TEST AND MEASUREMENT EQUIPMENT

The following test and measurement equipment was utilized for the tests documented in this report:

TEST EQUIPMENT LIST				
Description	**Manufacturer**	**Model**	**Asset**	**Cal Due**
Spectrum Analyzer, 26.5 GHz	Agilent / HP	E4440A	C01176	08/10/11
Preamplifier, 26.5 GHz	Agilent / HP	8449B	C00749	07/14/11
Antenna, Horn, 18 GHz	EMCO	3115	C00872	06/29/11
Antenna, Bilog, 2 GHz	Sunol Sciences	JB1	C01171	07/10/11
Preamplifier, 1300 MHz	Agilent / HP	8447D	C00558	01/06/11

FUNDAMENTAL, HARMONICS AND TX SPURIOUS EMISSION (30 – 1000 MHz)

COMPLIANCE Certification Services
FCC, VCCI, CISPR, CE, AUSTEL, NZ
UL, CSA, TUV, BSMI, DHHS, NVLAP
47173 BENICIA STREET, FREMONT, CA 94538
PHONE: (510) 771-1000 FAX: (501) 661-0888

Project #:	10U13382
Report #:	10U13382-1
Date& Time:	8/31/2010
Test Engr:	Vien Tran

Company:	Jonhnson Outdoors, Inc.
EUT Description:	433 MHz Battery-Power Remote Control
Test Configuration :	EUT Batteries Operated .
Type of Test:	FCC 15.231(b)
Mode of Operation:	Continuous Transmit

M% = ((t1+t2+t3+...)/T) = 17.4%

Av Reading = Pk Reading + 20*log(M%)
20 * log (M%) = -15.19 (Max=-20dB)

Freq. (MHz)	Pk Rdg (dBuV)	Av Rdg (dBuV)	AF (dB)	Closs (dB)	Pre-amp (dB)	Pk Level (dBuV/m)	Av Level (dBuV/m)	Pk Limit FCC_B	Av Limit FCC_B	Pk Margin (dB)	Avg Margin (dB)	Pol (H/V)
433.917MHz Fundamental frequency												
EUT At X Position												
433.92	69.59	54.40	15.60	1.80	0.00	86.99	71.80	100.83	80.83	-13.84	-9.03	3mH
433.92	54.85	39.66	15.60	1.80	0.00	72.25	57.06	100.83	80.83	-28.58	-23.77	3mV
EUT At Y Position												
433.92	69.17	53.98	15.60	1.80	0.00	86.57	71.38	100.83	80.83	-14.26	-9.45	3mH
433.92	61.03	45.84	15.60	1.80	0.00	78.43	63.24	100.83	80.83	-22.40	-17.59	3mV
EUT At Z Position												
433.92	67.70	52.51	15.60	1.80	0.00	85.10	69.91	100.83	80.83	-15.73	-10.92	3mH
433.92	66.50	51.31	15.60	1.80	0.00	83.90	68.71	100.83	80.83	-16.93	-12.12	3mV
X-Position is the worst case												
867.80	54.62	39.43	21.70	2.70	28.00	51.02	35.83	80.83	60.83	-29.81	-25.00	3mH
867.80	43.82	28.63	21.70	2.70	28.00	40.22	25.03	80.83	60.83	-40.61	-35.80	3mV

Note: No other emissions were detected above system noise floor from 30 MHz to 1000 MHz.

HARMONICS AND TX SPURIOUS EMISSIONS ABOVE 1GHz

High Frequency Measurement
Compliance Certification Services, Fremont 3m Chamber

Company:	Johnson Outdoors, Inc.
Project #:	10U13382
Date:	08/31/10
Test Engineer:	Vien Tran
Configuration:	EUT Battery Operated
Mode:	Continuous Transmit

Test Equipment:

Horn 1-18GHz	Pre-amplifer 1-26GHz	Pre-amplifer 26-40GHz	Horn > 18GHz	Limit
T60; S/N: 2238 @3m	T34 HP 8449B			FCC 15.209

Hi Frequency Cables

3' cable 22807700	12' cable 22807600	20' cable 22807500	HPF	Reject Filter
3' cable 22807700	12' cable 22807600	20' cable 22807500		

Peak Measurements
RBW=VBW=1MHz
Average Measurements
Average = Peak - Duty Cycle

f GHz	Dist (m)	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Fltr dB	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes (V/H)
1.301	3.0	55.2	40.0	25.5	2.7	-37.8	0.0	0.0	45.5	30.4	74	54	-28.5	-23.6	V
1.739	3.0	63.9	48.7	26.9	3.2	-37.2	0.0	0.0	56.8	41.6	74	54	-17.2	-12.4	V
2.170	3.0	61.9	46.7	27.9	3.6	-36.6	0.0	0.0	56.8	41.6	74	54	-17.2	-12.4	V
2.604	3.0	62.5	47.3	28.6	4.0	-36.2	0.0	0.0	58.9	43.7	74	54	-15.1	-10.3	V
3.037	3.0	52.7	37.5	29.8	4.4	-35.9	0.0	0.0	51.0	35.8	74	54	-23.0	-18.2	V
3.471	3.0	45.9	30.7	30.8	4.7	-35.5	0.0	0.0	46.0	30.8	74	54	-28.0	-23.2	V
3.905	3.0	46.9	31.7	31.8	5.1	-35.1	0.0	0.0	48.8	33.6	74	54	-25.2	-20.4	V
4.339	3.0	52.1	36.9	32.3	5.4	-34.9	0.0	0.0	54.9	39.7	74	54	-19.1	-14.3	V
4.773	3.0	44.3	29.1	32.6	5.8	-34.8	0.0	0.0	47.9	32.7	74	54	-26.1	-21.3	V
1.301	3.0	54.8	39.6	25.5	2.7	-37.8	0.0	0.0	45.1	30.0	74	54	-28.9	-24.0	H
1.739	3.0	57.7	42.5	26.9	3.2	-37.2	0.0	0.0	50.6	35.4	74	54	-23.4	-18.6	H
2.170	3.0	60.9	45.7	27.9	3.6	-36.6	0.0	0.0	55.8	40.6	74	54	-18.2	-13.4	H
2.604	3.0	59.6	44.4	28.6	4.0	-36.2	0.0	0.0	56.0	40.8	74	54	-18.0	-13.2	H
3.037	3.0	52.9	37.7	29.8	4.4	-35.9	0.0	0.0	51.2	36.0	74	54	-22.8	-18.0	H
3.471	3.0	45.7	30.5	30.8	4.7	-35.5	0.0	0.0	45.8	30.6	74	54	-28.2	-23.4	H
3.905	3.0	46.8	31.6	31.8	5.1	-35.1	0.0	0.0	48.7	33.5	74	54	-25.3	-20.5	H
4.339	3.0	48.1	32.9	32.3	5.4	-34.9	0.0	0.0	50.9	35.7	74	54	-23.1	-18.3	H
4.773	3.0	43.1	27.9	32.6	5.8	-34.8	0.0	0.0	46.7	31.5	74	54	-27.3	-22.5	H

f	Measurement Frequency	Amp	Preamp Gain	Avg Lim	Average Field Strength Limit
Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters	Pk Lim	Peak Field Strength Limit
Read	Analyzer Reading	Avg	Average Field Strength @ 3 m	Avg Mar	Margin vs. Average Limit
AF	Antenna Factor	Peak	Calculated Peak Field Strength	Pk Mar	Margin vs. Peak Limit
CL	Cable Loss	HPF	High Pass Filter		