APPLICANT	MANUFACTURER
X-10 USA, Inc. 19823, 58th Place S Kent, WA 98032	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 C63.4:2003

TEST SAMPLE DESCRIPTION

BRANDNAME: X10

MODEL: KR33A

TYPE: Pulsed Transmitter

POWER REQUIREMENTS: 6 VDC via (2) CR2016 Lithium Batteries

FREQUENCY OF OPERATION: 310 MHz

TESTS PERFORMED

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

REPORT OF MEASUREMENTS

Applicant:	X-10 (USA), Inc.
Device:	Pulsed Transmitter
FCC ID:	B4S-DS11A
Power Requirements:	6 VDC via (2) CR2016 Lithium Batteries
Applicable Rule Section:	Part 15, Subpart C, Section 15.231

TEST RESULTS

15.231 (a): This device 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.

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	=	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 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 = 37.9 milliseconds (maximum)

Transmitter Cycle Time = 203.1 milliseconds

Transmitter Duty Cycle = 37.9 %

CALCULATION:

2 Large Pulse	=	2(8.8)=17.6 milliseconds
39 x 520 µs (small pulse)	=	20.3 milliseconds
17.6+20.3	=	37.9 milliseconds
Duty Cycle (37.9/100)	=	37.9 %
Correction Factor = 20 log(0.30)	=	-8.4 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:

Setting pulse desensitization equal to zero and utilizing the minimum observed pulse width of 500 µs yields a minimum required bandwidth of 1333 Hz. FCC specified bandwidths of 100 kHz 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 3.1 GHz. All emissions not reported were more than 20 dB below the specified limit.

EQUIPMENT LIST
FCC Part 15/C Spurious, Fundamental & Harmonic Radiated Emissions

EN	Type	Manufacturer	Description	Model No.	Cal Date	Due
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
141	Spectrum Analyzer	Hewlett Packard	100 Hz - 40 GHz	8566B	8/5/2004	2/5/2005
141B	Quasi-Peak Adaptor	Hewlett Packard	100 Hz - 1 GHz	85650A	8/7/2004	2/7/2005
206B	6.0 dB Attenuator	Texscan	0 - 1.0 GHz	FP-50 - 6 dB	6/12/2004	6/12/2005
543	Preamplifier	Hewlett Packard	1.0 GHz - 26.5 GHz	8449B	7/27/2004	7/27/2005
723	H.P. Filter	Mini-Circuits	1 GHz	BHP-1000	7/14/2004	7/14/2005
067	Open Area Test Site	Retlif	3 Meter	RNY	10/1/2003	10/1/2006

FCC 15.231(b)
RADIATED EMISSIONS, FUNDAMENTAL & SPURIOUS CASE

Test Method:	FCC Part 15 Subpart C Radiated Emissions, Fundamental & Harmonic Emissions		
Customer:	X-10 Wireless Technology, Inc.	**Job No.**	R-10715-1
Test Sample:	Pulsed 310MHz Transmitter	**Paragraph:**	15.231
Model No.:	KR33A	**FCC ID:**	B4S-KR33A
Operating Mode:	Continuously Transmitting a pulsed 310 MHz signal		
Technician:	R. Soodoo	**Date:**	January 3, 2005.

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	V / 1.0	X	56.0	-4.0	52.0	398.1	58330
|	V / 1.5	Y	77.8	-4.0	73.8	4897.8	|
|	V / 1.5	Z	77.3	-4.0	73.3	4623.8	|
|	H / 1.0	X	78.7	-3.9	74.8	5495.4	|
|	H / 2.0	Y	71.7	-3.9	67.8	2454.7	|
310	H / 1.0	Z	74.4	-3.9	70.5	3349.7	58330
620	V / 1.0	X	38.5	3.5	42.0	125.9	5833
|	V / 1.5	Y	42.8	3.5	46.3	206.5	|
|	V / 1.5	Z	43.4	3.5	46.9	221.3	|
|	H / 1.0	X	47.3	2.6	49.9	312.6	|
|	H / 1.0	Y	41.8	2.6	44.4	166.0	|
620	H / 1.5	Z	40.8	2.6	43.4	147.9	5833
930	V / 1.25	X	23.4	8.5	31.9	39.4	5833
|	V / 1.0	Y	27.8	8.5	36.3	65.3	|
|	V / 1.0	Z	34.6	8.5	43.1	142.9	|
|	H / 1.0	X	24.9	8.4	33.3	46.2	|
|	H / 1.5	Y	26.8	8.4	35.2	57.5	|
930	H / 1.75	Z	26.6	8.4	35.0	56.2	5833
1240	V / 1.0	X	43.6	3.8	50.1	319.9*****	5000
|	V / 1.0	Y	43.6	3.8	47.4	234.4*****	|
|	V / 1.0	Z	47.2	3.8	51.0	354.8	|
|	H / 1.0	X	41.0	3.8	44.8	173.8	|
|	H / 1.0	Y	39.9	3.8	43.7	153.1	|
1240	H / 1.0	Z	38.2	3.8	42.0	125.9	5000
1550	V / 1.0	X	43.6	8.7	52.3	412.1*	5000
|	V / 1.0	Y	43.6	8.7	52.3	412.1*	|
|	V / 1.0	Z	43.6	8.7	52.3	412.1*	|
|	H / 1.0	X	33.7	7.7	41.4	117.5*	|
|	H / 1.0	Y	33.7	7.7	41.4	117.5*	|
1550	H / 1.0	Z	33.7	7.7	41.4	117.5*	5000

The Frequency Range was scanned from the first to the tenth harmonic. All emissions not reported herein are at least 20 dB below the specified limit. The EUT complies with the applicable limit.

*=Noise Floor Measurements (Minimum system sensitivity)

Test Method:	FCC Part 15 Subpart C Radiated Emissions, Fundamental & Harmonic Emissions		
Customer:	X-10 Wireless Technology, Inc.	**Job No.**	R-10715-1
Test Sample:	Pulsed 310MHz Transmitter	**Paragraph:**	15.231
Model No.:	KR33A	**FCC ID:**	B4S-KR33A
Operating Mode:	Continuously Transmitting a pulsed 310 MHz signal		
Technician:	R. Soodoo	**Date:**	January 3, 2005.
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	42.6	11.1	53.7	484.2*	5833
|	H / 1.0	Y	42.6	11.1	53.7	484.2*	|
|	H / 1.0	Z	42.6	11.1	53.7	484.2*	|
|	V / 1.0	X	32.6	10.2	42.8	138.0*	|
|	V / 1.0	Y	32.6	10.2	42.8	138.0*	|
1860	V / 1.0	Z	32.6	10.2	42.8	138.0*	5833
2170	H / 1.0	X	28.0	1.7	29.7	30.5*	5833
|	H / 1.0	Y	28.0	1.7	29.7	30.5*	|
|	H / 1.0	Z	28.0	1.7	29.7	30.5*	|
|	V / 1.0	X	28.8	1.7	30.5	33.5*	|
|	V / 1.0	Y	28.8	1.7	30.5	33.5*	|
2170	V / 1.0	Z	28.8	1.7	30.5	33.5*	5833
2480	H / 1.0	X	28.0	3.8	31.8	38.9*	5833
|	H / 1.0	Y	28.0	3.8	31.8	38.9*	|
|	H / 1.0	Z	28.0	3.8	31.8	38.9*	|
|	V / 1.0	X	28.8	3.8	32.6	42.7*	|
|	V / 1.0	Y	28.8	3.8	32.6	42.7*	|
2480	V / 1.0	Z	28.8	3.8	32.6	42.7*	5833
2790	H / 1.0	X	28.0	5.1	33.1	45.2*	5000
|	H / 1.0	Y	28.0	5.1	33.1	45.2*	|
|	H / 1.0	Z	28.0	5.1	33.1	45.2*	|
|	V / 1.0	X	28.8	5.1	33.9	49.5*	|
|	V / 1.0	Y	28.8	5.1	33.9	49.5*	|
2790	V / 1.0	Z	28.8	5.1	33.9	49.5*	5000
3100	H / 1.0	X	28.0	6.7	34.7	54.3*	5833
|	H / 1.0	Y	28.0	6.7	34.7	54.3*	|
|	H / 1.0	Z	28.0	6.7	34.7	54.3*	|
|	V / 1.0	X	28.8	6.7	35.5	59.6*	|
|	V / 1.0	Y	28.8	6.7	35.5	59.6*	|
3100	V / 1.0	Z	28.8	6.7	35.5	59.6*	5833
	The Frequency Range was scanned from the first to the tenth harmonic. All emissions not reported herein are at least 20 dB below the specified limit. The EUT complies with the applicable limit.						
	*=Noise Floor Measurements (Minimum system sensitivity)						

Test Method:	FCC Part 15 Subpart C Radiated Emissions, Fundamental & Harmonic Emissions		
Customer:	X-10 Wireless Technology, Inc.	**Job No.**	R-10715-1
Test Sample:	Pulsed 310MHz Transmitter	**Paragraph:**	15.231
Model No.:	KR33A	**FCC ID:**	B4S-KR33A
Operating Mode:	Continuously Transmitting a pulsed 310 MHz signal		
Technician:	R. Soodoo	**Date:**	January 3, 2005.

Notes: Test Distance: 3 Meters — Duty Cycle: 37.9%

Detector: Peak, unless otherwise specified — Duty Cycle Correction: -8.4dB

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	V / 1.0	X	52.0	-8.4	43.6	151.4	5833
|	V / 1.5	Y	73.8	-8.4	65.4	1862.1	|
|	V / 1.5	Z	73.3	-8.4	64.9	1757.9	|
|	H / 1.0	X	74.8	-8.4	66.4	2089.3	|
|	H / 2.0	Y	67.8	-8.4	59.4	933.3	|
310	H / 1.0	Z	70.5	-8.4	62.1	1273.5	5833
620	V / 1.0	X	42.0	-8.4	33.6	47.9	583
|	V / 1.5	Y	46.3	-8.4	37.9	78.5	|
|	V / 1.5	Z	46.9	-8.4	38.5	84.1	|
|	H / 1.0	X	49.9	-8.4	41.5	118.9	|
|	H / 1.0	Y	44.4	-8.4	36.0.	63.1	|
620	H / 1.5	Z	43.4	-8.4	35.0	56.2	583
930	V / 1.25	X	31.9	-8.4	23.5	15.0	583
|	V / 1.0	Y	36.3	-8.4	27.9	24.8	|
|	V / 1.0	Z	43.1	-8.4	34.7	54.3	|
|	H / 1.0	X	33.3	-8.4	24.9	17.6	|
|	H / 1.5	Y	35.2	-8.4	26.8	21.9	|
930	H / 1.75	Z	35.0	-8.4	26.6	21.4	583
1240	V / 1.0	X	50.1	-8.4	41.7	121.6*	500
|	V / 1.0	Y	47.4	-8.4	39.0	89.1*	|
|	V / 1.0	Z	51.0	-8.4	42.6	134.9	|
|	H / 1.0	X	44.8	-8.4	36.4	66.1	|
|	H / 1.0	Y	43.7	-8.4	35.3	58.2	|
1240	H / 1.0	Z	42.0	-8.4	33.6	47.9	500
1550	V / 1.0	X	52.3	-8.4	43.9	156.7*	500
|	V / 1.0	Y	52.3	-8.4	43.9	156.7*	|
|	V / 1.0	Z	52.3	-8.4	43.9	156.7*	|
|	H / 1.0	X	41.4	-8.4	33.0	44.7*	|
|	H / 1.0	Y	41.4	-8.4	33.0	44.7*	|
1550	H / 1.0	Z	41.4	-8.4	33.0	44.7*	500
	The Frequency Range was scanned from the first to the tenth harmonic. All emissions not reported herein are at least 20 dB below the specified limit. The EUT complies with the applicable limit.						
	*=Noise Floor Measurements (Minimum system sensitivity)						

Test Method:	FCC Part 15 Subpart C Radiated Emissions, Fundamental & Harmonic Emissions		
Customer:	X-10 Wireless Technology, Inc.	**Job No.**	R-10715-1
Test Sample:	Pulsed 310MHz Transmitter	**Paragraph:**	15.231
Model No.:	KR33A	**FCC ID:**	B4S-KR33A
Operating Mode:	Continuously Transmitting a pulsed 310 MHz signal		
Technician:	R. Soodoo	**Date:**	January 3, 2005.

Notes: Test Distance: 3 Meters — Duty Cycle: 37.9%
Detector: Peak, unless otherwise specified — Duty Cycle Correction: -8.4 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	53.7	-8.4	45.3	184.1*	583
|	H / 1.0	Y	53.7	-8.4	45.3	184.1*	|
|	H / 1.0	Z	53.7	-8.4	45.3	184.1*	|
|	V / 1.0	X	42.8	-8.4	34.4	52.5*	|
|	V / 1.0	Y	42.8	-8.4	34.4	52.5*	|
1860	V / 1.0	Z	42.8	-8.4	34.4	52.5*	583
2170	H / 1.0	X	29.7	-8.4	21.3	11.6*	583
|	H / 1.0	Y	29.7	-8.4	21.3	11.6*	|
|	H / 1.0	Z	29.7	-8.4	21.3	11.6*	|
|	V / 1.0	X	30.5	-8.4	22.1	12.7*	|
|	V / 1.0	Y	30.5	-8.4	22.1	12.7*	|
2170	V / 1.0	Z	30.5	-8.4	22.1	12.7*	583
2480	H / 1.0	X	31.8	-8.4	23.4	14.8*	583
|	H / 1.0	Y	31.8	-8.4	23.4	14.8*	|
|	H / 1.0	Z	31.8	-8.4	23.4	14.8*	|
|	V / 1.0	X	32.6	-8.4	24.2	16.2*	|
|	V / 1.0	Y	32.6	-8.4	24.2	16.2*	|
2480	V / 1.0	Z	32.6	-8.4	24.2	16.2*	583
2790	H / 1.0	X	33.1	-8.4	24.7	17.2*	500
|	H / 1.0	Y	33.1	-8.4	24.7	17.2*	|
|	H / 1.0	Z	33.1	-8.4	24.7	17.2*	|
|	V / 1.0	X	33.9	-8.4	25.5	18.8*	|
|	V / 1.0	Y	33.9	-8.4	25.5	18.8*	|
2790	V / 1.0	Z	33.9	-8.4	25.5	18.8*	500
3100	H / 1.0	X	34.7	-8.4	26.3	20.7*	583
|	H / 1.0	Y	34.7	-8.4	26.3	20.7*	|
|	H / 1.0	Z	34.7	-8.4	26.3	20.7*	|
|	V / 1.0	X	35.5	-8.4	27.1	22.6*	|
|	V / 1.0	Y	35.5	-8.4	27.1	22.6*	|
3100	V / 1.0	Z	35.5	-8.4	27.1	22.6*	583

The Frequency Range was scanned from the first to the tenth harmonic. All emissions not reported herein are at least 20 dB below the specified limit. The EUT complies with the applicable limit.

*=Noise Floor Measurements (Minimum system sensitivity)

Test Method:	FCC Part 15 Subpart C, Spurious Case Radiated Emissions, Paragraph 15.209(a)		
Customer:	X-10 Wireless Technology, Inc	**Job No.**	R-10715-1
Test Sample:	310 MHz RF Transmitter		
Model No.:	KR33A	**FCC ID:**	B4S-KR33A
Operating Mode:	Continuously Transmitting a pulsed 310 MHz Signal		
Technician:	R. Soodoo	**Date:**	January 03, 2005.

Notes: Test Distance: 3 Meters Temp: 13°C Humidity: 76%
Detector: Quasi-Peak Below 1 GHz, Peak above 1 GHz

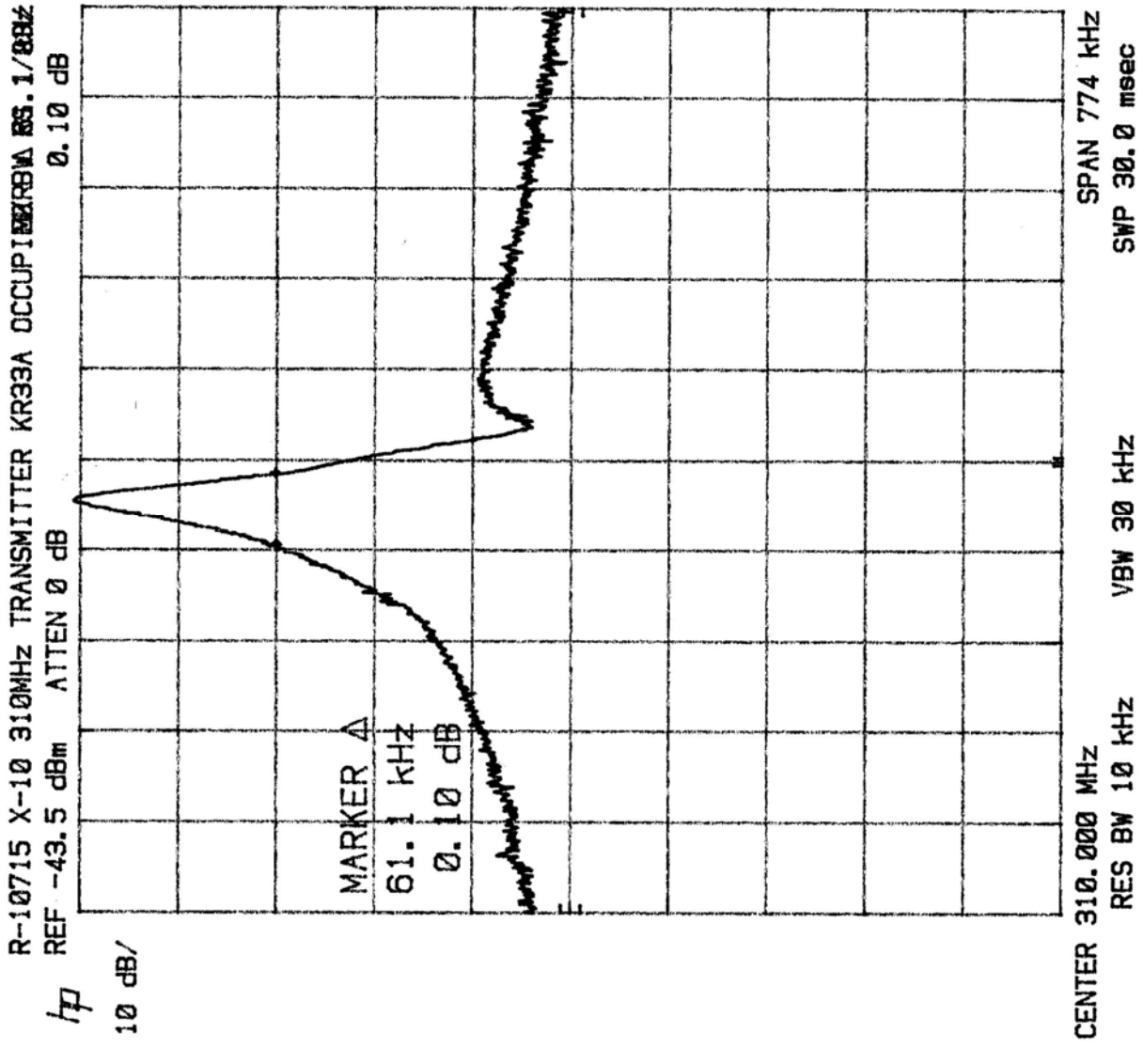
Test Freq.	Antenna Position	EUT Orientation	Meter Readings	Correction Factor	Corrected Reading	Converted Reading	LIMIT
MHz	(V/H) /	Degrees	dBuV	dB	dBuV/m	uV/m	uV/m
30.00							100
|							|
|							|
|							|
|							|
|							|
|							|
88.00							100
88.00							150
|							|
|							|
|	NO EMMISSIONS OBSERVED AT 3 METERS						|
|							|
|							|
|							|
|							|
|							|
216.00							150
216.00							200
|							|
|							|
|							|
960.00							200
960.00							500
|							|
|							|
|							|
3100.0							500

The EUT was scanned from 30 MHz to 3.10 GHz

The emissions observed from the EUT do not exceed the specified limits.

Emissions not recorded were more than 20dB under the specified limit.

FCC 15.231(c)
OCCUPIED BANDWIDTH



Customer:	X-10 Wireless Technology Inc.
Test Sample:	310 MHz Pulsed Transmitter
Model No.:	KR33A, FCC ID: B4S-KR33A
Test Method:	15.231(c) Occupied Bandwidth
Notes:	Bandwidth does not exceed 0.25% of Center Frequency at the 20 dbc points (775KHz)

Date: January 03, 2005. Tech: R.Soodoo Sheet 1 of 2

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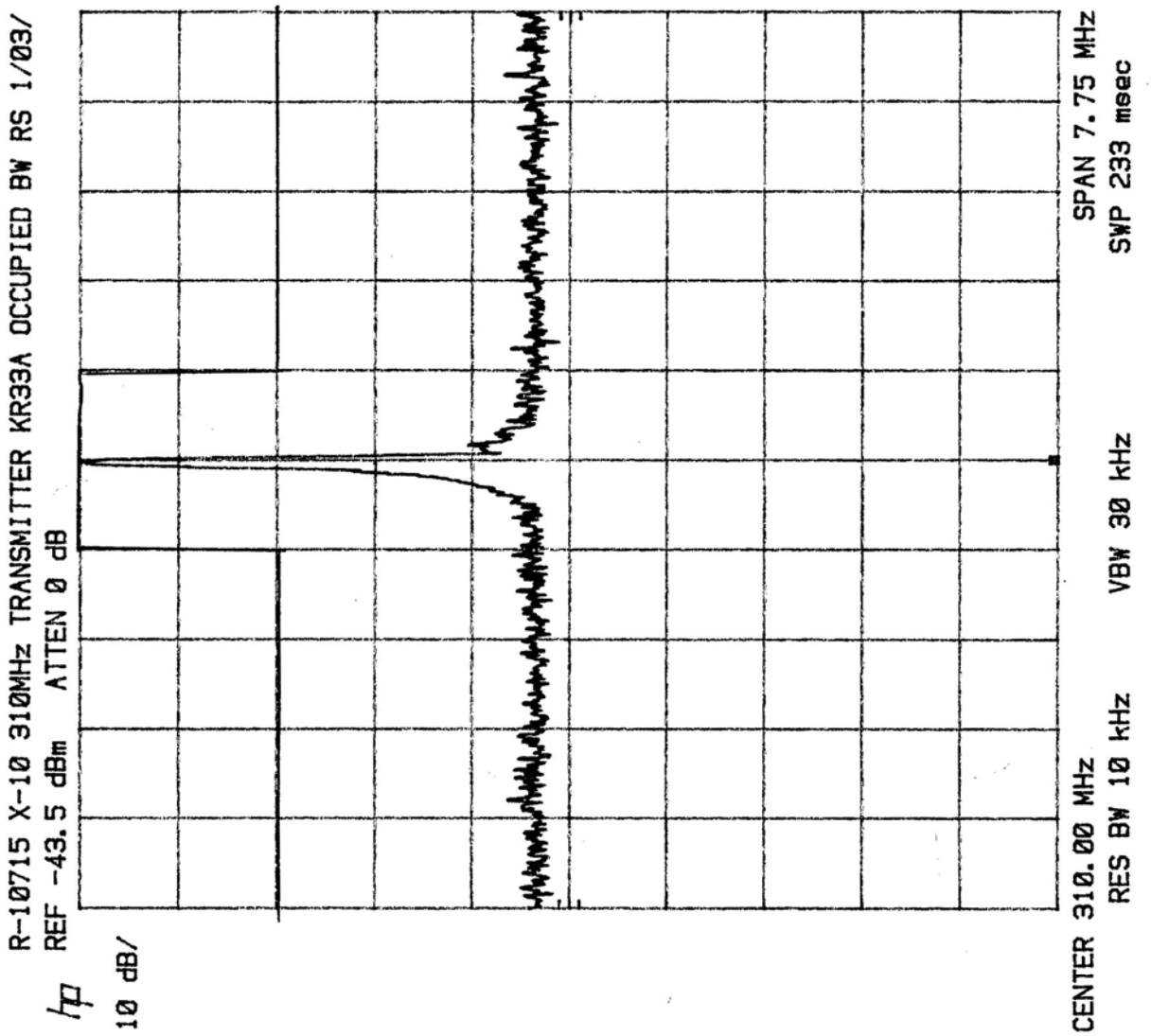
Report No. R-10715-1



Customer:	X-10 Wireless Technology Inc.
Test Sample:	310 MHz Pulsed Transmitter
Model No.:	KR33A, FCC ID : B4S-KR33A
Test Method:	15.231 (c) Occupied Bandwidth.
Notes:	Bandwidth does not exceed 0.25% of Center Frequency at the 20 dbc points (775KHz)

Date: January 03, 2005. Tech: R.Soodoo Sheet 2 of 2

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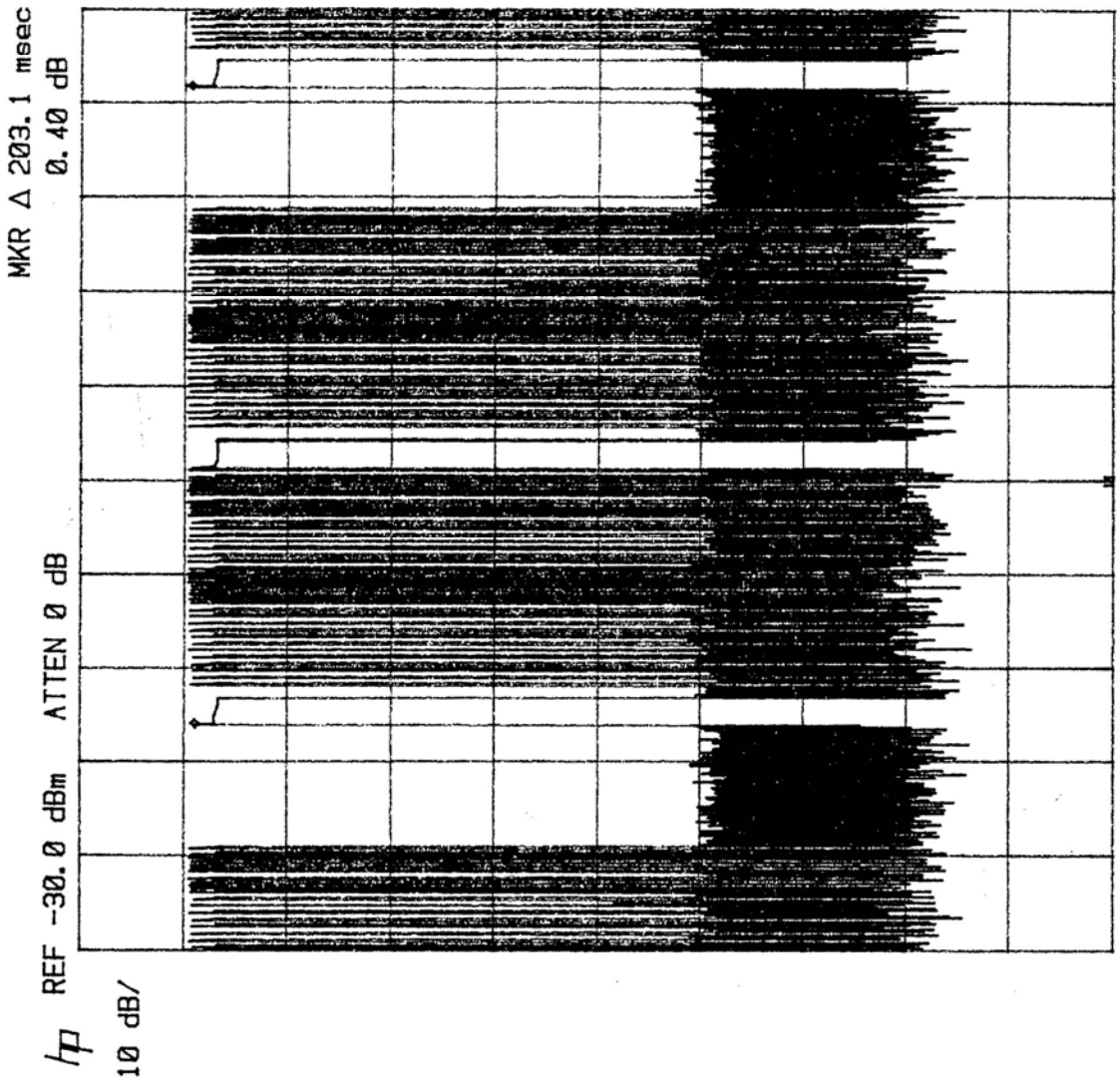
FCC 15.231(c)
DUTY CYCLE



Customer:	X-10 Wireless Technology Inc.
Test Sample:	310 MHz Pulsed Transmitter
Model No.:	KR33A, FCC ID: B4S-KR33A
Test Method:	FCC Part 15.35 Duty Cycle Determination.
Notes:	Measurement of cycle time = 203.1 mSec

Date: January 03, 2005. Tech: R.Soodoo Sheet 1 of 3

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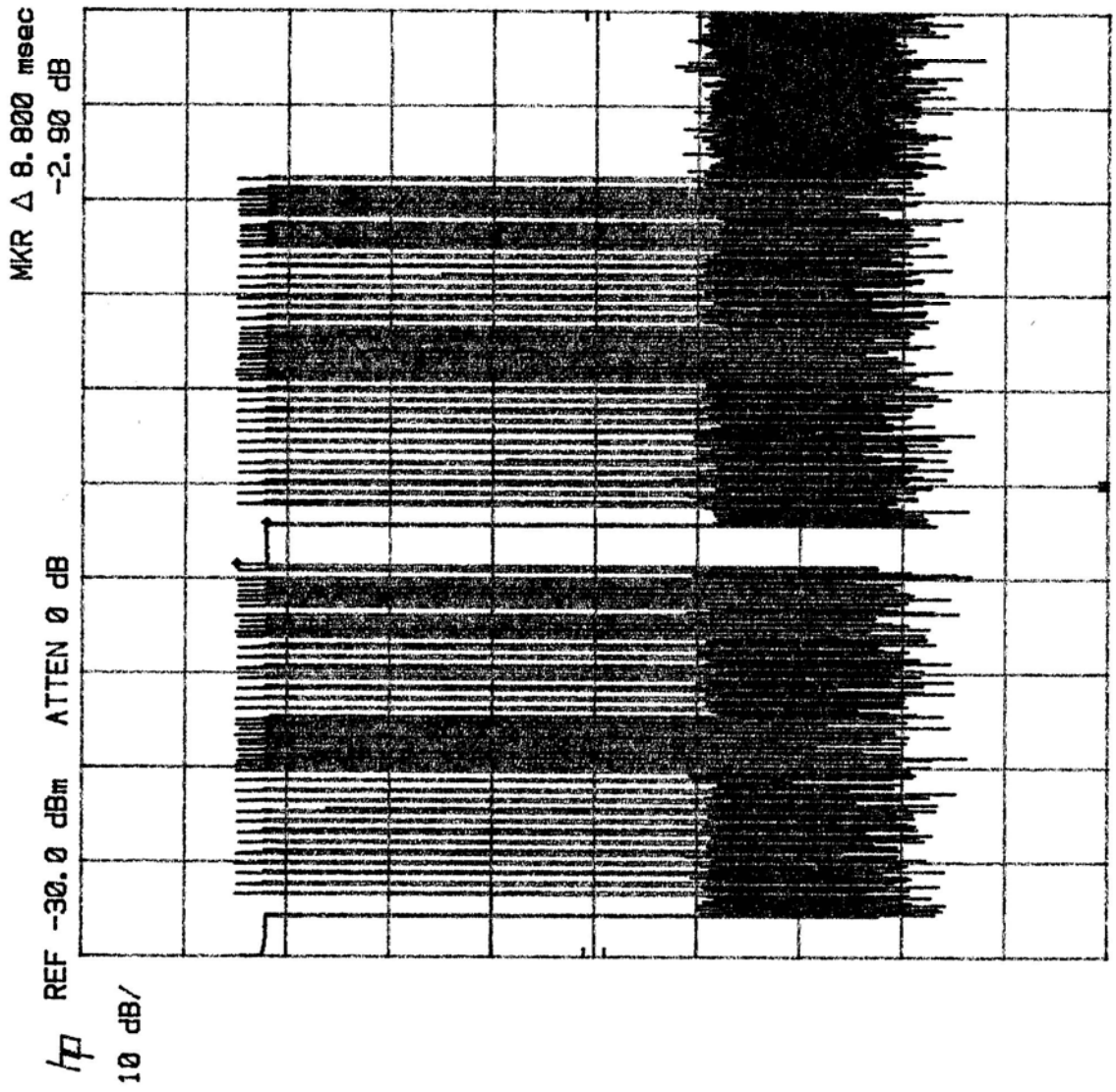
Report No. R-10715-1



Customer:	X-10 Wireless Technology Inc.
Test Sample:	310 MHz Pulsed Transmitter
Model No.:	KR33A, FCC ID: B4S-KR33A
Test Method:	FCC Part 15.35 Duty Cycle Determination.
Notes:	Measurement of 1 large pulse = 8.8 mSec.
	Duty cycle= (2)(8.8) + (39)(0.52) / 100 = 0.379 = 37.9% = -8.4 dB

Date: December 14, 2004 Tech: R.Soodoo Sheet 2 of 3

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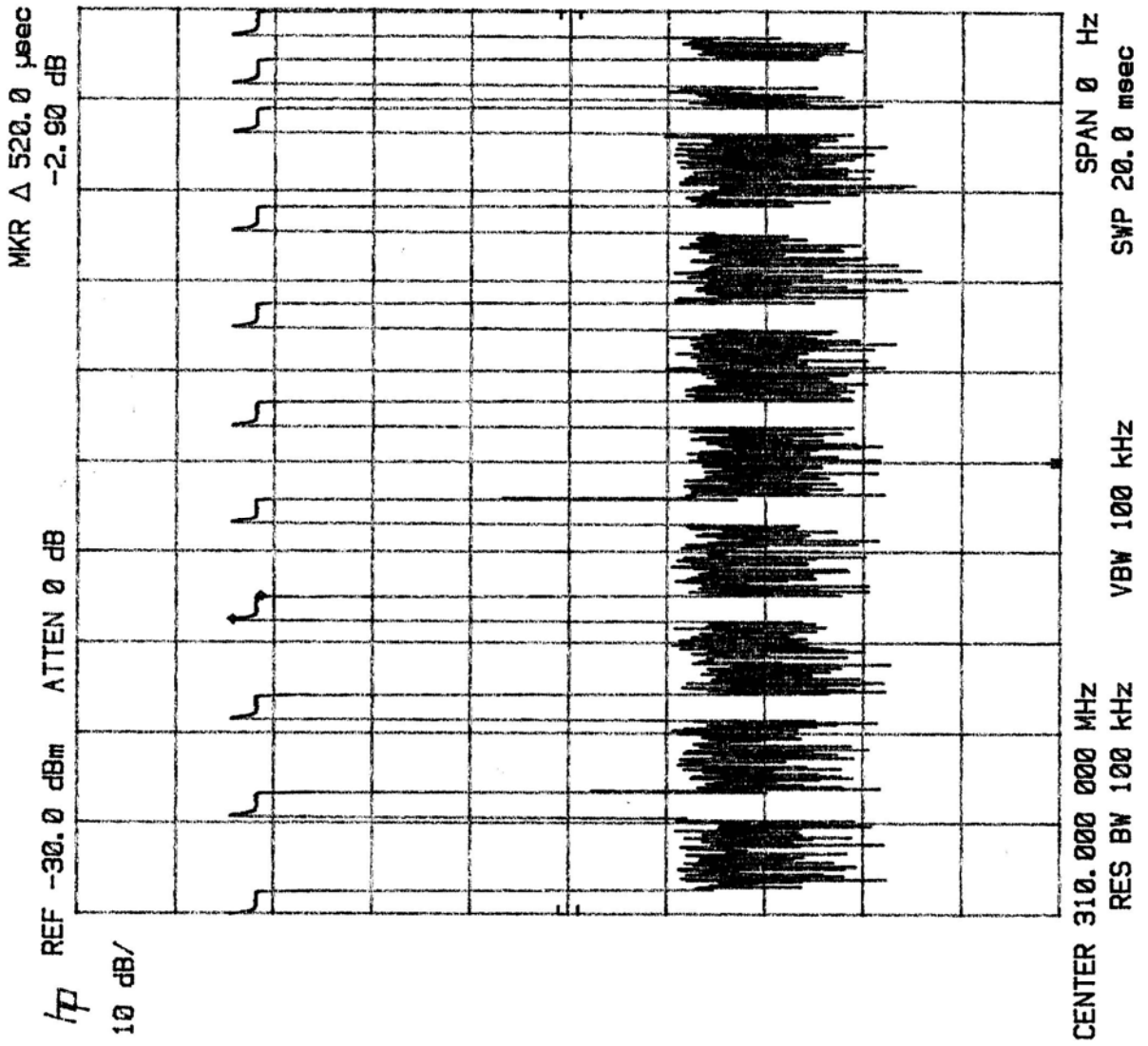
Report No. R-10715-1



Customer:	X-10 Wireless Technology Inc.
Test Sample:	310 MHz Pulsed Transmitter
Model No.:	KR33A, FCC ID: B4S-KR33A
Test Method:	FCC Part 15.35 Duty Cycle Determination.
Notes:	Measurement of 1 small pulse = 0.52 mSec.
	Duty cycle= (2)(8.8) + (39)(0.52) / 100 = 0.379 = 37.9% = -8.4 dB

Date: December 14, 2004 Tech: R.Soodoo Sheet 3 of 3

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Report No. R-10715-1