Technical Information

APPLICANT		MANUFACTURER	
Name:	X10 (USA), Inc.	**Name:**	X-10 Electronics (Shenzhen) Co. Ltd.
Address:	19823 58th Place South	**Address:**	Together Rich Industrial Park B Sanwei Industrial District, Xixiang Town
City, State, Zip:	Kent, WA 98032	**City, State, Zip:**	Baoan County, Shenzhen, China

Test Specification: FCC Rules and Regulations Part 15, Subpart C, Para. 15.231

Test Procedure: ANSI C63.4:2003

Test Sample Description

Test Sample: 310 MHz Pulsed Transmitter

Brandname(s): X10 (USA)

Model Number: VR40A

FCC ID: B4S-VR40A

Type: Pulsed Transmitter

Power Requirements: 6 VDC derived from external AC Adapter

Frequency of Operation: 310 MHz

Applicable Rule Section: Part 15, Subpart C, Section 15.231

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(b), Duty Cycle Determination

Para. 15.231(c), Occupied Bandwidth

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 150 kHz to 30 MHz did not exceed Class B limits as specified in CISPR 22.

15.231 (a): This device transmits a control signal and is used as a remote control transmitter.

15.231 (a)(1) The transmitter is manually operated. Transmission ends within 5 seconds of deactivation.

15.231 (a)(3): The transmitter does not perform periodic transmissions or the transmitter performs periodic transmissions at predetermined intervals greater than 1 hour apart and are shorter than 1 second in duration.

15.231 (b): The fundamental field strength did not exceed 5833.3 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 583.3 µV/M (AVERAGE).

15.231 (c) The Bandwidth of the emission was no wider than 0.25% of the center frequency (775 kHz) as measured 20 db down from the modulated carrier.

Determination of Field Strength Limits

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

	Frequency		Limit	
F1 =	260	3750 =		L1
Fo =	310		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 = 5833.3 µV/M (AVERAGE) @ 3 Meters

Harmonic Limit = 583.3 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 0 Hz. 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 = 25.66 milliseconds (maximum per cycle)

Transmitter Cycle Time = 103 milliseconds (100 ms maximum)

Transmitter Duty Cycle = 25.66 %

Calculation

1 Large Pulse = 8.5 milliseconds

33 x 520 µs (small pulse) = 17.16 milliseconds

8.5 + 17.16 = 25.66 milliseconds

Duty Cycle (25/100) = 0.2566 %

Correction Factor =20 log (0.2566) = -11.8 dB

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: minimum bandwidth = 1/{minimum pulse width (in seconds) x 1.5} = Hz Setting pulse desensitization equal to zero and utilizing the minimum observed pulse width of 520 µs yields a minimum required bandwidth of 1282 Hz. FCC specified bandwidths of 100 kHz and 1 MHz were utilized below and above 1 GHz, 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 3.1 GHz. All emissions not reported were more than 20 dB below the specified limit.

Certification and Signatures

We certify that this report is a true representation of the results obtained from the tests of the equipment stated. We further certify that the measurements shown in this report were made in accordance with the procedures indicated and vouch for the qualifications of all Retlif Testing Laboratories personnel taking them.

Donald C. Lerner
EMC Test Engineer

Richard J. Reitz
Laboratory Manager

Non-Warranty Provision
The testing services have been performed, findings obtained and reports prepared in accordance with generally accepted laboratory principles and practices. This warranty is in lieu of all others, either expressed or implied.

Non-Endorsement
This test report contains only findings and results arrived at after employing the specific test procedures and standards listed herein. It is not intended to constitute a recommendation, endorsement or certification of the product or material tested. This test report must not be used by the client to claim product endorsement by NVLAP or any agency of the U.S. Government.

EQUIPMENT LIST

Conducted Emissions

EN	Type	Manufacturer	Description	Model No.	Cal Date	Due Date
078	LISN	Solar Electronics	10 kHz - 30 MHz	8028-50-TS24BNC	6/29/2006	6/29/2007
079	LISN	Solar Electronics	10 kHz - 30 MHz	8028-50-TS24BNC	6/29/2006	6/29/2007
091	Shielded Enclosure	Retlif	10 kHz - 1 GHz	Room 6	10/16/2006	10/16/2007
141	Spectrum Analyzer	Hewlett Packard	100 Hz - 40 GHz	8566B	10/10/2006	4/10/2007
141B	Quasi-Peak Adaptor	Hewlett Packard	100 Hz - 1 GHz	85650A	10/9/2006	4/9/2007
456	LISN	Solar Electronics	DC - 60 Hz	9409-50-R-24	10/28/2005	11/30/2006
831	10 DB Atten. (50 ohm)	Narda	DC - 11 GHz, 20W	768-10	5/10/2006	5/10/2007
896	EMI Test Receiver	Rohde & Schwarz	20 Hz - 40 GHz	ESIB40	9/5/2006	9/5/2007

Duty Cycle Determination

EN	Type	Manufacturer	Description	Model No.	Cal Date	Due Date
141	Spectrum Analyzer	Hewlett Packard	100 Hz - 40 GHz	8566B	10/10/2006	4/10/2007
141B	Quasi-Peak Adaptor	Hewlett Packard	100 Hz - 1 GHz	85650A	10/9/2006	4/9/2007
512	Graphics Plotter	Hewlett Packard	N/A	7470A	10/18/2006	10/18/2007

Occupied Bandwidth

EN	Type	Manufacturer	Description	Model No.	Cal Date	Due Date
141	Spectrum Analyzer	Hewlett Packard	100 Hz - 40 GHz	8566B	10/10/2006	4/10/2007
141B	Quasi-Peak Adaptor	Hewlett Packard	100 Hz - 1 GHz	85650A	10/9/2006	4/9/2007
512	Graphics Plotter	Hewlett Packard	N/A	7470A	10/18/2006	10/18/2007

Radiated Emissions

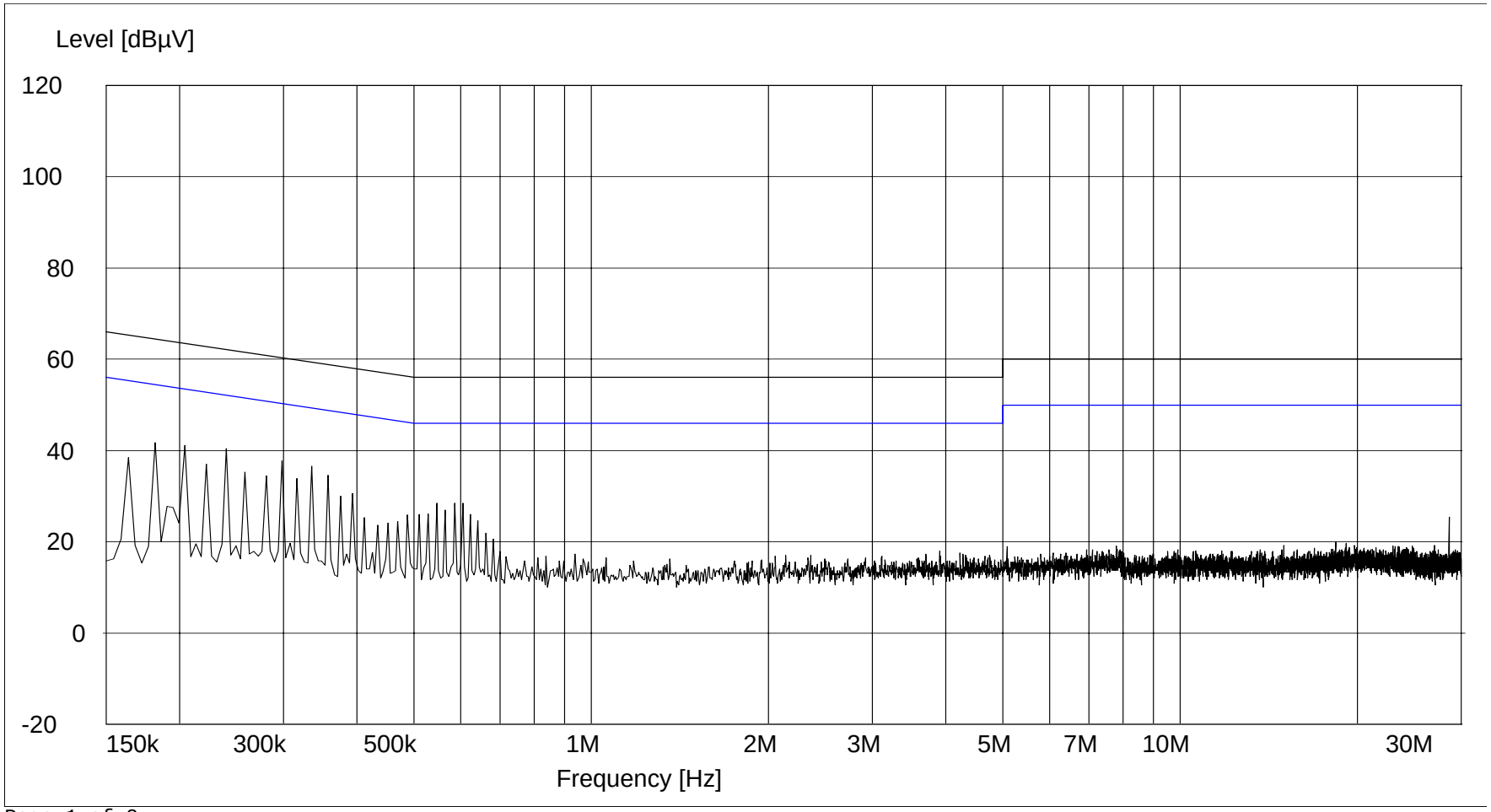
EN	Type	Manufacturer	Description	Model No.	Cal Date	Due Date
067	Open Area Test Site	Retlif	3 Meter	RNY	9/12/2006	9/12/2009
128	Double Ridged Guide	Electro-Mechanics	1 GHz - 18 GHz	3105	3/27/2006	3/27/2007
133	Broadband Pre-Amplifier	Electro-Metrics	10 kHz - 1 GHz, 26dB	BPA-1000	6/27/2006	6/27/2007
141	Spectrum Analyzer	Hewlett Packard	100 Hz - 40 GHz	8566B	10/10/2006	4/10/2007
141B	Quasi-Peak Adaptor	Hewlett Packard	100 Hz - 1 GHz	85650A	10/9/2006	4/9/2007
141C	Cable	Retlif	1 GHz ~ 18 GHz	1 METER, BLUE	1/4/2006	1/4/2007
141D	Cable	Retlif	1 GHz ~ 18 GHz	10 METER, BLACK	1/4/2006	1/4/2007
206B	6.0 dB Attenuator	Texscan	0 - 1.0 GHz	FP-50 - 6 dB	6/27/2006	6/27/2007
512	Graphics Plotter	Hewlett Packard	N/A	7470A	10/18/2006	10/18/2007
543	Preamplifier	Hewlett Packard	1.0 GHz - 26.5 GHz	8449B	9/9/2005	9/9/2007
617	Interference Analyzer	Electro-Metrics	10 kHz - 1 GHz	EMC-30	2/21/2006	2/21/2007
723	H.P. Filter	Mini-Circuits	1 GHz	BHP-1000	8/7/2006	8/7/2007
767	Biconilog	EMCO	26 - 2000 MHz	3142B	10/12/2006	10/12/2007

FCC Part 15, Subpart C, Section 15.207(a), Conducted Emissions, Power Leads,
150 kHz to 30 MHz
Test Data

RETLIF Testing Laboratories, Job Number R-11708-3

FCC Part 15 Subpart C, Conducted Emissions, 150 kHz to 30 MHz.

Customer: X-10 (USA), Inc.
Test Sample: 2.4 GHz Wireless Audio / Video Sender with an integrated 310 MHz pulsed transmitter
Model Number: VR40A ; Serial No.: N/A
Test Specification: FCC Part 15 Subpart B, 15.207(a)
Mode of Operation: Continuously transmitting a 310 MHz pulsed signal
Lead Tested: Hot input to AC adapter.
Technician / Date: R. S / November 14, 2006.
Detector / Note: Peak / Peak passed average limit.
FCC ID Number: B4S-VR40A



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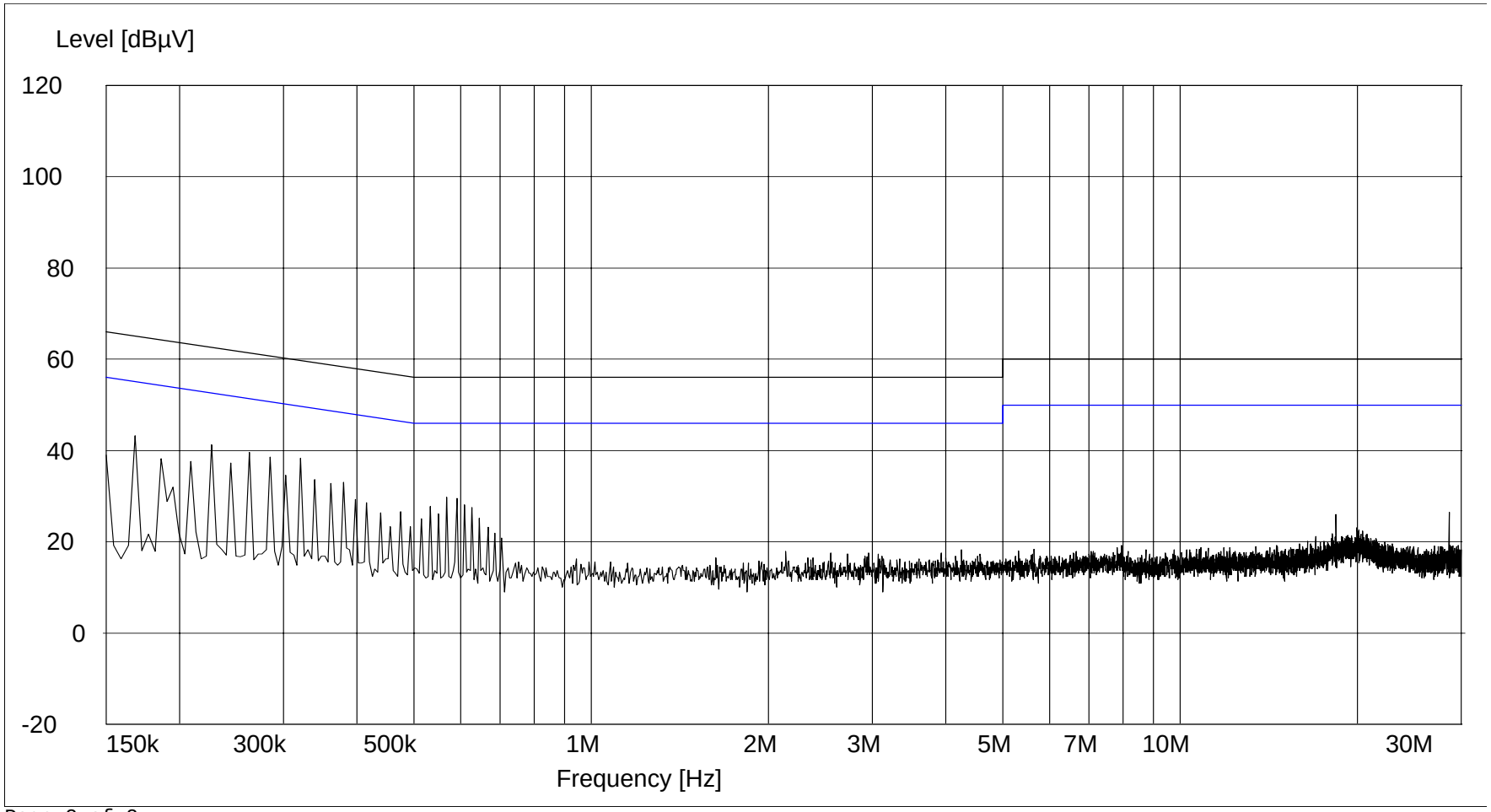
RETLIF Testing Laboratories, Job Number R-11708-3

FCC Part 15 Subpart C, Conducted Emissions, 150 kHz to 30 MHz.

Customer: X-10 (USA), Inc.
Test Sample: 2.4 GHz Wireless Audio / Video Sender with an integrated 310 MHz pulsed transmitter
Model Number: VR40A ; Serial No.: N/A
Test Specification: FCC Part 15 Subpart B, 15.207(a)
Mode of Operation: Continuously transmitting a 310 MHz pulsed signal
Lead Tested: Neutral input to AC adapter.
Technician / Date: R. S / November 14, 2006.
Detector / Note: Peak / Peak passed average limit.
FCC ID Number: B4S-VR40A



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Radiated Emissions, Fundamental and Harmonics
Test Data

Test Method:	FCC Part 15 Subpart C, Radiated Emissions, Fundamental & Harmonic Emissions,		
Customer:	X-10 (USA), Inc.	**Job No.**	R-11708-3
Test Sample:	A 2.4 GHz Receiver with an integrated 310 MHz pulsed Transmitter.		
Model No.:	VR40A	**FCC ID:**	B4S-VR40A
Operating Mode:	Continuously sending a Pulsed 310 MHz signal.		
Technician:	R. Soodoo	**Date:**	November 20, 2006.

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	dBµV	dB	dBµV/m	uV/m	uV/m
310.0	V / 1.0	X	79.1	-4.2	73.1	4518.6	58333.0
|	V / 1.0	Y	80.1	-4.2	75.9	6237.3	|
|	V / 1.0	Z	80.6	-4.2	74.6	5370.3	|
|	H / 1.0	X	82.1	-4.2	77.9	7852.4	|
|	H / 1.0	Y	79.4	-4.2	73.4	4677.4	|
310.0	H / 1.0	Z	81.6	-4.2	77.4	7413.1	58333.0
620.0	V / 1.5	X	43.7	4.0	47.7	242.7	5833.3
|	V / 1.0	Y	45.1	4.0	49.1	285.1	|
|	V / 2.5	Z	42.0	4.0	46.0	199.5	|
|	H / 1.5	X	44.0	4.0	48.0	251.2	|
|	H / 1.0	Y	47.8	4.0	51.8	389.0	|
620.0	H / 1.0	Z	46.9	4.0	50.9	350.8	5833.3
930.0	V / 1.0	X	31.2	8.7	39.9	98.9	5833.3
|	V / 1.0	Y	26.3	8.7	35.0	56.2	|
|	V / 1.0	Z	24.6	8.7	33.3	46.2	|
|	H / 1.0	X	28.1	8.7	36.8	69.2	|
|	H / 1.0	Y	27.8	8.7	36.5	66.8	|
930.0	H / 1.0	Z	21.7	8.7	30.4	33.1	5833.3
1240.0	V / 1.0	X	40.6	4.5	45.1	*179.9	5000.0
|	V / 1.0	Y	40.6	4.5	45.1	*179.9	|
|	V / 1.0	Z	40.6	4.5	45.1	*179.9	|
|	H / 1.0	X	40.6	4.5	45.1	*179.9	|
|	H / 1.0	Y	40.6	4.5	45.1	*179.9	|
1240.0	H / 1.0	Z	40.6	4.5	45.1	*179.9	5000.0
1550.0	V / 1.0	X	40.1	8.7	48.8	*275.4	5000.0
|	V / 1.0	Y	40.1	8.7	48.8	*275.4	|
|	H / 1.0	Z	40.1	8.7	48.8	*275.4	|
|	H / 1.0	X	40.1	8.7	48.8	*275.4	|
|	H / 1.0	Y	40.1	8.7	48.8	*275.4	|
1550.0	V / 1.0	Z	40.1	8.7	48.8	*275.4	5000.0

The frequency range was scanned from 30 MHz to 3.1GHz. All emissions not recorded were more Than 20 dB below the specified limit. Emissions from the EUT do not exceed the specified limits.

*= Noise Floor Measurements (minimum sensitivity).

Test Method:	FCC Part 15 Subpart C, Radiated Emissions, Fundamental & Harmonic Emissions,		
Customer:	X-10 (USA), Inc.	**Job No.**	R-11708-3
Test Sample:	A 2.4 GHz Receiver with an integrated 310 MHz pulsed Transmitter.		
Model No.:	VR40A	**FCC ID:**	B4S-VR40A
Operating Mode:	Continuously sending a Pulsed 310 MHz signal.		
Technician:	R. Soodoo	**Date:**	November 20, 2006.

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	dBµV	dB	dBµV/m	uV/m	uV/m
1860.0	V / 1.0	X	40.1	11.4	51.5	*375.8	5833.3
|	V / 1.0	Y	40.1	11.4	51.5	*375.8	|
|	V / 1.0	Z	40.1	11.4	51.5	*375.8	|
|	H / 1.0	X	40.1	11.4	51.5	*375.8	|
|	H / 1.0	Y	40.1	11.4	51.5	*375.8	|
1860.0	H / 1.0	Z	40.1	11.4	51.5	*375.8	5833.3
2170.0	V / 1.0	X	41.6	0.3	41.9	*124.5	5833.3
|	V / 1.0	Y	41.6	0.3	41.9	*124.5	|
|	V / 1.0	Z	41.6	0.3	41.9	*124.5	|
|	H / 1.0	X	41.6	0.3	41.9	*124.5	|
|	H / 1.0	Y	41.6	0.3	41.9	*124.5	|
2170.0	H / 1.0	Z	41.6	0.3	41.9	*124.5	5833.3
2480.0	V / 1.0	X	41.6	-1.9	39.7	*96.6	5833.3
|	V / 1.0	Y	41.6	-1.9	39.7	*96.6	|
|	V / 1.0	Z	41.6	-1.9	39.7	*96.6	|
|	H / 1.0	X	41.6	-1.9	39.7	*96.6	|
|	H / 1.0	Y	41.6	-1.9	39.7	*96.6	|
2480.0	H / 1.0	Z	41.6	-1.9	39.7	*96.6	5833.3
2790.0	V / 1.0	X	43.8	-1.0	42.8	*138.0	5000.0
|	V / 1.0	Y	43.8	-1.0	42.8	*138.0	|
|	V / 1.0	Z	43.8	-1.0	42.8	*138.0	|
|	H / 1.0	X	43.8	-1.0	42.8	*138.0	|
|	H / 1.0	Y	43.8	-1.0	42.8	*138.0	|
2790.0	H / 1.0	Z	43.8	-1.0	42.8	*138.0	5000.0
3100.0	V / 1.0	X	43.8	-0.5	43.3	*146.2	5833.3
|	V / 1.0	Y	43.8	-0.5	43.3	*146.2	|
|	V / 1.0	Z	43.8	-0.5	43.3	*146.2	|
|	H / 1.0	X	43.8	-0.5	43.3	*146.2	|
|	H / 1.0	Y	43.8	-0.5	43.3	*146.2	|
3100.0	H / 1.0	Z	43.8	-0.5	43.3	*146.2	5833.3

The frequency range was scanned from 30 MHz to 3.1 GHz. All emissions not recorded were more Than 20 dB below the specified limit. Emissions from the EUT do not exceed the specified limits.

*=Noise Floor Measurements (Minimum system sensitivity)

Test Method:	FCC Part 15 Subpart C, Radiated Emissions, Fundamental & Harmonic Emissions,		
Customer:	X-10 (USA), Inc.	**Job No.**	R-11708-3
Test Sample:	A 2.4 GHz Receiver with an integrated 310 MHz pulsed Transmitter.		
Model No.:	VR40A	**FCC ID:**	B4S-VR40A
Operating Mode:	Continuously sending a Pulsed 310 MHz signal.		
Technician:	R. Soodoo	**Date:**	November 20, 2006.

Notes: Test Distance: 3 Meters — Duty Cycle: 25.6%
Detector: Peak, unless otherwise specified — Duty Cycle Correction: -11.8dB

Test Freq.	Antenna Pol./Height	EUT Orientation	Peak Reading	Correction Factor	Corrected Reading	Converted Reading	Avg. Limit
MHz	(V/H)-Meters	X / Y / Z	dBµV	dB	dBµV/m	uV/m	uV/m
310.0	V / 1.0	X	73.1	-11.8	61.3	1161.4	5833.3
|	V / 1.0	Y	75.9	-11.8	64.1	1603.2	|
|	V / 1.0	Z	74.6	-11.8	62.8	1380.4	|
|	H / 1.0	X	77.9	-11.8	66.1	2018.4	|
|	H / 1.0	Y	73.4	-11.8	61.6	1202.3	|
310.0	H / 1.0	Z	77.4	-11.8	65.6	1905.5	5833.3
620.0	V / 1.5	X	47.7	-11.8	35.9	62.4	583.3
|	V / 1.0	Y	49.1	-11.8	37.3	73.3	|
|	V / 2.5	Z	46.0	-11.8	34.2	51.3	|
|	H / 1.5	X	48.0	-11.8	36.2	64.6	|
|	H / 1.0	Y	51.8	-11.8	40.0	100.0	|
620.0	H / 1.0	Z	50.9	-11.8	39.1	90.2	583.3
930.0	V / 1.0	X	39.9	-11.8	28.1	25.4	583.3
|	V / 1.0	Y	35.0	-11.8	23.2	14.5	|
|	V / 1.0	Z	33.3	-11.8	21.5	11.9	|
|	H / 1.0	X	36.8	-11.8	25.0	17.8	|
|	H / 1.0	Y	36.5	-11.8	24.7	17.2	|
930.0	H / 1.0	Z	30.4	-11.8	18.6	8.5	583.3
1240.0	V / 1.0	X	45.1	-11.8	33.3	*46.2	500.0
|	V / 1.0	Y	45.1	-11.8	33.3	*46.2	|
|	V / 1.0	Z	45.1	-11.8	33.3	*46.2	|
|	H / 1.0	X	45.1	-11.8	33.3	*46.2	|
|	H / 1.0	Y	45.1	-11.8	33.3	*46.2	|
1240.0	H / 1.0	Z	45.1	-11.8	33.3	*46.2	500.0
1550.0	V / 1.0	X	48.8	-11.8	37.0	*70.8	500.0
|	V / 1.0	Y	48.8	-11.8	37.0	*70.8	|
|	H / 1.0	Z	48.8	-11.8	37.0	*70.8	|
|	H / 1.0	X	48.8	-11.8	37.0	*70.8	|
|	H / 1.0	Y	48.8	-11.8	37.0	*70.8	|
1550.0	V / 1.0	Z	48.8	-11.8	37.0	*70.8	500.0

The frequency range was scanned from 30 MHz to 3.1GHz. All emissions not recorded were more Than 20 dB below the specified limit. Emissions from the EUT do not exceed the specified limits.

*=Noise Floor Measurements (Minimum system sensitivity)

Test Method:	FCC Part 15 Subpart C, Radiated Emissions, Fundamental & Harmonic Emissions,		
Customer:	X-10 (USA), Inc.	**Job No.**	R-11708-3
Test Sample:	A 2.4 GHz Receiver with an integrated 310 MHz pulsed Transmitter.		
Model No.:	VR40A	**FCC ID:**	B4S-VR40A
Operating Mode:	Continuously sending a Pulsed 310 MHz signal.		
Technician:	R. Soodoo	**Date:**	November 20, 2006.

Notes: Test Distance: 3 Meters — Duty Cycle: 25.6%
Detector: Peak, unless otherwise specified — Duty Cycle Correction: -11.8dB

Test Freq.	Antenna Pol./Height	EUT Orientation	Peak Reading	Correction Factor	Corrected Reading	Converted Reading	Avg. Limit
MHz	(V/H)-Meters	X / Y / Z	dBµV	dB	dBµV/m	uV/m	uV/m
1860.0	V / 1.0	X	51.5	-11.8	39.7	*96.6	583.3
|	V / 1.0	Y	51.5	-11.8	39.7	*96.6	|
|	V / 1.0	Z	51.5	-11.8	39.7	*96.6	|
|	H / 1.0	X	51.5	-11.8	39.7	*96.6	|
|	H / 1.0	Y	51.5	-11.8	39.7	*96.6	|
1860.0	H / 1.0	Z	51.5	-11.8	39.7	*96.6	583.3
2170.0	V / 1.0	X	41.9	-11.8	30.1	*32.0	583.3
|	V / 1.0	Y	41.9	-11.8	30.1	*32.0	|
|	V / 1.0	Z	41.9	-11.8	30.1	*32.0	|
|	H / 1.0	X	41.9	-11.8	30.1	*32.0	|
|	H / 1.0	Y	41.9	-11.8	30.1	*32.0	|
2170.0	H / 1.0	Z	41.9	-11.8	30.1	*32.0	583.3
2480.0	V / 1.0	X	39.7	-11.8	27.9	*24.8	583.3
|	V / 1.0	Y	39.7	-11.8	27.9	*24.8	|
|	V / 1.0	Z	39.7	-11.8	27.9	*24.8	|
|	H / 1.0	X	39.7	-11.8	27.9	*24.8	|
|	H / 1.0	Y	39.7	-11.8	27.9	*24.8	|
2480.0	H / 1.0	Z	39.7	-11.8	27.9	*24.8	583.3
2790.0	V / 1.0	X	42.8	-11.8	31.0	*35.5	500.0
|	V / 1.0	Y	42.8	-11.8	31.0	*35.5	|
|	V / 1.0	Z	42.8	-11.8	31.0	*35.5	|
|	H / 1.0	X	42.8	-11.8	31.0	*35.5	|
|	H / 1.0	Y	42.8	-11.8	31.0	*35.5	|
2790.0	H / 1.0	Z	42.8	-11.8	31.0	*35.5	500.0
3100.0	V / 1.0	X	43.3	-11.8	31.5	*37.6	583.3
|	V / 1.0	Y	43.3	-11.8	31.5	*37.6	|
|	V / 1.0	Z	43.3	-11.8	31.5	*37.6	|
|	H / 1.0	X	43.3	-11.8	31.5	*37.6	|
|	H / 1.0	Y	43.3	-11.8	31.5	*37.6	|
3100.0	H / 1.0	Z	43.3	-11.8	31.5	*37.6	583.3

The frequency range was scanned from 30 MHz to 3.1 GHz. All emissions not recorded were more Than 20 dB below the specified limit. Emissions from the EUT do not exceed the specified limits.

*=Noise Floor Measurements (Minimum system sensitivity)

Radiated Emissions, Spurious
Test Data

Test Method:	FCC Part 15 Subpart C, Spurious Case Radiated Emissions, Paragraph 15.209(a).		
Customer:	X-10 (USA), Inc.	**Job No.**	R-11708-3
Test Sample:	2.4GHz Wireless Audio / Video Sender with an Integrated 310 MHz Superregenerative		
Model No.:	VR40A	**FCC ID:**	B4S-VR40A
Operating Mode:	Continuously sending a Pulsed 310 MHz signal.		
Technician:	R. Soodoo	**Date:**	November 20, 2006.

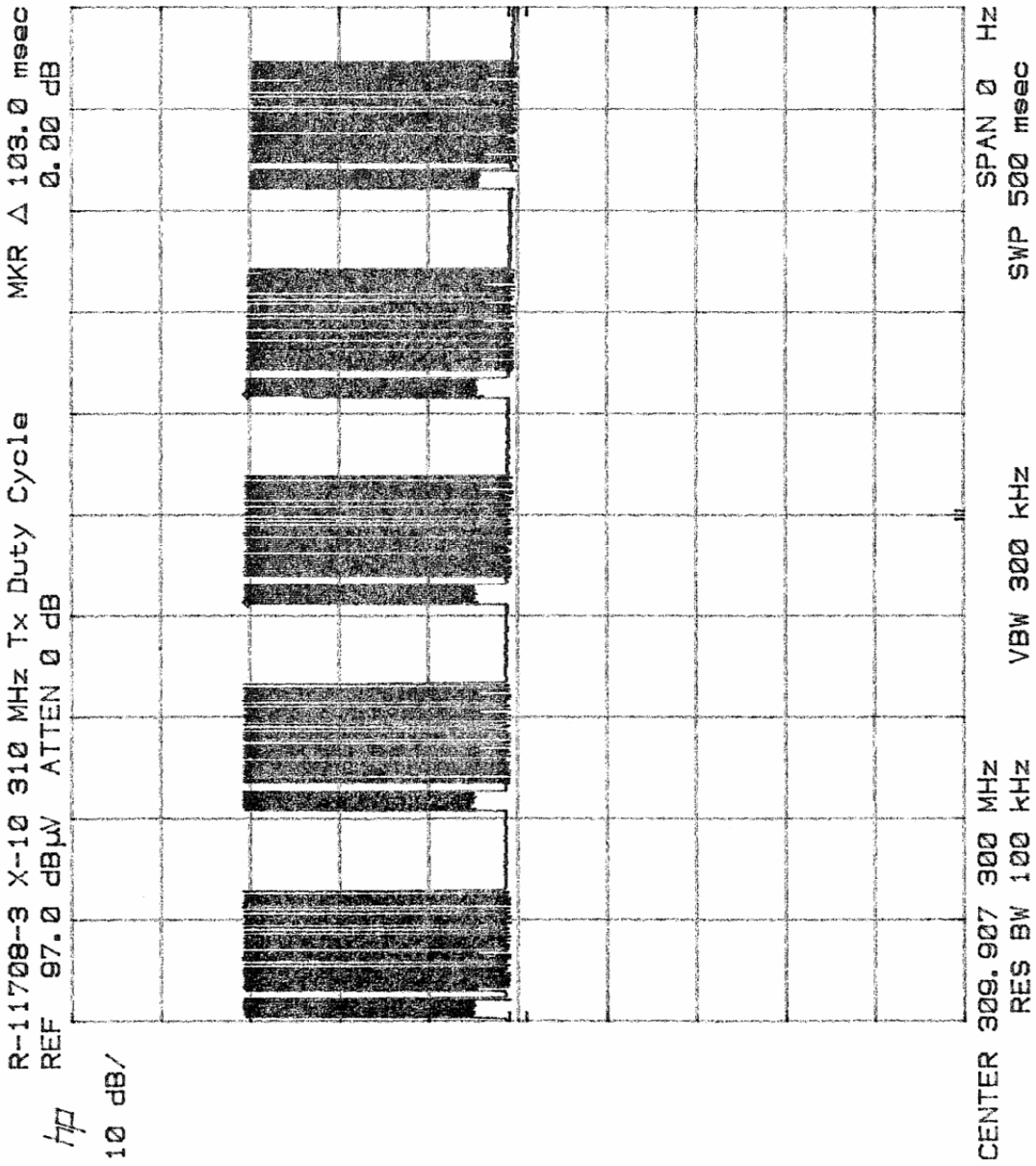
Notes: Test Distance: 3 Meters Temp: 14°C Humidity: 26%
Detector: Quasi-Peak from 30 MHz to 1 GHz, Peak above 1 GHz

Frequency	Antenna Position	EUT Orientation	Meter Readings	Correction Factor	Corrected Reading	Converted Reading	Limit
MHz	(V/H) /	Degrees	dBuV	dB	dBµV/m	µV /m	µV /m
30							100
85.90	V / 1.0	0.0	16.0	8.3	24.3	16.4	
88							100
88							150
171.8	V / 1.0	270.0	9.0	10.7	19.7	9.7	
216							150
216							200
960							200
960							500
3100							500

The frequency range was scanned from 30 MHz to 3.1 GHz.
The emissions observed from the EUT do not exceed the specified limits.
Emissions not recorded were more than 20dB under the specified limit.

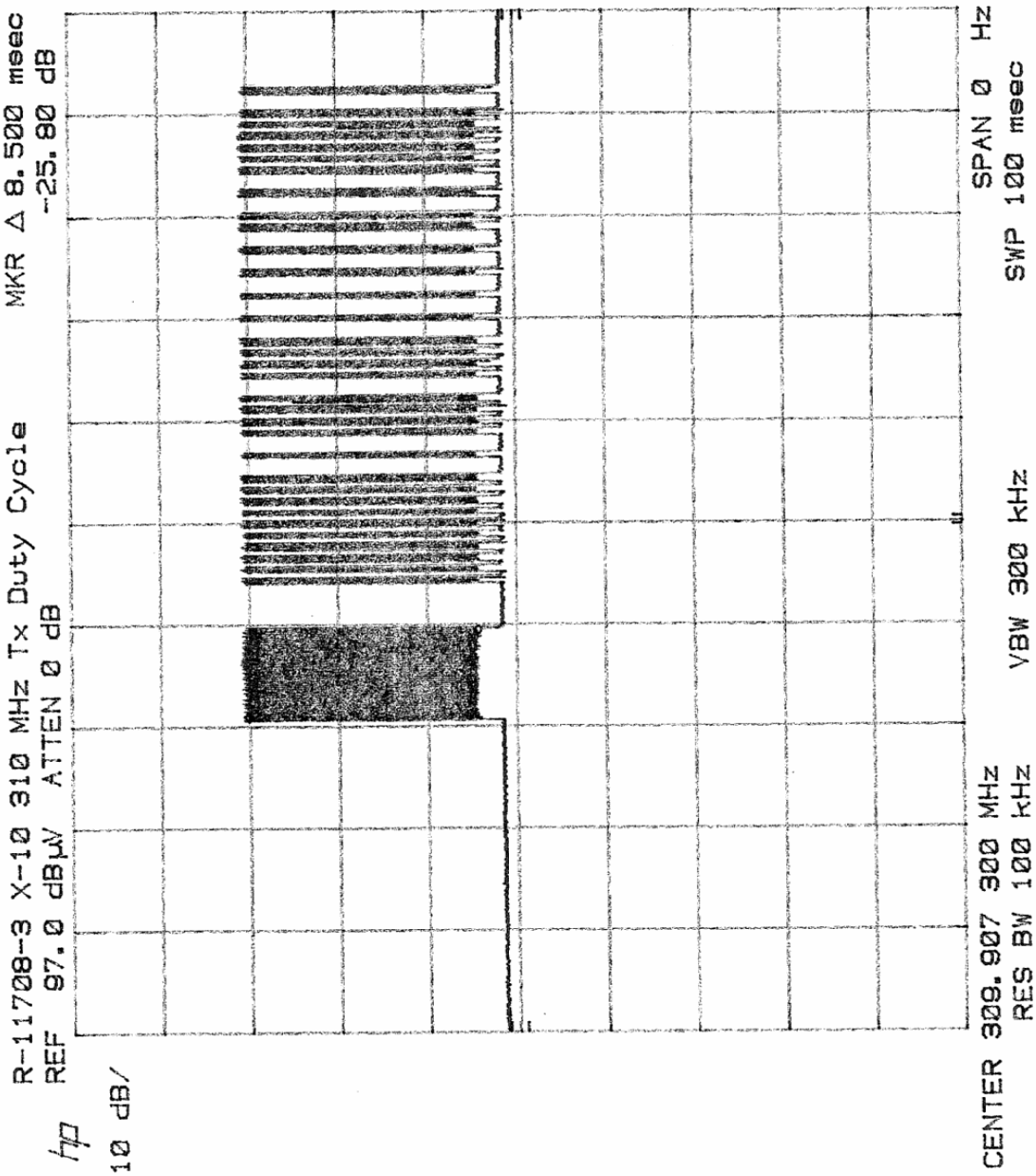
Page 1 of 1

Duty Cycle
Test Data



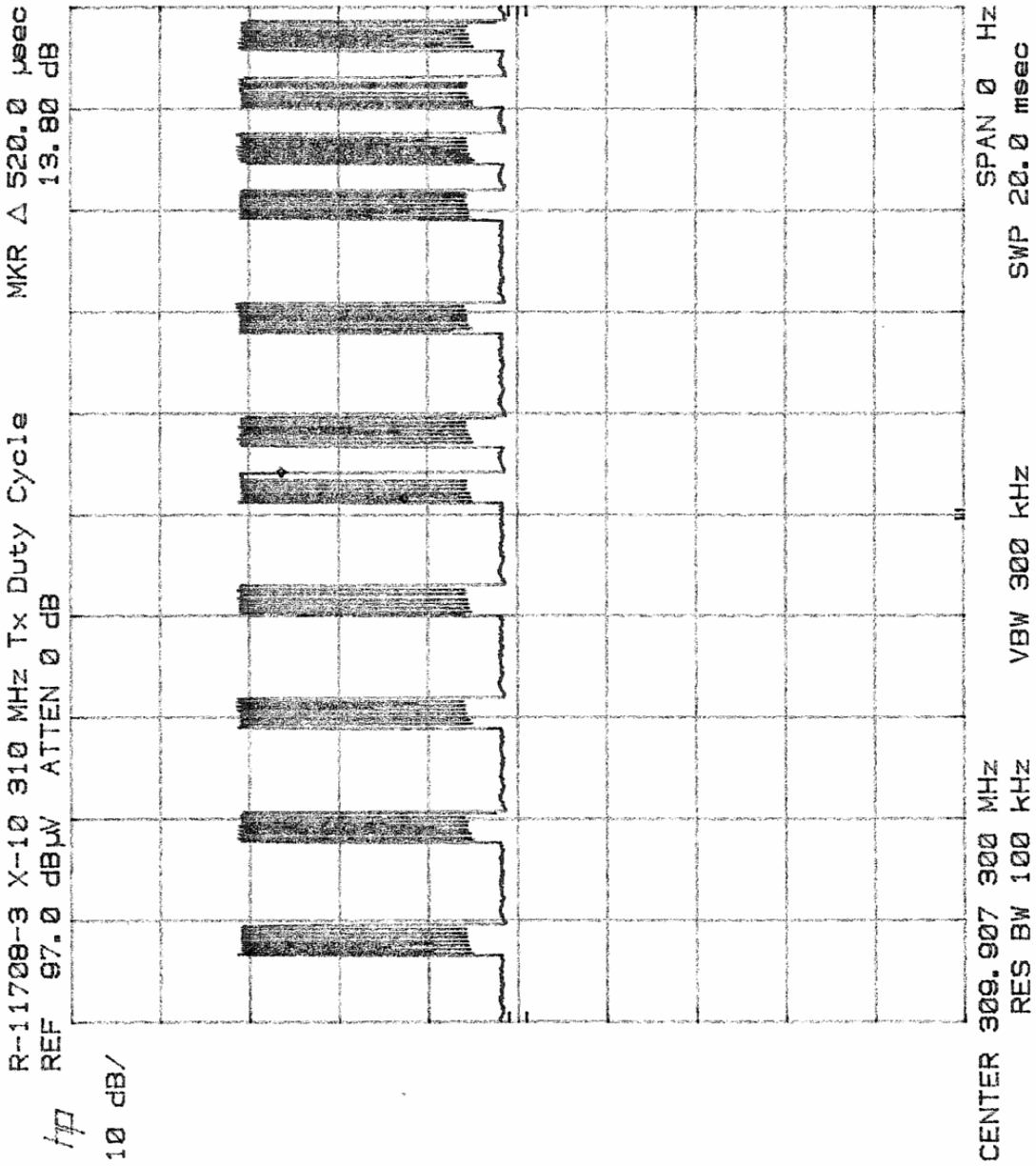
Test Method: FCC Part 15.35, Duty Cycle Determination.
Notes: Measurement of cycle time = 103 mSec.

Customer	X-10 (USA), Inc	
Test Sample	2.4 GHz Wireless Audio / Video Sender with 310 MHz pulsed transmitter.	
Model Number	VR40A	
Date: 11-16-06	Tech: R.S.	Sheet 1 of 4



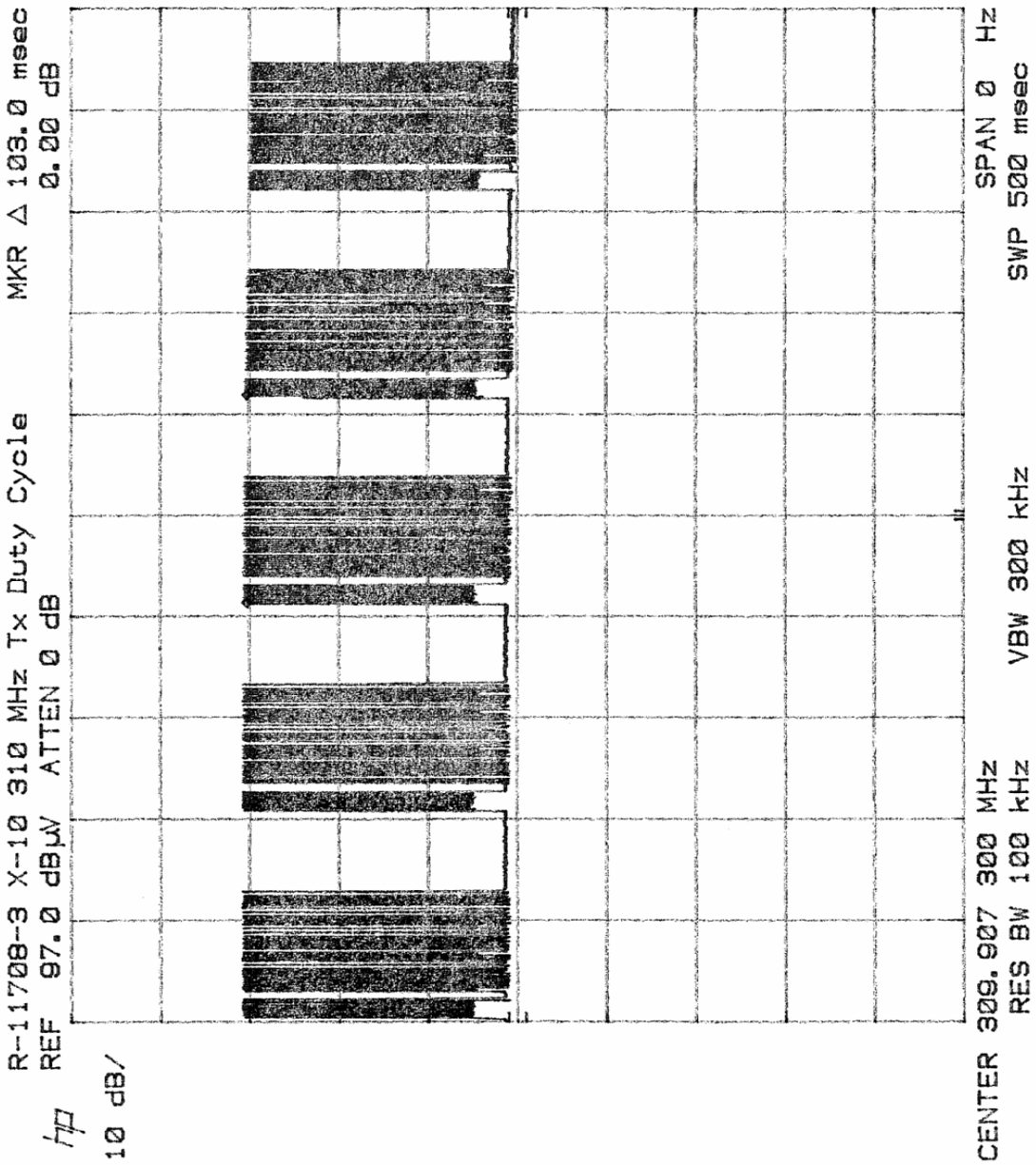
Test Method: FCC Part 15.35, Duty Cycle Determination.
Notes: Measurement of 1 large pulse = 8.5 mSec.

Customer	X-10 (USA), Inc	
Test Sample	2.4 GHz Wireless Audio / Video Sender with 310 MHz pulsed transmitter.	
Model Number	VR40A	
Date: 11-16-06	Tech: R.S.	Sheet 2 of 4



Test Method: FCC Part 15.35, Duty Cycle Determination.
Notes: Measurement of 1 small pulse = 520µSec.
Measurements of 33 small pulses = 33(520µSec) = 17.16mSec.

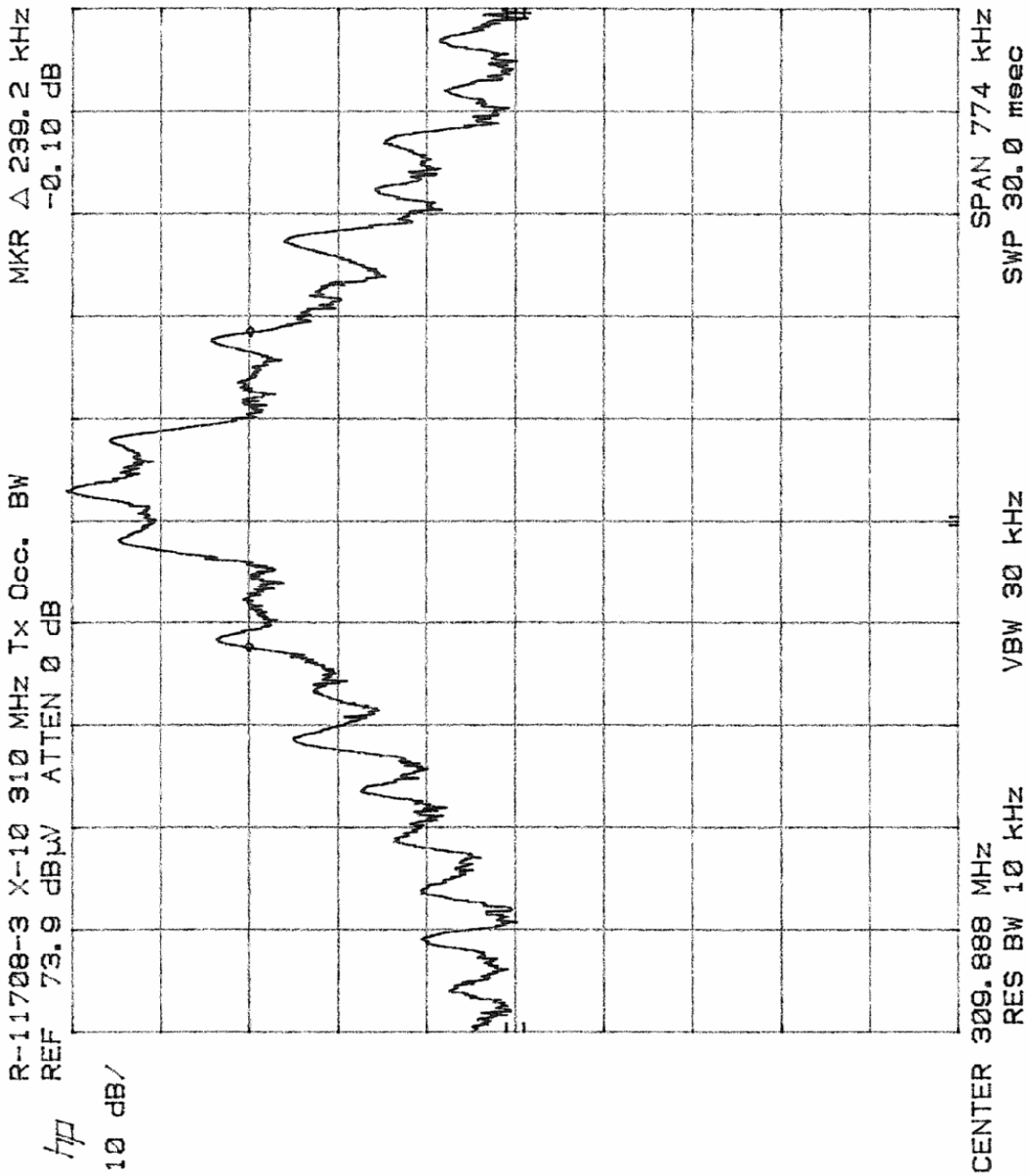
Customer	X-10 (USA), Inc	
Test Sample	2.4 GHz Wireless Audio / Video Sender with 310 MHz pulsed transmitter.	
Model Number	VR40A	
Date: 11-16-06	Tech: R.S.	Sheet 3 of 4



Test Method: FCC Part 15.35, Duty Cycle Determination.
Notes: Duty cycle = (1)(8.5mSec) + (33) (520µSec) = 2.56 mSec.
Duty cycle = (25.6 msec//100ms = 0.256) 20 log 0.256 = -11.8 dB

Customer	X-10 (USA), Inc	
Test Sample	2.4 GHz Wireless Audio / Video Sender with 310 MHz pulsed transmitter.	
Model Number	VR40A	
Date: 11-16-06	Tech: R.S.	Sheet 4 of 4

Occupied Bandwidth
Test Data



Test Method: FCC Part 15, Subpart C, 15.231(c), Occupied Bandwidth.
Notes: Occupied Bandwidth measured 239.2 kHz, does not exceed 0.25% of center frequency at the 20 dBc points (775 kHz)

Customer	X-10 (USA), Inc.	
Test Sample	2.4 GHz Wireless Audio / Video Sender with 310 MHz pulsed transmitter.	
Model Number	VR40A	
Date: 11-16-06	Tech: R.S.	Sheet 1 of 1