 31.34%
Detector: Peak, unless otherwise specified — Duty Cycle Correction: - 10.1 dB

Test Freq.	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
310	H / 1.3	X	64.0	-10.1	53.9	495.5	5833
|	H / 1.0	Y	65.5	-10.1	55.4	588.8	|
|	H / 2.0	Z	66.7	-10.1	56.6	676.1	|
|	V / 1.8	X	68.0	-10.1	57.9	785.2	|
|	V / 2.0	Y	63.5	-10.1	53.4	467.7	|
310	V / 1.5	Z	64.5	-10.1	54.4	524.8	5833
620	H / 1.3	X	40.9	-10.1	30.8	34.7	583
|	H / 1.3	Y	39.9	-10.1	29.8	30.9	|
|	H / 1.3	Z	40.7	-10.1	30.6	33.9	|
|	V / 1.8	X	41.2	-10.1	31.1	35.9	|
|	V / 2.0	Y	44.9	-10.1	34.8	55.0	|
620	V / 1.0	Z	42.2	-10.1	32.1	40.3	583
930	H / 1.0	X	39.4	-10.1	29.3	29.2*	583
|	H / 1.0	Y	39.4	-10.1	29.3	29.2*	|
|	H / 1.0	Z	39.4	-10.1	29.3	29.2*	|
|	V / 1.0	X	39.4	-10.1	29.3	29.2*	|
|	V / 1.0	Y	39.4	-10.1	29.3	29.2*	|
930	V / 1.0	Z	39.4	-10.1	29.3	29.2*	583
1240	H / 1.3	X	34.4	-10.1	24.3	16.4*	500
|	H / 1.3	Y	34.4	-10.1	24.3	16.4*	|
|	H / 1.3	Z	34.4	-10.1	24.3	16.4*	|
|	V / 1.3	X	34.4	-10.1	24.3	16.4*	|
|	V / 1.3	Y	34.4	-10.1	24.3	16.4*	|
1240	V / 1.5	Z	34.4	-10.1	24.3	16.4*	500
1550	H / 1.0	X	35.6	-10.1	25.5	18.8*	500
|	H / 1.0	Y	35.6	-10.1	25.5	18.8*	|
|	H / 1.0	Z	35.6	-10.1	25.5	18.8*	|
|	V / 1.0	X	35.6	-10.1	25.5	18.8*	|
|	V / 1.0	Y	35.6	-10.1	25.5	18.8*	|
1550	V / 1.0	Z	35.6	-10.1	25.5	18.8*	500

The frequency range was scanned from 30 MHz to 3.1 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-8853-1a

Test Method:	FCC Part 15 Subpart C Radiated Emissions, Fundamental & Harmonic Emissions		
Customer:	X-10 (USA)	**Job No.**	R-8885-1a
Test Sample:	310MHz Transmitter	**Paragraph:**	15.231
Model No.:	XC14A	**FCC ID:**	B4SXC14A
Operating Mode:	Continuously Transmitting a 310 MHz Signal		
Technician:	Peter Lananna	**Date:**	February 8, 2001

Notes: Test Distance: 3 Meters — Duty Cycle: 31.34%

Detector: Peak, unless otherwise specified — Duty Cycle Correction: -10.1 dB

Test Freq.	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
1860	H / 1.0	X	37.6	-10.1	27.5	23.7*	583
|	H / 1.0	Y	37.6	-10.1	27.5	23.7*	|
|	H / 1.0	Z	37.6	-10.1	27.5	23.7*	|
|	V / 1.0	X	37.6	-10.1	27.5	23.7*	|
|	V / 1.0	Y	37.6	-10.1	27.5	23.7*	|
1860	V / 1.0	Z	37.6	-10.1	27.5	23.7*	583
2170	H / 1.0	X	38.7	-10.1	28.6	26.9*	583
|	H / 1.0	Y	38.7	-10.1	28.6	26.9*	|
|	H / 1.0	Z	38.7	-10.1	28.6	26.9*	|
|	V / 1.0	X	38.7	-10.1	28.6	26.9*	|
|	V / 1.0	Y	38.7	-10.1	28.6	26.9*	|
2170	V / 1.0	Z	38.7	-10.1	28.6	26.9*	583
2480	H / 1.0	X	39.9	-10.1	29.8	30.9*	583
|	H / 1.0	Y	39.9	-10.1	29.8	30.9*	|
|	H / 1.0	Z	39.9	-10.1	29.8	30.9*	|
|	V / 1.0	X	39.9	-10.1	29.8	30.9*	|
|	V / 1.0	Y	39.9	-10.1	29.8	30.9*	|
2480	V / 1.0	Z	39.9	-10.1	29.8	30.9*	583
2790	H / 1.0	X	41.5	-10.1	31.4	37.2*	500
|	H / 1.0	Y	41.5	-10.1	31.4	37.2*	|
|	H / 1.0	Z	41.5	-10.1	31.4	37.2*	|
|	V / 1.0	X	41.5	-10.1	31.4	37.2*	|
|	V / 1.0	Y	41.5	-10.1	31.4	37.2*	|
2790	V / 1.0	Z	41.5	-10.1	31.4	37.2*	500
3100	H / 1.0	X	43.5	-10.1	33.4	46.8*	583
|	H / 1.0	Y	43.5	-10.1	33.4	46.8*	|
|	H / 1.0	Z	43.5	-10.1	33.4	46.8*	|
|	V / 1.0	X	43.5	-10.1	33.4	46.8*	|
|	V / 1.0	Y	43.5	-10.1	33.4	46.8*	|
3100	V / 1.0	Z	43.5	-10.1	33.4	46.8*	583

The frequency range was scanned from 30 MHz to 3.1 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-8885-1a

Test Method:	FCC Part 15 Subpart C, Spurious Case Radiated Emissions, Paragraph 15.209(a)		
Customer:	X-10 (USA)	**Job No.**	R-8885-1a
Test Sample:	310 MHz & 2.4GHz Transmitter		
Model No.:	XC14A	**FCC ID:**	B4SXC14A
Operating Mode:	Continuously Transmitting a 310 MHz & 2.4GHz Signal		
Technician:	Peter Lananna	**Date:**	February 8, 2001

Notes: Test Distance: 3 Meters Temp:10C Humidity:43%
Detector: Quasi-Peak Below 30 MHz to 1 GHz, Peak above 1 GHz

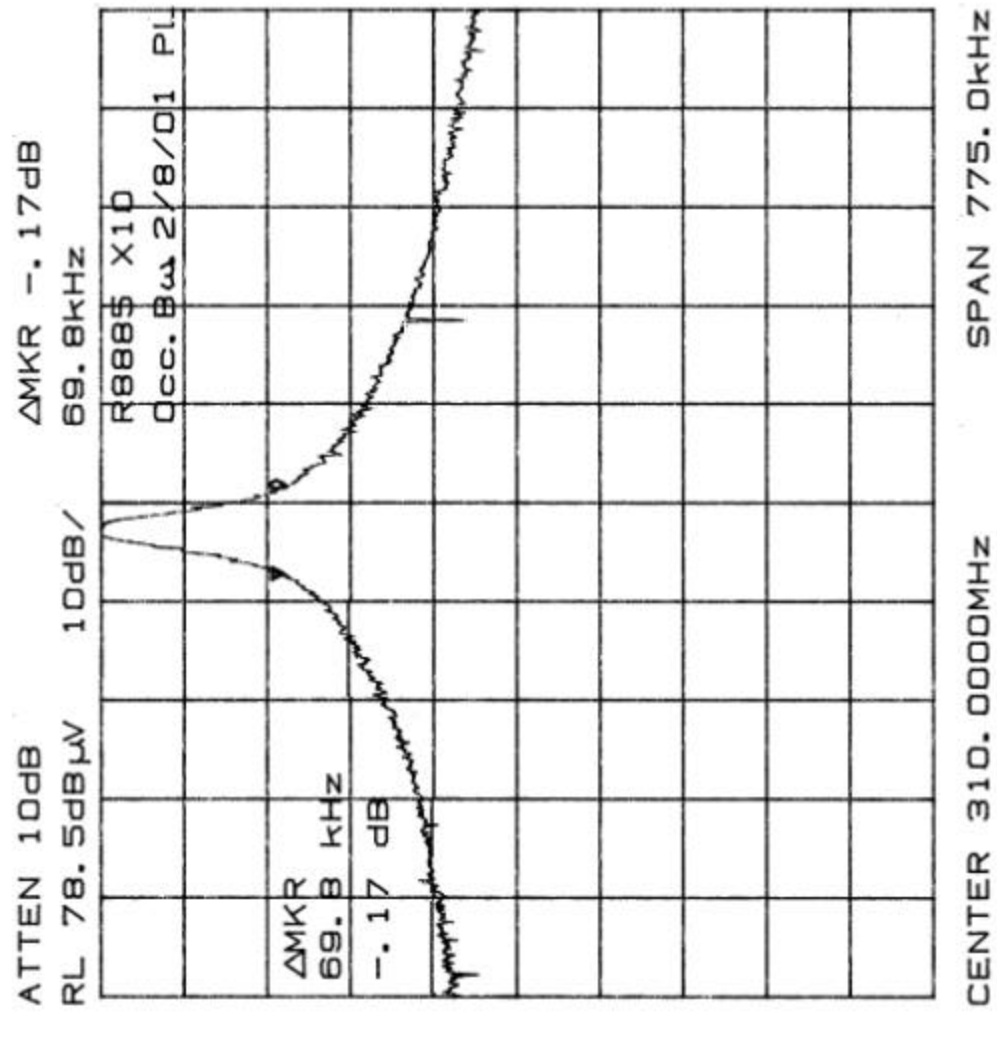
Test Freq.	Antenna Position	EUT Orientation	Meter Readings	Correction Factor	Corrected Reading	Converted Reading	**LIMIT**
MHz	(V/H) / Meters	Degrees	dBuV	dB	dBuV/m	uV/m	uV/m
30.00							100
88.00							100
88.00							150
216.00							150
216.00							200
960.00							200
960.00							500
1205.4	V/1.3	113	48.3	-3.3	45.0	177.8	
2400	V/1.1	180	49.2	3.0	52.2	407.4	
25000.0							500

The EUT was scanned from 30 MHz to 25 GHz

The emissions observed from the EUT do not exceed the specified limits. Emissions not recorded were more than 10dB under the specified limit

Retlif Testing Laboratories

Retlif Job Number R-8885-1a



Customer:	X-10 (USA)
Test Sample:	310MHz Transmitter
Model No.:	XC14A FCC ID.:B4SXC14A
Test Method:	FCC15.231(c) Occupied Bandwidth
Notes:	The bandwidth of the emissions not greater than 0.25% of fundamental carrier.
Date: February 8, 2001	Tech: Peter Lanarma Sheet: 1 of 1

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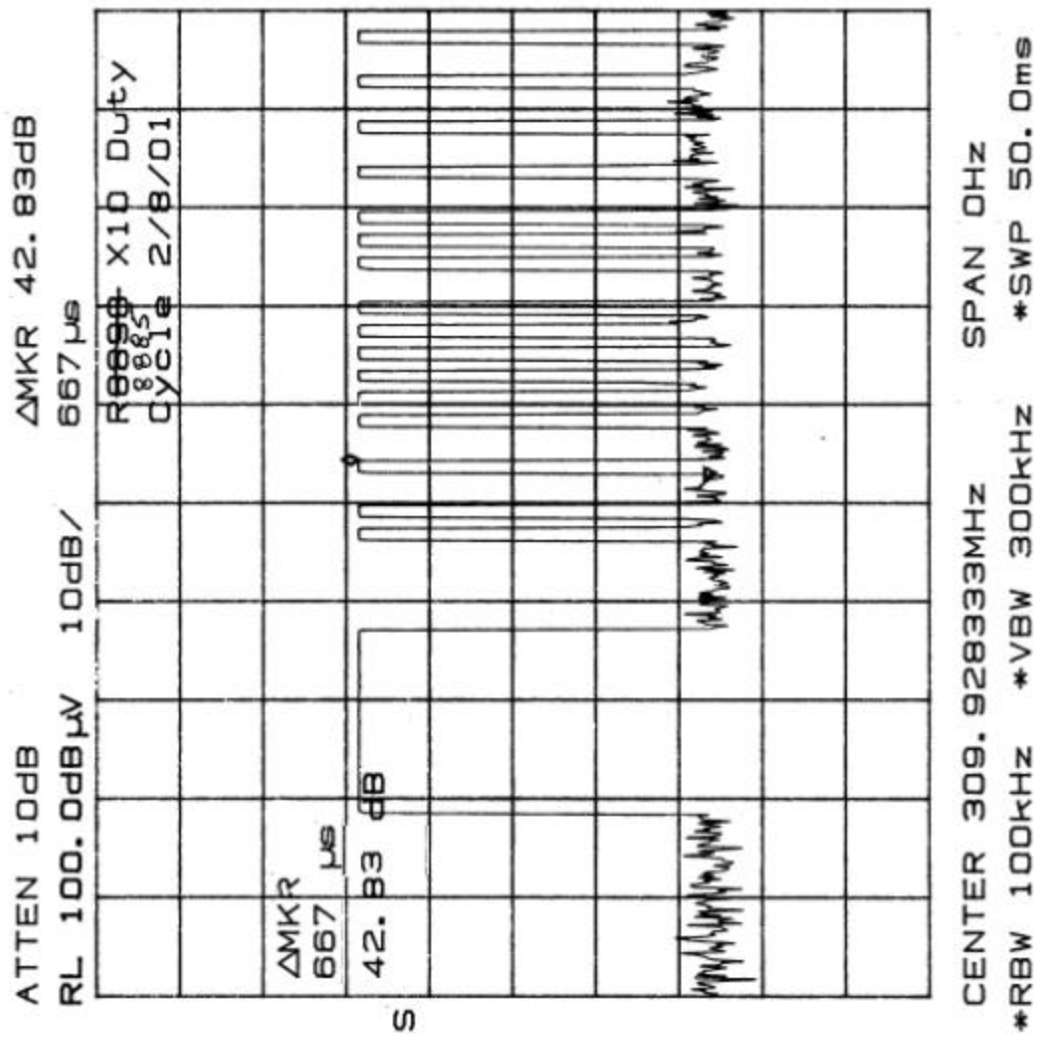

Customer:	X-10 (USA)
Test Sample:	310MHz Transmitter
Model No:	XC14A FCC ID.:B4SXC14A
Test Method:	FCC15.35 (b) Duty Cycle Determination
Notes:	Small Pulse=667micro seconds*33 Small Pulses=22.011milli seconds
Date: February 8, 2001	Tech: Peter Lanenna Sheet 1 of 3

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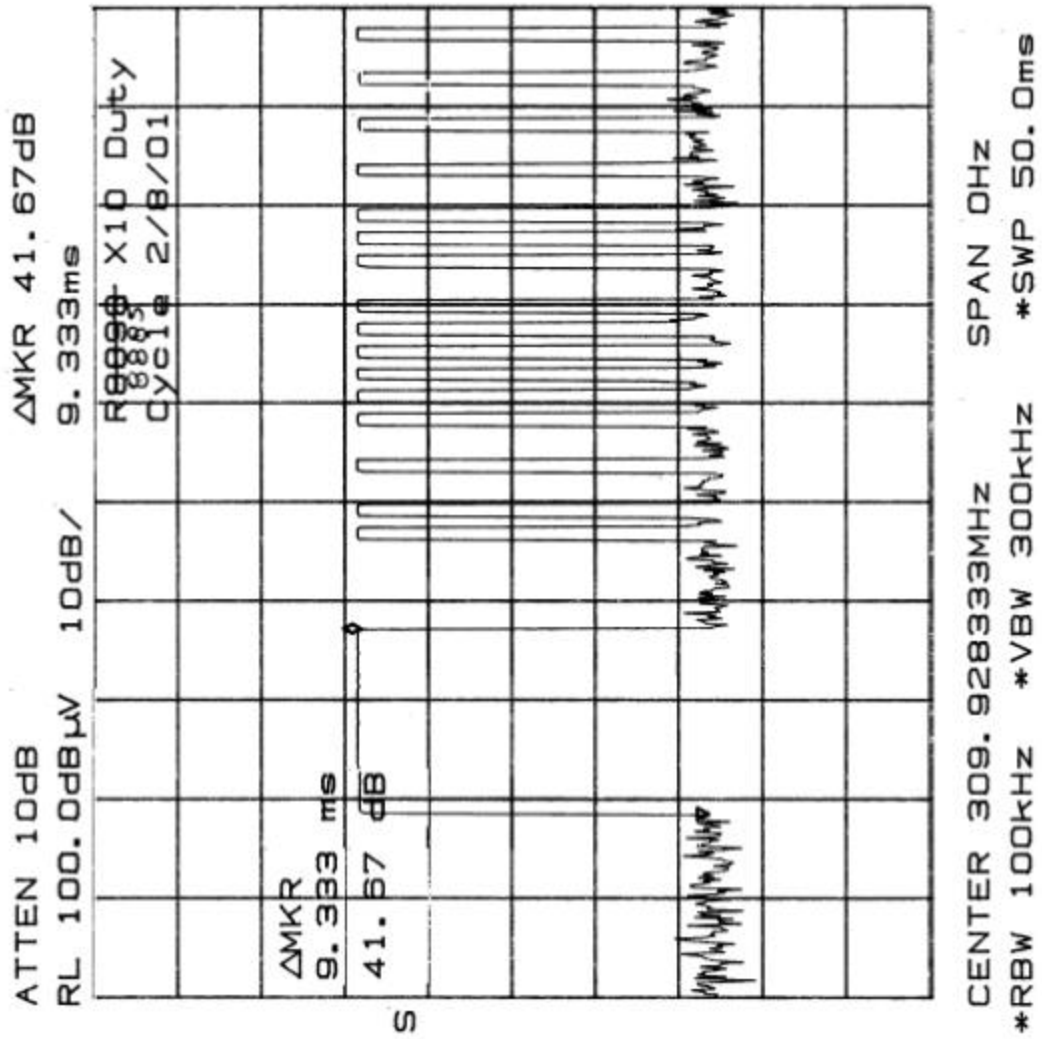

Customer:	X-10 (USA)
Test Sample:	310MHz Transmitter
Model No.:	XC14A FCC ID:B4SXC14A
Test Method:	FCC15.35 (b) Duty Cycle Determination
Notes:	Large Pulse=9.333milli seconds
Date: February 8, 2001	Tech: Peter Lananna Sheet 2 of 3

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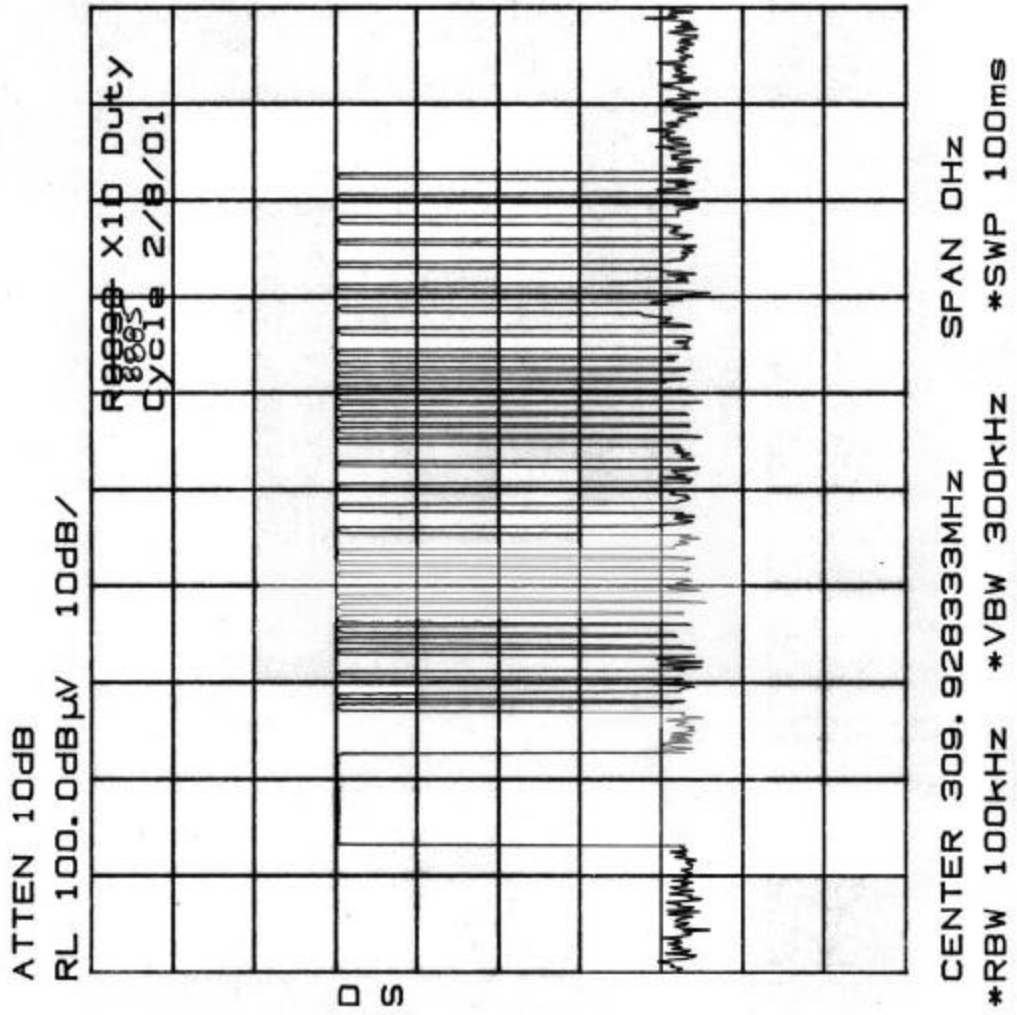

Customer:	X-10 (USA)
Test Sample:	310MHz Transmitter
Model No:	XC14A FCC ID:S4SXC14A
Test Method:	FCC15.35 (b) Duty Cycle Determination
Notes:	((33*967us)+9.333ms)/100ms=Duty cycle 31.34%=Duty cycle
Date: February 8, 2001	Tech: Peter Lanarna Sheet 3 of 3

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